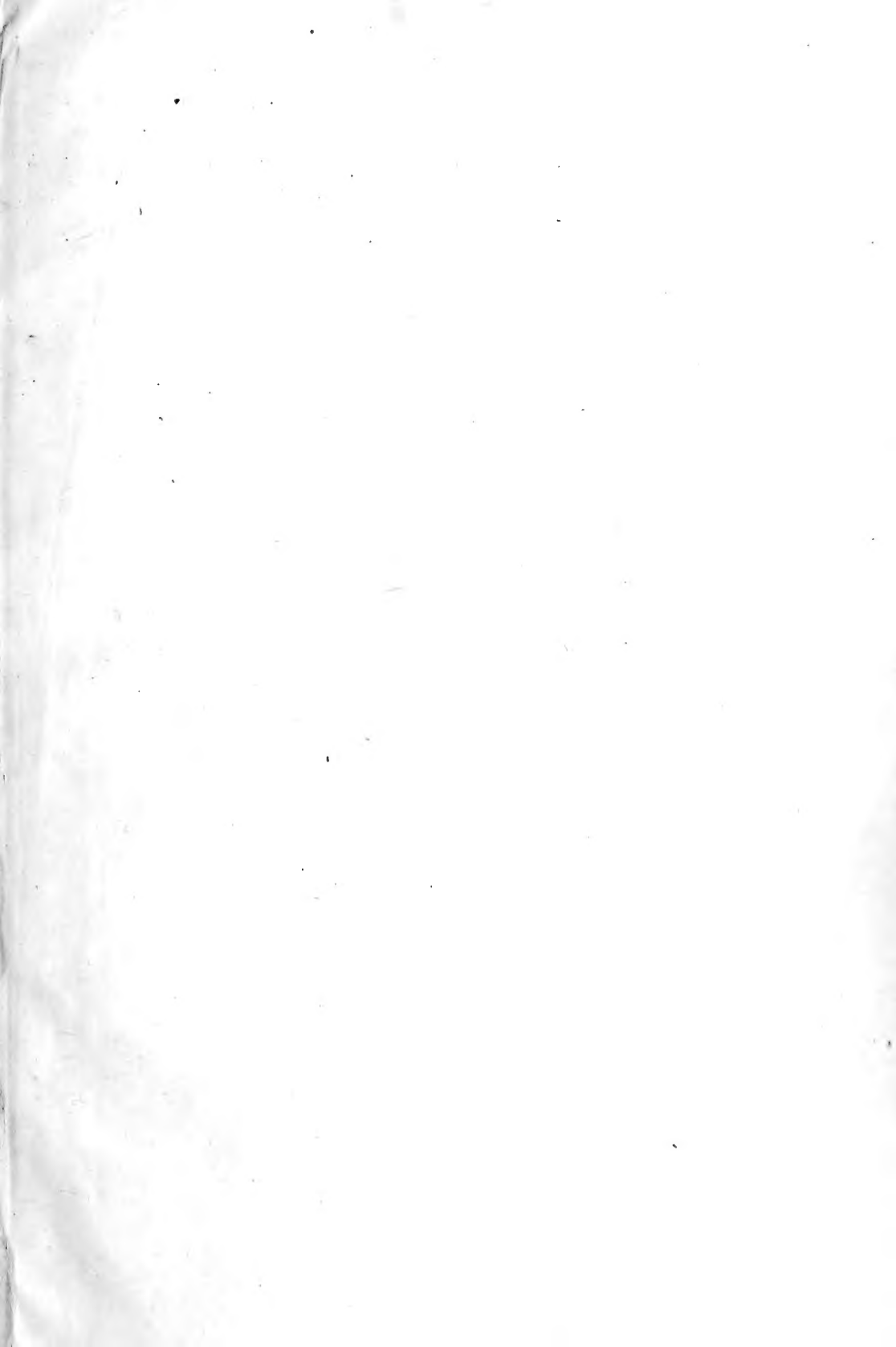
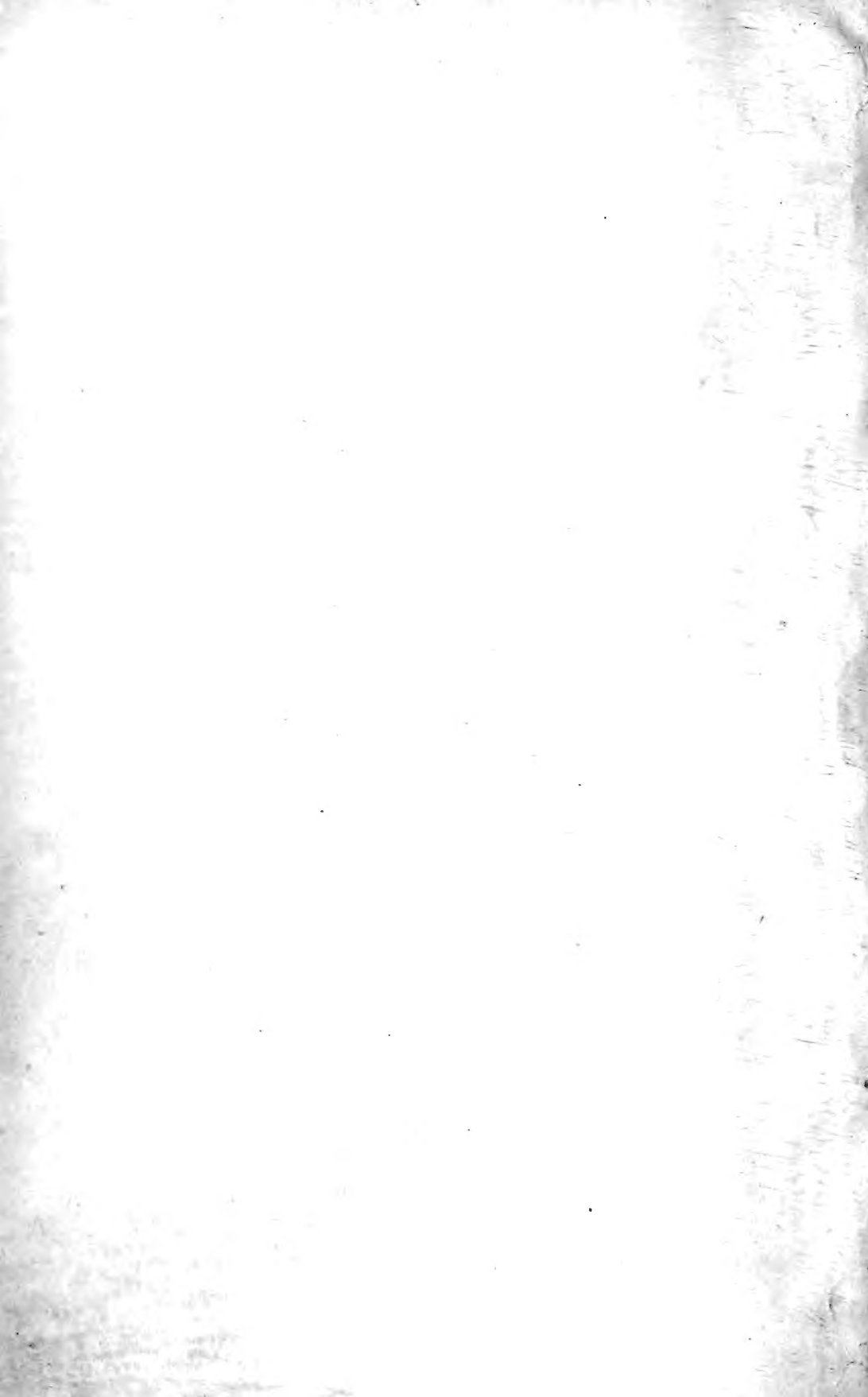




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PREFACE.

IN offering a few remarks by way of Preface to the Volume for 1887 which is concluded with the issue of the present number, the Editor desires to thank very cordially all those contributors who during the past year have given him their support and encouragement. The number and variety of the articles which have been contributed to the present Volume must strike every reader who glances at their titles, no less than the number of full-page illustrations which through the liberality of Mr. Newman have been expressly drawn and lithographed for this Journal. These plates it may be observed, as well as the articles which they have been designed to illustrate, are intended to bring home to the reader a more accurate impression of the actual appearance and habits of some of the smaller British Mammalia, which either from the nature of their haunts or from their retired mode of life are apt to escape the attention of all but the most observant. The plan pursued has been to have the original drawings made from the life if possible, or at least from perfectly fresh specimens while still in the flesh. In this way the natural features are preserved which otherwise would be lost in the process of drying and shrinking.

In the case of the Greenland Whale, *Balæna mysticetus*, the plate of this species issued with the April number was prepared from an original sketch by Capt. David Gray, drawn to scale after careful measurements of a recently captured specimen; so that it would be impossible to have any more satisfactory figure except by the aid of photography, which in the case of so large an animal could not well be applied.

As it is proposed to continue the series (so far as it may extend to the more uncommon species), those who may have opportunities for procuring specimens of such as are needed for illustration will materially aid the scheme by forwarding the same to the Editor. At present the *desiderata* are the rarer specimens of Bats which have not yet been figured in the series, and the three species of British Shrews.

At the same time any notes which may help in tracing the distribution of these mammals in the British Islands, or throw light on their life-history, will be very acceptable.

Attention may be here directed to the fact that comparatively little has been published on the Zoology of Wales, and the Editor notes with regret how few correspondents he has in any of the Welsh Counties. He would urge all those who may have friends in the

Principality, able and willing to undertake an investigation of the fauna of the districts in which they reside, to acquaint them with the desirability of collecting information, and to point out to them the medium which this Journal affords for the publication of their observations.

To a certain extent these remarks will apply to some of the more remote parts of Ireland which, from the naturalist's point of view, are still imperfectly known.

It should be borne in mind that one of the chief objects of this Journal is to aid in the collection of materials for a better knowledge of the British Fauna than at present can be acquired from the perusal of any existing publications. And here it may be observed that the researches of its contributors should not be limited solely to the Vertebrates, but should extend also to the Invertebrates, excepting perhaps the *Insecta*, to the special study of which other journals (the 'Entomologist' and the 'Entomologists' Monthly Magazine') are already particularly devoted.

The recent establishment of a Marine Biological Laboratory at Plymouth cannot fail to be productive of the most important scientific results in this direction; at the same time, naturalists who are resident on other parts of the coast may materially aid the cause of science which such an institution is designed to promote, by communicating the results of their researches into the life-history of many marine forms, especially amongst the Mollusca and Crustacea, about which we are still profoundly ignorant. Unhappily, attention has been too much restricted to an examination of external form, the internal structure being almost entirely neglected. In this direction a wide field of labour remains to be explored.

It need not, however, be supposed that the scope of 'The Zoologist' is limited to the study of British Zoology, although this naturally claims a large share of attention. The Editor is always pleased to receive zoological communications, to whatever part of the world they may relate. It should not be forgotten that the British Islands form but a very small portion of the British Empire, and the more we can learn of the Zoology of other parts of the world, the better shall we be informed of the productions of our own country. In fact, without such extension of knowledge we should know next to nothing of the species which in our lists come under the designation of periodical migrants and accidental visitors.

In offering these few remarks by way of Preface to the volume for 1887, 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.

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Del. et incis. a signat. del.
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The Greater Horse-shoe Bat
Lasiocornis ferrum-equinum

West. Newman & Co. Lith.



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HORSE-SHOE BATS.

BY THE EDITOR.

(PLATE I.)

NOTWITHSTANDING the close attention which is now-a-days paid to British Zoology by observers in all parts of the country, the Bats (with two or three exceptions) are still very imperfectly known. Their crepuscular habits, their rapid movements on the wing, and their retired and frequently inaccessible haunts, render them at all times difficult to procure for identification or examination.

In the last edition of Bell's 'British Quadrupeds' (1874) fourteen species are recognised as British, and are placed in five different genera. Of these the two Horse-shoe Bats belonging to the genus *Rhinolophus* are amongst the rarest or least known. The generic characters indicated by Bell are as follows:—

“Incisors $\frac{2}{4}$; molars $\frac{5-5}{6-6}$. Nostrils with two foliaceous appendages; the posterior one erect and pointed posteriorly, the anterior one horse-shoe shaped, and expanded over the top of the nose. Ears lateral, free; tragus wanting. Wing-membranes extending only to the distal extremity of the tibia; tail short, enclosed in the membrane.”

The use of the singular leaf-like appendage upon the nose has not been satisfactorily determined. Geoffroy supposed it

was intended to close the nostrils when not in use; Bell regards it as a delicate organ of touch, enabling the owner to avoid collisions when threading its way through intricate places.

Two species of the genus are found in the British Islands, the Greater and the Lesser Horse-shoe Bats, *Rhinolophus ferrum-equinum* and *R. hipposideros*. Both are partial to dark caverns and deserted buildings, shunning the light as much as possible, and flying late in the evening until dark.

On the wing the Greater Horse-shoe Bat appears as large as a Noctule, equalling that species in expanse of wing, but to a practised eye it is distinguishable by the proportionately greater width of the flying membrane. It was first made known as a British species by Latham, who procured specimens in the saltpetre-houses at the powder-mills at Dartford, clinging in a torpid state in winter to the roof. Since then it has been met with and procured in several other localities in the southern and western counties of England, including Dorset, Devon, Cornwall, and Glamorganshire, being considered rare in the midland counties, and altogether unknown in the north. (See 'Zoologist,' 1884, p. 483).

The Lesser Horse-shoe Bat, *R. hipposideros*, which was for some time regarded as a small variety of the larger species, was first recognised in England by Montagu, who procured specimens in Wiltshire, and like its larger congener is chiefly restricted to the southern counties of England.

In Ireland the larger species is unknown, but the smaller one has been found in Galway by Prof. King, and in different parts of Clare by Mr. Foot and Prof. Kinahan. (See Proc. Nat. Hist. Soc., Dublin. vol. ii. p. 152, and 'Zoologist,' 1861, p. 7617). All the caves in which specimens were found (in Clare) were in plantations, or near them, and most of them had the entrances hung with plants. From the observations of Prof. Kinahan it appears that the sexes hibernate apart. The particular respects in which the two species of *Rhinolophus* differ have been pointed out by Bell (*op. cit.* p. 100), and need not therefore be repeated here.

As few really good figures of Bats are accessible, those in Bell's work being almost too small to be of much use, it is very desirable that no opportunity should be lost of obtaining correct drawings of the rarer species whenever they can be procured

alive, or in a fresh condition, so as to secure an accurate delineation of the natural features before they become distorted or shrunk in the process of drying. As a first contribution to such a series, we give a plate of *Rhinolophus ferrum-equinum*, drawn by Mr. G. E. Lodge from a living specimen procured by the Rev. H. A. Macpherson in South Devon in August last.

The measurements, taken after death, from another specimen procured at the same time and place, and now preserved in the Natural History Museum, South Kensington, are (compared with the measurements given by Bell) as under :—

Length of head and body -	2·5 in.	Length of humerus	-	1·3 in.
„ tail - - -	1·2 „	„ forearm - -	-	1·9 „
„ head - - -	·9 „	„ longest digit -	-	3·1 „
„ ears - - -	·9 „	„ tibia - - -	-	·9 „
Width of ear - - -	·5 „	Expanse of wing -	-	11·5 „

On comparing these measurements with those given by Bell, it should be noted that the latter are given in inches and lines. The expanse of wing is apparently very variable. One procured in Dorchester by Mr. James Salter measured in extent of wing $14\frac{1}{8}$ inches. The weight of the specimen above referred to from Devonshire was little more than half an ounce the day after death.

ON THE HABITS AND MIGRATIONS OF WILDFOWL.

BY ALFRED CRAWHALL CHAPMAN.

IN Northumberland the autumnal immigration of fowl commences in July, and is continued throughout the remaining months of the year. Waders generally arrive before the migratory ducks and geese, and it is usually the latter end of September before any of the latter appear upon our coasts.

Wigeon are usually the first to make their appearance, and they are, I think, followed by arrivals of foreign-bred Mallard. Then, about the middle of October, the Scaup and Goldeneye arrive, and at any time after this date the resident winter ducks and divers may be looked for. Teal are of course to be found during the month of August and onwards, but

I have not been able to discriminate between home and foreign-bred Teal, and therefore their date of arrival is not easy to define exactly.

This year (1886) the first flight of Wigeon arrived on the 11th September. This is an earlier date than usual for them, and generally they may not be expected for at least ten days to a fortnight later. This was only a small company, however, and not until Sept. 19th did another small lot of about thirty birds arrive. On October 4th several companies arrived on the coast, and after this date there is a constant increment of Wigeon, until their regular winter numbers are made up. It is generally supposed that Wigeon are night-feeding birds, and that they spend the day at rest in some open extent of water, free from molestation. On this coast, however, when they first arrive their habits are very different from this, and they prefer to feed on the ooze during the daytime, spending the night at rest on some secluded pond or lake. I have come to this conclusion after carefully studying their habits, and I have frequently seen them, after quietly feeding all day, leave the ooze just before dusk, and betake themselves to a neighbouring pond, where they spend the night, returning to the ooze to feed shortly after daybreak. During this period, however, their numbers are woefully reduced by punt-gunners, and by the end of November—by which time mostly all the regular winter stock has arrived—they have assumed the habit of feeding almost exclusively by night, spending the day on the open sea.

It would be interesting to know what course they would pursue if left entirely unmolested. From their habits during the early weeks of their arrival I cannot help thinking that they are forced by man to assume a habit at variance with what appears to be their wont, and the same remarks apply to Grey Geese feeding inland, as I hope to show farther on.

Tidal influences, of course, affect the Wigeon, and there is no doubt that during a short winter's day, when their feeding-grounds are submerged, they would resort at night to the uncovered oozes to feed; but, given the opportunity, they unquestionably avail themselves of a diurnal feed, until they are scared away by the deadly fire of punt-gunners.

Moreover, the flocks that arrive first are composed mostly of young birds of the year, inexperienced to the dangers of an

approaching punt-gun. These are the birds which, feeding by day, suffer most, but as soon as the older birds arrive—though they too, with the young birds, resort at first to day-feeding—it only takes a very short time to put them well on the alert, and after that not a Wigeon will be found on the oozes, channels, or mudflats during daytime, except under the circumstances of exceptional stress of weather, when, weakened and reduced by a state of semi-starvation, they are glad to avail themselves of either diurnal or nocturnal feeds. I am aware that this does not harmonize with much that has been written on the subject, but I can only say that it is what actually takes place in the tidal estuaries of Northumberland.

Though the earliest comers are mostly young birds, yet there are some old ones amongst them, and as early as Sept. 20th I have seen the white speculum in the wings of some Wigeon, a sure sign of maturity.

Wigeon feed on grass, and they can frequently be seen during the day paddling and swimming along the margins of a mudbank, pulling off the salt-grass from its edges.

In the autumn of 1881, a small flight of Wigeon were observed to alight on the ornamental water in Roker Park, in the suburbs of Sunderland. The pond was frozen at the time, and one of the birds (a female) was taken at night in a net. A drake was procured from Norway, and in the summer of 1885 the duck made a nest, laid seven eggs, and hatched out five young.

They are all healthy and flourishing as I write. On July 2nd, 1886, the same old duck was again missing. She had made a nest on the side of one of the artificial channels in the park, and though she laid eight eggs they never hatched. Strange to say, about October 16th ult., another wild female Wigeon joined the original seven, and has remained with them ever since; they are all quite tame. About the same date,—*viz.* the 16th October last,—an immature Goldeneye suddenly appeared on this piece of water; it too has remained ever since, and appears to have taken up its quarters for good. At present it will not actually come close up to one, as the Wigeon do, but swims about and dives unconcernedly within a few paces; nor does it associate with any of the other ducks on the pond, but always remains alone.

Now as to Mallards; an old drake shot September 20th this year did not show a trace of green about his head, and the

plumage generally resembled that of the duck. Another killed on October 22nd was already in his handsome winter plumage, every feather clean and perfect.

This change of plumage is perhaps one of the most extraordinary we have in Nature, and it is well set out in 'The Zoologist' for June last (pp. 228—233). It is said—and I think with perfect right—that Mallards are night-feeding birds, spending the daytime in secluded rest. Though I have frequently met with them during the daytime, sitting both on the salt-slakes and on the banks of streamlets winding through the sandwashes, I never saw them feeding at this time. They are generally sitting all huddled up, their heads stowed away under their scapulars, simply passing the time away until "the sun takes the hill," when they betake themselves to the outlet of some freshwater stream running down from the country into the salt-slakes. Where such a place as this exists Mallards are nearly sure to frequent it at night, and none know this better than the flight-shooters. Many a countryman after his day's work is done shoulders his muzzle-loader, and if the moon is favourable he has a fair chance of getting a shot, aye, and sometimes half a dozen or more shots at Mallards as they come to feed at their favourite stream. Though Mallards have a distinct predilection for freshwater food, yet they do not hesitate to frequent also the saltwater pools and runners left by the ebb.

Pochards are seldom met with on the coast of Northumberland, and are never numerous. On the 22nd October last a duck flew past me when in the punt which I think can have been no other than a Pochard, though this is the only time I have ever come across it, and on the 7th October last one was killed by a local gunner near Ryhope, Co. Durham.

During the month of September, Teal are to be found regularly in the salt-slakes, and it is rather singular what becomes of these birds in the later autumn months. Towards the end of the month of August, and right through September, Teal are perhaps the most numerous of the Duck tribe on the coast. These are probably the birds that have been bred on our upland moors, but after September they generally disappear. Though the difference between home and foreign-bred Mallards is sufficiently palpable, I have never been able to discriminate between home and foreign-bred Teal, and it seems as if the coast of

Northumberland was not particularly well adapted to their habits, as they certainly never appear all through the winter months in anything like large numbers. Little bunches of four or five are occasionally met with, but they are never so numerous as are Wigeon and Mallard. During ten-days' shooting in October last I never saw a Teal, while in September I saw them every day. When in company they sometimes keep up a regular chorus as they "chatter" to each other. Six Scaup Ducks arrived on the coast on the 19th October last; previous to this date none had been seen.

I came across six Scaups, probably the same birds, early in the morning of October 23rd. They were very tame, and allowed the punt to come quite near them, when I secured two of them. No. 1 was, from its general appearance, an adult female. The beak was blue, with a black tip; a black line ran along the centre line of the upper mandible, and the edges of the mandibles were also black. The whole of the head and neck was brown, with the exception of the white face extending all round the forehead, and reaching nearly as far as the eyes, which were straw-yellow, as in an adult. The legs and feet were pale blue, with the usual dusky black marks on the joints of the toes. But on close examination faint black bars might be seen, especially about the ear-coverts and lower part of the neck, but these marks were still hardly visible on the crown of the head. The upper back was plain brown, and the breast was a mixture of very light and very dark browns, but the edges of each of the latter feathers were white. The stomach to vent was white. The flanks were brown, but the edges and centres of these feathers were gradually turning a fine silver-brindled grey. The back itself was brown, each feather assuming a brindled grey colour. The primaries were brown, with deep brown shafts; secondaries white, but tipped with black; tertiaries and scapulars a deep bronze colour with a fine sheen, the greater coverts being the same. The tail was brown. Yet this bird on dissection proved a male.

No. 2, which was a female containing five eggs large enough to be detected with the naked eye, weighed 1 lb. 14 oz., and was considerably smaller than the male. Two yellowish white spots were conspicuous in this bird on either side of the head between the beak and the eye, but this lightness of colour (the rest of the head being buff brown) did not join over the upper mandible as

in the male described. Moreover the bill in the female was a dull leaden colour, and the irides were a much darker colour than in the male. The whole of the upper plumage was brown but for the white secondaries, which were tipped with black, and here and there the brindled grey showed itself on the upper part of the back.

Judging from these birds and from other Scaups which I have seen, I believe their changes of plumage, which have been inaccurately described by various writers, to be somewhat as under. Further observation, however, is required to confirm the opinion here expressed.

During their first autumn and winter the young males and females are probably much alike, both having a dusky brown head and neck, but at this period I do not think they show any signs of the white face.

By October, in their second autumn, young males have the brown head, neck, and breast, and a pure white face as in the adult female, but the brown feathers are being rapidly displaced by feathers of a dull sooty black colour. By this period their bills, eyes, and feet have attained the colour of the adult bird, *viz.*, blue, straw-yellow, and dull blue, respectively; thus it appears that the soft parts attain the mature colours before the feathers do. Now, I think that by the end of the year these birds would have assumed a plain black head, but the white face would be retained. By this period the young females are in the state of plumage in which I have described No. 2, with the white face in an embryonic condition.

By October, in the third autumn after they are hatched, I think the young males begin to assume the glossy purple-green head of the adult bird, at the same time gradually losing the white face; but here a doubt perhaps exists as to whether another year would not have to elapse before the bird attained the purple-green head, as Scaups are obtained in winter with plain black heads and without any white face. By their third autumn the females also probably become adult, resembling very closely the state of plumage in which the male is when only sixteen months old.

Briefly, the changes in young males may be as follows:—First autumn, dull buff-brown head and neck; second autumn, white face and brown head, the latter turning sooty black; third

autumn, loses white face, head entirely sooty black; 4th autumn, attains the glossy (adult) head.

These Scaups had been feeding upon sea-grass, which was to be seen in their gizzards, chopped up into pieces about half-an-inch long; fragments of small sea-shells, periwinkles, mussels, &c., were also among the contents of the gizzard, but the crop was quite empty. I believe that sea-diving ducks eat much more grass than is generally supposed.

Though the Scaup is essentially a diving duck, yet when pursued with a broken wing, one of the above birds showed no tendency to dive, and allowed itself to be overtaken in a way at variance with their wont. They are fond of frequenting sea-weed covered rocks, where they can dive for their food.

If you see Scaups busy diving, they are nearly sure to be above some submerged tangle-covered reef, or over some bed of mussels known by the name of "scap" in Northumberland. Such a place is their regular feeding-ground, where they can by diving reach the young mussels adhering to the sea-tangles.

They are also fond of young cockles, small crabs, and the spawn of other molluscs. Scaup, unlike Mallards, are not "fighters;" they have no regular lines of flight to and from their feeding-grounds. During the daytime they may be found frequenting any rocky inlet of the sea, where there is plenty of black seaweed, or about the mouth of some burn running from the slakes proper into the open channels of the tide-way. I am not sure that Scaups ever leave tidal waters, at least in Northumberland, during the winter months, though with advancing spring they do resort to fresh-water loughs inland previous to taking their departure northwards to breed. With the exception of one solitary instance they have never been known to breed in the British Islands. In Northern Iceland they breed in immense numbers in the month of July, and Messrs. Slater and Carter have recently given, both in 'The Ibis' (1886, p. 45) and 'The Zoologist' (1886, p. 149), a most interesting account of the numbers that frequent that district during the breeding-season.

Goldeneyes, unlike Scaups, show a preference to freshwater loughs and rivers during their stay with us, and they are not nearly so often found frequenting tidal waters. They are generally in winter one of the wildest of the duck tribe to approach with a punt, but I must add that on their first arrival

here (before they retreat inland) they are easy birds to approach. In 1886 I observed them first on October 22nd on tidal water. There were only four, and when first seen they were swimming in company with four Red-breasted Mergansers, *Mergus serrator*. When we were yet a long way off, the Mergansers began to leave them, swimming right away from them. Then the Mergansers waited for them to come up. Meantime we were drawing nearer. Again the eight got together, and again the more cautious "Saw-bills" drew away. We were now about fifty yards from the Goldeneyes, but the Mergansers were more than double this distance, and still they evidently thought they were too near by taking wing and thus saving their lives, as is indeed usually their custom. The four Goldeneyes were swimming in open order, and I was anxious to get them together; for this purpose they actually allowed us to chase them about, only swimming away from the punt, but they refused to go close together, nor did they reluctantly take wing till driven into a bight of the sea, a real *cul de sac*, whence escape was possible only by flight. When in company with the Mergansers, their rates of swimming were severely contrasted, the Goldeneyes being invariably left "clean out of the race." On October 27th, another small detachment of five Goldeneyes arrived on the coast; they too were very tame until shot at, when they would not admit of further approach. On setting to them a second time, they resumed their usual wildness, and rose fully 300 yards away from the punt. No instance is known of the Goldeneye staying to breed in the British Islands, though they are regularly seen well into the month of May frequenting freshwater loughs and rivers. (But see More, 'The Ibis,' 1865, p. 447, and R. Gray, 'Birds of the West of Scotland' (1871), p. 395.) I once found the nest of this bird in Russian Finland in latitude 70°, but this is considerably beyond the ordinary limits of their northern breeding haunts.

The trees at this latitude are very small and stunted in growth, far too small, one would think, to afford a nesting hole for so bulky a duck as the Goldeneye. After a long search, however, the nest and six eggs were found in the inside of an old stump, and I believe this is the most northern breeding place of the Goldeneye as yet recorded.

I have never seen Goldeneyes out on the open sea by day, but I have seen them come up the harbour from the sea shortly after

daybreak, so I presume they spend the night, when on the coast, out on the open sea, just as Brent Geese and Mergansers do.

The crop of a young male Goldeneye, shot October 22nd, about 2 p.m., was empty, but the gizzard was packed full of sharp gritty sand, with rather large quartz pebbles. I have often seen the bill of a Goldeneye, after coming up from a dive, full of bottom refuse; this he lays on the water, and eats at leisure, after the manner of a surface-feeding duck.

Mergansers are, I think, by far the fastest swimming ducks we have; low in the water, with neck erect, they can quite outwit a gunning punt, and seldom indeed do they allow approach within fair range. When undisturbed, they frequently land on the sides of the sandbanks, and when ashore they stand nearly erect. I remember once, when at Bodö, in Nordland, getting quite close to a Merganser sitting nearly bolt upright on a small rock protruding from the deep water, and during the winter time they can often be seen thus standing along the sides of the tidal channels. When alarmed, they waddle quickly down to the water, or fly direct from the ground. Mergansers never stay inside the harbour by night: about dusk they all, to a bird, leave the channel where they have been busy feeding all day, and resort to the open sea for the night. One bird, shot thus going out at night, was crammed full of tiny plaice, which they catch about the sandy-bottomed channels which they frequent. When feeding they allow themselves to drive up with the flood perhaps a quarter or half a mile, when they all rise, and, flying back to their original starting-place, recommence their raids on the finny ones. With the first of the light in the morning they return from the sea to the harbour channels to feed.

About thirty of these birds arrived on our coast on October 20th, and I saw them all file out to sea about four o'clock in the afternoon. Their flight, like their natatory powers, is very rapid, and they usually move in a long thin line when on the wing in company. A winged Merganser is generally a lost one. The local name for it is "Yawol."

The Goosander, *Mergus merganser*, a far heavier and more bulky bird, is seldom found on the coast, unless driven by hard weather from his inland haunts, but the Merganser is essentially marine in its winter habits, and I think never during the winter season resorts to fresh-water lakes or streams inland, though

with approaching spring they at once betake themselves to fresh as well as salt-water loughs to breed. They have never been known to breed in England, though in Scotland, and all along the Scandinavian Peninsula, they nest freely. Their food, of course, consists of fish, for securing and holding which their saw-bills are most admirably adapted.

Off the Northumberland coast, the sea ducks proper are the Common and Velvet Scoters (though the latter is rather scarce), the Long-tailed Duck, the Eider, and the Shellduck.

Sea ducks obtain at least a great part of their food by diving, and in general this consists of the soft bodies of molluscs. That they will avail themselves, however, of other food when occasion offers is certain, and the following was narrated to me by a fisherman in whose observation I can place implicit faith:—About thirty-five years ago, a sailing vessel, “The Falcon,” loaded with grain, was wrecked off Holy Island in September. At first about a dozen Scoters frequented the scene, feeding on the grain, but afterwards many hundreds of these birds, as well as Long-tailed Ducks, were daily to be seen greedily devouring the floating grain as it was washed out of the ship.

The same man also told me how one night in the first or second week of September, twenty-five years ago,—a dark night it was, with drizzling rain,—a bird deliberately flung itself upon the burning coals of the stove in the coble where they were warming their coffee, and that he quickly picked it out of the fire to prevent it being burnt. The bird was a Storm Petrel (*Procellaria pelagica*), and he kept it alive for several days, till it ended its misfortunes by being eaten by his cat.

This man also told me how two birds hovered round the fishing-boat one day, which, from his description, can have been no other than Fulmar Petrels. Both of these Petrels occur irregularly on the Northumberland coast.

Though not a regular gunner, it will be seen that my informant is an observant man. When crossing along the edge of the ooze, he one day pointed to a bank a few yards above high-water mark, at the same time remarking that “it was on that very bank where he once saw, during the month of March, several hundred ‘Ware Geese’ sitting, and that this was the only instance during his lifetime that he had known these geese to alight above the “full sea-mark.” Generally speaking,

Brent Geese never alight above high-water mark during the period they are on our shores during winter.

The Eider, or, as he is locally termed "Culver" duck, is perhaps the most characteristic sea duck we have in Northumberland. He is with us all the year round, breeding freely on the Farne Islands, and sparsely on the mainland. On October 27th, this year, I observed a most extraordinary feat performed by Eiders. Four of them, all dark-coloured young birds of the year, were feeding along the edges of a basaltic reef thickly overgrown with sea-tangles, and here they were working havoc among the dog-crabs and other small shell-fish. We ran down on them, thinking they might be Scaups. When within gunshot they rose, and, being in a narrow bight of the sea, they had to head round, so as to pass us broadside on within twenty yards. I fired at the leading bird, and, to my surprise, all four went headlong into the sea from a height of perhaps twenty feet. At first, I wondered, could I have killed them all with the one shot? Presently one bird came up dead, but the other three had dived from the wing on the instant they perceived the real danger, nor did they come up again till well out of shot, when they immediately took wing and escaped!

The Sheldrake (*Tadorna vulpanser*) is resident in Northumberland, breeding on the sandlinks along the coast. They frequent the slakes, sandbanks, and mud-flats, as well as the open sea. During August the old duck brings her brood into the harbour, and if pursued they dive freely, but as soon as the young are full-grown they always take wing when pursued, in preference to diving. Yarrell states that the legs of the young bird in August are "flesh-colour": all I have seen at that season of the year have been lead-coloured.

In 1886, up to October 27th, I had seen no Long-tailed Ducks (*Harelda glacialis*), though by this date they may be expected to appear. They are essentially sea-ducks, and, I think, never come inside the harbour either by night or by day. In very rough weather Common Scoters (*Edemia nigra*) will sometimes venture inside, but this is unusual, and their regular haunts are the open sea, just to seaward of the foreshore breakers.

I have never seen either the Pintail (*Dafila acuta*) or the Tufted duck (*Fuligula cristata*), on the coast, but the Shoveller

(*Spatula clypeata*) occurs regularly during summer, and breeds on an inland pond in company with Mallards, Teal, Coots, Waterhens and Dabchicks. I think Shovellers, at least in Northumberland, seldom come into the slakes; on no occasion have I ever seen them there; probably they migrate direct from their breeding-places southwards. The only one I ever shot was on August 12th, 1877.

Of all the wildfowl visiting the coast of Northumberland, "Grey Geese" are, to the punt-gunner, the most difficult to negotiate. Feeding as they do during the daytime on grain-stubbles, they are then beyond the fowler's reach, unless, indeed, he has the right to follow them.

It was on the 16th September last that I shot the Lesser White-fronted Goose (*Anser albifrons minutus*; *Anser erythropus*, Linn), as elsewhere recorded ('The Field,' December 11th, 1886, p. 872); but the migratory hosts of the ordinary Grey Geese did not arrive until October 12th, nearly a month later, which is about their usual date. A special feature in connection with these Grey Geese was the extraordinary numbers in which they invaded our shores last autumn. Never previously, so far as I know, have such numbers been seen here. On the evening of October 14th I went to a place where I thought a shot might be had at them. About 5.15 p.m. I was greatly surprised to see a large flock rise off the open sand wastes where they generally spend the night, and, with a great "gag-gling," wing their way inland. After manœuvring some ten minutes, during which time they did not maintain their regular V-shaped formation, but flew in loose order, they all went down into a barley-stubble, when they made a great noise; then all was silent. The moon was rising at the time, and a herdsman who happened to be passing that way put them up again off the stubble. It was then too dark to see them, but I heard them flying and gag-gling about the fields for an hour afterwards, when I left them quietly feeding by night. At first this conduct seemed most strange, but reflection soon showed that it was only as it should be. At this time of the year, when, owing to the inhospitable nature of our climate, the farmer has been unable to get his cereals gathered and led from the fields, it is obviously impossible for the Grey Geese to get their diurnal feed, owing to the number of labourers working in the fields where they

want to feed, and consequently they have to wait till the fields are left quiet and undisturbed.

On October 14th it was 5 p.m. when the harvesters left the fields, and it was 5.15 (as above stated) when the geese, which had been sitting about a mile off on an open stretch of sand, rose to go into the fields. The geese at this season alight among the stooks, where they can feed at leisure, without having the trouble of walking about to look for the grain. That they will return, however, to their more regular habit of feeding by day on the very first opportunity was fully demonstrated to me, for on October 16th, when it was so stormy that the farm labourers could not work in the fields, I saw fully two hundred geese busily engaged in feeding on the stubbles, about ten o'clock in the morning, and this in the very field where but two days ago they were feeding at night. Again on October 21st I saw about five hundred geese sitting on the sands. They were very restless, and would not allow the punt to approach them. Every now and then they would rise in a body and betake themselves inland. Here, however, they found the fields frequented by workpeople, and after gyrating in the open air at a great height for a few minutes, they would return to the sands from whence they had risen.

During the three days succeeding this date they were regularly to be found sitting on the open sands during the day, waiting for the fields to be cleared, when they might feed unmolested by night. By October 25th the stooks had been got in, and the stubbles were left unfrequented by man. The geese at once assumed their normal habits, feeding all day, and half an hour before dark any night their extraordinary, V-shaped formation might be seen heading direct for their favourite resting-places. Their formation when on the wing is more mechanically true than is the case with Brent Geese, and the incessant gaggling which they make on going to and from their feeding grounds is audible at an immense distance. Many a flight-shooter has endeavoured to waylay these wary birds as they come to the sands at night, but with very indifferent success. I believe nine nights out of ten they do not even get a shot.

On October 23rd I all but succeeded in getting a good shot at them. The position was peculiar. An isthmus of sand 180 yards wide separates the north sea from the harbour waters. At a point in this isthmus is an opening or channel, some 50 yards

wide, deep and dangerous for a punt. This channel is the sluiceway for part of the harbour water direct into the breakers of the North Sea, and down it or up it, according as the tide is ebbing or flowing, the water runs like a millrace. Between 500 and 600 Grey Geese were sitting along the seaside of the isthmus on either side of the outlet channel. The punt was lying at the opposite end of the channel, *i. e.*, on the harbour side, and exactly 180 yards from the geese. The only means of a nearer approach was down the channel with the ebb, or, as my puntsman quietly remarked, "To perdition in ten feet of water among the breakers." There sat the geese, all unconscious of our presence. Everything about them was as clear as daylight through the binoculars, with this exception—I could not identify the colour of the nail on the beak; and so, alas! they remain unidentified to this day.

Before putting the birds up, we gave them gentle cause for alarm, and it was maddening to see how they separated into companies, each company so concentrating itself in its fear, that if only I could have come within range, a heavy shot must have been the result. On walking over the place where they had been sitting, it was evident that many were moulting their quills, as these feathers lay about all over.

During October and November these geese remain with us, and indeed as long as good stubble food is to be found. As soon, however, as the plough begins its work, and their feeding-grounds are destroyed, they rapidly increase in numbers, and before Christmas there are very few left, perhaps a dozen or two. About February and March they reappear in all their strength, making daily raids on the hard corn till their appointed time of departure in April to breed.

Grey Geese very seldom alight on the ooze. On the one occasion when I am told they did so, they paid a heavy penalty for their rashness.

Judging from Grey Geese shot by old gunners, and from what has been written on the subject, it would seem that most of the birds visiting us in autumn belong to the Pink-footed and Bean species. When, however, it is remembered that they disappear in winter almost entirely, I can see no valid objection to their being real Grey-lags, *Anser ferus*. The latter breed numerous on the Scandinavian seaboard (as well as sparsely in

Sutherlandshire and in the Hebrides). They do not remain during the winter in Norway, and why should the birds we have here during October and November not be the Norsk-bred Greylags resting in their passage southwards? From what I have seen of them I am inclined to think that this is the case.

They look enormous birds as they stand on the flat sands, and this is not in accordance with their being *A. brachyrhyncus*, the latter being much smaller birds. That they are not the White-fronted species, *A. albifrons*, I am sure, or I should certainly have identified them with the glass. Possibly they may be Bean Geese, *A. segetum*.

Though Brent Geese invariably frequent certain parts of the Northumberland coast during the winter months, the Bernicle, *Bernicla leucopsis*, very seldom does so. This year, on September 23rd, six Bernicles appeared in the slakes at Holy Island, probably on passage to their more regular haunts on the Solway. The islanders assert positively that none had been seen for fully thirty years previously. One of the six was wounded by a local gunner, but never bagged.

I have already remarked that in 1886 Wigeon arrived on September 11th; it was September 16th when the Lesser White-fronted Goose appeared. Both of these dates are unusually early for these birds, yet on September 17th I was even more surprised to witness the arrival of the Brent Goose in the slakes. This was a single bird, and not until October 18th did another occur, when four made their appearance, staying for a day or two, and again entirely disappearing. Small detachments keep arriving during November and December, by the end of which month perhaps a hundred or two may have assembled. During January and February this number is increased to perhaps a thousand or two, and this is the winter stock in mild weather. When, however, by stress of weather in the Baltic and other northern waters, the geese are compelled to retreat before the cold to more congenial shores, then the regular stock is increased, aye, tenfold! This is the time for the wildfowler afloat!

The Brent obtained by me on September 17th was an old bird in poor condition. The features in the plumage were pale yellow feathers at intervals among the ordinary slate-blue feathers of the back, giving the bird a splashed appearance, and, on examination, small brown feathers were visible among the sooty

black feathers of the neck; otherwise he was in the ordinary winter dress of the old bird. We saw him arrive flying direct westwards, but once inside the harbour he alit on a sandbank. Here he amused himself by making short quick runs on tip-toe, flapping his wings the while, till he received his *coup de grace*.

Brent Geese are day-feeders. Only when harassed by shooters do they venture on the *Zostera* banks by night, and this only when they are favoured by moonlight. With the first of the dawn, they rise from their resting-places on the open sea, preparatory to winging their way to their favourite feeding grounds. The sea-grass on which they feed attains a great length, some stalks measuring five feet in length. It is the decomposition of each year's growth that causes the immense deposit of soft mud known as the "slake," incapable in many places of bearing much more than the weight of the birds which feed on and about it. About sunrise, a little sooner or later, according to the tide, the Brents repair to this slimy ooze to feed. During the daytime, especially in fine weather, they may be frequently seen chasing each other, and playing the hours away till an hour or so before dark, when they are again hungry and wishful to get a good crop-full before taking flight seawards for the night. At this time, especially if it be a flood tide and hard weather, the punt gunner expects to get a heavy shot. Indeed, sometimes so intent are they about their own suppers that they will allow a punt to be shoved right up among them. Just as the sun disappears behind Old Cheviot's Firehills, the geese cease to feed, and go direct out to sea. With the exception of crossing a narrow strip of sandlinks both at their morning and evening flight, they never cross dry land, and their flights are usually made at a height beyond the reach of a shoulder gun; but under the conditions of a head wind, which makes them fly low, usually some gaps are made in their otherwise beautifully symmetrical formations.

A winged Brent is pretty sure to make for the water if it happens to fall on dry land. Here they make feeble attempts at diving, but on the whole cripples are usually easy enough to gather.

During October, and especially from the 20th to the 25th of the month, Redwings and Fieldfares were nearly always to be heard passing over westwards while we were busy launching the

punt in the early hours before daybreak. Snow Buntings and Sky Larks were also to be heard, and on October 15th, during a severe gale from the south-east, I frequently put up Redwings from amongst the black rocks, evidently birds newly arrived.

This feature of migration is, however, so regular and so certain in its annual recurrence, that it is doubtful if further observation will much increase our knowledge of the subject. Some birds, however, are very irregular in their immigrations. On October 18th and 20th ult., two specimens of the Great Spotted Woodpecker occurred at a point on the Northumberland coast, which only confirms the observations of others that these birds are immigrants to our shores. There was hardly a tree in the neighbourhood where they were, and one bird which flew off the ground alighted on a gate-post for want of a better perching place. In 'The Field' for October 30th ult., an instance is cited of the occurrence of this bird in Co. Down, Ireland, and, though the exact date is not given, it seems to coincide with my own observations. Probably there was a "rush" of them about October 20th, at which time the weather here was thick and foggy, though for several days previously a severe storm had raged from the east and south-east.

On October 15th thirty Swans were reported as having been seen by some fishermen when following their calling about seven miles out at sea, though nothing more was seen or heard of them. They were said to be flying westward at the time. These birds occur nearly every winter in Northumberland, and when they are seen to alight they are usually obtained. My brother (H.) shot a fine young Whooper, one of a pair, in January, 1881. Weight $17\frac{1}{2}$ lbs.

During the month of October enormous numbers of Peewits come to rest on the oozes during the day. Golden Plovers are also present, but in smaller numbers. Two shots fired at them produced twenty-nine Peewits, two Golden, and four Redshanks. I say "rest" advisedly, for I have watched them for hours, with perhaps a score of birds within ten yards of the punt, every bird sitting abreast to windward and head tucked away in the back feathers, sound asleep. So peaceful do they appear that they allow the approaching flood to creep gently round them. Half-inch by half-inch it gradually rises, till the Plovers actually seem to be swimming in the water. When breast-deep they wake up,

and, with a little scream of "ennui," fly perhaps fifty yards landwards, when they again go to sleep. I know of no prettier sight than to see a large flock of Peewits thus whiling away the daytime. About dusk they resort to the turnip and other fields inland, where they feed all night.

During the month of September the slakes swarmed with Oystercatchers, and I hardly saw any Peewits. In October exactly the reverse was the case, and I was at a loss to know where all the "sea piots" had got to. I imagine the great flocks of Peewits were mostly immigrants, though outwardly no proof of this was apparent. Most of those shot were young of the year. During November, however, there were great numbers of both Peewits and Oystercatchers.

A prominent feature in the slakes during October is the absence of the Lesser Black-backed Gull; in September they were numerous, but now their place is taken by their big brother, *L. marinus*. Often, when setting to fowl, this large Gull comes sailing straight at you, and with his loud "hau-hau-hau" he raises the slakes. In an instant, some Curlew, who had been brooding what that *strange white line* on the water might be, takes the warning, and, by his fearful vociferations, he usually succeeds in spoiling the punter's chance of a shot.

The *Columbidæ* are all represented on the Northumberland coast during winter. Though two of the three species breed in Scotland and in the Hebrides, they do not arrive here any sooner than the foreign-bred Wigeon, and often considerably later. Up to the end of October I noticed very few, but after that date their numbers increased till about the end of the year.

Mr. Cullingford tells me that he had a Red-throated Diver from Lewis (Oct. 29th, 1886) with a perfectly red throat. He also had a Black-throated Diver from Lincolnshire (Dec. 24th, 1885) with the new black throat already perfectly developed, and the general plumage, checkered back, &c., was equally advanced. It frequently happens that birds shot in March and April do not show nearly so much summer dress as in the above examples. The Red-throat is always much the commonest of the three Divers on our coast, the Black-throat being the rarest. At daybreak there is a regular flight of Divers from the sea, where they spend the night, into the tidal channels of the harbour. Divers, unlike Mergansers, do

not feed in company, and, though two or three may be seen together, they are usually solitary.

Grebes resemble divers in their habits when on the coast. The Slavonian (*P. cornutus*) is the commonest Grebe we have during winter, but the Eared, *P. auritus*, and Great Crested Grebe, *P. cristatus*, occur, the latter being the commoner of the two. I noticed one of the latter birds on October 22nd. The Red-necked Grebe, *P. rubricollis*, occurs, but I have never shot it.

ON THE BREEDING OF ARCTIC BIRDS IN SCOTLAND.

BY HENRY SEEBOHM.

IN 'The Zoologist' for August last my friend and travelling companion, Mr. Harvie Brown, placed beyond doubt the long-suspected fact that the Snow Bunting, *Emberiza nivalis*, breeds in Scotland. No one knows better than he does the significance of this statement. It is not known that any bird breeds farther north than this species. Major Feilden found a nest in Grinnell Land above lat. $82\frac{1}{2}^{\circ}$. When I was in Lapland with Mr. Collett we saw nothing of it until we reached lat. 70° . It passes through Archangel every spring and autumn, but retires farther north to the extremity of the Karim Peninsula to breed. In the valleys of the Petchora and the Yenesay thousands crossed the arctic circle in spring, but we saw them no more until in the former locality we reached lat. 68° , and in the latter lat. $71\frac{1}{2}^{\circ}$. The Snow Bunting is during the breeding season an exclusively arctic bird.

The Ptarmigan, *Tetrao mutus*, is quite as arctic a bird, though perhaps not so exclusively so. No arctic traveller has ever reached a latitude too high for this species to be found, and wherever it occurs south of the arctic circle it frequents the mountain tops where an arctic climate is to be found. In Scotland it comes down to 2000 feet, but in South Siberia and Japan only to 6000 or even 9000 feet. The only locality where it is found at a low level south of the arctic circle is on the Kurile Islands, a fact the significance of which will shortly appear.

The Red-necked Phalarope, *Phalaropus hyperboreus*, is another arctic species which breeds in Scotland. In Europe

and Asia it seldom breeds below the arctic circle, except at high elevations: Archangel seems to be too far south to suit its requirements; but curiously enough, on the shores of the Sea of Ochotsk, Middendorff found it breeding as far south as lat. 55°.

The Whimbrel, *Numenius phæopus*, is also an exclusively arctic species during the breeding season, Iceland and the islands between it and Scotland (where it also breeds in the most northerly counties), and probably Kamtschatka, being the only localities south of the arctic circle which it frequents in summer.

The Greenshank, *Totanus glottis*, is another arctic species, though it does not breed so far north as the other birds above named. In Scotland it breeds much farther south than on any part of the Continent, a statement which probably applies to many other species.

If time and space permitted it would be interesting to compare the breeding range in the British Islands of many other arctic or subarctic birds with their breeding range on the Continent. The Great Skua, *Stercorarius catarrhactes*, Richardson's Skua, *S. richardsoni*, the Black-throated Diver, *Colymbus arcticus*, the Fulmar Petrel, *Fulmarus glacialis*, and several species of Ducks, all come under the category of arctic birds which breed at exceptionally low latitudes in Scotland.

Now it is a remarkable fact that not one of these birds breeds either in England or Ireland; and the only conclusion that we can arrive at is that, from an ornithological point of view, Scotland belongs to the Arctic Regions! But like most other remarkable facts it admits of an easy explanation.

This explanation is climatic. Most, if not all, of the species named breed in July. A reference to a map on which the isothermal lines for July are traced will be found to explain all these apparent anomalies in a most remarkable manner. In Keith Johnston's 'Physical Atlas' there is a map of the world in which the mean temperature for the month of July is given in various parts of the earth.

Roughly speaking, the birds under consideration draw the line a few degrees below 60° Fahrenheit. For some special reason they do not breed in any locality where the mean temperature for the month of July is as high as 60°, their reason

probably having relation to the supply of food. In the map alluded to the isothermal line of 59° is drawn. It separates England and Ireland from Scotland, passes north of the Gulf of Bothnia, through the town of Archangel, extends nearly straight across Russia and Western Siberia, but east of the valley of the Yenesay again rises until it almost reaches the coast near the delta of the Lena. Farther east in Siberia it plunges south again, much more rapidly than it rose in Western Europe, and passing south of Kamtschatka it embraces the Kurile Islands in the latitude of the Pyrenees.

This line is almost exactly parallel with what we know of the southern breeding ranges of the various arctic birds which have been alluded to, thus conclusively proving that Scotland not only seems to be, but actually is, within the Arctic Regions during the month of July. There is therefore no reason for attempting to explain by any other causes than the ascertained climatic cause the interesting fact that British ornithologists are able to study the breeding habits of so many birds which their continental fellow students can only observe by travelling five hundred miles or more farther north.

NOTES AND QUERIES.

The Essex Field Club.—It is announced that the ‘Transactions’ and ‘Proceedings’ of the Essex Field Club are henceforth to appear in the form of a monthly periodical entitled ‘The Essex Naturalist.’ This new departure in the policy of local Societies has been adopted from a conviction that if local Societies are to flourish and do useful work it is necessary to devise some means of “keeping touch” with their members, and encouraging inter-communication among them. We understand that the first number of the ‘Essex Naturalist’ will appear in January, and will be conducted by Mr. W. Cole, who has edited the publications of the Club since its establishment seven years ago.

MAMMALIA.

The Fur Trade of London.—London is the great market for furs and skins of the world, and not St. Petersburg or Nijni-Novgorod, or any of the great cities of Northern or Western Europe, or Canada, as many imagine. To our metropolis come the fur merchants of every part of Europe, Asia, and

America, to purchase the finest and rarest skins. March and September are now the principal periods of their biennial visitation, and during these months the greatest activity is displayed in the neighbourhood of St. Mary Axe, where from time immemorial the Guild of Skinners have transacted their business. The following statistics will give some idea of the importance of this industry:—In March, 1886, the Hudson's Bay Company submitted to public auction no less than 10,841 Otter-skins; 4,022 Fisher-skins; 855 Silver Fox-skins, of a value of from £10 to £80 each; 3,173 Cross Fox-skins, ranging up to £8 in value; 1,400 Fox-skins, various; 5,200 Lynx-skins; 78,856 Marten, or Sable-skins; 76,374 Beaver-skins; and vast quantities of inferior quality skins. Also, in the same month, at an important sale ("Lampson's"), 1,020 Silver Fox; 7,449 Sables (Russian); 400 Blue Fox; 3,741 Cross Fox; 4,252 Sea Otter, from £8 to £140 value per skin; 7,000 Bear; 3,000 Fishers; 6,559 Otter; 5,000 Fox; 41,387 Marten (H. B. Sable); 250,000 Skunk; 253,000 Raccoon; and 150,000 Mink-skins were sold. The furs and skins are always sold at auction *in lots*. Those who are not acquainted with the system by which they are disposed of would be as interested as astonished if they spent an hour in one of the sale-rooms during the progress of a great sale. Each lot submitted often represents in value hundreds of pounds sterling, notwithstanding which there is seldom a word heard beyond those of the broker giving out the number of the lot and repeating the amount of the bids, the whole business being conducted in such a quiet and orderly manner that a stranger would scarcely imagine such valuable goods were changing hands. The crowd surrounding the auctioneer is a motley one, Russians, Germans, Poles, and French being the largest buyers, and naturally amongst these there is a preponderance of the Hebraic element. Of course the skins and furs have been on view for some days previous to the sale, and as they are generally in a raw state, with the pelt outside, there is merely the fringe to guide the purchaser. It therefore requires great judgment to discriminate their values, but the delicacy of touch of the really genuine merchant is such that he seldom makes a mistake. No skins, however, are seen in the auction rooms, but only at the warehouses, where they are on view some days before the sale.

Habits of the Weasel.—Apropos of the enquiry whether Stoats and Weasels kill Moles (Zool. 1886, p. 456), I would now ask do Weasels kill each other? A short time ago my brothers, when golfing on the Leven and Lundin Links, near Windygates, Fife, noticed a Weasel come out of the rough bents at the side of the golfing course, carrying something large in its mouth. It came along at a smart canter, with its head held high,—like a small retriever carrying a large hare,—its burden balanced across its jaws. My brothers gave chase, and, not without difficulty, forced it to drop its load to save its own life, when to their astonishment they found the

Weasel had been carrying the body of another full-grown Weasel! The question is, had the one Weasel killed the other, and was it carrying it off to eat it, or was it a case of a faithful mate or friend bearing off the dead for burial? I should add that there were no marks on the dead Weasel to indicate that it had died a violent death.—CHARLES COOK (Windygates, Fife).

BIRDS.

Ruddy Sheldrake in Ireland.—Having made enquiries about three separate captures of this species in June and July last, I beg to offer the following particulars. Mr. Robert Twiss, who killed two on the Shannon on the 16th June, writes:—"The two Ruddy Sheldrakes which I shot were male and female. When I first saw them they were feeding on a sandy beach. I sent my man in a boat to drive them over to me, but they got up wild and flew down the Shannon over half a mile, and pitched on a strand at the mouth of Cool River, where it empties itself into the Shannon. They only remained there for a few seconds, when they got up again and flew at least two miles down the river, and I sent my man after them. He succeeded in turning them back to me, and when they settled on the stream I got behind some bushes and stalked them. I am sure they could not have been escaped birds, for they were so very wary." Mr. Twiss adds that William Goggin, a farmer, who lives near O'Brien's Bridge, has now preserved in his possession two Egyptian Geese, male and female, which he shot about nine years ago on the same part of the Shannon. The second occurrence of Ruddy Sheldrakes is reported by Mr. Rohu, bird and animal preserver, Cork, who states that on the 26th June Mr. P. O'Connell wounded one of these birds out of a flock of six on the sea, at Bullen's Bay, near the Old Head of Kinsale. He recovered it a few days later on a bog near the sea, and it was sent to Mr. Rohu for preservation. The third capture above referred to was made by the keeper of Mr. Stephen Greehan, of Clonmeen Banteer, in an inland and northern part of the Co. Cork, between thirty-five and forty miles in a direct line from the Old Head of Kinsale. About this specimen Mr. Greehan writes:—"My keeper shot it about July 16th (as near as I can recollect), as three of them rose out of a small pond in the middle of a field about a quarter of a mile from the river (Blackwater?). They got up like ordinary Wild Ducks, and all appeared to be alike." I inspected this bird (a male in fine plumage) and the female shot near Kinsale, both of which appeared to be adults, and could see no traces of confinement. The ends of the primaries in each were a little worn, but this was only the result of natural wear, none of the feathers being at all broken or draggled. Even assuming that the birds met with near Clonmeen belonged to the Kinsale flock, which is by no means proved, we have still two distinct captures of this species at points so far apart as Kinsale and the Shannon near Lough Derg. The season was certainly one at

which we should rather expect ducks to be breeding, not migrating, and too early for the flight of birds of the year. Against the theory of their being all "escapes," I may point to the general absence in Ireland of a taste for keeping rare waterfowl. If, however, any large number of Ruddy Sheldrakes are known to have escaped last summer from any private water I hope this notice will elicit a statement of the circumstances.—R. J. USSHER (Cappagh, Co. Waterford).

[A letter from Mr. Rohu, for which we are obliged, confirms the account above given of the two specimens forwarded to him for preservation by Mr. O'Connell and Mr. Greehan.—ED.]

Little Guil in Co. Durham.—In reference to the editorial comment on my note of the occurrence of this species in Co. Durham (Zool. 1886, p. 457), I write to say the bird is certainly a Little Gull, *Larus minutus*, in first plumage, and not a Sabine's Gull, as suggested. The statements of dimensions, which I gave, are, I think, sufficient to prove this, the length of Sabine's Gull being given in "Yarrell" as 13 inches, while that of the present bird was but 9½ inches—a considerable difference. I can hardly agree with the Editor's statement that the tail of the Little Gull is *square* at the extremity. [It is so stated in the 4th edition of "Yarrell," vol. iii. p. 592, as well as in Seebohm's 'British Birds,' vol. iii. p. 297.—ED.] An examination of a number of specimens shows that in the immature stage it is nearly always distinctly forked,—as much so as, say, that of a Grey-hen,—though not so markedly forked as in Sabine's Gull. Even in adult specimens of *L. minutus*, when the tail-feathers are not abraded, it is slightly forked. The feature is interesting, not only as forming a connecting link with the Terns, but perhaps also as pointing to a common ancestry of both groups.—ABEL CHAPMAN (Roker, Sunderland).

Montagu's Harrier in Notts.—It is with regret that I record the slaughter of this rare bird in June last at Boughton in Nottinghamshire; an immature male, just beginning to assume the slate-coloured back. A careful comparison of the wings of this bird with those of the Hen Harrier placed its identity beyond a doubt. The contents of the stomach consisted of the remains of larks' eggs in various stages of incubation; perhaps also, from their resemblance, there may have been some Tree Pipits' amongst them.—W. BECHER (Wellow, Newark-on-Trent).

[These "hunting-hawks," as they are called in some parts of the country, from their habit of flying low and quartering their ground like pointers or setters, are now more frequently met with in England during the autumn months. In October last another Montagu's Harrier was shot near Hastings, as recorded in the present number by Mr. Theobald. A Hen Harrier, *Circus cyaneus*, was shot by one of Lord Scarsdale's keepers on the moors at Wild Boar Clough, near Macclesfield, early in

November last; and on the 30th of the same month a Marsh Harrier, *Circus æruginosus*, was killed in a marsh near Christchurch, Hants. Montagu's Harrier is perhaps nowadays the commonest of the three species in England. A most interesting account of the breeding of the Hen Harrier in Lincolnshire sixty years ago will be found in 'The Field' of the 4th December last.—ED.]

Blackcap in Co. Waterford in December.—On Dec. 5th, 1886, as I was strolling through a fir plantation here, I saw to my amazement a male Blackcap fly up and perch within a few yards of me. I had a good stare at him, for he was not particularly shy. There was no mistaking the species; top of head jet black, mantle slaty, under parts pale grey. He busied himself searching the branches of the Scotch firs. 'The season has been very mild hitherto, without any frost worth mentioning. On December 18th, 1856, I found a male Blackcap, recently dead, here, and a pair bred in 1885, near Clashmore (Zool. 1885, p. 261). These are the only instances in which I have undoubtedly met with Blackcaps here, though they seem to be regular visitants in small numbers to Co. Wicklow, which is nearer to the sources of immigration. How striking is the abundance in this part of Ireland of the Whitethroat, the Sedge and Willow Warblers and Chiffchaff, especially of the last, as contrasted with the absence of so many other insect-finding summer migrants, as the Whinchat, Redstart, Garden Warbler, Lesser Whitethroat, Reed and Wood Warblers, Ray's Wagtail, and Tree Pipit, which I have never met with! How these arbitrary distinctions of breeding-range among kindred species show that migration is an inherited habit!—R. J. USSHER (Cappagh, Co. Waterford).

Storm Petrel in London.—At the last meeting of the Linnean Society, held at Burlington House on December 16th, a Storm Petrel was exhibited, which had been picked up on Dec. 9th in an exhausted state near the Serpentine in Kensington Gardens. Its appearance so far from the sea is doubtless to be accounted for by the very tempestuous weather which prevailed about that date.—J. E. HARTING.

Red-throated Diver breeding in Co. Donegal.—Mr H. M. Wallis concludes his notice of the Tree Sparrow at Aranmore (Zool. 1886, p. 489) by the following allusion to this much more interesting species, which cannot, like the Tree Sparrow, be of recent introduction. He says, "I found the Red-throated Diver breeding on the mainland (Co. Donegal), but this I think you recorded last year." It appeared from the notice referred to (Zool. 1885, p. 348) that Mr. Lloyd Patterson received from Co. Donegal eggs which were identified as those of the Red-throated Diver, the first evidence recorded of the species breeding in Ireland. As Mr. Wallis is able to offer fresh information on the subject, I trust he will favour the readers of 'The

Zoologist' with all the circumstances, and state whether he found the eggs or young birds.—R. J. USSHER (Cappagh, Co. Waterford).

Phalaropes, Fulmar Petrel, and Montagu's Harrier near Hastings.—After the stormy weather in October last I shot a Grey Phalarope (*Phalaropus lobatus*) on the marshes near St. Leonard's, and two more were shot in the same vicinity. From other places in the neighbourhood many more were recorded, and at the same time a Red-necked Phalarope (*P. hyperboreus*) was killed. In the last week of October a Montagu's Harrier (*Circus cinereus*) was shot on the marshes to the east of Hastings and sent over to a local taxidermist for preservation, who also had a fine Fulmar Petrel (*Procellaria glacialis*), found a year ago in an exhausted state on the marshes near Rye.—F. V. THEOBALD (St. Leonard's-on-Sea).

Snow Bunting on Ben Nevis in Summer.—During a short tour in Scotland last September, while staying at Fort William, we made the ascent to Ben Nevis, and there at the Observatory saw Snow Buntings in their summer residence, and from information heard that they breed there, being seen the whole spring and summer.—E. C. MOOR (Great Bealings, Woodbridge, Suffolk). [See a note on the Snow Bunting breeding in Scotland, Zool. 1886, p. 336.—ED.]

Nesting of the Sedge Warbler.—Last summer I took two nests of this species, differing considerably in their construction from the general fashion, and partaking more of the character of the Reed Warbler than that of the Sedge Warbler; both are lined with hair, in one some feathers are interwoven with the lining. The bottom of both nests was placed at least twelve inches from the ground, in reeds and sedge by the side of the Norwich River, near Hardley Cross, and in both reeds pass through the fabric of the nests, though they are not so actually dependent from the reeds, as is the case, so far as my experience goes, with the Reed Warbler. I was, however, so much struck with the peculiar construction of these nests, that I captured the two birds belonging to one of them; they proved to be Sedge Warblers.—G. SMITH (Great Yarmouth.)

Immigration of Fieldfares.—On November 8th we were visited by numerous flocks of Fieldfares, all flying in the same direction, from east to west, the flights continuous and following each other at short intervals. They did not deviate from their course in the least, but each flock followed in the direction of the one before it. They flew low, just topping the hedges and woods; a few struck against the telegraph wires on our railway; five were picked up and brought to me in the evening. I observed a similar occurrence, in vastly superior numbers, in the autumn of 1878, just previous to the two following severe winters, since which time Fieldfares about here have been scarce.—WALTER PRENTIS (Rainham).

Distribution of the White-bellied Brent Goose.—So far as I know, little or no attention has hitherto been paid to the distribution of the White-bellied Brent Goose during its stay with us; the only locality named for its occurrence in the 4th edition of Yarrell's 'British Birds' being the Lincolnshire sea-board. As winter is come it would be well if ornithologists would look out for, and record, the occurrence of this very marked race of goose. To set the ball rolling, let me say that a young White-bellied Brent Goose was shot on Loch Pooltiel, Isle of Skye, on October 28th, 1886.—H. A. MACPHERSON (3, Kensington Gardens Sq., W.).

MOLLUSCA.

Habits of *Testacella haliotidea*.—Between four and five months ago I found eleven specimens of this slug upon a low wall surrounding the garden of a house near the Oxford University Parks, and on the following day I captured eleven more in the same place. There had been exceptionally heavy rain, extending over some days, immediately previous to those on which I found the specimens, and it therefore seems probable that these animals are driven out of the earth when it becomes sodden with moisture. Thus it is possible to account for the capture of a very unusual number of specimens, for, as far as I can learn, the species has hitherto only been met with singly in this locality. I have also ascertained what happens to the animals when the earth in which they are contained becomes hard and dry from loss of water. A few of the twenty-two specimens were killed and hardened, and the remainder were put in a box containing earth, in which they buried themselves. In the press of other work the box was neglected, and remained untouched in my laboratory until to-day, the earth having quickly dried into a hard cake. To-day I emptied the box, and fully expected to find the slugs dried up dead, but to my surprise I found twelve specimens alive, each encysted in a thin transparent capsule formed of the hardened mucous secretion of the animal's skin. The body was contracted, and oval in shape, but it had been so completely protected from evaporation that there was no noticeable reduction in bulk after these hottest months of the year, during which water had been entirely withheld. One or two specimens had died almost immediately after capture, and a few escaped, so that all those which had been exposed to the heat and dryness in the box had become encysted, and survived in apparent health.—EDWARD B. POULTON (Wykeham House, Oxford) in 'Nature.'

A CORRECTION.—Kindly spare me space to observe that A. H. Macpherson and H. A. Macpherson have separate existences. Owing to the unlucky similarity of initials, several notes of my cousin, A. H. Macpherson, of Oxford, have been attributed to me in the Index of the volume for 1886; and various friends have also identified our unfortunate individualities as one and the same.—H. A. MACPHERSON (3, Kensington Gardens Square).

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

November 18, 1886.—WILLIAM CARRUTHERS, F.R.S., President, in the chair.

Mr. Henry Bury was elected a Fellow of the Society.

Mr. A. D. Michael exhibited living specimens and preparations of an *Argas*, received from Mrs. Crawford, the State Entomologist of Adelaide, Australia. These appear to be identical with the much-dreaded *Argas persicus*, Fischer, the bite of which is supposed to cause madness and death.

The fifth and concluding part of the Rev. A. E. Eaton's Monograph of the Recent Ephemeroïdæ, or Mayflies, was read in abstract. He states that in his entire memoir 55 genera and 270 species have been characterized, in addition to eleven nameless nymphs and nineteen species named by other authors, which cannot now be classified exactly. Amongst them five genera and sixty-eight species may be reckoned new to Science, and thirteen of the older species have had to be renamed. The author gives a revised summary of the groups, series, sections, and genera, a full description of the figures in the plates, and complete index to the species, and a contents generally of the volume.

Besides the foregoing zoological contributions a number of interesting exhibitions and papers of a botanical character were brought forward and discussed.

December 2, 1886.—WILLIAM CARRUTHERS, F.R.S., President, in the chair.

The following gentlemen were elected Fellows of the Society, *viz.*:—Dr. Robert von Lendenfeld, Messrs. J. W. Willis Bund, Arthur Dendy, Anthony Gepp, Kutaro Ito, F. Krause, Francis Molesworth Lascelles, Frederick Sander, John Samson, Harry Sanford Burton, Arthur Warwick Sutton, and Charles W. Wilson. Mr. George Sim was elected an Associate.

Dr. Day read a paper on the Lochleven Trout, which is the form that has been utilized by Sir James Maitland at Howietown, where the elevation is similar to that of their original home from which it is about twenty-five miles distant. These fish are known by their numerous cœcal appendages, and up to their fourth or fifth year they are of a silvery grey with black, but no red spots; subsequently they become of a golden purple, with numerous black and red spots. Undergrown ones take on the colour of the Burn-Trout. Remove these fish to a new locality, and they assume

the form and colour of *Salmo fario*. In 1883 a Salmon-parr and Lochleven Trout were crossed, and the young assumed the red adipose dorsal fin and white-edged margins to the dorsal and ventral, also the orange edges to both sides of the caudal—all colours found in the brook-trout, but not in the Salmon or Lochleven Trout. The statements that the maxilla in this form does not extend behind the eye, that there is no knob on the lower jaw in old males, and that the fins differ from those of *Salmo fario* were shown to be erroneous.

A communication "On a new Species of *Brachyonchus* from the Mergui Archipelago," by Mr. H. W. Bates, was read by the Secretary. The beetle in question is said to be intermediate between *B. lævipennis* and *B. sublævis*, both known only from Siam and Cochin China.

December 16.—WILLIAM CARRUTHERS, F.R.S., President, in the chair.

H.R.H. the Prince of Wales was elected an Honorary Member of the Society.

Messrs. Arthur Bawtree, Frederick Justen, Trailskya N. Mukharji (of Calcutta), Francis W. Oliver, and Richard V. Sherring were elected Fellows, and Mr. George Nicholson an Associate of the Society.

The President announced that Sir George MacLeay, K.C.M.G., F.L.S., had presented to the Society a framed water-colour portrait of the Rev. William Kirby, F.L.S., the distinguished Entomologist; and the MSS. and Correspondence of his Father, Alexander MacLeay (elected F.L.S. 1794), formerly Secretary of the Society. For these valuable donations a special vote of thanks was unanimously accorded by the Fellows present.

Mr. Edward A. Heath exhibited a Storm Petrel, *Procellaria pelagica*, which was picked up alive in Kensington Gardens on December 9th. It had doubtless been driven inland by the great storm of the preceding day.

"Experiments on the Sense of Smell in Dogs" was the title of a paper read by Dr. George J. Romanes. After preliminary observations on the faculties of special sense generally, and particularly that of smell as developed in Carnivora and Ruminants, the author detailed the results of some experiments which he had made with a Setter.—J. MURIE.

ZOOLOGICAL SOCIETY OF LONDON.

November 16, 1886.—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 months of June, July, August, September, and October, 1886, and called attention to certain interesting accessions which had been received during that period. Amongst these were specially noted a specimen of the Glaucous Macaw, *Ara glauca*, purchased June 3rd;

two young Tcheli Monkeys, *Macacus tcheliensis*, from the mountains north of Pekin, presented by Dr. S. W. Bushell; and other animals.

An extract was read from a letter addressed to the President by Dr. Emin Bey, dated Wadilai, Eastern Equatorial Africa, January 1st, 1886, and containing some notes on the distribution of the Anthropoid Apes in Eastern Africa.

A letter was read, addressed to the Secretary by Dr. Chr. Lütken, of Copenhagen, containing some information as to the locality of *Chiropodomys penicillatus*.

A letter was read from Dr. A. B. Meyer, communicating some remarks by Mr. K. G. Henke on a specimen of a hybrid Grouse in the Dresden Museum.

Prof. Flower exhibited and made remarks on a specimen of a rare Armadillo, *Tatusia pilosa*, belonging to the Scarborough Museum.

Prof. Bell exhibited and made remarks on an object (apparently of the nature of an amulet) made from a portion of the skin of some Mammal, and received from Moreton Bay, Australia.

Mr. H. Seebohm exhibited a skin of what he considered to be a young individual of the Lesser White-fronted Goose, *Anser albifrons minutus*, shot in September last on Holy Island, off the coast of Northumberland, and observed that it was the first recorded example of the small form of the White-fronted Goose which had been obtained on the coasts of our islands.

Mr. Blanford exhibited and made some remarks on a mounted specimen of a scarce Paradoxure, *Paradoxurus jerdoni*, from the Neilgherry Hills in Southern India.

A communication was read from Col. Charles Swinhoe, containing an account of the species of lepidopterous insects which he had obtained at Mhow, in Central India.

A communication was read from Dr. R. W. Shufeldt, containing an account of the anatomy of *Geococcyx californianus*.

Mr. Lydekker described three crania and other remains of *Scelidotherium*, two of the former being from the Argentine Republic, and the third from Tarapaca, in Chili. One of the crania from the first locality he referred to the typical *S. leptcephalum* of Owen, while the second, which had been described by Sir R. Owen under the same name, he regarded as distinct, and proposed to call *S. bravardi*. The Tarapaca form, which was characterized by the extremely short nasals, was also regarded as indicating a new species, for which the name of *S. chilense* was proposed. The author concluded that there were not sufficient grounds for separating Lund's proposed genus *Platyonyx* from *Scelidotherium*.

Mr. G. A. Boulenger pointed out that two distinct forms of the Batrachian genus *Bombinator* occur in Central Europe, and read notes on their distinctive characters and geographical distribution.

A communication was read from Dr. R. W. Shufeldt, containing a correction, with additional notes, upon the anatomy of the *Trochilidæ*, *Caprimulgidæ*, and *Cypselidæ*.

A communication was read from Dr. R. A. Philippi, containing a preliminary notice of some of the Tortoises and Fishes of the coast of Chili.

Mr. Sclater exhibited the head of, and made remarks upon an apparently undescribed species of Gazelle from Somali-land.

December 7, 1886.—Prof. W. H. FLOWER, LL.D., F.R.S., President, in the chair.

Prof. Bell exhibited and made remarks on a rare Entozoon, *Tænia nana*, from the human subject.

Mr. Tegetmeier exhibited and made remarks on a pair of antlers of an Elk, *Alces machlis*, said to have been recently obtained in the Galtee mountains in Ireland.

Mr. Frank E. Beddard read a paper on the development and structure of the ovum in the Dipnoid fishes. The present communication was a continuation of a research into the structure of the ovary in *Protopterus*. The author, besides being able to give a more complete account of the ovarian ova of *Protopterus*, was able to supplement this account with some further notes respecting the structures observed in the ovary of *Ceratodus*.

Mr. A. Smith Woodward read a paper on the anatomy and systematic position of the Liassic Selachian, *Squaloraja polyspondyla*. After a brief notice of previous researches, the author attempted an almost complete description of the skeletal parts of *Squaloraja*, as revealed by a fine series of fossils in the British Museum. He confirmed Davies's determination of the absence of the cephalic spine in certain individuals (presumably females), and added further evidence of its prehensile character, suggesting also that the various detached examples afforded indications of one or more new species. The author concluded with some general remarks on the affinities of the genus, and proposed to institute a new family, "*Squalorajidæ*," which might be placed near the *Pristiophoridæ* and *Rhinobatidæ*.

Mr. Sclater pointed out the characters of an apparently new Parrot of the genus *Conurus*, from a specimen living in the Society's Gardens. The species was proposed to be called *Conurus rubritorquis*.

Mr. F. Day communicated (on the part of Mr. J. Douglas Ogilby, of the Australian Museum, Sydney) a paper on an undescribed fish of the genus *Pimelopterus* from Port Jackson, New South Wales, proposed to be named *P. meridionalis*.

Mr. G. A. Boulenger read a paper on the South African Tortoises allied to *Testudo geometrica*, and pointed out the characters of three new species of this group, which he proposed to call *Testudo trimeni*, *T. smithii*,

and *T. fiski*. A second paper by Mr. Boulenger contained some criticisms on Prof. W. K. Parker's paper "On the Skull of the Chameleons," read at a previous meeting of the Society.

Mr. Oldfield Thomas read a paper on the Wallaby commonly known as *Lagorchestes fasciatus*, and showed that the dentition of this animal was entirely different in character, not only to that of the typical species of *Lagorchestes*, but even to that of all the other members of the subfamily Macropodinæ. He therefore proposed to form a new genus for its reception, to which he gave the name of *Lagostrophus*.

A communication was read from Prof. R. Collett, containing the description of a new Pouched Mouse from Northern Queensland, which he proposed to name *Antechinus thomasi*.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

December 1, 1886.—ROBERT M'LACHLAN, Esq., F.R.S., President, in the chair.

Mr. W. H. Miskin, of Brisbane, Queensland, Mr. R. E. Salwey, of Folkestone, and Mr. F. W. Biddle, M.A., of Beckenham, were elected Fellows.

Mr. Howard Vaughan exhibited a long series of *Gnophos obscurata*, comprising specimens from various parts of Ireland, North Wales, Yorkshire, Berwick-on-Tweed, the New Forest, Folkestone, Lewes, and the Surrey Hills. The object of the exhibition was to show the variation of the species in connection with the geological formations of the various localities from which the specimens were obtained.

Dr. Sharp showed a series of drawings of New Zealand Coleoptera, by Freiherr von Schlereth, which, though executed in pencil, were remarkable for their delicacy and accuracy.

Mr. R. Adkin exhibited specimens of *Cidaria reticulata*, recently bred by Mr. H. Murray, of Carnforth, from larvæ collected by him near Windermere, on *Impatiens noli-me-tangere*. Mr. Adkin said that as the food-plant was so extremely local, and consequently difficult for Mr. Murray to obtain, he had endeavoured to get the larvæ to feed on some other species of balsam, including the large garden species, usually known as Canadian balsam, but that he had not succeeded in doing so. Mr. E. B. Poulton observed that this statement tended to confirm the remarks he made at a recent meeting of the Society on the subject of the habits of lepidopterous larvæ with reference to their food-plants.

Mr. Billups exhibited a number of living specimens of *Aleurodes vaporariorum* (Westw.), obtained from a greenhouse at Snaresbrook, where they had caused great havoc amongst tomato plants (*Lycopersicum esculentum*). He remarked that the species had been first figured and described

by Prof. Westwood in the 'Gardener's Chronicle,' 1856, and that attention had been recently called to it by Mr. Douglas (Ent. Mo. Mag. for December). Mr. J. Jenner Weir stated that plants in his greenhouse had been attacked by the same species.

Mr. Poulton exhibited the bright green blood of the pupa of *Smerinthus tiliæ*, which is one of many lepidopterous pupæ possessing in the blood a chlorophyll-like pigment called meta-chlorophyll by Mr. Poulton. The blood of the larva contains the same pigment in a much smaller amount, while in the pupa the additional colouring-matter fixed in the larval hypodermic cells also passes into solution in the blood. By means of a micro-spectroscope Mr. Poulton was able to show the most characteristic absorption-band of the pigment, together with its resemblance to chlorophyll.

Mr. G. T. Porritt exhibited forms of *Cidaria suffumata* from Huddersfield, including one very similar to that taken at Dover by Mr. Sydney Webb (Proc. Ent. Soc. 1886, p. xxv); and one still more extreme, having only the basal mark and the central stripe, with a slight streak at the tip, brown, the remainder of the wings being perfectly white. He also exhibited a series of small bilberry-fed *Hypsipetes elutata* from Huddersfield, showing green, red-brown, and black forms.

Mr. S. Stevens exhibited forms of *Camptogramma bilineata* and *Emmelesia albulata* from the Shetland Isles, and a curious variety of *Chelonia caja* from Norwich.

The Secretary read a letter from the Administrator-General of British Guiana, on the subject of the urticating properties possessed by the larvæ and pupæ of certain species of Lepidoptera collected in Demerara.

Mr. McLachlan read "A Note concerning certain Nemopteridæ."

Miss E. A. Ormerod communicated a paper "On the occurrence of the Hessian Fly (*Cecidomyia destructor*) in Great Britain." It appeared from this paper that there could be no longer any doubt as to the occurrence of the insect in this country, specimens obtained in Hertfordshire having been submitted to, and identified by, Prof. Westwood, and by Mr. W. Saunders, of London, Ontario. Prof. Westwood said the specimens agreed exactly with Austrian specimens in his possession, sent to him some years ago by Mons. Léfèbvre, who had received them from the late Dr. Hammer-schmidt, of Vienna. A discussion followed the reading of this paper, in which the President, Mr. C. O. Waterhouse, Mr. Theodore Wood, and others, took part.

At the close of the Ordinary Meeting a Special Meeting was held, for the purpose of considering certain proposed alterations in the Bye-Laws. These having been explained to the meeting were, after some discussion, agreed to, and the proceedings terminated.—H. Goss, *Secretary*.

NOTICES OF NEW BOOKS.

Letters on Sport in Eastern Bengal. By FRANK B. SIMSON (Bengal Civil Service Retired). Royal 8vo, pp. 252, with ten illustrations. London: R. H. Porter. 1886.

SINCE the publication of Mr. Sanderson's 'Thirteen Years amongst the Wild Beasts of India' in 1879, no better book on Sport in India has appeared than that now before us. With a longer experience even than that of his predecessor, Mr. Simson is able not only to confirm from personal observation much that was already known concerning the haunts and habits of the animals which usually come under the denomination of "big game," but in many cases to supplement the remarks of previous writers with useful information. His special delight seems to have been the chase of the Wild Boar, on which subject he writes enthusiastically; and it must be confessed that from a sportsman's point of view he has left little to be said by any future votary of this particular branch of sport who may contemplate writing upon it. It is true that his book is addressed rather to sportsmen than to naturalists, but it is equally true that naturalists would know very little about the habits of many wild animals were it not for the published observations of such men as Mr. Simson—men who are constantly exploring fresh tracts of country, primarily in search of sport, but indirectly helping with their carefully kept journals to elucidate and help forward the study of Zoology. To such writers especially do we look for information on the geographical distribution of animals; for they have such excellent opportunities (if they will only take the trouble) to furnish lists of the species met with in the districts explored by them. In this way, and perhaps in this way only, is it likely that we shall be able to solve some of the interesting problems relating to what may be termed the sporadic distribution of certain remarkable species.

There are other points upon which the testimony of such experienced observers as Mr. Simson is valuable; such, for instance, as the length of Tigers and the height of Elephants, questions which are repeatedly cropping up, and to answer

which it is desirable to have some trustworthy statistics. On the subject of Tigers Mr. Simson writes:—

“I have no need to tell you much about the natural history of the Tiger; specimens are to be seen in every menagerie. But as to his size you will have very different accounts. There was an article on this subject, written by my friend Sir Joseph Fayrer, in ‘Nature’ for November, 1878. The statements of many experienced sportsmen were recorded, my own among the number. I say there that no Tiger killed by me measured more than eleven feet from snout to tail when properly measured. I have shot with several of the gentlemen whose notes were recorded by Sir Joseph. A curious thing happened when I was shooting with Mr. C. Shillingford, which I will relate presently. Had that Tiger been measured before he was skinned in my presence, I might have been able to say I had shot a Tiger between eleven and twelve feet long; but though I wounded the animal when alive, I was not present when he was killed. I merely, to my chagrin, was repeatedly shown the skin afterwards. I may remark that the most experienced Tiger-shooter in my own service stated that he did not think he had once killed one more than eleven feet and a few inches long; and I know he killed between four and five hundred Tigers. The conclusion Sir Joseph comes to, after careful comparison of accounts, is that anything over ten feet is very large, but that Tigers may exceed ten feet three inches, and that, in a few rare and exceptional instances, eleven and even twelve feet have been recorded.

“Tigers vary greatly in size and weight; those of the Tippera, Sylhet, and Chittagong Hills are smaller in every way, as far as my experience went, than those which inhabited the churs and riverain lands in the same part of Bengal.”

To judge by the questions which are repeatedly put to us on the subject, there seems to be much difference of opinion as to the height which Elephants attain. On this point Mr. Simson writes as follows:—

“I cannot say much about exact heights. The largest Elephant I ever rode or saw was one called ‘Bruce,’ which belonged to the Government stud at Dacca; it was, I believe, about ten feet high, and had only one tusk, which was magnificent. This animal shook me to pieces; I could not shoot properly off him. Latterly he became so slow as to be almost a nuisance when in line.

“My own female Elephants, the large howdah ones, varied in size, I think, from a little under seven feet to nearly eight at the shoulder; I never recorded the exact size. Mahouts and merchants who sold Elephants

always made them out taller than they actually were; I went by the rule, 'Twice round an Elephant's fore foot, when standing with it on the ground, is the height of the animal at the shoulder.' Stout, deep-bodied, short-legged, broad-backed Elephants are the ones to choose; lanky, long-legged, narrow animals are of much less value."

These extracts are not the best which might have been selected to give an idea of the author's style. He is seen at his best when graphically describing in detail the result of an enjoyable day's sport, with all its varied incidents of danger, disappointment, or success. He gives valuable hints throughout to sportsmen who may be keen enough to follow his example, but who lack experience and a knowledge of the country; while the interspersal of some good anecdotes here and there make this book a most readable one.

Catalogue of the Birds of Suffolk: with an Introduction and Remarks on their Distribution. By CHURCHILL BABINGTON, D.D., F.L.S., &c., Rector of Cockfield, Suffolk. 8vo, pp. 281, with a Map and seven Photographs. London: Van Voorst. 1886.

THIS Catalogue is reprinted from the 'Proceedings of the Suffolk Institute of Archæology and Natural History,' and was issued to the members in 1884 as far as the end of the Land Birds (p. 110), the remainder being issued in 1886. It forms a welcome addition to the already long list of county avifaunas, and should find a place in every ornithologist's library.

It is of course much easier to criticise a work of this kind than to write it, but we candidly think that Dr. Babington has not hit upon the best mode of presenting his facts. His division of the county into eight Districts formed by the combination of two or more Hundreds, with purely artificial boundaries, and the employment throughout the volume of different type to indicate this division and subdivision, tends rather to perplex the reader than to enlighten him. One has constantly to turn back to the Introduction to ascertain what districts are intended by the numbers which are given under the head of each species, and from the Introduction one must go to the last chapter in the book "on the distribution of the birds of Suffolk" to discover the natural and physical condition of these districts, whether

woodland or marshland, inland or littoral, before one is in a position to estimate the value of the information supplied. This is too troublesome a process to be repeated with equanimity, especially in an age when new books succeed each other in such rapid succession that it is difficult to keep pace with the flow of literature on any given subject.

Dr. Babington's chapter, however, on the distribution of birds in Suffolk will be read both with pleasure and profit, since it conveys a very fair notion of the physical aspect of the county at the present time, and the changes which have been affected by drainage, cultivation of waste land, disafforesting, and re-planting.

“The woods and plantations in the county are almost entirely of modern growth; some timber is also scattered about, but trees of all kinds are diminishing in many parts and perhaps generally; ancient forests such as those at Staverton and Fakenham are very rare, as are also old woods, those for instance near Needham Market.

“Of marsh land there is now for the most part no great quantity, and much fen has entirely disappeared. . . . The fens which once occupied a large district about Mildenhall appear to have been drained in the early years of the present century; the peat remains in a dry form. . . . There are no mountains and no rocks, and even the hills scattered about the county are few and inconsiderable. . . . On the coast there is abundance of sand and shingle, especially on Orford Beach, the acreage of which is probably larger than anything else of the kind on the east coast. . . . Adjoining the sea are considerable estuaries formed by the Stour, the Orwell, and the Deben. . . . There are also large pieces of water of a brackish character, particularly Breydon Water, Lake Lothing, and Thorpe Mere. The large tract of loose blowing sand below which there is chalk at various depths, lying in the north-west part of the county and known as the ‘Breck District,’ is a peculiar feature, having its characteristic avifauna.”

Dr. Babington's sketch of these physical conditions no doubt explains to some extent the distribution of the birds which are to be met with in the county, and accounts for their great variety. He tells us that 247 species may be regarded with reasonable certainty as Suffolk birds, and of these a very large proportion—more than half—are distributed over the whole of the county. It is a little surprising to learn that no ornithologist in Suffolk has detected the presence (even temporarily, as during the period of migration) of the Water Pipit or the White Wagtail, and that

notwithstanding the geographical position of the county, so favourably situated as it is for the visits of feathered stragglers from the Continent, the occurrence of the Great Reed Warbler, Savi's Warbler, and the Ortolan Bunting is considered more or less doubtful.

Dr. Babington's book will doubtless awaken fresh interest in the study of Ornithology in Suffolk, and we may expect to hear of the discovery of these and some other species which hitherto seem to have escaped observation. The enumeration of the local lists of birds which he has consulted, and the public and private collections in the county which he has examined, testify to the care and pains which the author has bestowed upon the preparation of this useful volume.

British Birds' Eggs: a Handbook of British Oology. By A. G. BUTLER, F.L.S., F.Z.S. Parts IV - VI. 8vo, pp. 113 - 219. London: E. W. Janson. 1886.

WORKS designed for publication in parts do not always appear punctually, nor are they, when begun, always completed. Mr. Butler may be congratulated both upon punctuality and completion. We have already noticed the first three parts of his work (Zool. 1886, p. 378); the remaining three are now before us, forming a goodly volume of 220 pages, with thirty-eight coloured plates of eggs. Looking at some of the earlier plates, as they appeared, we felt compelled to express disappointment, as they did not seem to us to be sufficiently accurate in colouring. In the later parts there is a marked improvement in this respect, several of the figures, although chromo-lithographs, being almost as good as if coloured by hand.

Looking at the number of plates (which contain 370 figures) and the price at which the book is published, we do not doubt that there are many who will be glad to possess in a single volume a handy guide such as this to the study of British Oology. It may be added that Mr. Butler gives figures not only of typical specimens of each species, but also of many of the most striking varieties.



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HOLOTHURIANS OR SEA SLUGS.

BY PROF. F. JEFFREY BELL, M.A.

WE are so much in the habit of associating hardness of the external parts with the Sea-urchin, the Starfish, or the Brittle-star that it is not at first sight easy to believe that the soft-bodied Sea-slug belongs to the same great division of the Animal Kingdom as the forms just named. There are, however, very good reasons for placing the Sea-slugs or Holothurians (in the same division of the Echinodermata with the Urchins (Echinoids), the Starfishes (Asteroids), or the Brittle-stars (Ophiuroids).

If we put our knowledge of the fact that a number of these echinoderms have hard outer skins into a generalised form, we should say that the Echinodermata had deposits of lime-salts in their integument; this is as true of nearly all Holothurians as it is of other members of the group; the striking difference is that these deposits in the Sea-slug are not, as a rule, continuous; they do not form a compact test, the parts of which fit close to one another as they do, for example, in the Urchin, nor do they form a lattice-work, as in the Starfish. As an ordinary rule, the calcareous deposits are scattered spicules, which may be rod-like, cup-shaped, or discoid, like wheels or anchors; sometimes, indeed, they form, as in *Psolus fabricii*, a continuous arrangement of tile-like scales on the dome-shaped upper surface; and, on the other hand, they sometimes are altogether absent, or disappear with the advance of age; it is obvious that they must be reduced to a minimum in those species which are

edible—the Bêches-de-mer, or Trepangs, which are so abundant in the Eastern Seas, and so much relished by the gourmands of China.

The possession of calcareous deposits is but one of the two leading characteristics of the Echinodermata: when we compare a Starfish with a Crayfish we see that, while the latter has a definite right and left side, or is bilaterally symmetrical, a Starfish has a number of arms or rays, or exhibits a radial symmetry:

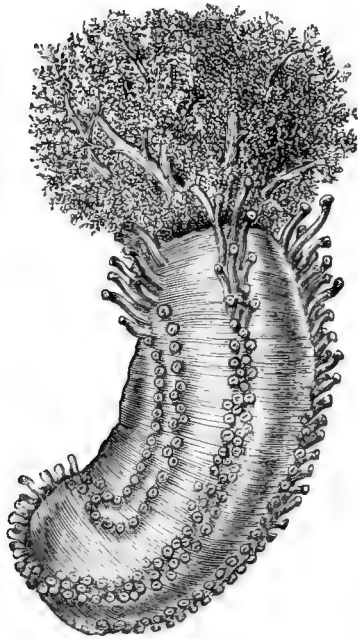


FIG. 1.—A Holothurian, *Cucumaria planci*, with the buccal tentacles expanded. Twice the natural size (Cassell's 'Natural History,' vol. vi. p. 272).

and in the next place we observe that, though there are exceptions, such as in the case of the common Sun-star of our own shores, yet the ordinary rule is that these rays are five in number. Further, if we look to the lower surface of a Starfish, we note that along the rays there are arranged double rows of little tubes or suckers, and if we examine a Sea-urchin we see that the rows of suckers are separated by inter-radial spaces in which there are no suckers. Now, if we examine a typical Holothurian, such as a *Cucumaria* (fig. 1) we find that there are here five equidistant double rows of suckers, which mark the five rays and are separated from one another by bare interradial spaces.

In the possession, then, of a quinquerradiate symmetry and of calcareous deposits in its integument a Holothurian conforms to our idea of a typical Echinoderm.

The mouth is placed at one end of the body and the vent at the other; round the mouth is a circlet of tentacles, which in the simplest cases are ten in number—that is, there are five pairs; these tentacles may be withdrawn into the body, and in some cases this retraction is aided by five radially placed muscles. At the base of these tentacles is a circular vessel, containing a fluid and giving off branches to the tentacles, and five larger trunks which run along the rays of the body, and communicate with the suckers; this circular vessel, with its tentacular and

radial branches, makes up one of the most characteristic structures of Echinoderm organisation—the system of water-vessels. In the Starfish it communicates directly with the exterior by a canal which opens on the upper surface of the body, but which in the Sea-slug hangs freely in the body cavity and draws its water thence. On the circular vessels and its trunks there are swellings or sacs with contractile walls, and it is by the action of these that the water is propelled through the system; when it is driven into the tentacles or the suckers these parts are forthwith erected.

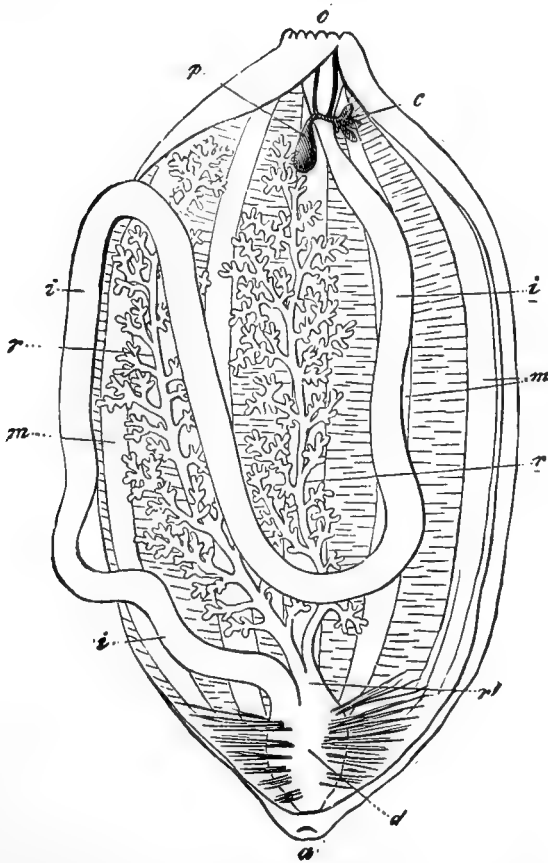


FIG. 2.—INTERNAL STRUCTURE OF A HOLOTHURIAN. *o*, Mouth; *i*, Intestine; *d*, Cloaca; *a*, Vent; *c*, Branched stone-canal; *p*, Polian vesicle; *rr*, Lungs; *r'*, their point of insertion into the Cloaca; *m*, Longitudinal muscle. (From Gegenbaur, 'Comparative Anatomy,' Bell's translation, p. 215.)

The intestine is looped and opens by a vent at the end of the body opposite to the mouth; its walls are exceedingly delicate, and owing to the fact that the contents are often sandy and gravelly, or composed of calcareous *débris*, they are frequently

found to be broken in preserved or dissected specimens. When irritated or alarmed a Sea-slug ejects its intestines, but by no means dies on account of this apparently suicidal act; just like all other Echinoderms it possesses a power of repair amply sufficient to make up for even the most remarkable acts of self-mutilation.

In *Cucumaria*, and in a large number of Holothurians, there are connected with the cloaca, into which the intestine opens, a pair of elaborately and exquisitely branched delicate tubes which extend far forwards into the body; into these water passes from the exterior and is again driven out; as this supply of fresh water brings with it oxygen, and as this oxygen is only separated by a thin wall from the carbonic acid gas in the body cavity an exchange of gases is effected—the water giving up its fresh oxygen, and taking away the carbonic acid or waste product;* owing to this respiratory function the branched tubes are called “lungs.”

There is only one other organ of the Sea-slug to which reference need be made here, and it also is connected with the walls of the cloaca; it consists of a system of blind tubes which may be very small or very large in number, and may form a compact mass, be branched, or whorled in arrangement. These tubes, which we know by the indifferent name of Cuvierian organs, have had very various functions ascribed to them at different times; it is now certain that, as shall be shown later on, Prof. Semper's supposition that they were organs of offence is correct.

Slight as our knowledge of Holothurian organisation is from this sketch, it is sufficient to enable us to understand the principles on which the group is classified; to the consideration of its arrangement we will, therefore, now proceed, taking on our way opportunities of saying a few words about the more interesting examples which are to be found in our own seas.

If we start with such a typical form as the *Cucumaria* which has formed the basis of the preceding account, we find we have had to do with an elongated animal whose body is divided by five rays into five parts, that the suckers are confined to the rays, that there are five pairs of tentacles, and scattered spicules

* Compare “Some of the Ways in which Animals Breathe,” Zool. 1886, pp. 305—318.

in the integument; there are five retractor muscles for the tentacles, and branched lungs.

Several species of *Cucumaria* are found in the British Seas, but one only is of large size; that is the sausage-shaped creature which É. Forbes called the Great Sea-cucumber (*Cucumaria frondosa*) and the Tangle Sea-cucumber (*C. fucicola*), in his well-known work, these being synonymous terms. This species has been found as far north as Greenland, and lives in North American as well as North European waters. Dr. William Stimpson, the well-known American naturalist, states that it makes very palatable soup.

The first change from the typical *Cucumaria* is seen in the modification of the tentacles, one pair of which becomes smaller than the other four; this is to be observed in some species of *Cucumaria* itself. The next step is the scattering of the suckers, which are no longer confined to the lines of the rays, but distributed apparently irregularly over the whole of the body; this also is found in what some naturalists still call *Cucumaria*, though Dr. Lampert the author of a recent monograph of the group, has proposed for such Sea-cucumbers the new generic term of *Semperia** — a name given, it need hardly be said, in honour of the distinguished professor of Würzburg, who during his now classical travels in the Philippines devoted much attention to the Holothurians; in our own seas the common *Thyone* (*Thyone papillosa*) is an excellent example of a form in which the suckers are scattered over the whole body, or take on what systematists call a sporadipod arrangement.

In another set of forms the integument becomes very heavily armed with calcareous plates, and the body is consequently always of the same form, and not variable like the Great Sea-cucumber. The Sea-girkin (*Ocnus lacteus* and *O. brunneus* of Forbes being synonymous terms) is one good example of this; another is presented by the Snail Sea-cucumbers (members of the genus *Psolus*), though here the species vary a good deal in the extent of their armature, the circumpolar *P. fabricii* being much richer in large plates than the *P. phantapus* which is found in our own seas. Another remarkable peculiarity in

* New, that is, for Holothurians; it has long been used amongst Mollusca, and if the generic division be allowed to stand, it must be altered for Echinoderms.

Psolus is the fact that the suckers are confined to the lower (trivial) surface, and that the movement of the creature is, therefore, in a way comparable to that of the snail.

We may now pass to another group in which lungs are likewise found, but in which there are no special retractor muscles for the tentacles, and these organs, instead of being branched as in *Cucumaria* (the *Dendrochirotæ*), are stouter and shield-shaped (*Aspidochirotæ*). The best known genus of this group is *Holothuria*, of which, though there are a large number of species, only two are to be found in the British Seas; *H. intestinalis* has only been dredged in the Minch, and *H. nigra* is found in the English Channel off the coasts of Devonshire and Cornwall.

It is to the latter species—which has various local names, but is best known as the “Nigger” or the “Cotton-spinner”—that we owe our certainty as to the function of the Cuvierian organs. *Holothuria nigra* has been called the Cotton-spinner from its habit of shooting out from its hinder end white tubes which swell up in the sea-water, and become exceedingly sticky, so that an object—such as a crab—which becomes covered with them finds it exceedingly difficult to set itself free. This pernicious habit causes this Sea-slug to be held in great detestation by fishermen. The tubes may be drawn out to twelve times their own length, and at the same time they swell up to seven times their original diameter; six of these tubes, drawn out to be so thin as to be scarcely visible, are sufficient to hold up a weight of nearly 1000 grains. It is easy to understand the effect such powerful, tenacious, and extensile threads must have on any object which they attack.

While all these forms are provided both with feet and with lungs there are other Holothurians which depart more widely from the Cucumarian type; in some lungs, but no suckers, are developed, and in others neither lungs nor suckers, either radial or scattered, are to be found. Of the former of these two groups, of which *Molpadia* may be taken as an example, we have no representatives in our own seas; of the latter there are two which are well known—*Synapta inhærens* and *S. digitata*. At first sight these creatures appear to be very different from our typical *Cucumaria*, owing to the fact that the quinquerradiæ symmetry is no longer marked by the tube-feet externally or their vessels internally, so that they appear as bilaterally sym-

metrical as many worms; they still, however, have calcareous deposits in their integument; *Chirodota*, an allied genus, having little rounded structures which look like toothed wheels, and *Synapta*, having fenestrated plates to which a projecting anchor-shaped spicule is attached; it is to the projecting ends of these anchors that the skin of *Synapta* owes its peculiar roughness. Though larger than *Chirodota*, *Synapta* never reaches in our own seas to the size of more than a few inches, but in the tropical seas the species of this genus may attain to a great length, being even as much as seven feet long. *Synapta* is remarkable among Echinoderms for having the sexes united.

A group of curiously modified Holothurians have been made known by the recent explorations in deep water, but as the Elaspoda are confined to great depths, and an enumeration of their characteristics would obscure these leading facts in Holothurian organisation which it is the purpose of this paper to describe, we must postpone any notice of them to another occasion.

During the last few months some of the more leading types of Holothurians have been set out in spirit for exhibition in the Starfish Gallery of the British Museum (Natural History). What are to be seen there are such forms as every reader of 'The Zoologist' ought to know a little about, but they do not, of course, give any idea of the extent of the National Collection of these animals. Comparatively rich as that collection is, it is certain that it still wants a number of described forms, and that there are still many Holothurians in the sea which have never yet been named or described. If this little paper should excite the interest of any reader in these instructive and incompletely known animals he may give a proof thereof by devoting his leisure to their collection; in justice, however, it must be said that the appearance of his preserved specimens will not give the brilliant results that fall to the collector of birds or insects. Holothurians have an irritating way of ejecting their viscera or of breaking to pieces; the best way, therefore, to kill and preserve them is to plunge them at once into spirit; before the specimens are packed off and sent to the Museum it is well to completely change this spirit, as it soon becomes weakened by the quantity of water in the Sea-slug's body.

NOTES ON A VOYAGE TO THE GREENLAND SEAS
IN 1886.

BY ROBERT GRAY.

[THE following notes, which I hope may prove of some interest to your readers, have been extracted from my journal of the voyage of the s. s. 'Eclipse' of Peterhead, David Gray, Master, to the Greenland Whale Fishery last season. I may state here that in former years the 'Eclipse' had left Peterhead regularly for the Greenland Seal and Whale Fishery early in March; but the small number of Seals obtained during the last few years at the Seal-fishing, and the low price to which Seal-oil had fallen, rendered the chance of obtaining a sufficient number of Seals to defray the additional expense incurred in their capture so uncertain as to cause the owners to delay the vessel's departure to the date mentioned below, sending her out therefore with the intention of prosecuting the Whale-fishing alone.—R. G.]

LEAVING Peterhead on April 20th, the 'Eclipse' the day following arrived at Lerwick. While here fifteen Shetland men were shipped to complete our crew of fifty-five hands all told. Sundry preparations being completed, on the forenoon of the 22nd the 'Eclipse' got under way, and before the sun set the lofty cliffs of Noss faded dimly in the distance astern.

The 23rd saw us well clear of land; already we noticed with interest unmistakable signs of our advance to the northward. Seventy miles N. of Lambaness the first Mallemites, *Procellaria glacialis*, were seen; some thirty miles further north several schools of Bottle-nose Whales, *Hyperoodon rostratus*. They appeared to be feeding—not on their northward journey, as we have noticed them year after year in the same latitude, some six weeks earlier in the season. Also a few Kittiwakes, *Rissa tridactyla*, and Gannets, *Sula bassana*, were noticed, and just before dark a small bird, believed to be a Snow-flake, *Plectrophanes nivalis*, was seen fluttering about the rigging, but unfortunately it was not captured to prove its identity.

Continuing to steam to the northward we experienced remarkably fine weather until the evening of the 24th, when the wind freshened from the northward, and the sea began to rise. In the evening a few Bottle-nose Whales were seen going southwards, and at the same time a Killer Whale, *Orca gladiator*, easily recognised by the height of its dorsal fin, pursuing a similar

direction. The wind continued adverse throughout the 25th, so that we made but little progress. Some Porpoises, *Phocæna communis*, were seen in the afternoon, the first I had seen so far north: I apprehend therefore that they were beyond the northern limit of their range.*

On the 26th and 27th we had light head-winds with frequent showers of snow. Crossed the Arctic Circle on the latter date, and noticed the first Looms, *Alca arra*, and Rotches, *Mergulus alle*; also a few Bottle-nose Whales and one large Finner, most probably *Balænoptera sibbaldii*. On the evening of the 28th the brightness of the northern sky indicated our approach to the ice, and as we advanced towards it the temperature of the water, which had previously stood for some time at 39°, began to fall, slowly at first, more rapidly afterwards, until it stood at 29° F., when we were within half a mile of the ice itself. The "West Ice," as it is called by the whalers, lying along the east coast of Greenland, northwards from Cape Farewell, renders its shores ice-bound throughout the entire year, and thus limits the extent of open water to the westward. Our position being lat. 70° 14' N. and long. 2° 23' W., the position of the ice-edge this season may be considered normal. Schools of Bottle-nose Whales seen in the afternoon, and at midnight we watched two large Finners playing about the ice-edge. By their bluish grey colour and by the diminutive size of their dorsal fins I at once recognised the *B. sibbaldii*. I will embrace this opportunity of correcting a statement in the 'Arctic Voyages of A. E. Nordenskiöld' (p. 52). The author says:—"It is probable that 'Finners' never live in colder water than 2·5° C. (= 36·9° F.), and that the northern limit of their distribution coincides with sea of this temperature." It is a fact well known, to those on board the 'Eclipse' at least, that this whale (*Balænoptera sibbaldii*) is found in water quite as cold as any other, *Balæna mysticetus* not excepted. I have seen it in water below 32° quite as often as above it, and the reader by referring to the Table appended will see how often the temperature of the water was below 36°, and how often above it on the days in which it is mentioned. Hereafter I hope to show that its northern distribution, instead of being restricted to a line of temperature at once arbitrary and unreasonable agrees more

* For latitudes and longitudes, temperatures, &c., see Table appended.

nearly with the southern distribution of *Balæna mysticetus*, and as the vanguard of the latter retreats to the northward the vanguard of *B. sibbaldii* advances to occupy the ground left vacant.

Having now reached the ice, it remained for us to proceed northwards towards the whaling ground; but as some time yet remained before we could expect to see whales, we hoped to pick up a few old Saddle Seals, *Phoca grœnlandica*, on our way north, and for this purpose the examination of each successive point of ice was commenced. By way of explanation, I may state that in the month of March, the Saddle Seals, male and female, come from the northward and southward, along the ice-edge, and, owing apparently to the formation of the latter, they converge towards a great point of ice, which in a normal season lies along the 73rd parallel of latitude, and runs out beyond the meridian of Greenwich. Here meeting, the united body of seals direct their course inwards, until ice is found suitable for their purpose. They now take the ice, and soon afterwards the young seals are born. On the 3rd of April, at what might be called a critical period in the history of the seal, the close-time ends, the sealers are at liberty to kill them, and before the creatures are many days old the whole "pack" is generally slaughtered before their mother's eyes. And what for nearly two hundred years has proved a sure and certain source of annual wealth, the support of an extensive industry, is—unless legislation comes speedily to its rescue—doomed to almost complete annihilation, by the greedy, short-sightedness of man. Towards the end of April the few young Saddle Seals which have escaped this wasteful destruction, having cast their snow-white fur, and assumed instead a coat of steel-blue hair, marked over with small dark spots, are now able to provide for themselves. Abandoned to their own resources, the "spots" as they are called, betake themselves towards the sea, and dispersing along the ice-edge are seen, alas! too infrequently! lying on the small outlying pieces of ice near the pack edge, enjoying the bright sunshine, and the warmth of the summer air. Before the young seals have taken to the water, the males commence seeking the females; pairing having taken place, all the old Saddle Seals abandon the locality, and, dividing into droves or herds, disperse both north and south along the ice edge. Selecting the outlying "streams" and "points," the old seals again take the ice, and the hunting of

them constitutes the "Old Saddle Sealing." A good many "Finners," *B. sibbaldii*, were seen on the 29th, and many Looms flying eastward, as we afterwards discovered, for the next point of ice. A few "spots" (young Saddle Seals) were seen on the 30th, and one Great Skua, *Stercorarius catarrhactes*, was for some time seen following in the ship's wake. This is only the second bird of this species of Skua I have seen in these seas during the last four seasons.

May 1st. "Finner Whales," *B. sibbaldii*, numerous in the evening. Having crossed a deep bight, May 2nd found us at another point in lat. $75^{\circ} 1' N.$, long. $0^{\circ} 42' W.$ Continuing our way northward, the same evening we passed a Norwegian steamer, lying amongst the ice, engaged in sealing. On the morning of the 3rd a patch of old Saddle Seals was discovered, numbering about 5000: they were scattered over a strip of ice some three miles in length by one in breadth: as many as fifty seals might have been collected on one single piece of ice. The boats, eight in number, were manned and sent away. Every shot drove hundreds off the ice, and in a remarkably short time the whole herd was driven into the water. After going a few miles to the northward they again went on to the ice in considerable numbers; their coats, however, not having had time to dry before they were again attacked, they required even less persuasion than before to return to their watery element. A heavy swell amongst the ice made shooting difficult, and kept the seals continually awake. All day they continued howling and screeching in the most melancholy manner, the sure and certain sign, the seamen said, of bad weather. Having bagged some 120 seals, the boats returned on board, and we made sail and proceeded northwards. One Narwhal seen; Snow-birds, *Larus eburneus*, and Burgomasters, *Larus glaucus*, numerous as these birds always are when seals are in the neighbourhood.

A heavy gale from the N.E., with showers of snow, blew on the 6th; having found shelter under lee of a point of ice, we lay comfortably under storm canvas. During the afternoon a small bird was noticed fluttering about the rigging; some time afterwards it was seen crouching under lee of the weather bulwarks, its feathers puffed out to their full extent; latterly it found its way underneath the fore-castle-head, where, protected from the inclemency of the weather, it soon fell into its last long sleep.

On examining it I found it to be a Wheatear, *Saxicola cenanthe*. Our position was lat. 77° N., long. 1° W. Numbers of old Saddle Seals were seen coming from the S.E. on the 6th, undoubtedly having been washed off an outlying "stream," and now returning to the main ice. On the 7th, the s.s. "Hope," of Peterhead, spoke us. We learnt from Capt. J. Gray, that the young Saddle Seal fishing had proved a complete failure. Comparatively fine weather was experienced until March 25th, when the weather changing for the worse, a succession of heavy north-easterly gales set in. Several of the Norwegian vessels were almost ashore on Jan Mayen, and one Scotch vessel, the 'Polar Star,' was driven as far south as Iceland (a distance of 400 miles), where she narrowly escaped being wrecked. The strong winds had also the effect of separating the ice, and necessarily also of dividing the seals into a number of separate patches. Owing to the severity of the weather the ships were unable to lower their boats until the 7th of April. The consequence was that the young seals were older than usual before being killed, and therefore in better condition. The seals were found in lat. 74° N., long. 2° E., at the extremity of the "point" already referred to, a few miles from the sea. Twenty-one Norwegians and three Scotch vessels were present, the former captured about 31,600, the latter about 4500 "white coats" (young Saddle Seals), besides these, a few old Saddle Seals were captured, perhaps 4000. In round numbers, the twenty-four vessels present captured a total of 40,000 seals, old and young, an average of 1600 per ship, certainly quite insufficient to pay expenses, and undoubtedly the poorest young Saddle Sealing as yet recorded.

Towards the evening of the 8th the weather moderated sufficiently to allow us to proceed. After "fishing" several patches of seals which we discovered on our way north, the 14th found us in lat. 78° approaching whaling-ground. On the 11th, amongst a patch of seals, a young Saddle was noticed lying on the ice, still wearing its snow-white coat. By the 15th, after several days work, the necessary preparations for whaling were completed. 600 fathoms (= 1,200 yards) of line were carefully coiled into each boat, harpoons were spliced on to the lines, harpoon guns fixed in the boat bows, &c. The day following we spoke the s.s. 'Erik,' of Peterhead. Capt. A. Gray reported having been

north in whaling-ground since April 25th; on April 30th one whale was seen (exceptionally early), but no others since then.

The North Greenland whaling-ground lies to the northward of the 75th parallel, to the westward of a line running obliquely north eastward, from the intersection of the latitude mentioned, by the meridian of Greenwich, to Amsterdam Island off the west coast of Spitzbergen. In the area whose south-eastern limits have been described, the margin of the Greenland west ice lies. Its sinuous outline presents a succession of points and bays, outlying "streams" and deep recesses. Among these the Greenland Right Whale makes its appearance about the middle of May, coming apparently from the S.W. They appear to come up through the very heart of the Greenland ice, finding breathing room in the lanes and open spaces of water, which are continually breaking out and closing again amongst the floes, perchance occasionally finding sporting-room in some large "polynia," far removed from the sea. Diverted apparently from their northern course by encountering a close barrier of ice, running obliquely across their path as they advance northwards, they are gradually forced to the eastward, until reaching lat. 78° they make their appearance at the sea edge. Here they resort during a variable period, from a month to six weeks or even less, in the months of May and June. Owing apparently to the opening of the obstruction referred to, they leave as suddenly as they made their appearance, are last seen going N.W., and the North Greenland whaling is over for the season.

After working north-eastward along the margin of the ice, on the evening of the 18th our further progress northward was prevented by a sudden alteration in the line of the ice-edge; hitherto its direction had been about N.E., now it ran eastwards for some distance, then taking a sweep to the S.E. it ran in upon the north-west coast of Spitzbergen. The ice lying east and west, forming the angle just referred to, is known as the "barrier," its origin being believed to be distinct from that of the west ice. Certainly its position remains almost unchanged throughout the season, and northerly winds have but little power in opening out its southern face. Most probably this ice owes its position to an easterly current, which carries it westward along the southern shores of Franz Joseph Land, round

the north end of Spitzbergen, and hence into the Greenland Sea.*

Easterly winds having prevailed the ice was exceedingly tight, and there was that want of outlying "points" and sheltered "bights" which forebodes a bad season. Narwhals were very numerous, flocks of Looms and Rotches were flying hither and thither, Snow-birds and Burgomasters were flying overhead. Mallemites followed in our wake. No whales making their appearance at the "barrier," accompanied by the 'Erik' and the 'Polar Star,' we took advantage of a northerly wind and ran south to try our luck in the next "bight." On the morning of the 19th, while lying becalmed a few miles off the ice-edge, a whale suddenly made its appearance alongside the 'Erik,' and her boats took it. The colour of the water was grass-green. Looms were very numerous. At noon of the same day, a breeze springing up from the S.E., and the ice being slack to the westward, we made sail and ran through it. Towards evening the wind increased to the force of a gale, and next morning, after having ran N.W. for about fifty miles, we tacked at the edge of the "fast ice," consisting of hard packed floes, then lay. The wind died away about noon and thick fog set in; at night a strong breeze sprang up from the westward, and clearing the fog away we found ourselves lying in an open space of water, circular in shape, some ten miles in diameter; the ice appeared to have completely closed behind us to the eastward; large floes were lying in sight to the westward. The colour of the water still continued grass-green, and contained abundance of whales' food, chiefly *Calanus Finmarckicus*. On the 21st a small whale made its appearance, evidently coming from the S.E., and was captured by the 'Polar Star.'

The westerly wind continuing, it began to tell on the tightness of the ice to the westward. A vast expanse of open water had broken out amongst the floes, and our room becoming somewhat circumscribed, after some trouble we succeeded in entering it. The water, clear and cerulean, contained no life; not even a bird was to be seen.

* Might I suggest that the wreckage of the 'Jeannette,' United States Exploring Vessel, found on an ice-floe, near Julianhaab, South Greenland, came by this route, rather than by a north-western.—See 'Nature,' December 4th, 1884.

Against strong northerly winds we now commenced to work our way back again to the "barrier." On the 24th, while plying northwards against a strong breeze, a short sharp sea or heavy "wind-lipper" running, a whale was discovered about a hundred yards from the ship, apparently lying asleep—a black object resembling in size and shape a fisherman's buoy was all that appeared above water. Perfectly motionless, it had no apparent inclination to rise to the sea, the short sharp waves washing freely over it. On the nearer approach of the ship, apparently awakened by the noise, it first rose fully six feet above the water, then sank quickly out of sight. At the distance of only a few yards I easily recognised it as the upper jaw of a Greenland Right Whale, and that part which originally attracted attention must therefore have been the tip of the animal's nose. When, where, and how the whales sleep is an interesting question which I do not propose discussing here: certainly it is a rare occurrence to see one asleep at the surface, especially in stormy weather. An anxious look-out was kept for two hours afterwards, without anything further being seen.

Reaching lat. 80° on the 26th, the ice was found to have undergone a remarkable change for the better, floes and fields were lying about quite unbroken in the sea. The same evening a whale was seen, which we succeeded in capturing. Falling over on its side during its death-struggle, it bent its body forwards until its caudal extremity was within some twenty feet of its chin. While in this strange position it spun round the centre of a circle, of which its body lay along by far the greater part of its circumference. In addition to the particulars regarding the capture, size, &c., of this and the other whales we captured, to be found in a Table appended, I may state that the tail of this one measured, transversely, 17 ft. 6 in.; antero-posteriorly along the median line 5 ft.; and that the smallest girth of the rump, 5 ft. 6 in., was obtained at the anterior commencement of the lobes of the tail.

During the following week we captured five whales; of these the smallest was that killed on May 28th. In proportion to its length — about 30 ft. — its head seemed remarkably short, certainly not more than one-fourth of the entire length; its skin was decidedly bluish black, almost azure-blue. Including those which we captured, we saw perhaps twenty whales, nearly all of small size. Except coming out below the ice, feeding and

returning again, they seemed to be going in no particular direction. Strong gales prevailed from the northward; often the boats were quite unable to pull to windward, and sometimes had even difficulty in living in the short sharp sea. Imagine, therefore, the additional difficulty and danger of harpooning and lancing whales to keeping a boat above water in such weather. Frequent snow-storms and stinging frost made four or five hours in an open boat none the less uncomfortable under such circumstances. The water, grass-green in colour, sometimes thick and obscure, sometimes clear and transparent, contained abundance of surface life, *Calanus finmarchicus* being as usual by far the most abundant—next, perhaps, *Clio borealis*. Birds (principally Looms and Rotches), Narwhals and Floe-rats (*Phoca hispida*) were numerous.

Whether going to windward or to leeward it was observed that whales, when amongst much sea, invariably appeared heading to leeward, apparently by interposing their backs between their spiracles and the sea, preventing the access of water into their lungs during inspiration. In this our boats were more than once deceived, for several times, when pulling to leeward after a whale, which had dived heading in that direction, they were somewhat disgusted to find that, on its next appearance it was considerably to windward of its former position. In former voyages I have a distinct recollection of chasing whales to windward against a short sharp head-sea; once, at least, while personally taking a leading part in the pursuit, several times as an onlooker, the observation I made on these occasions was, that every time the whale appeared at the surface, invariably turning away from its path, it described a circle of no great extent, and on coming round again to its old course would continue swimming to windward. What appeared to me then a most eccentric-like evolution I am now of opinion was performed for the very same reason as on the occasions already mentioned, *viz.*, to prevent the access of water to the lungs during inspiration. The spiracles are semilunar openings about 12 in. long, placed longitudinally on the very summit of the head or crown, having their convexities turned towards one another and the mesial plane, their posterior extremities farther apart than their anterior, which are situated within 4 in. of one another. These openings can be opened and

closed at pleasure, muscular effort, apparently, pulling their convex outer borders away from the mesial plane and their inner concave borders. These muscles relaxing, the spiracles close by the approximation of their own walls, and thus during sleep they are seen closed, and after death (post mortem rigidity having ceased) the spiracles are found rigidly closed.

In the following Table will be found the position of the s. s. 'Eclipse,' the surface temperature of the sea, and the temperature of air, at noon, on the different days on which any event of zoological interest is recorded as having occurred:—

DATE.	SHIP'S POSITION.		TEMPERATURE.	
	Lat.	Long.	Surface of Sea.	Air.
April 23	62° 14' N.	0° 25' W.	47° Fh.	48° Fh.
„ 24	64° 38'	0° 25'	44°	39°
„ 25	64° 49'	2° 33' E.	44°	34°
„ 26	66° 5'	0° 45'	42°	33°
„ 27	67° 55'	1° 53' W.	41°	35°
„ 28	70° 14'	2° 23'	39°	32°
„ 29	71° 54'	2° 34'	32°	31°
„ 30	72° 38'	1° 49'	30·5°	34°
May 1	74° 20'	1° 29'	29·5°	27°
„ 6	76° 38'	0° 7'	29·5°	30°
„ 11	78° 0'	1°	29°	20°
„ 18	79° 57'	4° 20' E.	30°	22°
„ 19	78° 53'	4° 6'	29·5°	27°
„ 21	78° 40'	1°	31°	27°
„ 26	79° 41'	2° 0'	31°	27°
„ 29	79° 24'	2° 2'	29°	16°

(To be continued.)

NOTES ON THE VERTEBRATE ANIMALS OF
LEICESTERSHIRE.

BY MONTAGU BROWNE, F.Z.S.
Curator, Town Museum, Leicester.

(Concluded from Zool. 1886, p. 415.)

CLASS REPTILIA.

Order SAURIA.—FAM. LACERTIDÆ.

Lacerta agilis, Linn. Sand Lizard.—Harley writes:—"This species is liable to much variation in colour. It has been met

with of a pale greenish yellow, with the back of an umber-brown colour; others of a darker hue, and others again variegated with black spots down the centre of the back. It is of limited distribution in the county, being mainly confined to Charnwood Forest and the adjacent woodlands."

Lacerta vivipara, Jacq. Common Lizard; "Scaly Lizard," "Viviparous Lizard."—Occurs generally in most parts of the county, and is common about Charnwood. Harley was informed by a correspondent that he had occasionally seen in the neighbourhood a species of Lizard which affected the leaves of brambles and other plants, its habits being described as similar to those of a Chameleon, especially when basking in the sun or intent on feeding; but it is well known that this is a common habit with *Lacerta vivipara*, and probably with most Lizards.

Fam. SCINCIDÆ.

Anguis fragilis, Linn. Blind-worm; "Slow-worm."—Resident and commonly distributed. There are specimens in the Museum at Leicester from Bradgate and Bardon Hill.

Order OPHIDIA.—Fam. COLUBRIDÆ.

Tropidonotus natrix (Linn.). Common Snake; "Ringed Snake."—Resident and commonly distributed. A large female specimen in the Leicester Museum measures a little over three feet. [We have seen one over five feet.—ED.]

Fam. VIPERIDÆ.

Vipera berus, Linn. Viper; "Adder."—Resident and generally distributed, but not so common, fortunately, as its harmless relative. Harley remarks, under date 1846:—"Peliæ berus and *Coluber natrix* were abroad very early this season, viz. during the first and second week of March. On the 13th and 14th of that month we noted both reptiles in Bradgate Park. There are specimens in the Museum from many localities in the county, all of the dark variety.

Class BATRACHIA.

The following are all resident and generally distributed:—*Rana temporaria*, Linn.; Common Frog. *Bufo vulgaris*, Laur.; Common Toad. *Molge cristata* (Laur.); Great Warty Newt;

“Warty Eft,” “Effet.” *Molge vulgaris* (Linn.); Smooth Newt;
 “Common Effet,” “Asker.”

Class PISCES.

Order GANOIDEI.—Fam. ACIPENSERIDÆ.

Acipenser sturio, Linn.; Sturgeon.—A rare straggler of accidental occurrence. Harley says a specimen was taken in the Soar, below Loughborough, but gives no date. Some few years ago a small specimen was taken in the little River Smite near to Belvoir.

Order ACANTHOPTERYGII.—Fam. PERCIDÆ.

Perca fluviatilis, Linn. Perch.—Commonly distributed. In the Leicester Museum there is a cast of a specimen taken at Saddington by Mr. J. Benskin which weighed about three pounds. On July 19th, 1886, Mr. Smith presented one to the Museum taken at Aylestone which weighed two pounds two ounces. At Thornton, where it abounds, I have taken several specimens with blunt heads or rounded noses, evidently a malformation, which appears, however, persistent.

Fam. COTTIDÆ.

Cottus gobio, Linn. Miller’s-thumb; “Bull-head.”—Commonly distributed.

Fam. GASTEROSTEIDÆ.

Gasterosteus aculeatus, Linn. Three-spined Stickleback, “Robin,” “Soldier,” “Jack Bannel,” “Tittle-bat,” “Stuts.”
G. pungitius, Linn. Ten-spined Stickleback, “Tinker.”—Both commonly distributed.

Order ANACANTHINI.—Fam. GADIDÆ.

Lota vulgaris, Cuv. Burbot; “Burbolt,” “Eel-pout.”—Rare. It has been occasionally taken in the Soar about Kegworth; and Harley saw one taken in an eel-net at Zouch Mills, near Loughborough.

Order PHYSOSTOMI.—Fam. CYPRINIDÆ.

Cyprinus carpio, Linn. Carp.—Not uncommon in pools such as those of Groby and Saddington.

Barbus vulgaris, Flem. Barbel.—Occurs occasionally in the

Soar, near its junction with the Trent and Derwent, and is frequently caught below Loughborough.

Gobio fluviatilis, Flem. Gudgeon.—Common in the Soar, and in various parts of the county. The largest I have seen have been taken at Thornton Reservoir.

Leuciscus rutilus (Linn.). Roach.—Commonly distributed. In the Leicester Museum there is a cast of a specimen, taken in Narborough waters, which turned the scale at two pounds.

L. cephalus (Linn.). Chub.—Generally distributed, attaining a good size. A specimen, weighing five pounds two ounces and a half, taken in the River Soar at Narborough by Mr. T. Lumb, Feb. 27th, 1883, and another weighing five pounds and half an ounce, taken at the same place and by the same angler, Feb. 6th, 1885, are in the Leicester Museum. Another taken at Aylestone, Feb. 6th, 1883, by Mr. A. Smith, weighed four pounds and a half.

L. vulgaris, Flem. Dace.—Generally distributed in sharp streams—"backwaters" of the rivers. A specimen weighing twelve ounces was taken by Mr. W. Benskin in the Soar near Barrow.

L. erythrophthalmus (Linn.). Rudd; "Red-eye."—Occasionally met with in the Soar.

L. phoxinus (Linn.). Minnow.—Commonly distributed.

Tinca vulgaris, Cuv. Tench.—Not very common.

Abramis brama, Linn. Common Bream; "Yellow Bream."—Commonly distributed in the Soar, where, at Kegworth, I have seen many large-sized fish. One taken in this river weighed seven pounds.

A. blicca, Bl. White Bream; "Bream-flat."—Occurs in the Soar and Trent.

Alburnus lucidus, Häckel. Bleak.—Widely diffused.

Nemachilus barbatulus (Linn.). Loach; "Bearded Loach," "Stone Loach."—Generally distributed.

Cobitis tenia, Linn. Spined Loach; "Groundling."—Locally distributed. Has been met with in the Soar and Wreake. I took a specimen in a small stream at Aylestone on April 14th, 1883.

FAM. ESOCIDÆ.

Esox lucius, Linn. Pike.—Commonly distributed, attaining a large size in ponds such as those of Bosworth, Saddington, and Naseby. In 1811 Harley saw a brace of Pike, taken in a pond

at Leishley, the property of Mr. March Phillips, each of which weighed twenty-five pounds. I saw one weighing twenty-six pounds, which was captured in April, 1869, in Bosworth Pool. The MS. Donation Book at the Leicester Museum records, August 20th, 1872, the capture of one at Barrow-on-Soar, which weighed seventeen pounds and three-quarters, and measured three feet six inches in length. It was presented to the Museum by Mr. Noble, of Barrow.

Fam. SALMONIDÆ.

Salmo salar, Linn. Salmon.—Harley writes, “Found commonly in the Trent and Derwent at their confluence; in the Soar about Kegworth, and near Loughborough.” At present, however, it must be regarded as rare, although I heard of one taken at Ratcliffe Lock, in 1883, which was said to have weighed twenty-six pounds.

Salmo fario, Linn. Common Trout; “Brook Trout.”—Sparingly distributed in the county. At Bradgate, where it is strictly preserved, it is abundant, and attains a good size.

Thymallus vulgaris, Nilss. Grayling.—“Appears to be limited to the Soar and its confluence with the Trent.”—Harley.

Fam. MURÆNIDÆ.

Anguilla vulgaris, Flem., Eel; and *A. latirostris*, Broad-nosed Eel. Both commonly distributed.

Fam. PETROMYZONTIDÆ.

Petromyzon fluviatilis, Linn., Lampern, “River Lamprey”; and *P. branchialis*, Linn., Small Lampern, “Pride.” Both sparingly found in some of the streams of the county.

A FEW WORDS ON EUROPEAN BATS.

BY THE RT. HON. LORD LILFORD, F.Z.S.

PROMPTED by your remarks in the last number of ‘The Zoologist,’ and by the excellent plate of the Greater Horse-shoe Bat, I venture to offer to your readers a few notes on those species of the order Cheiroptera which I have met with in the European region. I may mention that I took up the study of Bats in the summer of 1870, and in a few days discovered that

five species are tolerably abundant in the neighbourhood of Lilford, and that at least two more, which I have not been able satisfactorily to identify, are occasionally to be met with in the northern division of Northamptonshire. I have no work of reference at hand except Lord Clermont's 'Guide to the Quadrupeds and Reptiles of Europe,' so I adopt his arrangement and nomenclature. From the habits of the European Bats a close study of the animals in their natural state is almost impossible, but to my mind most attractive; I have no pretence to any special knowledge on the subject, and my only object in thus addressing you is the hope that my notes may induce some of your readers to turn their attention to this comparatively little-known branch of Zoology, and give us the result of their experiences in your Journal. To those who have as yet paid no attention to Bats, it may be useful to mention Dr. Dobson's exhaustive British Museum Catalogue of the Cheiroptera as the standard English work on the subject.

During my visit to Cyprus in the spring of 1875 I was informed by a fellow-countryman, who had resided for some years in the island, that a considerable amount of damage to fruit was there done by some large Bats: in spite of some search in likely localities we did not succeed in finding any of these animals during our five weeks' stay on the coasts of Cyprus; but a collector, whom I sent out shortly after the British occupation of the island, sent me some thirty specimens of *Cynonycteris collaris* in spirits. It is somewhat remarkable that the fruit-eating Bat of Cyprus should be of a different species to that of Egypt and Palestine, *C. aegyptiacus*. I believe that I am correct in stating that till the receipt of these Collared Fruit-Bats from Cyprus, the species had not been recorded from any locality nearer home than S. Africa. The Zoological Society have for many years past had more or less of this species alive in the monkey-house in the Regent's Park, where one or more young ones have been produced every year since 1870. I have a pair of these animals at Lilford; they are very tame, exceedingly cleanly in their habits, and seem to thrive upon almost any sort of fruit, with a decided preference for dates, bananas, grapes, and cherries.

Dysopes Rüppelii, Temm.—The only specimen of this very curious species that I have ever seen alive was brought to me in

Seville, in April, 1872, by a man who said that he found it clinging to the old brickwork of an aqueduct just outside the city wall on the road to Alcalá de Guadaira. I have received specimens from Genoa, and have reason to believe that it is by no means very uncommon in many parts of Italy and Sicily. I found it in the Museum of Palermo, and was informed that it was not rare in that neighbourhood.

Rhinolophus ferrum-equinum, Bonap. Faun. Ital.—I procured a few of this species alive from some sea-caves near Syracuse, in the spring of 1874. It is common in most parts of Italy, and, as far as my own observation goes, prefers caves or buildings to hollow trees. In England it is by no means abundant. In Spain it is extremely local, and not very common.

Rhinolophus euryale, Blasius.—This species, intermediate in size between the Greater and Lesser Horse-shoe Bats, I met with in Andalusia in tolerable abundance, and procured many specimens in Sicily from small caverns and fissures in ancient quarries. The fur of this species is of a lighter colour than that of either of the other two European Horse-shoe Bats, and lacks the rufous tinge which is generally to be observed in those species.

Rhinolophus bihastatus, Desm.*—I have received specimens of this Bat from South Devon, where I believe it to be much more common than is generally supposed. It abounds in Southern Spain, Sicily, and the neighbourhood of Algiers, in all which localities I have met with it hanging in clusters in caves and old buildings. The Horse-shoe Bats appear to be very savage and pugnacious, and other species are seldom to be met with in company with them. The flight of this genus is somewhat weak and fluttering, as compared with that of most European members of the order.

Vespertilio noctula, Desm.—This species, the largest of our British Bats, is common in Northamptonshire, inhabiting the cavities of old ash, elm, and beech trees in colonies of from six to upwards of twenty. It flies high, often out of gunshot range, and is seldom to be seen on wing after the end of August. The

* The Lesser Horse-shoe Bat. According to Dr. Dobson this should stand as *Rhinolophus hipposideros*, Bechstein, Naturg. Deutschl. p. 1194 (1801); *Rhinolophus bihastatus*, Geoffroy, Descript. de l'Égypte, ii. p. 132 (1812).—ED.

presence of these animals has often been betrayed to us by a constant twittering squeak issuing from holes in our old trees. I am inclined to think that many Woodpeckers, Starlings, and other hole-breeding birds are ousted from their homes by these Bats. In spite of many attempts I never could succeed in getting a Noctule to take food of any sort in a cage or box. I have found this Bat in every part of Spain that I have visited.

Vespertilio murinus, Desm.—This Bat, whose claim to rank as a British species is, I believe, founded on the occurrence of a solitary individual in the precincts of the British Museum many years ago, is recorded as very common in France and Germany. The only living specimens that I have handled were one taken in a ruined house near Seville, and another brought to me, with some hundreds of another species, from a cave near Syracuse. A friend, whom I had asked to look out for Bats for me, wrote from Aix-les-Bains that he saw several thereabouts, “nearly as big as Woodcocks”; and when I was subsequently at that place I saw two or three very large Bats that were certainly not Noctules, and must, I think, have belonged to this species; unless this was the case, I cannot speak positively as to having seen this Bat on the wing. This animal is, in my opinion, one of the most repulsive in appearance and odour of the Bat family, being generally mangy in coat, and covered with parasites, from which, indeed, few of the European Bats are ever completely free.

Vespertilio Nattereri, Desm.—This species, though apparently very local, is by no means uncommon in the neighbourhood of Lilford; as far as I have been able to ascertain it seldom hunts for food at more than a few hundred yards distance from its diurnal retreats, though it is a comparatively strong flyer. I shot one on wing many years ago on the road in the village of Achurch, and, though I then knew nothing about Bats, noticed that it was a very different animal from the three species that swarm around the house at Lilford in the summer evenings; in 1870, when I began to collect Bats, I was told by our old fisherman, a native of Achurch, that whilst smoking his evening pipe at his cottage door he had often seen many Bats emerge from a crack in the stonework below the chimney of his nearest neighbour's abode; I asked him to try and catch some of them, and he brought me some twenty of this species a day or two after

making the announcement; this was early in July, and a short time afterwards I received several more of the same species from under the roof of Pilton Church, which is a short quarter of a mile from Lilford. I tried in vain to keep some of these Bats alive, and sent two of them to the Regent's Park Zoological Gardens; but they all declined to feed, three or four of mine died, and were placed in spirits, and I liberated the survivors after a few days' captivity. I never met with Natterer's Bat anywhere but in the two localities above-mentioned; it is said to occur in Belgium, Eastern France, Germany, and other parts of Central and Eastern Europe.

Vespertilio serotinus, Desm.—Although I have never been able hitherto to obtain the Serotine in Northamptonshire, I feel certain that it occurs occasionally near Lilford; but as its mode of flight, general coloration, and make, very much resemble those of the Noctule, to which species adult specimens approach in the extent of wings, it is of course impossible to speak positively without having handled and examined a freshly-killed specimen. I have received specimens of this Bat from Sussex and Hampshire, and found it to be common in various parts of France and Central Spain. The Serotine, as far as my own observation goes, appears addicted to hollow trees in preference to caves or buildings. I saw some fifty or more of this species in a cage at the Jardin des Plantes in 1867, and was assured that they had been taken from old trees in the neighbourhood of Paris by wood-cutters. In many parts of Eastern Germany this Bat appears to be common. It flies high, and is very fast on wing.

Vespertilio Schreibersii, Desm. — Many of this species were brought to me alive from the caves and quarries near Syracuse in April, 1874, and I knocked one down with a carriage-whip as he flew in bright sunshine near the well-known Grotto del Cane, at a short distance from Naples. I also caught four specimens of this Bat with one of *R. euryale* in a dark chamber in Pompeii; this latter animal was devoured by the others as they were carried in a handkerchief from the exhumed city to Torre del Annunziata, where our yacht was lying. This is one of the most common Bats in Southern Italy: I have also received it from Genoa, and it is abundant in Southern Spain, especially in the neighbourhood of Seville.

Vespertilio pipistrellus, Desm.—This little animal is *the Com-*

mon Bat of our islands, and abounds in Northamptonshire as in most parts of England with which I am acquainted. I have met with it in Spain, and I think in Italy, but to anyone but an expert it is difficult to discriminate this from the following species.

Vespertilio Kuhlii, Temm.—Of this species I can only say that, if my identification is correct, I have found it not very abundantly in Spain, commonly in S. Italy, Sicily, and Corfu. I am informed that *V. rispistrellus*, Penn., *V. aleythœ*, and *V. albo-limbatus*, Bonaparte, are only synonyms for this species.

Vespertilio mystacinus, Desm. — The only living specimens of this Bat that I have ever seen were three or four brought to me from the belfry of Tichmarsh Church, Norths., in 1870, and one that I picked out of the Avon below the bridge at Christchurch, Hants, in 1873; the latter little animal was making a fairly strong swim of it against a moderate stream. This so-called Whiskered Bat is the darkest in colour of the British species with which I have any acquaintance.

Plecotus auritus, Geoffroy. — The Long-eared Bat is exceedingly common in Northamptonshire, as in most parts of England, and may often be seen flying in broad daylight and sunshine, sometimes even in the depth of winter; it seems especially to affect the roofs of summer-houses, porches, and cattle-sheds; its presence in such localities is often betrayed by the wings of moths on the floor below its lurking-places. This is the only species of British Bat that I could ever succeed in keeping alive for any length of time; the two or three with which I made the attempt fed greedily upon live house-flies and other small winged insects, taking them eagerly from our hands; but they refuse mealworms, beetles, and every sort of raw meat. During the hibernation of these animals I frequently examined them very minutely, and could not detect any pulsation whatever, or the slightest stain on a small mirror applied close to the nostrils; but they would slowly recover animation when exposed to a heat of about 75° Fahr., and eat ravenously as long as I had any flies to offer them; one of these Bats lived for more than two months in a state of complete torpor in a temperature varying from about 40° to 60°, and eventually flew off on a warm morning in February, and commenced hawking for gnats on the sheltered side of the house as briskly as if it had been mid-summer.

Barbastellus communis, Bonap. — I found this curious-looking

little animal in great abundance in a ruined monastery in Arragon, at the foot of the Pyrenees, in the summer of 1867, and in smaller numbers in a similar locality at Pótes, in the Province of Santander, in 1876. I have also met with it in Switzerland. This Bat is generally supposed to be uncommon in England, but although I have at present no positive proof of the fact, I strongly suspect that it occurs about Lilford. It generally flies lower than any other Bat of my acquaintance, with a somewhat feeble and hesitating flight.

In conclusion, I may mention that, besides the species mentioned above as occurring in our islands, I find that Lord Clermont (on the authority, as I suppose, of Thomas Bell, 'Brit. Quad.') admits six other species, viz., *V. Bechsteinii*, Desm., *V. Leisleri*, Desm., *V. discolor*, Desm., *V. Daubentonii*, Desm., *V. emarginatus*, Desm., and *Plecotus brevimanus*, Bonap.*; but the simple truth is that very few English zoologists have studied, or at all events published the results of their studies of our Bats, and if my meagre remarks should induce any of your readers to turn their attention to this subject, I will hope that we may shortly have the benefit of "more light."

NOTES AND QUERIES.

MAMMALIA.

Young Otters in August.--On the 14th August last I had two young Otters sent me by a friend, who had taken them the previous evening. They were interesting on account of their very tender age, for I should think they were not more than a day old, if so much. A gamekeeper said he was sure they had "seen daylight" only a few hours, which was an error of observation, as the little creatures were of course blind. The first thing that struck me was their diminutive size, as they certainly were no larger than an ordinary kitten at the time of birth; in fact, I think I have seen very young kittens larger and more robust than these tiny Otters were, but their webbed feet and thick tail were characteristics not to be overlooked.

* *Plecotus brevimanus*, Jenyns, is now generally admitted to be merely the young of *Plecotus auritus*, Linnæus. The nomenclature here adopted from Lord Clermont's 'Guide to the Quadrupeds and Reptiles of Europe' (1859) stands in need of considerable revision, and cannot be regarded as authoritative at the present day.—ED.

They were of an uniform *grey* colour, and in this respect very unlike older individuals. They were deposited underneath some planks forming part of the floor of a boat-house, to which the female gained entrance by burrowing under the water into the bank, and then working upwards, as I believe is their usual wont. There was but little semblance of a nest, only a few green water-weeds having been collected together, and upon these the infants were reposing with their parent, who stoutly refused to leave her tender charge, and with a maternal courage which certainly deserved a better fate forfeited her life in their defence. Is August the usual time for young Otters, and are there usually two at a birth? [Young Otters have been found in almost every month of the year.—ED.] My friend informed me that indications of the presence of Otters near the boat-house—by partly devoured fish—were abundantly evident for a long time previous to the capture of the above; and it is gratifying to all who take an interest in our comparatively few British wild quadrupeds that Otters are far from rare about the Hampshire Avon, and they naturally frequent those parts of the river where fish-preservation offers them the best chance of livelihood with the least amount of labour. I was not aware of the fact that Otters will kill and devour Wild Ducks when in the “flapper” state. Is it well known?—G. B. CORBIN (Ringwood). [We have heard on good authority of their killing and eating Moorhens and also Water-rats.—ED.]

Weasels killing Moles.—Apropos of the question whether Stoats and Weasels kill Moles (Zool. 1886, p. 456), I came upon the following note in ‘The Field’ of May 1st, 1886, which may perhaps be worth reprinting as bearing on the question. Mr. H. H. Simpson, of Bowdon, Cheshire, writes:—“In ‘The Field’ of April 24th a correspondent mentions the capture of a Weasel in a mole-trap, and asks whether it is a common thing for Weasels to hunt Moles. As there seems to be some doubt whether Weasels actually prey upon Moles or not, I may mention that I saw a Weasel run across the road near here carrying a Mole in its mouth, apparently with the greatest ease, for its head was held up high, and the Mole was quite clear of the ground. The Weasel with its burden disappeared down a hole, where it is reasonable to suppose that the Mole would be made a meal of.” Another instance of a Weasel having been seen in the act of carrying a Mole was previously recorded in the same paper, July 9th, 1881. In this case the Mole was picked up by the person who witnessed the occurrence, and who shot the Weasel and had both animals stuffed. On the 7th May last my brother told me that he had a few days before found a young Weasel in a large mole-hill in some marshes at Leiston. It was apparently only just born, and he thinks it must have been the first of a litter, and that the mother, disturbed by his dog, probably escaped through some of the holes or runs of the Mole.—G. T. ROPE (Blaxhall, Suffolk).

Bats in Winter.—It is not uncommon on mild sunny days in winter to see the Pipistrelle, *Vespertilio pipistrellus*, flying about during mid-day; but until the 2nd January inst., in Surrey, I never saw one out with the ground covered with snow and the thermometer at the time below freezing-point. There was a bright sun shining at the time, about noon, and I only saw the Bat fly round some three or four times.—L. H. IRBY (Wadenhoe, Oundle).

Dormouse in a Woodpecker's Nest.—On the 25th June last I was surprised to find a Dormouse's nest in an old Woodpecker's hole in an oak. I had examined the hole not long before and found nothing in it, and when I saw pieces of dry grass I thought a Starling had taken possession; but on my poking with a bit of wire the two Dormice came out and ran up the trunk at a great pace. I often find their nests here in bushes,—F. H. BIRLEY (Dorman's Land, East Grinstead).

BIRDS.

The Mediterranean Black-headed Gull on the Norfolk Coast.—On the 26th December last an adult specimen of *Larus melanocephalus*, a male by dissection, was shot on Breydon Harbour, near Yarmouth, and was brought to me about an hour afterwards. At first I did not recognise the species, but its white wings, with only the outer primary edged with black, its deep umber-brown legs and feet, and stout bill, convinced me that I had a rarity. On consulting the fourth edition of Yarrell's 'British Birds,' Mr. Howard Saunders' excellent description (vol. iii. p. 605) showed me that the specimen in question was the Mediterranean Black-headed Gull. It was examined in the flesh by Mr. J. H. Gurney, jun., Mr. Thomas Southwell, and Major Feilden. I believe that this is the first properly authenticated specimen which has been procured in Great Britain, and I am glad that such an addition to the British Avifauna should have occurred in this county.—GEORGE SMITH (Great Yarmouth).

[This bird was exhibited by Mr Howard Saunders at a meeting of the Zoological Society on the 18th January last.—ED.]

Lesser Redpoll nesting in Surrey.—On the 20th May, about two miles from Leigate, I came across two pairs of Lesser Redpolls in a clump of willows. They were much agitated, and soon betrayed the cause of their distress by clustering to a nest which contained one egg. It was placed in the fork of a willow about six feet from the ground. I think there are not many recorded instances of these birds breeding in Surrey.—F. H. BIRLEY (Dorman's Land, East Grinstead).

Variety of the Wild Duck.—On December 10th I shot a pretty and curious variety of the Wild Duck, *Anas boschas*, from a pond in the

park here. The bird was a male, and had been seen about the park for several days, in company with two ducks of the natural colour. It had the crown and a large patch on each side of the head of the usual colour; the rest of the head and neck white. The dark brown band on the upper part of the breast was absent, the ordinary grey colour of the under parts extending to the neck; belly, yellowish white; back, tail, and under tail-coverts of the usual colour; a few white feathers in the upper tail-coverts; wings white, with the exception of a few feathers in one of them.—G. H. CATON HAIGH (Grainsby Hall, Great Grimsby, Lincolnshire).

Waxwing in Aberdeenshire.—In a small garden near the Lumphanan Railway Station, during the last fortnight in December, a solitary Waxwing was seen daily. It was very tame, suffering an approach within a few yards, and when scared did not fly far. It was feeding voraciously on the red berries of the Cotoneaster.—GEORGE BROWN (Elsick House, by Stonehaven, Kincardineshire).

[The appearance of this occasional winter visitor is most uncertain and irregular. Sometimes we hear of flocks arriving, sometimes a winter will pass without one being seen or at least reported. The last we heard of was seen at Hickling in January, 1884, as recorded in 'The Zoologist' for 1885, p. 55.—ED.]

Blue-throat in Norfolk—Correction of Error.—Allow me to correct a statement in 'The Zoologist' for 1886. The Blue-throated Warbler recorded, at p. 160, by Mr. J. H. Gurney, jun., as having been shot by Mr. G. Hunt on the Horsey sand-hills on Sept. 25th, 1885, was only a female Redstart. It was, moreover, on the Winterton sand-hills where Mr. Hunt "wiped my eye" at this bird; we were both rabbit-shooting and on the look out for Blue-throats, when the "fire-tail" of this bird when rising attracted my notice. Mr. Hunt shot a Black Redstart at West Somerton in October, 1885, and on the 19th December, 1886, a female or immature male Black Redstart came into Mr. Bonner's greenhouse at East Rudham, where it continued for two or three days until allowed to go free.—MAURICE C. H. BIRD (West Rudham, Norfolk).

Harlequin Duck on the Northumbrian Coast.—On December 6th I received in the flesh and in a perfectly fresh condition a Harlequin Duck, shot on Dec. 2nd off the coast of Northumberland, near the Farne Islands. The correspondent who kindly sent it to me tells me he never met with such a bird before, and that there were three swimming together close to the islands. He shot them all, but only succeeded in getting two of them. Probably the wounded bird became the prey of some large gull. My specimen is a young male, and probably a bird of the previous year, as the white patch of feathers near the carpal joint of each wing, the pure white spot behind the eye, the stripe on the neck, and the chestnut

colouring on the sides are all clearly defined ; there are many blue feathers among the brown on the back, and one of the scapulars on the right side has a broad white mark ; the breast and underparts are mottled all over with pale brown and dingy white, much like those of a female Pintail. The eyes were brown, the beak lead-colour ; the legs and feet yellowish brown, without the least tinge of blue. I believe the legs and feet of the Long-tailed Duck, which species has been most frequently mistaken for the Harlequin, are greyish blue in both sexes, and at all ages. The bird was in very good condition. It seems difficult to account for a bird which breeds not uncommonly in Iceland being so rare a visitor to Britain.—JULIAN TUCK (St. Mary's, Bucknall, Stoke-on-Trent).

Birds observed in North Devon.—A fine Buzzard was brought into Ilfracombe about the middle of August, having been trapped on the borders of Exmoor, and I heard that both this bird and the Raven (of which I saw recently stuffed examples) were still found in some numbers in that district. On the 16th, when on the Little Hangman, I saw half-a-dozen Choughs flying round the cliff below me. Walking up the East Lynn from the sea to Watersmeet I counted upwards of a dozen Grey Wagtails, but not one with a black throat ; of Dippers I only saw two. The Wood Wren seemed common, especially in the oak woods at Clovelly. Stock Doves haunted the cliffs to the west of Ilfracombe, and probably bred in some likely looking holes and fissures. The only waders I came across were four Turnstones and a large kock of Curlews at Braunton Burrows on the 21st, and a Common Sandpiper at Barnstaple on the 19th ; many, however, passed over on several nights, and I recognised Whimbrels, Redshanks, Ringed Plovers, and Common Sandpipers. I met with the Cormorant on three occasions ; in each case a single bird and at widely distant localities. An adult Gannet came in sight on the morning of the 15th, but I did not see another. When off Morte-hoe one morning we passed a large flock of Gulls fishing, chiefly Kittiwakes, with a few Herring Gulls and Lesser Blackbacks, the only occasion on which I saw any number together.—OLIVER V. APLIN (Great Bourton, near Banbury).

Scarcity of Fieldfares.—My experience upon the east coast last autumn recalls to my mind a note by Mr. J. Young (Zool. 1884 pp. 228), wherein he relates that during the winter of 1883-4, being in different parts of the counties of Monmouth, Gloucester, Wilts, Berks and Kent, he never saw a Fieldfare or Redwing ; during the same period they were plentiful in North Oxon (Zool. 1884, p. 339). When I left home on November 15th last, Fieldfares and Redwings were here in numbers, and I noticed them from the train all up the Nene Valley as far as Peterborough. In two days, at Freiston Shore, Lincolnshire, the only Fieldfares noticed were a few which were heard flying over head after dark, and which may have been

on migration, and during three weeks (Nov. 18th to Dec. 8th) spent in different parts of Norfolk—north and south—I did not see a single bird. In Lincolnshire I saw no Redwings, and in Norfolk only two or three on Nov. 19th, and a solitary bird just over the Suffolk boundary a fortnight later. On returning to Oxon I found both species abundant, and though their numbers have diminished with the severe weather they have remained up to the time of writing. Perhaps the big hawthorn hedges of Oxon and North Hants are the attraction in these counties.—OLIVER V. APLIN (Great Bourton, near Banbury).

Curlew Sandpiper and Spotted Crake in Shetland.—A specimen of this bird (*Tringa subarquata*) was shot by Andrew John Garriock on the 11th August last, in a meadow on Tingwall parish. It was in company with several snipe, feeding among the high grass, and seemed very shy and uneasy in its movements. The only recorded instance of the previous occurrence of this species in Shetland is by Dr. Saxby, who states that “one was brought to him by a fisherman in the Island of Uunst, on June 7th, 1859.” I have also a Spotted Crake (*Crex porzana*) shot by the same person in the Island of Bressay, on October 7th last. So far as I know this is the first instance on record of its occurrence in Shetland. I have both birds now in my collection.—J. T. GARRIOCK (Lerwick).

Reported Occurrence of the Citril Finch near Brighton.—In ‘The Zoologist’ for December last (p. 490), Mr. Herbert Langton reported the capture of the Citril Finch, *Fringilla citrinella*, near the race-course at Brighton on the previous 14th October. A little correspondence on the subject has resulted in Mr. Swaysland of Brighton bringing the bird to London for inspection; and on submitting it to Mr. Sharpe, of the Natural History Museum, South Kensington, who has paid a good deal of attention to Finches, he pronounced it to be not the Citril Finch, but the Cape Canary, *Serinus canicollis*. At first glance the two species are not very unlike, and might be easily confounded in the absence of specimens for comparison. In fact, both these birds as, well as the wild Canary, *Serinus canaria*, or the Serin, *Serinus hortulanus*, have such a general resemblance in size and colour that it requires a practised eye to discriminate them offhand. As all four have been reported to have been taken in England at different times, and may be again referred to as occasional visitants, it may be well to note briefly some of their distinguishing characters. The Cape Canary, *Serinus canicollis*, a common cage-bird, has a bill like the Greenfinch, *F. chloris*, but smaller; the forehead and chin greenish yellow; nape and sides of neck grey; dorsal plumage greenish yellow; the outer web of all the wing-feathers strongly marked with the same colour. The Citril Finch, *F. citrinella*, in general coloration bears a close resemblance to this species, having like it a yellow forehead,

chin, and underparts (though of a greener tinge), and a grey nape. But the dorsal plumage is of a greyer tone, and the wing-feathers not margined so vividly with yellow. The shape of the bill also is very different, being more like that of the Goldfinch (*Carduelis*). The Wild Canary, *Serinus canaria*, with a bill like *canicollis*, has none of the bright greenish yellow uniformly distributed over the dorsal plumage (except on the upper tail-coverts), and is of a much greyer tone, each feather with a darker centre; while the smallest of the four, the Serin, *Serinus hortulanus*, with the shortest and thickest bill of all (in proportion to its size), is at once recognizable by the great amount of striation on the flanks, as well as on the back and scapulars. As to whether the specimen of *Serinus canicollis* recently procured at Brighton was anything but an escaped cage-bird (as seems probable), opinions will doubtless differ; but it may be remarked that the plumage was in excellent order, and showed no traces of confinement.—J. E. HARTING.

Additions to the Avifauna of the Færoe Islands.—At page 487 of 'The Zoologist,' 1886, I have recorded, at second-hand, the capture of the Little Tern, *Sterna minuta*, in the Færoe Islands. Since then Herr H. C. Müller, of Thorshavn, has been kind enough to send me the specimen alluded to, and I find that it is an immature example of *Hydrochelidon nigra*, the Black Tern, so that the occurrence of *Sterna minuta* will have to be expunged, but the Black Tern is an equally interesting addition; this specimen was obtained on the island of Nalsae in the month of September, 1886. Herr Müller has likewise sent me specimens of *Larus minutus*, the Little Gull, obtained in the island of Nalsae on February 11th, 1886, and an example of *Upupa epops*, the Hoopoe, which was shot near Thorshavn on the 12th October, 1885; both additions to the Færoese list.—H. W. FEILDEN (West House, Wells, Norfolk).

Birds which Sing or Call at Night.—Mr. Flemyng's interesting note headed "Birds which Sing at Night" (Zool. 1886, p. 486), recalls the following circumstance. On March 10th, 1884, a fine bright night just before the full moon, and about the hour of midnight, I heard the following birds almost simultaneously: Song Thrush, Partridge, Redshank and Waterhen. Owing to the ignorance and destructive tendencies of gamekeepers, Owls have, I regret to say, become very scarce here, and in the early spring by far the noisiest bird we have at night is the Waterhen, whose strange nocturnal habit of leaving its usual haunts, and visiting places where one would least expect it to turn up, has given rise at times to various conjectures as to the origin of certain mysterious sounds heard in the dark, and I have more than once been startled by suddenly hearing overhead the loud harsh cry of this night wanderer in the most unlikely spots. The Norfolk Plover or Stone Curlew, *Ædicnemus crepitans*, though

hardly a night "singer," keeps up while at its feeding-grounds (often a field of young turnips) an almost continuous screeching through the hours of darkness. Much bird music of the most attractive and interesting kind is probably unknown to a great proportion of mankind. The mighty rush of a large flock of Wigeon, for instance, heard on a still, frosty winter's night, is a sound which once heard is not easily forgotten. The well-trained ear of the flight-shooter at his post on the lonely marshes, becomes aware of a faint and indescribable, but all pervading, rushing sound, which seems to come from any or every direction; nearer and nearer it approaches, and again, perhaps, fades away into the distance, as the birds turn off in another direction; suddenly back they come, with the rush of a whirlwind, and the beautiful whistle, "whee-ou," of the mates (before blended with, and scarcely distinguishable from the sound of a multitude of wings), is heard again and again as the flock sweeps close overhead and again disappears into the darkness. But who has not enjoyed listening to the voices of our more familiar birds on a fine still evening in early spring, conveying to the ear, as surely do the swelling buds to the eye, unmistakable and ever welcome tidings and evidence of the gradual approach of the season when "the flowers appear on the earth, the time for the singing of birds has come, and the voice of the turtle is heard in the land." The distant note of the wheeling Peewits on their return to their nesting-ground; nearer as hand, perhaps, the jubilant evensong of the Thrush; the weird chattering and plaintive whistle of the Starlings on the topmost twigs of the tall elms, wonderful in variety and execution; the occasional note of deep solemn bass from the frogs in the nearest pool or ditch; and above all the fine loud burst of melody from the throat of the Blackbird, surely unsurpassed (as far as quality of tone is concerned) by the Nightingale itself, and in whose pure liquid notes the voice of the springtide itself seems to make itself heard. Such music fully compensates us for the annual loss of a few cherries and currants, and makes one wish that "collectors" and birds'-nesters were less abundant.—G. T. ROPE (Blaxhall, Suffolk).

Varieties of the Brambling.—In 'The Zoologist' for 1885 (pp. 346, 389) were some notes on black-chinned Bramblings. Two of these birds, both having *white chins*, have occurred at Yarmouth—one about the 12th October, 1882, the other on the 3rd February, 1886. They both proved to be males, and present no variation in their plumage. This absence of colouring seems equally curious with the excess of it in those vigorous examples which have the chin and throat black. Both the birds were obtained by Mr. G. Smith. Although the extent of white is small, it is quite pure. Most birds seem more liable to be pied on the head than elsewhere, and in young Rooks a few white feathers on the chin are not unusual, as pointed out by Mr. R. M. Christy (Zool. 1886, p. 339), and I have

seen it accompanied by white nasal bristles, the rest of the plumage being of the ordinary colour. The Goldfinch also has a white chin sometimes, and is then called a "cheverel." Prof. Newton has some interesting observations on the origin of the name (Yarrell's 'British Birds,' 4th ed., vol. ii. p. 124): he states that the extent of white varies greatly in different examples which he has examined. "Cheverels" in confinement are stated to breed "cheverels."—J. H. GURNEY, JUN. (Northrepps, Norwich).

Grey Phalaropes in Ireland.—The appearance of so many of these birds near St. Leonard's last October, as noted in 'The Zoologist' for January (p. 28), leads me to mention that Mr. Rohu told me on Oct. 20th last he had received a specimen from Mitchelstown, an inland locality; and on November 9th he mentioned that he had received another from Castle-townsend, on the West coast of Cork. On November 18th I received a Grey Phalarope from Mr. Higginbotham, Dungarvan Lighthouse. Two others are doubtfully reported from Kingstown on October 3rd, not having been obtained. I believe the capture of the Red-necked Phalarope in Ireland has never yet been announced.—R. J. USSHER (Cappagh, Co. Waterford).

Bittern in Norfolk.—I beg to correct an error which appeared in 'The Zoologist' for December last. Mr. Gunn, in his "Notes from Norfolk and Suffolk," says I killed a Bittern at Aylsham on January 19th, 1885. It occurred at Foulsham, about twelve miles west of this place. As the visits of the Bittern are now unfortunately rare, it is well to be accurate with such notes. Part of my property in Aylsham lies in the valley watered by a small tributary of the Bure, and I should not like to have destroyed a Bittern so near the old breeding-grounds of the species, which if properly protected would now adorn its marshy solitudes. The bird in question was standing by the side of a pit near the middle of a grazing-ground, and allowed me and my son to approach within twenty-five yards. I did not fire; it flew slowly over the first fence, under which it alighted, and we held a consultation about killing it. Being in a dangerous locality, and I thought possibly wounded, I decided to shoot it.—R. J. W. PURDY (Woodgate, Aylsham).

Rare Birds in Ireland.—The following occurrences may be worth recording in 'The Zoologist.' Great Shearwater (*Puffinus major*), received on August 12th from Co. Sligo: the plumage being full of sand, and the bird much wasted, it had evidently been picked up dead on the sea shore. Spotted Redshank (*Totanus fuscus*), received Sept. 27th, having been shot near Sallins, Kildare: an immature bird of the year, its breast mottled with grey. Great Snipe (*Gallinago major*), shot in the first week of October by Major Hutchinson, of Rookville, near Drumsna, Co. Leitrim: this bird weighed eight ounces, and is the first genuine solitary snipe

which in the course of twenty-five years has passed through our hands. Dotterel (*Eudromias morinellus*), two shot by Mr. St. George, near Cloumell, in September: one, an adult female, still shows the bare hatching spots, the other is an immature bird of the year. Great Spotted Woodpecker (*Picus major*): on December 3rd, an adult male was sent to us from Kilkeel, Co. Down, by Dr. Evans, and was by him generously presented to the Science and Art Museum; soon afterwards we received a female, which had been shot by Mr. Menzie's gamekeeper, in the woods of Glasslough, Co. Monaghan, the residence of Sir John Leslie. Sabine's Snipe (*Scolopax sabini*), one obtained on December 5th, in Kildare, by Mr. McSheehy, who has most liberally presented it to the Science and Art Museum. Another somewhat darker specimen we purchased in the Dublin market on December 27th.—WILLIAMS & SON (2, Dame Street, Dublin).

Estimated duration of life in an Albatross.—A curious incident is reported by the 'Hiogo News,' being communicated to it by Capt. Heard, of the British ship, the 'Duchess of Argyle.' When rounding Cape Horn, an immense Albatross was noticed following the ship. One day, as it hovered over the poop, it was noticed that an object about the size of a dollar was hanging round the bird's neck, and an attempt was at once made to catch it by means of a large hook baited by a piece of pork and allowed to drift astern. Several other Albatrosses were caught, but it was not until the third day that the one in question took the hook, which fixed itself firmly in its beak. On the bird being dragged on board it was found that the object hanging from its neck was a brass pocket compass-case, fastened with three strands of stout copper wire round the bird's neck. Two of the wires had worn through, and the box was thickly covered with verdigris. On its being opened there was found written on a piece of paper in faded ink the following:—"Caught May 8th, 1848, in latitude 38°6' S., 40°14' W., by Ambrose Cochran, of American ship 'Columbus.'" A fresh label, with the old and new dates of capture, was fastened round the bird's neck, and it was then released. It was measured before being allowed to fly, and was found to be twelve feet two inches between the tips of its wings. As the bird was probably four or five years old before being captured the first time, the interesting fact is proved that the natural life of an Albatross is at least fifty years.

Purple Sandpiper in the Channel Islands.—It may be of interest to note the occurrence of the Purple Sandpiper, *Tringa maritima*, in Jersey. I shot a bird of this species there on January 6th last, on the rocks at La Coupe, and on taking it to Mr. Caplin, taxidermist, was informed that only two or three Purple Sandpipers from this island had passed through his hands. This bird is not included either in Professor

Ansted's list or in Mr. Cecil Smith's, 'Birds of Guernsey.'—J. NICOLL (Le Vivier, St. Martin's, Jersey).

Moorhen nesting in a disused Punt.—While shooting on Sutton Heath, near Woodbridge, Suffolk, on October 12th, I noticed a curious spot for a Waterhen to build her nest; she had placed it upon the bow end of a disused punt which was lying nearly full of water at the edge of a pond, in full view of everyone passing. I drew the attention of my friends who were shooting with me to it, and we thoroughly investigated the matter. Upon making enquiries of the gentleman farming the land he said that when the nest was built the punt was rather more concealed by overhanging boughs.—E. C. MOOR (Great Bealings, Woodbridge, Suffolk).

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

January 20, 1887.—WILLIAM CARRUTHERS, F.R.S., President, in the chair.

Mr. John Benbow and Mr. Fiennes L. Y. Cornwallis were elected Fellows of the Society.

The President announced that H.R.H. The Prince of Wales had officially entered his name as an Honorary member on the Roll of the Society.

An oil portrait of Francis Masson, F.L.S., who was elected 1796, and made extensive collections of living plants in South Africa, was laid before the Fellows, and offered for their acceptance by the President. The announcement of this donation was received with acclamation.

A letter was read from Mr. Benjamin T. Lowne, referring to an exhibition by him of photographs from microscopical specimens of the retina of insects. One section represented the retinal layer detached from the opticon; other sections showed the basillar layer; thus practically affording evidence that the nerves terminate in end organs, *viz.*, rods placed in groups beneath the opticon,—a view promulgated by Mr. Lowne in his memoir, "On the Compound Vision and the Morphology of the Eye in Insects." (new ser. Zool. vol. ii. pp. 389-420).

Mr. J. W. Waller exhibited a large block of wood, part of an oak grown in Sussex. The wood having been sawn up lengthwise, it was found to contain a long tunnel and a large living larva of the longicorn beetle, *Prionus coriarius*.

Dr. John Anderson communicated a paper by the Rev. Thomas Hincks, *viz.*:—"Report on Hydroida and Polyzoa from the Mergui

Archipelago." The author states that though the material is moderate in amount, it nevertheless possesses interest in a fine mass of *Nellia oculata*, Busk (preserved in spirit), which proves rich in minute forms, both of Polyzoa and Hydroida. A new genus is described, provisionally ranked amongst the *Bicellariidæ*, and probably nearly related to *Bugula*. *Steganoporella smithii* is noted, the Mergui example being undoubtedly identical with the Cornish species. A variety of Smitt's *Schizoporella spongites* is described, forming a spreading crust, white and silvery, on stone. *Buskia setigera*, n. sp. is figured. The occurrence of a second species of *Buskia* has a positive interest as throwing further light on a peculiar kind of structure. Hitherto the genus has been represented by *Buskia nitens*, Alder, a smaller form than the present, which is not uncommon on the English coasts, and ranges from the Mediterranean to the extreme north (Davis Strait, Barents Sea, White Sea), and to the Queen Charlotte Islands in the North Pacific. *B. setigera* is comparatively large; and from the suberect habit of the cell, the ventral aperture extending from the bottom (or nearly so) to the top, is more apparent and more readily studied. The solid or chitinous portion of the zoecium forms a kind of carapace closed in below by a membranous wall. The polypide stretches along the upper portions of the cell immediately beneath the chitinous shell, and issues at the top of the oral area. The structure, so far as it can be determined in spirit-specimens, is extremely simple; there seems to be no trace of a gizzard. In the setose portion of the tentacular sheath there is an interesting peculiarity. The setæ, before expanding, instead of being packed together so as to form a straight pencil, are seen to be subspirally arranged, some tending to one side, some to the other, and bear some resemblance to loosely twisted strands in a cord. As the tentacular corona moves upward and presses upon the base of the operculum, the setæ disentangle themselves and expand into the usual funnel-shaped figure. The setæ with the reversible portion of the sheath from which they rise equal the cell in length. The four setose appendages placed round the upper portion of the cell-margin form a very conspicuous and striking feature. When the polypide is exerted, they are thrown back and stand out from the cell; when it withdraws they are brought together and project at the summit. The tubular adherent processes given off from the lower part of the cell correspond with the spines round the base of the zoecium in *B. nitens*. The cells are developed in large numbers on the creeping stem, and the habit of growth is luxuriant.

Membranipora favus, *M. marginella*, *Lepralia robusta*, *Porella malleolus*, with others, are among the new species fully entered into. Of Hydroids, *Obelia andersoni* and *O. bifurca* are new to science, the latter probably allied to the *bicuspidata*, Clarke, known from the Thimble Islands, coast of New England.—J. MURIE.

ZOOLOGICAL SOCIETY OF LONDON.

December 21, 1886.—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 November, 1886.

Mr. Howard Saunders exhibited and made remarks on a specimen of a hybrid between the Tufted Duck and the Pochard, bred in Lancashire in 1886.

Mr. J. Bland Sutton read a paper on Atavism, being a critical and systematic position of the Sponges. This was based on the recent researches on the *Hexactinellida*, *Tetractinellida*, and *Monaxonida* of the 'Challenger' Expedition, and on his own investigations on the rich Australian Sponge-fauna, particularly of the groups *Calcarea*, *Chalinidæ*, and Horny Sponges. A complete system of Sponges was proposed, and worked out down to the families and subfamilies, and all the principal genera were mentioned. An approximately complete list of the literature of Sponges (comprising the titles of 1446 papers), a "key" to the determination of the forty-six families, and a discussion of the systematic position of the Sponges were also contained in the paper.

Prof. Ray Lankester communicated a paper by Dr. A. Gibbs Bourne, of the Presidency College, Madras, on Indian Earthworms, containing an account of the Earthworms collected and observed by the author during excursions to the Nilgiris and Shevaroy Hills. Upwards of twenty new species were described.

Jan. 18.—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, 1886, and called attention to a young male of the true Zebra, *Equus zebra*, purchased December 11th; and to a young male Indian Rhinoceros, presented by H.H. the Maharajah of Cooch Behar, through the kind intervention of Dr. B. Simpson, and received December 25th.

Mr. F. W. Styan exhibited and made remarks on a series of Chinese Birds' eggs which he had collected at Kiukiang and Shanghai.

Mr. Howard Saunders exhibited and read some notes on a skin of the Mediterranean Black-headed Gull, *Larus melanocephalus*, killed on Breydon Water, near Great Yarmouth, and sent for exhibition by Mr. G. Smith, of that town. This was stated to be the first absolutely authentic occurrence of this southern species on the British coasts.

Mr. Sclater exhibited and made some remarks on an example of a rare Amazon Parrot, *Chrysotis bodini*, from British Guiana.

Mr. W. B. Tegetmeier exhibited and made remarks on three heads of the Sumatran Rhinoceros, *A. sumatrensis*, from Sarawak, Borneo.

Prof. Rupert Jones read a paper by himself, Messrs. H. B. Brady, and

W. K. Parker, on the Foraminifera dredged up on the Abrolhos Bank by H.M.S. 'Plumper' in 1857. The series contained examples of 124 species and notable varieties, and furnished results of definite value as regards the distribution of this group of animals.

Prof. G. B. Howes, read a paper on the skeleton and affinities of the paired fins of *Ceratodus*, and added observations upon the corresponding organs of the Elasmobranchii and other fishes.

A communication was read from Prof. T. Jeffrey Parker, of the University of Otago, New Zealand, containing an account of the anatomy of Rondelet's Shark, *Carcharodon rondeletii*.

A communication was read from the Rev. N. Abraham, containing an account of the habits of the Trapdoor Spider of Graham's Town, *Moggridgia dyeri*.

A communication was read from Dr. R. W. Shufeldt, containing notes on the visceral anatomy of certain Auks.

Mr. P. L. Selater pointed out the characters of eight new species of birds of the family Tyraunidæ.

Mr. Selater also described a new Ant-Thrush of the genus *Grallaria* from Ecuador, for which he proposed the name *Grallaria duboisi*.

ENTOMOLOGICAL SOCIETY OF LONDON.

Fifty-fourth Anniversary Meeting, January 19, 1887. — ROBERT M'LACHLAN, Esq., F.R.S., President, in the chair.

An Abstract of the Treasurer's Accounts, showing a large Balance in the Society's favour, was read by Mr. Stainton, one of the Auditors; and the Secretary read the Report of the Council.

The following gentlemen were elected as Officers and Council for 1887:—*President*, Dr. David Sharp, F.Z.S.; *Treasurer*, Mr. Edward Saunders, F.L.S.; *Secretaries*, Mr. Herbert Goss, F.L.S., and the Rev. W. W. Fowler, M.A., F.L.S.; *Librarian*, Mr. Ferdinand Grut, F.L.S.; and as other Members of Council, Messrs. Robert M'Lachlan, F.R.S.; Gervase Mathew, R.N., F.L.S.; George T. Porritt, F.L.S.; Edward B. Poulton, M.A., F.G.S.; Osbert Salvin, M.A., F.R.S.; Henry T. Stainton, F.R.S.; Samuel Stevens, F.L.S.; and J. Jenner Weir, F.L.S., F.Z.S.

The retiring President delivered an address, for which a vote of thanks to him was moved by Mr. E. B. Poulton, seconded by Prof. Meldola, and carried unanimously.

A vote of thanks to the Treasurer, Secretaries, and Librarian was moved by Mr. M'Lachlan, seconded by Mr. Stainton, and carried; and Mr. Goss and Mr. Grut replied.

A vote of thanks to the Council was proposed by Mr. Waterhouse, seconded by Mr. White, and carried.—H. Goss, *Hon. Sec.*



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ON THE FORMER EXISTENCE OF PTARMIGAN IN SOUTH-WEST SCOTLAND.

BY ROBERT SERVICE.

I HAVE long been aware, without thinking until lately that the fact had any special significance, that Ptarmigan used to be found on the higher summits of the range of hills that divides Kirkcudbrightshire and Dumfriesshire from the neighbouring counties of Ayr, Lanark, Peebles, and Selkirk. It has often been a matter of surprise to me that the former existence of these birds in this south-west corner of Scotland was never alluded to, even incidentally, by writers on Scottish Ornithology, with the single exception of the late Sir William Jardine ('Game Birds,' 1834). In no other ornithological work that I am aware of is the occurrence of Ptarmigan in these two counties mentioned, unless indeed Montagu's remark that "some few are yet to be found south of the Tweed" may be taken as applying here. But Montagu, who doubtless meant the statement to refer to Cumberland, was probably unaware, like a good many other Southrons, that a considerable and by no means unimportant portion of Scotland lies "south of the Tweed"! I had intended writing a note on the subject immediately after reading Mr. A. G. More's communication (Zool. 1881, p. 44), in which he endeavoured to show that the whole story of the former existence of Ptarmigan in Westmoreland and Cumberland was unreliable. Like other good resolutions, however, this intention of mine went out of mind until now, when in the course of beginning to take in hand the Ornithology of the

Scottish Solway district, the matter of Ptarmigan again came under notice. Believing this hitherto almost overlooked subject to be of more than local interest, and looking to the important bearing it has on the former occurrence (disputed in the meantime) of Ptarmigan in the English Lake district, I have deemed it advisable to lay the result of my enquiries before the readers of this journal.

There are four localities in which the former existence of Ptarmigan can be traced, *viz.*—(1) The mountains of Minnygaff parish; (2) the mountains in the parishes of Kells and Carsphairn; (3) the district surmounted by the peak of the Lowthers, on the dividing ridge betwixt Dumfriesshire and Lanarkshire; and (4) the district around Hartfell, at the head of Moffatdale. The first two localities are in Kirkcudbright, the last two are in Dumfries. These various localities are so nearly connected that I separate them only for the sake of treating the subject more clearly.

KIRKCUDBRIGHTSHIRE. Minnygaff. — The earliest notices of the Ptarmigan that I have been able to find in local literature are contained in Symson's 'Description of Galloway.' This work, written in 1684 at the request of Sir Robert Sibbald and forming part of the Sibbald MSS. deposited in the Advocate's Library in Edinburgh, was not printed until 1823. At page 79 there is an interesting paragraph, which I may be excused for quoting in full. Enumerating the natural productions of Galloway, Symson writes:—"As concerning animals I can say nothing save that in this countrey, consisting both of moors and valley grounds along the sea shore, we have such as are usually found in the like places; as in the moors we have plenty of moor-fowles, partridges, *tarmakens*, &c. In our hills and boggs, foxes, good store. In our lochs and bourns, otters; near the sea severall sorts of wild geese, wild ducks, teal, small teal, seamaws, gormaws, and an other fowl, which I know not the name of; it is about the bigness of a pigeon; it is black, and hath a red bill. I have seen it haunting about the Kirk of Mochrum." The bird which Symson describes in the latter portion of the passage is of course the Chough, which may still (though rapidly decreasing) be seen about the locality named. Several old MSS. relating to Galloway are printed as appendices to Symson's work. One of these is entitled 'Description of Minnygaff,' and forms part of the Macfarlane MSS., also in the Advocate's Library. This MS. appears

to have been written in the early part of last century by Andrew Heron, of Bargaly, a famous botanist in his day. Heron (*op. cit.*, p. 132), referring to the mountain of Meyrick, states:—

“In the remote parts of this great mountain, are very large Red Deer; and about the top thereof, that fine bird, called the *Mountain Partridge*, or, by the commonalty, the *Tarmachan*, about the size of a Redcock, and its flesh much of the same nature: feeds, as that bird doth, on the seeds of the bullrush [?], and makes its protection in the chinks and hollow places of thick stones, from the insults of the eagles, which are in plenty, both the large gray and the black, about that mountain.” Further on (p. 142), describing his own property of Bargaly, Heron says, “The land extends to Cairnsmure,* whereunto the greatest part of that mountain belongs, where there is good store of Bristol stone of divers colours, very well cutt naturally: very large Reddeer, with plenty of *mountain partridges* and other muirfowl.” No one who has ever been on the Minnygaff Mountains can doubt their suitability as Ptarmigan-ground. The very name of the parish, which is from the Gaelic *monadh geodh*, signifying “the mountainous expanse full of deep hollows and chasms,” is thoroughly descriptive of its aspect. Within the parish there are twelve peaks from 1500 to 2000 feet in height, and no less than ten peaks ranging from 2000 up to 2764 (Meyrick). There can be no doubt, from the number of people to be met with who have heard their forbears speak of Ptarmigan, that these birds were in former times comparatively abundant in the parish. I may name two individuals entitled to every credit, and their statements correspond with those of many others who might be cited if necessary. Mr. Erskine, gunsmith and game-dealer in Newton Stewart, who has been connected with guns, game, and gamekeepers all his life, as were his father and grandfather before him, says he well remembers hearing his grandfather, William Erskine, who died in 1820, tell of shooting Ptarmigan on Meyrick and other hills in Minnygaff. Mr. Thomas Galbraith, retired gamekeeper in Newton Stewart, who has been following his profession over these hills since 1827, informs me that no Ptarmigan have been seen in his time, but that he had known older keepers who had shot them; and that all the older keepers and shepherds

* Cairnsmore of Fleet, not Cairnsmore of Carsphairn, hereafter mentioned in this article.—R. S.

then in the district when he began used to tell him of the former existence of Ptarmigan on the hill-tops, and regret their disappearance. In Harper's 'Rambles in Galloway' (p. 150) it is recorded that the last Ptarmigan shot in Galloway was killed on the Dungeon o' Buchan in 1820 by one of the Earl of Galloway's keepers. I have been told that this very bird was preserved by the then factor on the estate, but have been unable to verify the information. In the 'New Statistical Account' (Parish of Minnygaff, p. 120, 1842) it is stated that Ptarmigan were formerly common there, but had at that date disappeared. I think 1820 may be taken as the date of their extinction in the parish.

Kells and Carsphairn. — In these two parishes, the former of which marches with Minnygaff, traditions of the former existence of Ptarmigan abound, almost every elderly native being able to say that he had heard his father talk of the birds. In the 'Old Statistical Account' (Parish of Kells, vol. iv., p. 263, 1792) the Rev. John Gillespie states that Ptarmigan were at that time to be found on the high hills of Kells. The highest peak in the two parishes is Cairnsmore of Carsphairn, and here the birds seem to have been found until about 1818. Mr. Kennedy, of Knocknalling, in reply to my question, states that he had been informed by old Mr. M'Millan, tenant in Viewfield, that he had shot Ptarmigan on Cairnsmore in the winter of 1817-18, and sent them to Mr. Oswald, of Auchencruive. That winter Mr. M'Millan said was unusually severe, the snow lying far into the spring (a circumstance verified by local records), and that Ptarmigan were never afterwards seen or heard of in that district. Mr. Hastings, the well-known taxidermist in Dumfries, tells me that in 1835 (he is tolerably certain of the year) he was on Cairnsmore, and being anxious to ascertain if it was probable that any Ptarmigan were still on the mountain, he made some enquiries of the residents, and learnt from William Johnstone, a shepherd, who then lived at Burnfoot, of Carsphairn, that he had known the Ptarmigan all his life on the top of Cairnsmore; but they gradually dwindled away, and he had not seen a single bird during the previous fourteen or fifteen years. The shepherd was then apparently a man of over sixty years of age, and Mr. Hastings says he was greatly diverted at the time with the deep guttural and sonorous tone with which the shepherd uttered the word *torrmachan*—a rather remarkable confirmation of Heron of

Bargaly's somewhat supercilious reference to "the commonalty" and their name for the bird!

In the 'New Statistical Account' (Kells Parish, 1844, p. 110) it is stated, "Ptarmigan are extinct"; and again (*op. cit.*, Carsphairn Parish, 1844, p. 275), we find that "it is commonly said that the last place in the South of Scotland which the Ptarmigan frequented was Cairnsmuir. They have for some time, however, been completely destroyed or banished."

DUMFRIESSHIRE. The Lowthers and District.—On the Dumfriesshire side of the Nith, traditions relating to Ptarmigan are by no means so rife as in the Stewartry. I have not been able to ascertain anything at all definite in the way of traditionary record. It is pretty certain that the bulk of the stock of birds must have gone much sooner than those in Galloway, leaving only a few stragglers to linger into the present century. In the course of quest for information on this subject it occurred to me to search the old files of the local newspaper, the 'Dumfries and Galloway Courier,' and I was very kindly permitted to do this by the courtesy of the proprietor. I was aware that the late Mr. John M'Diarmid, who was for about fifty years the editor, was intimately acquainted with the denizens of all our mountains and glens, and a naturalist of repute, as is abundantly testified by his published 'Sketches from Nature,' and the constant references made to the standard authors of that day, such as Pennant, Latham, Lewin, Montagu, Willughby, Heysham, and Bewick, when recording ornithological occurrences in the 'Courier.' I mention these matters because had the late Mr. M'Diarmid been an ordinary newspaper editor (I use the term with due reverence for the Fourth Estate!) the paragraphs given below would not have been entitled to any particular credence in a matter of this kind. The first notice of Ptarmigan is in the 'Courier' for August 26th, 1823, and I quote the entire paragraph:—

"Natural History. — We have just seen and examined a very beautiful bird, shot by Mr. Murray, of Broughton, on the 18th current, and which appears to be quite a nondescript in ornithology. The following is a correct description:—In size, form, and weight, the same as a well grown grouse, with the roughness of the feet and claws, and red fleshy ring above the eye, that belong to that species. Plumage beautiful, and totally different. Colour of the back and breast, a light brown, tinged with yellow;

wing-feathers unspotted, and of a dingy white or *blae* colour. This curious bird is evidently neither a partridge, a grouse, or a ptarmigan, and yet it has several points of resemblance to all three; and may peradventure be a cross betwixt either of them. But the Ptarmigan, which is white in winter and grey in summer, scarcely ever visits the low grounds; and indeed the general opinion is that this bird which lingered long about Cairnsmuir of Carsphairn, is now entirely rooted out of Galloway. Of late years it has never been seen; but the severity of last winter brought many feathered fugitives to our doors; and we know an individual in Sanquhar, who obtained, last season, no fewer than ten brace of Ptarmigan, which were eagerly purchased by stuffers and persons curious in ornithology. Wolves, wild boars, and all those animals that fly before the march of civilization, and seem exorcised by the woodman's axe, can be easily spared, and are well out of the way; but to us, 'the universal feathered people' are so truly interesting, that we never wish to see a single bar in their escutcheon, or a twig severed from the beautiful family tree."

There is a reference again to the same occurrence contained in the following notice of the capture of a Bittern, recorded in the 'Courier' for February 21st, 1826:—

"The bittern, or miredrum, is so seldom met with in the south of Scotland that it was supposed by many to be totally unknown, but although the extension of tillage and other causes have compelled this and other bipeds to return to wilds 'where things that own not man's dominion dwell,' the chapter of accidents or the severity of the weather is every now and then throwing a solitary specimen in the fowler's way. The tremendous snowstorms of 1822 brought whole flocks of wild swans to our shores, and during the same period three or four brace of Ptarmigan were killed somewhere above Sanquhar, although the opinion had become prevalent that not one of these birds existed among the highest hills of Dumfriesshire and Galloway. Some of the ptarmigans were sent to our townsman, Mr. Shanks, to be stuffed, and we have just been informed that Mr. John Lewars has a brace of young ptarmigans alive and so tame that they run about the doors like domestic fowls. *These birds were brought, we understand, from the English side, and were probably hatched on the top of Skiddaw.* But our object in lifting the pen at present is to state that a fine bittern of the largest size, and the first we have heard of for a

long time, was shot last week on the estate of Broompark, which stretches almost to the side of the Nith, and is within a few minutes walk of this town. This bird, which we have seen, is obviously a cock, with very bright plumage, considering its colour, and has been finely stuffed by Mr. Hellon, at Messrs. J. Kerr & Coy's."

It will be seen there is a difference in the number of brace said to have been taken, but the main interest of this paragraph centres in the passage concerning the young Ptarmigan from Cumberland. That the writer, who was beyond doubt M'Diarmid himself, comprehended the importance attached to the capture of Ptarmigan is well shown in the following words occurring in an article contained in the 'Courier' for November 29th, 1828:—

"To us few things are more agreeable than a day spent among the mountains of Scotland; and hence our *penchant* for exploring every loch and cleuch, where a trout leaps, an eagle soars, a *ptarmigan lingers, the last of its race*, or a bittern, derved in some solitary marsh, beats his hollow drum as the night closes in."

In the 'Courier' for May 14th, 1833, in describing a curious variety of the Black Grouse, the specimen mentioned in a paragraph above quoted is again referred to in the following terms:—

"Some years ago Mr. Murray, of Broughton, shot a bird which the best judges considered a cross between the Red Grouse and Ptarmigan."

We may now dismiss the specimen in question with the remark that, after all, it seems to have borne a suspicious resemblance to a Ptarmigan in the lavender-tinted autumn plumage. I have failed to discover any trace of the person who captured the birds "above Sanquhar"; but the gamekeeper at Wanlockhead, who has been fifty years a keeper in the district, says he had heard that some Ptarmigan in the Dumfries Museum were killed near Wanlockhead. The Museum was established in 1835, but the catalogue of the contents, printed in 1843, does not mention any Ptarmigan. There were two old specimens in the Museum, however, that had been there for over forty years. It is a painful reflection to me to know that these were thrown to the rubbish-heap by myself three or four years ago, being then so much moth-eaten and moulded, owing to a long course of neglect, that they were barely recognisable as Ptarmigan. I am convinced, from enquiries made into their history, that they were really two

of the birds captured near Sanquhar in 1822, and there is every reason to believe they were presented to the Museum by Mr. M'Diarmid himself. He was one of the projectors of the Museum, and for many years afterwards took a keen interest in promoting its welfare. The late Duke of Buccleuch introduced Ptarmigan near Sanquhar about twenty-five years since, but they immediately disappeared. This is, I believe, the only attempt that has been made to re-stock any part of the hills in Galloway and Dumfries with these interesting birds.

Hartfell and District. — The same remark I made about the absence of oral traditions of Ptarmigan in the district surrounding the Lowthers has also to be made in the case of the locality under notice. Mr. Roy, Secretary of the Moffat Naturalists' Field Club, has most obligingly made enquiries for me in that district, but with only a negative result. There are two printed records of Ptarmigan in Moffatdale. One of these is contained in the 'New Statistical Account' (Moffat Parish, 1835, p. 108):—"Ptarmigan are very rarely seen." The other record is that of Sir W. Jardine ('Game Birds,' 1834, p. 172), the same passage being repeated *verbatim* in his 'British Birds' (vol. iii., p. 95):—"According to Pennant, and some contemporary writers, these birds were found on the hills of Westmoreland and Cumberland; and, I believe, recollections even exist of a few having been seen upon the high ranges which appear on the opposite border of Scotland. These have been for some time extirpated, and unless a few solitary pairs remain on Skiddaw, or some of its precipitous neighbours, the range of the Grampians will be its most southern British station." No precise locality is here named, but "the high ranges" on the border of Scotland "opposite" to Cumberland can only be the Moffat Hills.

I think I have in the preceding pages succeeded in showing that Ptarmigan were natives of the South-west of Scotland until near the end of the first quarter of the present century. During my enquiries I have never heard the slightest hint that the Ptarmigan that used to live on our hills might have been white or particoloured specimens of the common Red Grouse. The suggestion in question is of such a nature that it is not easily disproved, but I look upon it as a rather gratuitous complication introduced into an otherwise very interesting piece of historical ornithology. But when we find that on nearly all the outlying

stations of the present race of Ptarmigan in Scotland, such as in Arran, in Argyle, and the Outer Hebrides, these birds are decreasing and on some places have even become extinct, and that on many of the high inland ranges they are also known to be diminishing in numbers, their extinction on the Scottish and English borders over half a century ago is not surprising. When they were on the mountains of Dumfriesshire and Galloway there is no improbability, but the reverse, that they were also at the same time native to the Cumbrian mountains. The English hills are within easy sight from all the higher peaks on our ranges; and there can be no question that the former are high enough, and in other respects suited to be the abodes of these feathered children of the mist.

THE DISTRIBUTION IN GREAT BRITAIN OF THE LESSER HORSE-SHOE BAT.

BY J. E. KELSALL.

As a supplement to the editorial remarks on Horse-shoe Bats in 'The Zoologist' for January last, and encouraged by the further observations of Lord Lilford (p. 62), I have collected all the records that I have been able to find of the occurrence of the smaller species, *Rhinolophus hipposideros*, in Britain, being able, thanks to the kindness of many naturalists, to add a few which have not before been printed. As the Editor truly remarked, the larger species, *R. ferrum-equinum*, is found only in the southern and western counties; its distribution may be summarised as "England south of the Thames (from Kent to Cornwall) and South Wales." Its Welsh localities have not been mentioned before in 'The Zoologist': they are the Mumbles near Swansea, in Glamorganshire ('Field,' Jan. 1, 1881), and the Old Wogan, a partly natural, partly artificial, cave, which adjoins Pembroke Castle, where it has been found by Mr. James Tracy, of Pembroke. In the same article it was stated that the smaller species also was chiefly restricted to the southern counties of England, but the following records will show that its range extends much more to the north and west than that of its congener, and not so far eastward.

In the south-western corner of England it is frequently met with: for Cornwall I may quote Couch (Zool. 1853, p. 3941).

[See also Couch, 'Cornish Fauna,' part i. p. 6, and Cocks, 'The Naturalist,' vol. i. p. 37.—ED.] For Devonshire, see Montagu, Trans. Linn. Soc. vol. ix. p. 163, and Lord Lilford, in last month's 'Zoologist' (p. 63). [See also Bellamy, 'Nat. Hist. South Devon,' p. 193; Brooking Rowe, 'Cat. Mamm., &c., Devon,' p. 3; W. Borrer, Zool. 1874, p. 4129; D'Urban, 'Handbook S. Devon,' Append. p. xxvi. (1875); and Parfitt, 'Fauna of Devon' (1877), p. 17.—ED.]

Somerset is given as a habitat in Jenyns' 'Manual,' and the venerable author has kindly written, in answer to my inquiry, that it is frequent in the neighbourhood of Bath, the specimens in the Museum there having been taken in a stone-quarry together with the larger species; and that "many years back" he received others taken in churches in Bristol. The Rev. M. A. Mathew also informs me that he has taken *R. hipposideros* in a cave at Uphill, near Weston-super-Mare, "some years ago." For Dorsetshire we have again the authority of Jenyns' 'Manual of British Vertebrates' (p. 20).

In the Isle of Wight Mr. H. Rogers, of Freshwater, who knows the larger species, and feels sure that he is not mistaken in the identification, tells me that one specimen of *R. hipposideros* was taken about twenty years ago at Niton; but it must be uncommon in the island (perhaps a recent immigrant?), as it was never discovered there by Mr. A. G. More, nor by any other good observer who has lived there. [*R. ferrum-equinum*, on the other hand, is the commonest large Bat in the Undercliff; cf. More in Venables' 'Guide to the Isle of Wight,' p. 409; and W. Borrer, Zool. 1874, p. 4129.—ED.]

It was in Wiltshire that it was first discovered, by Montagu, to be a British species. (Linn. Trans. ix. p. 163).

[Worcestershire.—Dr. Hastings, in his 'Illustrations of the Nat. Hist. Worcestershire' (1834), includes (p. 62) "the large Horse-shoe, *Rhinolophus ferrum-equinum*," but not the lesser species.—ED.]

Gloucestershire and Warwickshire were added by Mr. Tomes in the second edition of Bell's 'British Quadrupeds' (1874), though it cannot be considered common in the latter county, since Mr. Tomes mentions only two localities for it—Welford, and Ragley near Alcester. In the former county it is stated to be not rare at Cirencester.

[Staffordshire.—The Lesser Horse-shoe Bat is not mentioned by Garner in his 'Nat. Hist. of the Co. Stafford,' but Mr. J. R. Masefield, in a paper on 'The existing Indigenous Mammalia of North Staffordshire,' includes it as occurring near Burton, on the authority of Mr. Edwin Brown.—ED.]

It is remarkable that these counties appear to form the south-eastern limit of this Bat in England. On the Hampshire mainland ten other species have been met with, in Sussex nine, not counting Mr. Borrer's specimens of the Serotine (Zool. 1874, p. 4126), in Kent eight, and the same number in Essex (where Mr. Laver is well acquainted with seven); and yet neither Mr. Bond, Mr. Borrer, Mr. Laver, Mr. Rope, nor Mr. Southwell seem to have met with *R. hipposideros* in any district to the south-east of those I have named; indeed, Mr. Laver, in his "List of the Mammals of Essex" ('Trans. Essex Field Club,' vol. ii. p. 162), states that he does not believe either species of Horse-shoe Bat occurs in the district, which is strong negative evidence, considering the large number of Bats which have passed through his hands. I should be glad if any reader of 'The Zoologist' could suggest a reason for its absence from the south-east corner of England: it can scarcely be for want of natural caverns, since it has often been taken in buildings. Leisler's Bat, an arboreal species, appears to be similarly restricted in its range.

But passing to the north and west we find distinct, if fragmentary, evidence of a much wider range than that of the larger species.

Wales is mentioned as a habitat in Jenyns' 'Manual of British Vertebrates,' although, as the author informs me, he does not now remember from what county he heard of it; but Mr. Storrie, of the Cardiff Museum, tells me that he has found it near Bridgend, Glamorganshire; and Mr. Tracy, of Pembroke, states that he has frequently taken it at Stackpoole, Pembrokeshire. A more vague report from Denbighshire I have yet to investigate. [Donovan found a living specimen of this Bat amongst the ivy overhanging the mouldering battlements of Raglan Castle, Monmouthshire (Brit. Quadrupeds, pl. ii.).—ED.]

In Herefordshire it has been taken over the kitchens at Sufton Court, as recorded by Mr. R. M. Lingwood (Ann. & Mag. Nat. Hist. 1840, p. 185).

For Derbyshire we have the evidence of Sir Oswald Mosley, in his 'Natural History of Tutbury,' that he received many specimens from "the calcareous caverns of Dovedale and Matlock," and believed it to be dispersed over the whole of the limestone districts of the county.

In Nottinghamshire Mr. Whitaker has not met with it, but Mr. J. Ray Hardy, of the Manchester Museum, informs me that he picked up a dead one from the ground at Edwinstowe, in Sherwood Forest, years ago, "too far gone to make a good specimen." In sending me two Irish specimens he observed that if these are rightly named (as they certainly are) the Nottinghamshire specimen was identical with them.

For Yorkshire we have the authority of Messrs. Roebuck and Clarkson for its occurrence in a cave at Eavestone, near Ripon (see Zool. 1882, p. 186, and 1884, p. 173), and at Pateley Bridge ('Naturalist,' 1886, p. 339); and for Cheshire, Byerley's 'Fauna of Liverpool,' where we learn that one was taken at Storeton Quarry, near Birkenhead, about 1834.

Renfrewshire apparently marks its northern limit. In Dr. A. R. Young's 'Statistical Account of Renfrewshire,' Crookston Castle in that county is mentioned as a locality, but the late Mr. Alston, in his 'Fauna of the West of Scotland' (p. 7), expressed his opinion that some mistake had been made in the identification.

The discovery of this Bat in Galway and Clare was referred to in the editorial remarks above mentioned, and Mr. A. G. More informs me that he has himself taken it in some numbers, in the former county, in a cave at Coole Park, near Gort, the seat of Sir W. Gregory.

Thanks to the kindness of Mr. Ray Hardy, I am glad to be able to record the occurrence of *R. hipposideros* in the county of Kerry, namely, at Muckcross, near Killarney. "Both males and females were common," he writes, "flying about the old Abbey by hundreds." He says:—"It was in July, 1885: I got the stable-man to let me go into the hay-loft at Mr. Herbert's stables at Muckcross, where they hung from the beams above in great numbers. With my butterfly-net I could have taken ten at one stroke, and the excrement between the joists of the floor was half an inch deep; I measured it carefully. I only got one specimen of the curious parasite, *Nycteribia hermanni* (N.

biarticulata, Westwood), though I looked on scores." This description of their haunt agrees very well with that given by Mr. Tomes in Bell's 'British Quadrupeds.*' Mr. Hardy has lent me two of his Irish specimens, one of which measures $9\frac{1}{3}$ in. between the tips of the extended wings, without unnatural distention. I have a white specimen from the collection of the late Mr. Slopur, of Devizes.

On two females of this Bat, taken by Mr. Ingleby in the Red Hole, Eavestone, near Ripon, on Christmas Day, 1885, I found two specimens of an orange-coloured *Acarus* (on the margin of the ear of one of them) and two of a *Nycteribia*, since identified by reference to Prof. Westwood's paper in the Zoological Society's 'Transactions' (vol. i. p. 292) as *N. biarticulata*, Hermann. The same parasite was found upon this Bat by Donovan. Perhaps in hybernation the parasite gains more completely the upper hand. In 'The Zoologist' for 1861 Dr. Kinahan speaks of this Bat as infested with a large and "disgusting-looking" tick; and the position of the *Acari* agrees with that of those found on a *Barbastelle* by Mr. Gurney, as described in 'The Zoologist' for 1847.

In one of the books I have lately consulted it was mentioned that this Bat carried its tail over its back, as is shown in the figure of the Greater Horse-shoe Bat given in 'The Zoologist' for January. [This observation is made by Couch (Zool. 1853, p. 3941). In the Noctule, on the contrary, the tail is tucked under it, just as a dog puts its tail between its legs. Two living specimens now before us, as they hang suspended, look as if they were tailless.—ED.]

In conclusion, while thanking the many naturalists who have answered my inquiries, whether able to help me or not, I may say that I should be glad to hear of any new locality for this Bat, or any British species other than the Pipistrelle, the Long-eared, and the Noctule. I feel sure that if readers of 'The Zoologist' were to furnish the results of their experience they could put on record a better account of the distribution of these obscure animals in Britain than is at present to be found in any published work.

* According to Dr. J. R. Kinahan the sexes hibernate apart. See an interesting article by him entitled "Three days among the Bats in Clare," 'Zoologist,' 1861, pp. 7617-7624.—ED.

NOTES ON A VOYAGE TO THE GREENLAND SEAS
IN 1886.

BY ROBERT GRAY.

(Continued from p. 57.)

A CONTINUATION of northerly winds, strong generally to the force of a gale, had not the effect, as might naturally be supposed, of causing any remarkable change in the position of the ice. Beyond a certain limit it continued to remain close and impenetrable. No blueness of the western sky indicated open water and invited approach; all in that direction presented a uniform and dazzling whiteness, sea and sky! Along the edge of this impenetrable mass, however, a belt of navigable ice, extending seawards some fifty miles, was gradually formed. In this area we continued cruising in search of whales. Floes and fields lay scattered about in careless-like confusion with packs and streams of broken-up ice; Polar bears were seen almost daily, stalking about on the ice-fields, doubtless attracted by the vast numbers of Floe-rats (*Phoca hispida*). Narwhals were in hundreds to be seen almost at all times more or less abundant. Looms and Rotches there were without number, Dovekies (*Uria grylle*), Puffins (*Fratercula arctica*), Snow-birds, Burgomasters, Kittiwakes (*Rissa tridactyla*), were also numerous; the sea was generally grass-green in colour, and always contained an abundance of the various forms of Entomostraca, Pteropoda, Gasteropoda and Medusidæ, &c., which go to constitute the food of the whale. Nothing in fact was wanting to complete a perfect resort for the Greenland Right Whale, its food was in abundance, the surroundings were apparently congenial to its habits, and still more, the time it was when these animals are wont to frequent this part of the Arctic Seas for a considerable period.

June 5th. Spoke the s.s. "Erik." Capt. A. Gray told us that on the 3rd inst., in lat. 79° 15' N., 2° 30' E., a large Finner (*B. sibbaldii*) was seen for several hours, feeding amongst the ice near his ship, *accompanied by two calves*.

June 6th. Saw three whales*; one of these we captured, a

* It is scarcely necessary to explain that when the word "whale" is used *B. mysticetus* is implied.

small bull (5 ft. 2 in. bone). Although a small animal its rump was quite grey. I found the spaces between the laminæ of baleen to measure three-eighths of an inch; the length of the "hair" attached to their inner margins 12 in., the thickness of the blubber on the body 8 in., at the neck decreasing to 6 in. towards the tail.

June 8th. Narwhals numerous with their young.

June 11th. A flock of Brent Geese (*Bernicla brenta*), consisting of at least forty birds, seen flying westward, very low, across the ice. Large flocks of these birds are to be seen here about this time, flying in a similar direction every season. Therefore, if not an open Polar sea, yet sufficient open water must break out annually beyond the "barrier" to warrant the migration, not only of these birds, but also (as has already been said) of *Balana mysticetus* towards it. The same day, while reaching eastwards from the edge of the close-ice, we passed over a number of strips of water, alternately blue and green.

June 12th. While sailing southwards along the edge of the close-ice, in company with the "Erik," a whale was seen coming towards us from the S.E. Both vessels hauled to and lowered their boats. The whale continued its course to the N.W., towards the close-ice, six boats following in hot pursuit. Owing to the competition between the two ships it soon became evident that all caution, all rules being laid aside, the chase would either prove a failure, or rashness would win the day. Reaching the edge of the close-ice, the "fish," which hitherto had been swimming at a rate of five miles per hour, now relaxed its speed and began playing about. The first boat up would get a chance! Towards it all the boats directed their course, every oarsman pulling his very utmost; a boat from each ship led the way; neither had the advantage; they were rapidly approaching within shot; the harpooners stood to their guns, when the two boats steering for the same object rapidly closed with one another and unavoidably came into collision. The whale meanwhile had dived, soon afterwards it reappeared, again the boats were almost within shot, again it dived to reappear once more before finally dipping under a floe. This time one of our boats pulled right on to its back, and the harpooner, depressing the gun, would undoubtedly have got fast, had not the gun unfortunately snapped. One of the "Erik's" boats had by this time fired, but not being

within range (20 yards) the "foregoer" tightened and the harpoon fell short. The whale, a young animal, undoubtedly long ere this fully conscious of being pursued, at this juncture seemed to forget itself, for moving too far forward, it allowed its under jaw to become shelved on a "tongue" of ice. Quickly backing astern, however, the animal very soon cleared itself and immediately dived under the ice, a small round floe. The whale could now only be regarded as "scared," and the chase virtually at an end. Nevertheless, as a slight hope remained of the animal again making its appearance, the boats took up stations round the floe and patiently waited. Thirty minutes elapsed without its reappearing, already some of the boats were returning to their ships; forty minutes had just elapsed, when at the very same place where it had first disappeared the animal was seen coming out below the ice. All the boats were by this time returning on board, but the last one to give up the chase—fortunately yet at no great distance,—saw the whale and immediately returned. Thereafter the others followed, and the whale was eventually harpooned by one of the 'Erik's' boats. Immediately when harpooned the animal dived, taking out line with great rapidity, and descending almost perpendicularly downwards. Meanwhile the boats took up positions about the place where they expected the "fish" to reappear. The whale having ran out about one mile of line, and having probably descended to a depth of over 500 fathoms, returned to the surface some thirty minutes after being harpooned. Several boats being at hand, second and third harpoons were successively "fired in." The whale now set out along the surface, at a rate of some six miles per hour, towing, however, four heavy whale boats behind it. Swimming between wind and water, it continued for some time to throw itself bodily forward, half of the animal appearing above water, falling into the sea again with a dreadful splash, at the same time rolling off one side on to the other as it advanced forward; the pectoral fins as they alternately appeared above water were raised erect, the tail was also frequently exposed. At length becoming quieter in its movements and slower in its speed, some of the boats succeeded in getting up and endeavoured to lance. Their efforts, however, were on almost every occasion frustrated by the animal turning upon the boats and violently pushing them away with its head. A number of oars were

broken and more than one boat narrowly escaped being capsized. Subsequently the whale received a fourth harpoon, when, throwing its tail high in the air, it disappeared. The boats were patiently waiting its reappearance, many with some of their oars broken, all the seamen more or less drenched. Suddenly, but slowly and steadily, the animal's tail was seen rising vertically upward, close alongside one of the boats; having reached a certain height, it commenced to descend with equal slowness, rubbing against the boat's gunwale all the while, until at length it sank out of sight. A few minutes afterwards the animal quietly floated up to the surface dead.

June 13th. Life very abundant, Narwhals and Floe-rats being particularly numerous. Four Bears were shot, and several others were seen; of the former two were mother and young, the latter, however, so large as to be scarcely recognisable as a cub. The same evening, while two of these bear-skins were towing astern, a Narwhal was noticed following in the wake; after examining the bear-skins it seized hold of one of them with its mouth and commenced tugging at it, and if it had not been for a timely rifle-bullet would undoubtedly have succeeded in tearing the skin to pieces.

June 19th. Laying in a small "bight" in the ice-edge, where we have been for several days. Narwhals have been very abundant, visiting us regularly every morning, being always most numerous about 4 a.m. A few Arctic Terns, *Sterna hirundo*, seen in the morning. At night we passed a small land-bird resembling a Snipe sitting on a piece of ice.

June 21st. A heavy point of ice, which, hitherto remaining close and impenetrable, had extended over a considerable portion of the whaling-banks, now broke up and we were enabled to reach this part of the ground. The water, although blue and clear, contained a very great abundance of whales' food, *Calanus finmarchicus*. Narwhals were playing about in hundreds; here also had been the Greenland Right Whale quite recently and in no inconsiderable numbers. This we were led to believe from the quantities of "blowings" (mucous discharges from the spiracles of whales) which were lying about everywhere on the surface of the sea. Some of these blowings still shed a film of oil around them, and appeared to be of no great age. More convincing still, perhaps, amongst it there was found the hard shell of that

particular kind of parasite which is occasionally found infesting the whale. An easterly swell, the cause which had been so effective in destroying this point of ice, had been equally effective in breaking up into pack-ice the floes lying to the westward. To the refuge so formed the whales had undoubtedly retreated, and most likely were still lying there perfectly secure from attack.

Although undoubtedly ice-loving in its habits before the interference of man, the Greenland Right Whale, having there no enemy to fear from which it had not the power to escape, wandered seawards in quest of its food, which in many seasons, owing to the position of the ice, is to be found there in the greatest abundance. Certainly it found a resort in the bays and fiords of Spitzbergen, which in the stillness of their recesses closely resembled the "polynias" of its native ice-fields. Although necessarily in some seasons many miles from the Greenland west ice, from the margin of which I conceive it to have strayed, *Balæna mysticetus* nevertheless annually visited the bays and fiords of the western coast of Spitzbergen, but only, I presume, a visit in its duration and date coincident with its appearance at the west margin of the west ice in "North Greenland," as already described. The effect of the interference of man will now be easily understood. In the bays and fiords of Spitzbergen it was first found, there it was first harpooned, and from thence, as being farthest from its home, by continued persecution it was first driven. To the west ice it was followed, there the persecution was continued, the animal became still more timid in its habits, still more anxious of its safety, the bays and deep recesses along the margins of the ice became less frequently visited, and the Greenland Right Whale, avoiding open water as dangerous, regarded the heave of the ocean's swell as the signal to retreat, and thus preferred to remain amongst the close-ice, knowing that while there it was secure beyond the reach of its enemies. In short, *Balæna mysticetus* was originally so ice-loving in its habits, that its annual migrations were formerly the same as at present, but that by long and continued persecution it has become considerably more timid and cautious in its habits, which, together with the great reduction in its numbers, brought about by the same means, it first ceased to visit the west coast of Spitzbergen, its appearance in the open sea became an occurrence of increasing

rarity, until at length the open bays along the margin of the ice have almost ceased to be visited, and the Greenland Whale of the present day seldom leaves the protection afforded by the close-ice. Further, that the extent of sea covered by ice broken up by the action of swell ("pack-ice") and impenetrable to ships is in most seasons of vast extent, and if to this area be added the polynias or open spaces of water, large and small, which there is every reason to believe break out amongst the floes, the former only at certain times and in certain places, the latter perhaps always and everywhere, it will be seen that with whatever zeal and perseverance its persecution is continued, an area of sufficient extent will always remain unpenetrated, in which the Greenland Whale, enjoying immunity from attack, will continue to exist in sufficient numbers to remove the possibility of its ever becoming exterminated; and that its present apparent exceeding scarcity in the Greenland Seas is to be ascribed to the seclusiveness of its habits and its preference to remain amongst close impenetrable ice rather than to the species becoming extinct.

June 24th. One Great Skua, *Stercorarius catarrhactes*, seen; also a small bird about the size of a Swallow, with a reddish throat and brown wings.

June 25th. Sailing southwards along the ice-edge, the wind light from the eastward, a really dreadful swell from the S.E. running. The 'Erik,' then in our company, at the distance of only half a mile, was being taken completely out of our sight, masts and all, as she sank in the trough of the sea; a strong gale from the S.E. had recently been blowing. The effect of such a swell on the neighbouring ice is to be imagined rather than described; at a distance of four or five miles the noise was sufficiently appalling to forbid nearer approach. 6 p.m., being in lat. $78^{\circ} 10' N.$ and long. $1^{\circ} W.$, a Chimney Swift, *Chætura pelagica*, was noticed sitting on one of the yards. A seaman went aloft, and finding it asleep brought it down in his hand. The bird was very much exhausted—in fact, almost dead. I suppose it had been carried across from Norway by the recent gale. A few Arctic Puffins seen; they are not common so far from land. The North Greenland whaling was now over for the season, and we were steering southwards along the ice-edge towards the South Greenland whaling-grounds. These lie to the southward of the 75th parallel of latitude and to the eastward of the coast of

Greenland; it may also be added that this region is limited to the southward and eastward by the ice-edge, and that the South Greenland whales are generally killed to the westward of the meridian of Jan Mayen, and to the northward of the 70th parallel. The fishing is extremely uncertain; in some seasons the ice is so far to the eastward as to prevent the ships getting within several hundreds of miles of the ground, in others it is so far west that the swell is able to reach the ice lying on the ground, and convert it into an impenetrable pack, and thus, although the ships are able to reach the locality, unless the winds prevail from the S.W. and keep the ice open, they are almost as helpless as before. If, however, the ice is not too far to the eastward, and is navigable as far west as the ground, whales are occasionally found here in comparatively great numbers, and good cargoes are sometimes obtained. The appearance of whales so far south at this time of the year, apparently in direct contradiction to their migration northwards earlier in the season, as already stated, is somewhat difficult of explanation. It may, however, be interesting to know:—(1) That the greater proportion (about 90 per cent.) of the whales killed here are full-grown males; (2) that they have been followed south-westwards from the North Greenland grounds, from which they are frequently seen departing about the month of June; (3) that this class of old whales sometimes never migrate northwards, and consequently remain on the South Greenland grounds during the whole season (May to September); (4) that in some years the South Greenland grounds are completely deserted early in the season, or at any rate no whales are seen there during the summer. The ice undoubtedly plays a most important part in influencing these migrations, but the exact manner in which this is effected has yet to be explained.

[With the concluding portion of this article we hope to give, in our next number, a good figure of *Balæna mysticetus*, from a careful drawing by Capt. David Gray.—ED.]

(To be continued.)

BELOSTOMIDÆ AND OTHER FISH-DESTROYING BUGS.

BY GEORGE DIMMOCK.

INSECTS are generally considered to be beneficial to fishes by furnishing them one of the most unfailing sources of food. There are, however, a few insects which are injurious to fishes, thus making an exception to the rule. DeGeer published a statement, in 1774, that the larvæ of dragonflies (*Libellulidæ*) would seize and kill fishes, a statement confirmed by Dale in 1832. Von Müttschefahl, in 1778-79, mentions several aquatic insects which attacked the Perch, among them two species of water-beetles (*Dytiscidæ*) and two species of water-bugs (*Notonecta glauca* and *Nepa linearis*, now called *Ranatra linearis*). The destruction of young fishes by water-beetles has since been noted by Elles in 1830, by Dale in 1832, and by Riley in 1885. In regard to the water-bugs, observations published within the past few years have not only confirmed the above-mentioned earlier statements, but other bugs have been discovered to attack fishes. Leidy, as early as 1847, writes that species of *Belostoma* and *Perthostoma* (*Zaitha*) prey upon fishes. Glover, in 1875, states that *Ranatra quadridenticulata* and *Belostoma americanum* feed on small fishes, and that *Nepa apiculata* probably, and *Notonecta insularis* possibly, do the same. Milner, in 1876, writes that *Belostoma grande* captures and eats fishes. Miss Ormerod, in 1878, describes how *Ranatra linearis* attacks fishes; the same year Peck called attention to the destruction of the eggs of Carp by the same insect. Turner, the next year, mentions the killing of young Sticklebacks in an aquarium by *Belostoma*. Leonard notices the showing, at the Edinburgh Fisheries Exhibition in 1882, of a preparation by Hugh D. McGovern, of Brooklyn, N. Y., of a year-old Trout, "surmounted by the fish-eating bug, *Belostoma grandis*," which was in the act of killing the fish by piercing its head; and Todd, the same year, describes how a *Belostoma*, about three-quarters of an inch long, was seen to vanquish a fish three or four times its own length. Uhler, in 1884, states that *Ranatra* destroys the eggs of fishes, and sometimes attacks the young fishes themselves and sucks their blood. Writing of *Belostoma grande*, the giant species of this genus, that is found in tropical America, he states that, "It is a formidable monster in the pools of Demerara, where it lurks on

the bottom of the muddy pools which match its colour, ever ready to grasp the unwary fish in the cruel embrace of its sharp hooked fore-legs, there to remain fixed until life becomes extinct with the outflow of its blood." This author adds, "Scarcely less rapacious are the species inhabiting the United States. One of these, *B. grisea*, is the facile master of the ponds and estuaries of the tidal creeks and rivers of the Atlantic States. Developing in the quiet pools, secreting itself beneath stones or rubbish, it watches the approach of a *Pomotis*, mud-minnow, frog, or other small-sized tenant of the water, when it darts with sudden rapidity upon its unprepared victim, grasps the creature with its strong, clasping fore-legs, plunges its deadly beak deep into the flesh, and proceeds with the utmost coolness to leisurely suck its blood. A copious supply of saliva is poured into the wound, and no doubt aids in producing the paralysis which so speedily follows its puncture in small creatures."

That the loss of fish due to these insects is considerable seems quite probable, because, notwithstanding their secluded habits, they are not rarely to be seen about ponds, sometimes even in the act of taking fishes. The following quotation from a letter from Mr. E. A. Brackett, of Winchester, Mass., Chairman of the Commissioners on Inland Fisheries for Massachusetts, under date of Dec. 16th, 1886, will illustrate this fact. He writes, "In October last, while drawing off the Carp-pond, the water became very roily, and I noticed several young Carp moving on the surface, sidewise, evidently propelled by some external force. With a dip-net I took these young fish out, and found that in every case they were firmly held by a water-bug. The fish were dead, and the bugs apparently had been feeding on them. I had no means of determining how many of these bugs were in the pond."

The largest, and without doubt the most dangerous to fishes, of these water-bugs, are those which belong to the family, Belostomidæ. It is especially of these Belostomidæ that this paper treats. In the north-eastern United States the common forms of these bugs belong to the genera, *Zaitha*, *Belostoma* and *Benacus*. The form of insects belonging to the genus *Belostoma*, is elongated oval, and their considerably flattened form and large size, serves to distinguish them from all the other before-mentioned water-bugs, except those belonging to the genus

Nepa, and from them they are easily distinguished by the fact that the body of *Nepa* terminates in a long tube formed by the apposition of two grooved appendages; through this tube the insect obtains air for breathing, while the species of *Belostoma* have no such tube. The form in *Zaitha* is like that of *Belostoma*, but the species are smaller. In *Benacus*, another closely allied genus, of which the sole species, *B. haldemanum*, is found in the United States, the femur of each fore-leg lacks the groove on its forward side,—a groove which is present in the species of *Belostoma*, and which serves for the partial reception of the tibia when the fore-leg is folded up. The genera *Zaitha* and *Benacus* formerly were considered to be a part of the genus *Belostoma*.

Insects of the family Belostomidæ are abundant in nearly all parts of the tropical and temperate zones of both hemispheres, except in Europe, where they are extremely rare; but, as a general rule, these insects are larger the warmer the climate in which they live. Individual specimens of *Belostoma grande* are sometimes found in tropical America, which measure four inches in length, and *B. griseum*, which is found in the northern United States, attains a length of three and a half inches. The young of this species when only two days from the egg measured, according to Packard, a third of an inch in length.

The colour of the species of Belostomidæ is brown, of a greater or less depth, or of a yellowish or a greenish shade. Partially covered with mud, they are difficult to discover. The sexes are not easy to distinguish from one another, except that females can at times be distinguished by the eggs which they carry.

These large insects are not only provided with powerful fore-legs which they use to seize their prey, and strong, somewhat oar-shaped hind-legs for swimming; but, when full-grown, they have strong wings and are capable of long-sustained flight. By their flights, which, as in most aquatic Hemiptera, take place at night, these insects pass from one pond to another. This insures them a wide distribution, and makes their extermination a difficult matter. Living, as they often do, in pools which dry up at certain seasons of the year, this provision for flight is a necessity of their existence. That these flights are often long and high is proved by the fact that the bugs have been found in the midst of large cities, far from any pond or pool, upon the roofs of three and four story blocks. It is probable that they

are found in these situations from having been attracted to the reflecting surfaces of sky-lights, for it is well known that water-beetles, with their imperfect sight, mistake large expanses of glass, such as are presented by greenhouses, for sheets of water. Especially attractive, however, to these large water-bugs are electric lights, and notices have appeared in the daily press of the swarming of these, as well as other insects, about the electric lights of cities. In flight, as Mr. Brackett states in the letter from which I have already quoted, the species of *Belostomidæ* which he observed can rise directly from the surface of the water.

These insects differ, according to the species, as to their mode of egg-laying. Some, like the common *Zaitha fluminea* of our northern waters, lay their eggs on their own backs. In my collection I have a specimen of this species, which has her back almost entirely covered by a nicely-arranged layer of elongated-oval dark-brown eggs, which number over 175. These eggs are set nicely upon one end, and placed in transverse rows, by means of a long protrusile tube, or ovipositor, which the insect can extend far over her own back. This mode of oviposition insures the safety of the eggs until the young are hatched. The eggs are fastened to the back of the mother by a very thin layer of a waterproof gum secreted by the insect. The entire layer of eggs is apt to split from the insects when they are dried, and consequently is rarely seen in collections of insects. The young bug hatches from its egg by means of cutting out a round lid from the top of the egg, and, at about the time when the young brood begins to hatch, the mother sheds the entire layer of eggs from her back, something as she would moult her skin during growth. It is probable that all the species of *Zaitha* carry their eggs about with them, while, on the other hand, some, if not all, the species of *Belostoma* deposit their eggs in masses, under boards and logs, near the margins of the pools which they inhabit.

The young, upon hatching from the eggs, go immediately on their predaceous course, often feeding at first on young snails. As is true of most Hemiptera—the bugs properly speaking—the young differ little from the adults except in the absence of wings in the former. In *Belostoma* the young, however, have two claws on the tarsi of the fore-legs, while as adults they have only

one tarsal claw in the same place. It is not certainly known, but it is likely that these insects reach their full growth in a year.

In seizing upon fishes or other small animals these insects grasp their prey with their fore-feet, holding it firmly in their claws, then piercing it with their beak or proboscis; for they only suck blood, not being able, as is the case with water-beetles, to eat the whole animal. The proboscis consists of stout horny setæ or bristles, which fit closely together to form a fine sucking-tube, while the exhaustion is performed by means of a muscular, extensible pharynx, or throat. As is probably the case with all carnivorous Hemiptera, only living prey is acceptable to these insects. The predaceous water-bugs are said to destroy the eggs of fishes, although further confirmation of this statement is desirable.

When the water-bugs attack other animals it is noticeable that the prey dies much quicker than it would normally do, from simply the loss of blood consequent upon the sucking of the bug, so it is generally supposed that these insects inject a poisonous secretion through their proboscis into the wound they make. Most of these insects inflict severe stings in self-defence, if they are handled too freely, using the proboscis for this purpose. Leidy has described the salivary glands of *Belostoma*, which are well developed (Journ. Acad. Nat. Sci. Philad. 1847, p. 57), and it is the secretion of these glands that poisons the prey when pierced by the proboscis.

To destroy the bugs that attack fishes is not an easy matter. The water-beetles can be trapped by the use of decaying animal matter, of which they are very fond. I have seen a dead rat in a small pond surrounded by a great number of these beetles (Dytiscidæ), and they prefer such food to living prey. On the other hand, the water-bugs will take only living food, so that their entrapping by any bait would be difficult.

The use of poison for aquatic Hemiptera seems also impracticable. Water-bugs are so much hardier than fish, that nothing dissolved in the water would injure them that would not prove dangerous for the fish.*

* Abridged from the 'Annual Report of the Fish and Game Commissioners of Massachusetts, 1886.'

NOTES AND QUERIES.

Death of Mr. Robert Gray.—The name of the author of ‘The Birds of the West of Scotland’ will be well known to our readers, who, we feel sure, will hear with regret of his death, which took place in Edinburgh on February 18th. The son of a merchant in Dunbar, Mr. Gray early in life entered the service of the City of Glasgow Bank, where he rose by his ability to the position of Inspector of Branches. It was during his journeys through the country in that capacity, and especially in the Western Highlands, that he obtained much of the information about birds which he afterwards published in his work above named. From the position of Inspector of Branches he was promoted to be Manager of the West End Branch of the City of Glasgow Bank in Glasgow, which position he occupied until he accepted (about twelve years ago) the post of Superintendent of Branches of the Bank of Scotland. After having filled that appointment for some years, he became Cashier to the Bank at their head office in Edinburgh, and in that capacity he has ever since been well and favourably known. He was a Vice-President of the Royal Society of Edinburgh, and Secretary to the Royal Physical Society. To naturalists his name will be best known by his little book ‘The Birds of Ayrshire and Wigtownshire’ (1869), in which he was assisted by Mr. Thomas Anderson, and his larger and more important work, ‘The Birds of the West of Scotland,’ published in 1871, and it is to be regretted that he did not live to carry out the project which he had in hand of bringing out a second edition of this, and of publishing, in conjunction with Mr. W. Evans, of Edinburgh, a companion volume on the Birds of the East of Scotland.

MAMMALIA.

Dormice in a Garden.—Some Dormice took up their abode last year in an old Blackbird’s nest in this garden. The nest was placed in a thorn bush about eight feet from the ground. The Dormice showed themselves readily on the trunk near the nest on the tree being tapped; but soon after their discovery they disappeared altogether, owing, I am afraid, to their being too constantly visited.—E. P. LARKEN (Gatton Tower, Reigate).

Bats in Captivity.—On the 17th January I found a dead *Vespertilio pipistrellus*, without any external injury, in the fork of a laburnum tree, about four feet from the ground. It had evidently come out from its winter retreat and succumbed to the cold. I once captured one of these small Bats in my bedroom on the 27th August, and it lived in captivity for nearly three weeks. I fed it on flies and moths, the latter of which it relished the most. It was very partial to raw meat, which it devoured ravenously when

presented to it. I tried the experiment of putting butterflies into its cage, but these it never touched. At the beginning of August last I discovered a colony of the species *V. noctula* in a hollow branch of a sycamore tree. In order to ascertain their species I resorted to the method of smoking them out with brown paper; upon the smoke reaching them they came scrambling out of their aperture gnashing their little white teeth like so many furies, and making a great squeaking. More than a dozen succeeded in making good their escape before I captured one, owing to the awkward position of their abode. There were numbers of others in the hole, but directly they appeared at the aperture and saw me, they beat a hasty retreat, and nothing would induce them to venture forth again. The one I caught I placed on the lawn to test the accuracy of the common assertion that "Bats rise with much difficulty from the ground," and was much surprised with what ease it took wing. It scrambled about a foot along the turf, then rose in the air, and was soon lost to sight, being in no wise confused by the sun, which was then shining brilliantly. This species is very common about the Vale of Aylesbury.—F. HAYWARD PARROTT (Walton House, Aylesbury).

BIRDS.

On the Wing-spur of the Coot, Moorhen, and Water Rail.—On examining a nestling Moorhen a year or two ago I was surprised to find a perfect hook or claw at the extremity of each of the bastard wings. With the exception of the new edition of 'Yarrell,' and 'The Naturalists' Library,' no ornithological work in my possession makes mention of this fact. The allusion in Yarrell's 'British Birds' is as follows:—"Moorhen. Wings . . . armed with a small sharp recumbent spine." Jardine states:—"Gallinula. Generic characters: wings . . . carpal joint armed with a spine." Neither of these authors even hint at the idea of Coots and Water Rails possessing the spine in either a greater or less degree. In the Moorhen it is white, reflexed (or claw-shaped) and sharp. In the Water Rail it is horn-coloured, straight, and blunt. What is its true use or *raison d'être*? The Horned Screamer, *Palamedea cornuta*, is similarly armed, as is also the Spur-winged Goose, although I am not certain as to the exact position of the spurs in the last two cases. The spine must be intended to serve as a weapon of offence or defence, or may be intended for pacific purposes only,—as a boat-hook; or, as the Moorhen is known to use its wings in diving, these hooks may then be brought into play, or they may be of assistance in keeping the rest of the body submerged when the beak and nostrils only are protruded above the surface of the water to obtain a breath of fresh air "*in rebus adversis*." Or is this a case of evolution? The "claw" is certainly most rudimentary in the Water Rail, which is the most averse to flying of either of the three birds mentioned. Is it that these birds are now evolving a second pair of legs! or, *vice versâ*, a perfect (*i. e.* a toeless and toe-nailless)

pair of wings from a former second pair of feet? Certainly this claw is not a temporary natural appendage such as the nib on the beak of a newly-hatched chick, or the tail and two-chambered heart of the tadpole. What then is its use?—MAURICE C. H. BIRD (West Rudham, Norfolk).

[Our correspondent should read an article "On the Claws and Spurs on Birds' Wings," by Mr. J. A. Jeffries (Proc. Boston Soc. Nat. Hist. 1881, p. 301); and another with the same title by Mr. P. L. Sclater, published in 'The Ibis' for April, 1886, pp. 147-151.—ED.]

Note on Eider Ducks.—On reading Mr. A. H. Chapman's article in 'The Zoologist' for January last "On the Habits and Migrations of Wild-fowl," I was especially interested in his remarks on what he calls "a most extraordinary feat performed by Eiders" (p. 13). On firing at the leading bird of four flying in company all dropped to the shot, although only the first was killed. During my stay of two years (1881-3) in Arctic Alaska, with the U.S. Signal Service Expedition to Point Barrow, I had ample opportunity for observing the habits of a different species of Eider, the King Eider, *Somateria spectabilis*, very abundant in that locality during the migrations, and frequently observed a somewhat similar performance. I have made a brief reference to this observation in my report on the birds of the expedition (Report U.S. International Polar Expedition to Point Barrow, 1885, p. 120). The King Eiders, when migrating northwards, pass Point Barrow during May and June in enormous flocks. They have already paired before reaching the Point, and travel (to quote my words in the passage referred to) in "pairs, flying alternately, ducks and drakes. If a duck is shot down, the drake almost invariably follows her to the ice, apparently supposing that she had alighted." In such cases the drake drops so suddenly that more than once we were deceived when shooting Eiders, and, running in to pick up our two birds, were surprised to find the drake, who was sitting flat on the ice with his head up like a wounded bird, suddenly "pull himself together" and make off unhurt, before we could collect our senses sufficiently to secure him with the second barrel. Dr. Leonhard Stejneger, of the U.S. National Museum, who spent a year on Behring Island, informs me that he has witnessed a similar performance by Steller's Duck, *Eniconetta stelleri*. I had supposed that this peculiar feat was only performed by paired birds, but Mr. Chapman's observation goes to show that other influences than those of sex may induce the Eiders to indulge in this extraordinary game of "follow my leader."—JOHN MURDOCH (U.S. National Museum, Washington, D.C.).

Partridges with white "Horse-shoes."—When shooting, on the 20th September, just over the Northamptonshire boundary, I shot a Partridge which had the horseshoe pure white, with the exception of a spot or two of faint chestnut at the upper end, imperceptible until the feathers were lifted.

It was a bird of the year, having almost completed its moult. For two or three years I have noticed that the birds on a certain farm in Oxfordshire, not far from where the bird in question was killed, have a good deal of white mixed with the ordinary chestnut of the horseshoe, and the proportion of white seems to be increasing year by year, some birds killed this season showing about an even amount of white and brown. The bird shot the other day is, however, the first I have ever heard of about here with a quite white mark. The first of this variety I ever saw was sent to a stuffer in Banbury in 1879, and was killed, I believe, in Bedfordshire; it was considered a great rarity. In Nottinghamshire, Mr. Whitaker tells me that the birds with white horseshoe are often met with, but the abundance of Partridges in that county would partly account for this. Mr. Whitaker has skins of some curious dark-coloured birds, also procured there.—OLIVER V. APLIN (Bloxham, near Banbury, Oxon).

Usefulness of the Rook in destroying Caterpillars.—A notable instance of the usefulness of the Rook has recently come under my own observation in Sutton Park. During the summer almost every oak tree in the woods is stripped of its leaves by the larva of a lepidopterous insect known to lepidopterists as *Hybernia defoliaria*, and locally known as the Oak or Autumn Moth. The imago of this insect makes its appearance during the autumn and winter months, from the end of September to the middle of January. The males, in the daytime, may be seen at rest on the trunks of trees, generally in great abundance; but the females, which resemble spiders, are seldom observed, because they effectually hide themselves in the crevices of the bark and under leaves, and only stir about at night, when they deposit their eggs. In April the young caterpillars hatch and crawl up the branches of the trees, commencing at once to devour the buds as they open. As the leaves expand they grow correspondingly, until they reach the length of a little more than an inch. After a shower of rain or a little wind thousands of these caterpillars, becoming alarmed, let themselves down by their webs, and remain suspended for hours in mid-air swinging to and fro in the breeze. Everyone going through the woods during the months of May and June experiences the unpleasantness of constantly coming into contact with their webs, and the incessant itching of the hands and face occasioned thereby. Indeed to many persons this annoyance causes them to avoid the woods during this part of the year. The caterpillars continue to feed until about the middle of July, by which time they have stripped nearly every oak tree of its leaves, and caused it to look as if winter had overtaken it. During the last few years these insect-pests have not contented themselves with stripping the oaks, but have attacked indiscriminately mountain ash, bilberry, brake fern, and all low-lying vegetation. No artificial means could effectually cope with such a wide area as the one attacked. The only remedy is to let Nature take her

own course. Immediately after the breeding-season Rooks, with their newly-fledged young, fly off to the woods, where they remain for several weeks, where amongst these caterpillars they obtain an abundance of food without any trouble. All day long these birds may be seen, in company with large flocks of Jackdaws and Starlings, busily engaged on the tops of the trees devouring the grubs. Last year a visible decrease was made in their numbers, judging from the decrease in the number of moths that emerged in the autumn. This year the caterpillars have been much less plentiful; but some allowance must be made for the numbers destroyed during the wet which was experienced in the early spring.—W. HARCOURT BATH (The Limes, Sutton Coldfield, near Birmingham).

Albino Birds observed in the Harrogate District.—During the last few years albino specimens of some of the commoner birds have been of frequent occurrence. Those which have come under my notice in this district are the following:—An albino Blackbird for the last three years frequented Harlow Moor, and a perfectly white specimen was obtained at Harewood. A pied House Sparrow for some months frequented Parliament Street, one of our main thoroughfares. In the summer of 1884 Mr. J. Simpson shot a pure white albino Sky Lark at Birk Crag. Mr. J. Heaton, also during the same year, shot in the fields adjoining the Hydropathic Establishment a smoky white Starling, the bill and legs of which were of the same colour. On the 3rd of January last Mr. R. Wood (Oatlands, Harrogate) informed me that he had on the previous day observed in his stackyard a pied Robin, the back and tail of which were perfectly white, the remaining parts being of the usual colour. — J. R. FITZGERALD (Harrogate).

Habits of the Green Sandpiper.—That the Green Sandpiper, *Totanus ochropus*, occasionally winters in this country is well known to most ornithologists. The reason for its not doing so more frequently seems in no way connected with the severity of our climate or the scarcity of food, as the following notes will show. In December, 1885, the Green Sandpiper was quite plentiful on most of our "becks" and drains, though we had several days of severe frost early in the month. Throughout the great snow storm which commenced on March 1st, 1886, a few remained in the district up to the middle of the month. Last summer they arrived rather later than usual,—I saw the first on July 27th,—but were very abundant about the middle of August. On the 23rd of that month I flushed over a dozen from our stream in a distance of less than a mile, and they have been by no means uncommon up to the present time. On the night of December 1st a thermometer placed on the ground showed twelve degrees of frost; on December 2nd, twenty-one degrees; and on December 3rd, nine degrees; yet the Green Sandpipers remained, and

appeared perfectly at home and comfortable. Again, from the 17th of December to the 7th of January the frost continued with very little intermission and some heavy falls of snow, but the Green Sandpipers seemed totally unaffected by it, not even losing their customary wildness, and generally flying a long distance when disturbed. I seldom shoot these birds, but those I have examined, killed in winter, were always in good condition. The Snipe apparently felt the recent long-continued frost much more than the Green Sandpipers, those I killed being in very poor condition. They lay exceedingly close, and when flushed only flew a short distance slowly and heavily, offering the easiest of shots.—G. H. CATON HAIGH (Grainsby Hall, Great Grimsby).

Crossbills at Rynn, Rosenallis, Queen's County.—On Sept. 23rd a flock of Crossbills visited a belt of spruce-fir trees near the house, perching on the fir-cones and pecking out the seeds, twittering and throwing down the cones in numbers. On Sept. 24th Mr. Croasdaile shot three out of the flock, one reddish cock with a fine large bill, one yellowish cock, and a hen; the two cocks were sent to Messrs. Williams, Dame Street, Dublin, to be stuffed. Many of them broke off the cones from the branches, and carrying them close to the stem of the tree pecked out the seeds there. They kept up a constant twittering and chirping, and sometimes one of the cock birds would sing a short song from the top of a spruce. They had young ones with them, which they fed while perched on the branches of the firs, and were still at Ryme on October 30th.—ANNA CROASDAILE (Ryme, Queen's County).

Little Bustard in Sussex.—A fine specimen of the Little Bustard, *Otis tetrax*, was shot in a turnip-field by Mr. Coote, at Clymping, near Arundel, Sussex, in October last. Photographs have been obligingly forwarded me by Mr. Hobgen, of Chichester, placing the identity of the species beyond a doubt. It has been well preserved by Mr. Henry George, taxidermist, of that town.—PERCY E. COOMBE (23, Carlyle Square, S.W.).

Varieties of Common Wild Ducks.—Two very beautiful varieties (duck and mallard) of the Common Wild Duck were caught last December in the decoy at Park Hall. The mallard had the head and neck white, a green patch under each eye and one or two on the back of the head; back white, with a band of dark grey between wings; wing-coverts grey-brown; wings white; tail with two white curled feathers, the others of the normal colour: thighs salmon-colour; breast white, crossed with a band of a salmon-grey colour. The duck was a pale slate-colour, each feather edged with bright chestnut; the wings dark slate-colour, with the speculum very pale grey, edged with white at the top.—J. WHITAKER (Rainworth Lodge, near Mansfield, Notts.).

Thrush nesting on the Ground.—On the 13th May I saw four Thrush's eggs in a slight depression on the ground under a hedge, with no nest except a few oak-leaves. The eggs were quite warm; and so they were three days later, when I saw the bird fly from them. I did not take any, because I wanted to give them every chance of being hatched; but on the 18th they had disappeared.—F. H. BIRLEY (Dorman's Land, East Grinstead).

Plumage of the Tufted Duck.—When passing through the Metropolitan Market on January 15th I found to my surprise a male Tufted Duck, *Fuligula cristata*, in which the forehead was sprinkled with white feathers. The late Mr. Yarrell recorded a female Tufted Duck, in which the forehead was "speckled with white like the adult female of the Scaup." I examined two female Tufted Ducks at Lewes in which the forehead was white; these birds were known to be eight years old. An adult female living in the collection of the Zoological Society at present has likewise this variation; but I am not aware that the *male* Tufted Duck has been recorded to exhibit this Scaup-like tendency. Since the foregoing was written, Mr. J. H. Gurney, jun., has pointed out to me that the assumption of a white forehead by the Tufted Duck is not necessarily a sign of old age, since "there is a very young Tufted Duck in the Wolley Collection at the Norwich Museum, which has a white face." Mr. Gurney adds that a female Tufted Duck in his collection, shot on August 8th, shows a trace of the white forehead. Perhaps Mr. Whitaker, whose opportunities for studying the Tufted Duck have been so exceptional, may be able to throw further light upon this point.—H. A. MACPHERSON.

Plumage of the Kestrel.—In 'The Zoologist' for 1883, p. 496, I communicated the result of some observations made by my brother and myself on the plumage of the young Kestrel, and it was there implied that the tail of the adult female was rufous with dark bars; this I find is not exactly correct. Since the above note was written I have obtained two specimens, both females by dissection, in which the tail has a strong tinge of blue. One specimen has the upper tail-coverts blue, with a faint tinge of the same colour on the tail, the other has the tail so decidedly washed with blue that the ground colour might be called blue rather than rufous, although there is still a rufous shade. In both birds the tail is barred in the character of the younger and rufous-tailed female, instead of having the upper aspect clear blue, with the exception of a broad subterminal dark band as in the adult male. I may add that the dark bars on the tail of the adult male are only seen when the feathers are spread or reversed; they exist on the inner webs only, and gradually disappear with age. In a very old pale specimen in my possession these dark markings are obsolete in some of the feathers, and appear in the shape of spots in others. To return to the adult female: in my opinion fully adult birds always possess more

or less blue upon the upper tail-coverts and the tail, and I am unable to agree with Mr. J. H. Gurney, jun., who, in the 'Transactions of the Norfolk and Norwich Naturalists' Society' (vol. iv. pt. ii. p. 155), refers to some examples of female Kestrels showing more or less blue colouring, and treats them as instances of the females assuming male dress. I think the bird mentioned by the Rev. H. T. Frere in 'The Zoologist' for 1886 (p. 180), and described as "a young male in immature (female) plumage, with the exception of a few blue feathers on the upper tail-coverts," was really (unless actually sexed) the female bird of the pair, a very old bird in the adult bluish dress, and not a second male paired to the female belonging to the nest in two hours, as he suggests. With regard to Mr. Cecil Smith's remarks, in 'The Zoologist' for 1886 (p. 110), I would submit that his No. 1 is (unless actually sexed) not a male at all, but an example of the fully adult female. In addition to the evidence of the colour and markings of the tail, Mr. Smith's description of the tail-coverts being "distinctly barred with dark brown," and "the feathers on the breast and rest of the upper parts" having "broad patches of dark brown towards the tip, and also dark brown bars nearer the body," all tend to this conclusion.—F. C. APLIN (Bloxham, near Banbury, Oxon).

Supposed assumption of Male Plumage by a Female Kestrel.—If the Kestrel mentioned by the Rev. H. T. Frere (Zool. 1886, p. 180) was not dissected, and if it was judged to be a male because it had blue feathers on the upper tail-coverts, this affords no proof that such was the case; for it is by no means uncommon for the female Kestrel to assume this colour. The specimen No. 8 described by Mr. Cecil Smith (*tom. cit.* p. 112) is a case in point.—J. H. GURNEY, JUN. (Northrepps, Norwich).

Hybrid Finches.—At the recent Crystal Palace 'Cage-Bird Show' (Feb. 12th to 17th) an unusual number of hybrid finches were exhibited. Of course the usual mules between Goldfinch, Linnet, and Canary were common enough, but besides these there were fifteen Siskin-Canary, one Redpoll-Canary, and one Bullfinch-Canary mules, the last two being very rarely seen. There were also the following hybrids between other finches, *viz.*:—one Greenfinch-Linnet, one Greenfinch-Goldfinch, one Linnet-Bullfinch, one Linnet-Goldfinch, five Goldfinch-Bullfinch, one Redpoll-Bullfinch, and one Redpoll-Linnet. In this list the male bird is in every case placed first. The most beautiful of these hybrids was the Goldfinch-Bullfinch, the colours and the shape of the bill of each species being completely blended. It is apparently not difficult to obtain such hybrids, for some have been exhibited at every show for many years. To my mind the most remarkable bird at the recent show was the Redpoll-Bullfinch, the disparity in size of the parents being so great. I do not doubt that all the above named were bred as described, but there was a bird shown as a Siskin-

Greenfinch which appeared to me to be a Cape Canary, *Serinus canicollis*, and as the specimen of that species taken at Brighton (see Zool. for February, p. 72) was also exhibited by Mr. Swaysland, I was enabled to make a minute comparison between the two, and Mr. Swaysland concurred in my view. I would not, however, put forward this opinion too positively, for I have seen an undoubted hybrid between a Redpoll and Linnet so closely resembling the Twite that it could scarcely be distinguished from that species, and had I not known the person who bred it (Mr. J. H. Verrall, of Lewes), I could scarcely have been convinced that such was not the case; indeed I believe that if the bird had been taken wild it would certainly have been regarded as a Twite.—J. JENNER WEIR (Beckenham, Kent).

[A hybrid between male Redpoll and female Bullfinch is noticed by Rev. H. A. Macpherson (Zool. 1883, p. 504), where mention is also made of hybrids between Goldfinch and Bullfinch, Bullfinch and Linnet, Linnet and Lesser Redpoll, Goldfinch and Siskin, and Bullfinch and Goldfinch.—ED.]

White's Thrush in the Scilly Islands.—Early in December last the butler of Mr. Dorien-Smith killed at Tresco, Scilly, a bird which he thought to be a large Missel Thrush. Fortunately he showed it to Mr. Smith, who at once sent it on to Mr. W. H. Vingoe, of this place, with whom I saw it. It is unmistakably a specimen of "White's Thrush," of the ordinary size and plumage.—THOMAS CORNISH (Penzance).

FISHES.

Scabbard Fish on the Cornish Coast.—Early in this month Mr. Fortescue Millett obtained from the sea-shore near Marazion the head and part of the body of a Scabbard Fish, *Lepidopus argyreus*, washed ashore. He kindly showed it to me, and I have no doubt that its identification is correct. I believe that this is the first recorded occurrence of this fish in Mount's Bay.—THOMAS CORNISH (Penzance).

[This fish was first described as British by Montagu (Mem. Wern. Soc. i. p. 82, pls. 2, 3), from a specimen obtained in Salcombe Harbour, Devon. We believe it has only been met with on the south coast of England.—ED.]

MOLLUSCA.

Muscular Power of Snails.—Seeing the remarks on the wonderful strength of snails (Zool. 1886, p. 491) reminds me of what came under my observation many years ago, of which a note was made and a sketch taken. On the 7th of April, at 9 a.m. (ther. 46°), I noticed a cluster of hibernating Snails, *Helix aspersa*, that had taken up their quarters in a rough garden-wall; two or three of those near the opening had slightly relaxed their hold since the previous day. On the 9th, at 9 a.m.. I found one on the move; there had been rain during the night, and the thermometer had risen to 50°. Later in the day a Snail was observed coming out with one

tightly adhering to its shell, seemingly not much hindered or retarded by it till it began to ascend the face of the wall, where a slight twig barred the way, which the burdened Snail could neither get under nor over. After a close inspection of the obstacle and its surroundings it began to creep up the slender twig, which was gradually enveloped and good progress made till a projecting ledge had been reached, to surmount which it had to relax its hold of a part of the twig, causing the pendant load to oscillate and drag away the greater part of the body, which, drawn out to great length, swung to and fro like a pendulum. How this mishap was to be got over I was at a loss to imagine, and momentarily expected to see the Snail come toppling down, but it held on tenaciously, and ere long began to contract its attenuated body till, bit by bit, it had regained its hold of the stem, and ere night had succeeded in overcoming all obstacles. But for this marvellous muscular power many Snails might perish, seeing that the first which revive have to tear themselves away from the agglutinated mass, and are not unfrequently heavily laden as described.—HENRY HADFIELD (Ventnor, Isle of Wight).

Marine Mollusca of Kerry.—In the last volume of 'The Zoologist' (p. 418) I described the various forms of inland Mollusca sent to me by the Rev. A. H. Delap from the neighbourhood of Valentia, and now proceed to give some account of the marine species collected, which are both numerous and interesting. Most of the species were taken in Valentia Harbour, and the following is a list of those from that locality:—*Anomia ephippium*, *A. patelliformis*, *Pecten varius*, *P. maximus*, *P. opercularis*, *P. pusio*, *Modiolaria discors*, *M. marmorata*, *Arca tetragona* (curiously worn and distorted by the rocks, as described in 'British Conchology'), *Tellina tenuis* and var. *alba*, *T. balthica* and var. *citrina*, *T. squalida*, *Psammobia ferroënsis* (and var. *pallida*, without the pink rays), *P. tellinella*, *Venus ovata*, *V. gallina*, *V. verrucosa*, *Axinus flexuosus*, *Mactra subtruncata*, *Saxicava rugosa* var. *pholadis*, *Mya truncata*, *M. binghami*, *Cardium echinatum*, *C. nodosum*, *Helcion pellucidum*, *Trochus umbilicatus*, *T. cinerarius*, *T. tumidus*, *T. magus*, *T. zizyphinus*, *Lacuna divaricata* and var. *quadrifasciata*, Mont., *Littorina obtusata* var. *lutea*, *L. rudis*, small varieties, one, *pallidula*, 10½ mill. long, pale yellowish, and not strongly ribbed, and two forms of var. *jugosa*, Mont.,—*rubra*, entirely red, and *albagrisea*, whitish grey, with a white band below the periphery and a white base. *Rissoa membranacea*, *R. parva*, type form, *R. striata*, *Odostomia lactea*, *Natica alderi*, *Scalaria communis*, *Nassa reticulata*, *N. incrassata*, *Murex erinaceus*, *Aporrhais pes-pelecani*, *Defrancia purpurea*, var. deep chocolate-brown, variegated with white, *Pleurotoma costata*, *Cerithium reticulatum*, *Cypræa europæa* (of two forms, *typica*, pale brownish or pinkish, with or without brown spots, and an ash-coloured variety, spotless or with black spots), *Scaphander lignarius*, and *Acera bullata*. Accompanying the above, also

from Valentia Harbour, dredged in six fathoms, was some foraminiferous mud. This has been carefully examined by Mr. C. D. Sherborn, who reports the following species:—*Lagena sulcata*, W. & J. var., *L. lævis*, Will., *Truncatulina lobatula*, Mont., *Rotalia beccarii*, Linn., *Miliolina oblonga*, Mont., *Polystomella crispa*, Linn., *P. striatopunctata*, J. & M., and a species of *Bulimina*. Some very interesting forms of *Purpura lapillus* were sent from Donlus Head. In shape and size they agree with Jeffreys' var. *minor*, and as regards colour may be divided into three races—*a. nigra*, brown-black; *b. bizona*, similar, but with two pale brown bands; and *c. lineolata*, pale yellowish with three white bands and numerous dark brown spiral lines. Bally-na-Skellig Bay yielded *Kellia suborbicularis* and *Helcion pellucidum* var. *lævis*, specimens of the latter being beautifully iridescent with purple inside. Finne Strand was the locality of specimens of *Actæon tornatilis* and *Donax vittatus* sent; and from Darrynane Strand were sent *Corbula gibba*, and *Phasianella pullus* of five varieties—*a. millepunctata*, regularly and minutely spotted with pink; *b. cinereolineata*, with brown-band and some rather ill-marked grey, closely set interrupted lines; *c. interrupta*, with a dark interrupted lines; and two other less marked forms. This completes the list of Kerry shells sent by Mr. Delap, and though necessarily incomplete it is of some interest as a contribution to the fauna of a little-worked district, and more especially for comparison with other local lists, and its bearing upon the question of geographical distribution. It is to be hoped that before long we shall know in some detail the local distribution of our marine fauna, but at present the materials are far too scanty to form any definite conclusions or for any considerable generalizations. With the Kerry collection were three species from Donegal—*Spirula peronii*, Lam. (*S. australis*, Brug.) from Maghery Strand, and *Fissurella græca* (a small depressed form, perhaps var. *ima*, De Greg.), and *Emarginula fissura* from Rutland Island.—T. D. A. COCKERELL (Bedford Park, Chiswick).

CRUSTACEA.

Inachus dorynchus at Penzance.—On February 17th I obtained from the stomach of a codfish, caught in Mount's Bay, five specimens of *Inachus dorynchus*, one a large male measuring fourteen-sixteenths of an inch on the lengthwise of the carapace, and the others (females) much smaller, and all bearing berry. They were all more or less covered with sponges, *Fuci*, and small corallines. In the male the rostrum was obscurely bifid, but in all the females it was distinctly so. In all of them the colour was reddish brown, and in each the fingers were marked by transverse darker coloured bars. The specimens were perfectly fit for observation, but too far gone for preservation.—THOMAS CORNISH (Penzance).

[For a figure of this species see Bell, 'British Stalk-eyed Crustacea,' p. 16.—ED.]

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

February 3, 1887.—WILLIAM CARRUTHERS, F.R.S., President, in the chair.

Dr. Michael C. Grabham (Oporto) and Capt. Wingate (Cashmere) were elected Fellows of the Society.

Mr. W. Simpson exhibited a series of sketches of the Afghan Boundary, as illustrative of the region traversed by the Delimitation Commission.

An important paper on the Fauna and Flora of the Afghan Boundary, by Brigade-Surgeon J. E. T. Aitchison, C.I.E., was read and discussed. Among the speakers who took part in the discussion were Sir J. D. Hooker, Dr. Günther, Mr. G. A. Boulenger, Dr. P. L. Selater, Mr. W. T. Blanford, Mr. O. Thomas, Sir J. Fayer, Mr. R. Bowdler Sharpe, Mr. Howard Saunders, Mr. C. O. Waterhouse, and others. The following is the author's summary of the zoological collections:—Nineteen species of mammals, belonging to fifteen genera, were collected, and other species belonging to three genera were seen. Perhaps the most interesting, as being the least known, was *Ellobius fuscicapillus*, the type of which was originally obtained many years ago near Quetta. The geographical range of the Tiger, *Felis tigris*, was now ascertained to include the district round Bala-Morghab, and that of the Cheetah, *Felis jubata*, as far as the valley of the Hari-rud; while the Egyptian Fox, *Vulpes famelica*, was obtained as far north and east as Kushk-rud, and Kiu in the basin of the Harut river. As regards birds, 123 species belonging to some eighty-four genera were collected, while fourteen other species were identified, though not preserved. Two new species only were procured, viz. a Pheasant, *Phasianus principalis*, and a Woodpecker, *Gecinus Gorii*. The birds in Afghanistan are chiefly migratory, with the exception of the above new Pheasant, the Raven, Rook, Carrion Crow, Jackdaw, Sparrow, Starling, Sky Lark, Crested Lark, Bokhara Lark, *Melanocorypha bimaculata*, Wall Creeper, *Tichodroma muraria*, Bittern, *Botaurus stellaris*, several Raptores, Sand Grouse, *Pterocles arenarius*, and Red-legged Partridge, *Caccabis chukar*. As spring advances birds are seen to arrive, following each other rapidly, such as *Aedon familiaris*, and various species of *Sylvia*, *Saxicola*, *Lanius*, *Motacilla*, *Pastor*, *Merops*, and *Coracias*. Various ducks then leave the country, but the Brahminy Duck or Ruddy Sheldrake, *Casarca rutila*, remains throughout the year and breeds there. The greater number of the species met with belong to the genera *Saxicola* (8), *Lanius* (6), *Sylvia* (5), *Motacilla* (5), and *Emberiza* (4). Of Reptilia thirty-five species were collected—a Tortoise and twenty-one species of Lizards, of which three are new; of Ophidians thirteen species, one of which is new; also adult examples of *Naiu oxiana*, which

heretofore has only been recognised from young specimens. Of Batrachia two specimens were obtained, viz. *Rana esculenta* and *Bufo viridis*, and on the latter a Leech, *Aulostoma gulo*, was found. Circumstances prevented more than seven species of fish from being procured; these proved to belong to six genera: two of these species are new to science. *Schizothorax intermedius* is interesting, as it was found by Griffith in the Cabul river, an affluent of the Indus. In the great eastern drainage of East Turkestan it was found at Youngsi-Hirsar by the second Yarkand Mission. The new species of *Schizothorax* was only met with in the Hari-rud and its tributaries. Over one hundred species of insects were collected, of which twenty prove new. The greater number of them are typical of the Arabian, North African, and Mediterranean faunas; a few only have Indian and Central Asian affinities. It was observed that the Lepidoptera generally appeared at irregular intervals, only when there was perfect stillness in the air, and then in limited numbers.

February 17. 1887.—The only zoological paper read at this meeting was by Dr. Hoek, of Leiden, "On *Dichelaspis pellucida*, Darwin, from the scales of an Hydrophid obtained at the Mergui Archipelago by Dr. John Anderson." As far as the author's knowledge goes, this species of Cirripede has not been observed since Darwin published his description from specimens procured in the Indian Ocean and also from a sea-snake. It seems that although somewhat larger in dimensions, and with other slight variations which may be due to difference of age, there can be little doubt of the identity of the Mergui specimens with Darwin's *D. pellucida* (Monogr. Cirriped. i. p. 125).—J. MURIE.

ZOOLOGICAL SOCIETY OF LONDON.

February 1, 1887.—Dr. ST. GEORGE MIVART, F.R.S., Vice-President, in the chair.

Mr. F. Day exhibited and made remarks on a hybrid fish supposed to be between the Pilchard and the Herring, and a specimen of *Salmo purpuratus* reared in this country.

Mr. W. L. Sclater exhibited and made remarks upon some specimens of a species of *Peripatus* which he had obtained in British Guiana during a recent visit to that country, and added some general observations on the distribution and affinities of this singular form of Arthropod.

Mr. A. Thomson read a report on the insects bred in the Society's Insect House during the past season, and exhibited the insects referred to.

A communication was read from Dr. B. C. A. Windle, containing an account of the anatomy of *Hydromys chrysogaster*.

Mr. Martin Jacoby read a paper containing an account of the Phyto-

phagous Coleoptera obtained by Mr. G. Lewis in Ceylon during the years 1881, 1882. About 150 new species were described and many new generic forms.

Mr. F. E. Beddard read some notes on a specimen of a rare American Monkey, *Brachyurus calvus*, which had died in the Society's Gardens.

Mr. Oldfield Thomas read a note on the Mammals obtained by Mr. H. H. Johnston on the Camaroons Mountain.

A paper was read by Capt. Shelley, containing an account of the birds collected by Mr. H. H. Johnston on the Camaroons Mountain. The collection contained thirty-six specimens referable to eighteen species, and of these four were new to science.

Mr. G. A. Boulenger read a list of the Reptiles collected by Mr. H. H. Johnston during his recent visit to the Camaroons Mountain.

Mr. Edgar A. Smith read a paper on the Mollusca collected at the Camaroons Mountain by Mr. H. H. Johnston, and gave the description of a new species of *Gibbus*, proposed to be called *Gibbus johnstoni*, of which specimens were in the collection.

A communication was read from Mr. Charles O. Waterhouse, containing a list of some coleopterous insects collected by Mr. H. H. Johnston on the Camaroons Mountain.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

February 2, 1887.—Dr. D. SHARP, President, in the chair.

The President nominated Mr. Robert M'Lachlan, F.R.S., Mr. Osbert Salvin, M.A., F.R.S., and Mr. Henry T. Stainton, F.R.S., Vice-Presidents during the Session 1887-1888.

The Rev. W. J. Holland, M.A., of Pittsburgh, United States; Dr. F. A. Dixey, M.A., Fellow of Wadham College, Oxford; Mr. C. J. Gahan, M.A., of Brompton, S.W.; and Mr. Sydney Klein, F.R.A.S., of Willesden, N.W.; were elected Fellows.

Mr. P. Crowley exhibited a new species of *Synchlœ*—*S. Johnstoni*—from Kilima-njaro; also, for comparison, specimens of *Synchlœ mesentina* and *S. hellica*, which the new species closely resembled.

Mr. W. White exhibited a number of preserved larvæ of European Lepidoptera in various stages of growth,—including nine examples each of *Saturnia carpini* and *Deilephila euphorbiæ*,—illustrating the gradual development of the markings and colours, as explained by Prof. Weismann, in his 'Studies in the Theory of Descent.'

Mr. Gervase F. Mathew exhibited a variety of a female of *Lycæna telicanus*, from the neighbourhood of Gallipoli, Turkey: also some specimens of a *Lycæna* from Vigo, believed to be varieties of *Lycæna baton*, but differing from the type in being much larger and darker. He further

exhibited several examples of a *Leucophasia* from Vigo, which appeared to be identical with *L. æstiva* (Staud.).

Mr. Porritt exhibited, on behalf of Mr. N. F. Dobrée, a series of a remarkable red form of *Tæniocampa gracilis*, bred last season from larvæ collected in Hampshire.

Mr. Eland Shaw exhibited specimens of *Pachytylus cinerascens* (Fab.), *Mecostethus grossus* (Linné) and *Gryllus flavipes* (Gmel.), and read a "Note on the Identity of *Gryllus* (*Locusta*) *flavipes*, Gmel."

The Secretary read a communication from Prof. Riley, of Washington, on the subject of the "Australian Bug" (*Icerya purchasi*). It was stated that the insect had of late years become very destructive to various trees and shrubs in California, into which country, as well as into New Zealand and Cape Colony, it had been introduced from Australia, where it was believed to be indigenous; but on this point further evidence was asked for.

The Rev. T. A. Marshall communicated "A Monograph of the British Braconidæ," Part 2, being a continuation from Part 1 of the 'Transactions' for 1885.

Mr. Francis P. Pascoe read a paper entitled "Descriptions of some new species of *Brachycerus*."

Mr. Francis Galton, F.R.S., read a paper on "Pedigree Moth-breeding as a means of verifying certain important Constants in the General Theory of Heredity." In this paper Mr. Galton suggested the institution of a system of experimental breedings, to be continued for several years, with the object of procuring evidence as to the precise measure of the diminution of the rate at which a divergence from the average of the race proceeds in successive generations of continually selected animals.

Mr. Frederic Merrifield read a paper (by way of an appendix to Mr. Galton's paper) entitled "A proposed method of breeding *Selenia illustraria*, with the object of obtaining data for Mr. Galton."

Mr. M'Lachlan said he considered the fact that *S. illustraria* was dimorphic an objection to its selection for the experiments proposed, and he suggested that the Common Silkworm Moth, or some other large Bombyces, would be more suitable for Mr. Galton's purposes.

Prof. Meldola called attention to some observations on *Selenia illustraria* by Dr. Knaggs, in vol. iii. of the Ent. Mo. Mag., which had some bearing on the projected experiments; and he remarked that although, for some reasons, the species selected was well adapted for testing Mr. Galton's conclusions, he believed that the fact of the moth being seasonally dimorphic was likely to introduce disturbing elements into the experiments which might influence the results.

The discussion was continued by Dr. Sharp, Messrs. Baly, Kirby, White, Klein, Porritt, Dunning, Waterhouse, Bates, Merrifield, Galton, and others.—H. Goss, *Hon. Secretary*.





From drawing by Capt. David Cook
L. H. Huxford, 1897

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L. H. Huxford, 1897



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NOTES ON A VOYAGE TO THE GREENLAND SEAS
IN 1886.

BY ROBERT GRAY.

(Concluded from p. 100.)

June 28th. The wind prevailing from the south-eastward, with a heavy and continual swell. In dense and incessant fog we have been feeling our way south-westwards along the pack-edge: the dreadful roar of the swell amongst the ice, which could be heard at a distance of about six miles, gave us timely warning of its proximity on more than one occasion. Passed several pieces of drift-wood, one piece being of deal, the others parts of trees. At eight o'clock the ship nearly ran down three young Saddle Seals lying asleep; they were all lying heading to leeward, and as they rose and fell on the bosom of the southerly swell the wavelets washed freely over them. Lying on their backs, with their breasts just awash, and only about two inches of their noses above water, respiration did not appear to be going on.

July 2nd. While running S.W. along the ice-edge we came to a strip of oily water, with a number of birds sitting around it. A boat was lowered down, and a large flat fish was found lying dead at the surface. It was not brought on board, but appeared to be about three feet long, and the boat's crew said that it was a Halibut. Shannon Island in sight, bearing W.N.W., distant about sixty miles.

July 3rd. A most beautiful day; not a cloud in the sky, the sea as smooth as glass. The sun being very bright during

the afternoon, the thermometer rose to 50° in the shade, the highest temperature recorded during the voyage north of lat. 70°. In the evening, water was discovered over the ice to the S.W., and, after a few hours' boring through close pack, we entered wide water surrounded on all sides by ice. A few large Finners (*B. sibbaldii*) seen playing about in the morning.

July 4th. Lay about becalmed all day in our "polynia," clear, cloudless, and warm. The water, although clear and cerulean, contained a fair quantity of whales' food. Narwhals were very numerous, lying about at the surface in almost every direction, the sunshine glistening on their backs. Three were killed,* and one was lost. I found their stomachs and intestines on this, as on every other occasion I have examined them, to contain nothing but the undigested portions of a small species of cephalopod, principally the hard mandibles and eyes.† Floe-rats also numerous, most of them lying asleep on very small pieces of ice; many of them, with their bodies firm and rigid, their hind flippers clasped together, were lying on one side, supported only at a single point, a somewhat unstable and curious attitude of repose. Mallemites, especially the white kind, numerous; also a few other birds, Looms, Rotches, Dovekies, a solitary Arctic Puffin, Snow-birds, a few Skuas, and several Arctic Terns.

July 5th. Narwhals very numerous; the males, easily distinguished by their horns, were lying about sunning themselves at the surface; the females, with their young, keeping by themselves, were generally seen swimming about.

July 7th. Our "polynia," at first circular and circumscribed, had now become continuous with the open sea to the N.E., and had extended itself many miles to the S.W. along the edge of the fast ice. At the bottom of this great *cul de sac* we found the water clear and blue, with a general absence of life. An occasional Finner, *B. sibbaldii*, however, was seen coming from the S.W., and, passing us, would continue its way to the N.E. While sitting in the "crow's-nest" several passed within a short distance of the ship, and, the water being smooth and very clear, I enjoyed a rare opportunity of watching their movements while

* A few measurements obtained will be found appended.

† One entire specimen was obtained. Through the kindness of Mr. Sidney F. Harner, of King's College, Cambridge, it was submitted to Mr. W. E. Hoyle, who had no hesitation in referring it to *Gonatus Fabricii* (Licht.).

under water. In whaler's parlance, the Finners were "spanning," *i. e.*, appearing at regular intervals, and swimming in a decided direction. Watch in hand, I found them to remain under water from eight to ten minutes, and to remain at the surface every time they came up to breathe from thirty to sixty seconds; their speed I estimated at about five miles per hour. It is commonly believed, if I mistake not, that during progression the body of the Whale describes a succession of short curves, each answering to every stroke of the tail. No such acrobatic feat is performed; the hinder part of the body and the fin thereto attached are alone in motion, slowly but regularly, and decidedly, and only in a vertical direction; along the resultant in a direct and undeviating manner the body advances forward. The pectoral limbs thus freed of their share of locomotion are at liberty to act in guiding the animal, or to serve any other function for which they may be adapted. The Finners I was watching were never many feet under water; they could be easily followed from the moment they left the surface until they again rose to breathe, the eye being greatly assisted by a peculiar whitish—perhaps phosphorescent—appearance their bodies assumed while under water. To cause them to rise to the surface the great pectoral fins were slowly extended, then perhaps being rotated on their axis; the water through which they were moving was thus caused to strike obliquely on their surface,—hence the anterior portion of the body, being thus raised upward, the force resulting from the action of the caudal fin was obviously caused to act at an angle on the axis of the body, and the animal, as it advanced forward, gradually approached the surface. As soon apparently as the power exerted by the muscles of expiration was sufficient to overcome the weight of the supercumbent water respiration took place, and before the animal's head was above the surface a column of breath was projected vertically upward to a height of about fifty feet. Inspiration then followed, and just before the animal left the surface close scrutiny could detect a secondary puff containing but little moisture, and rising only to the height of a few feet. As to this second act of expiration, a few words: I believe that in the cetaceans, respiration being effected, the lungs in their function become hydrostatic. It is obvious that to facilitate submarine progression the specific gravity of the body must be equal to that of the surrounding

medium. Now it is well known that, owing apparently to the paucity of blubber, the body of *B. sibbaldii*, immediately after death, has a decided tendency to sink. Consequently, a sufficient quantity of air must be retained in the lungs during life to establish the necessary equilibrium. This quantity of air is, I think, exactly represented by the amount expired on the animal's appearance at the surface in the manner described; it is replaced necessarily during respiration by the quantity of air inspired, but on this occasion exceeded by the amount expired during the second puff; the latter operation being, therefore, the act of re-establishing equilibrium between the weight of the body and the amount of water it displaced. Of course, if the animal should have occasion to reduce its power of flotation below equilibrium the second puff will necessarily be greater, or if, on the other hand, it should be in somewhat poor condition, the second puff will become unnecessary, all the air retained in the lungs being necessary to establish equilibrium. Meanwhile the body had showed itself above water, the head broad and flattened, the shoulders abrupt and noticeable; the back broad and flat in front, narrow and sharp behind, surmounted by a small and insignificant fin, situated far back just in front of the tail, which latter did not appear above the surface. As these parts each in succession appeared and passed in review, to the eye their lines, interrupted and uneven, wanted those soft and gentle curves which lend a beauty and a grace to the slower but more majestic movements of the Right Whale.

The situation and condition of the ice rendering it apparent that the South Greenland whaling would be a failure on the 8th, we proceeded north-eastwards towards the open sea, turned the point of ice which we had been to the westward of on the 10th, and the same day we spoke the 'Hope' and 'Earl of Mar and Kellie,' thereafter proceeded eastwards bound for the Barentz Sea.

In the year 1880 Mr. Leigh Smith, in his yacht, the 'Eira,' had seen two Right Whales in one of the bays of Franz Joseph Land during the month of August. There being, therefore, a likelihood of finding whales amongst the ice in the offing, thither we were going to examine for ourselves the nature of the navigation, the state of the ice, and to endeavour to come to a conclusion whether the coast of Franz Joseph Land is accessible sufficiently early in the season to allow ships to reach it in time

to devote at least two months to the object of their voyage before the commencement of the winter's frost, and the increasing severity of the weather should compel them to retreat to the southwards.

While crossing the Spitzbergen water we found it continually grass-green in colour from the ice-edge in long. 12° W. lat. $73^{\circ} 3'$ N. to long. 2° E. lat. $75^{\circ} 30'$ N., a distance of some 220 miles; thereafter its colour was not uniform, being either green, dark brown, or blue. Surface-life seemed equally abundant all the way. On the 10th, a minute Medusa, just visible to the naked eye, was most abundant; and on the 15th *Limacina arctica* was very numerous. *B. sibbaldii* was seen daily, in numbers; but no other cetaceans were observed. On the 12th, in lat. $74^{\circ} 38'$ N., long. $4^{\circ} 36'$ W., we passed a solitary piece of ice, which, however, reminded us that the margin of the Greenland West Ice, now in this latitude 270 miles to the westward, was in this longitude on the 1st of May, showing that it had retreated westward at the rate of four miles daily since then.

Passing some forty miles to the southward of Cape Look-out on the 15th we continued to steer eastwards; the day following, however, we had to alter our course to the southward somewhat, clear of ice. A large "berg," fully 100 ft. high, was passed on the 17th. The same day a young Ground Seal, *P. barbata*, was noticed. Continuing to work our way to the eastward we experienced a succession of strong southerly gales, which, with a nasty short sea and very thick and almost continuous fog, made our work of tracing the edge of the ice somewhat hazardous, as well as disagreeable. On such occasions the thermometer is of the greatest service, and from its readings the proximity of ice may be very accurately estimated. Soundings were taken every two hours; the water in the Barentz Sea being very shallow, we got bottom generally from thirty to eighty fathoms. *B. sibbaldii* was seen once or twice on the 18th, also many Kittiwakes and a few Arctic Terns. We were favoured with a few hours of clear weather on the 18th: the ice to the northward was a close and impenetrable pack, as hard and tight as a season of continued southerly gales could well have made it; the water very blue and clear, with an almost total absence of life of any kind. On the evening of the 19th a great many Saddle Seals were seen going eastwards along the ice-edge. Kittiwakes were very

numerous, great numbers of them sitting on the hummocks ; one Polar Bear was seen.

The day following having been led as far southward as the 75° in long. 40° E., and the sky denoting the continuation of the ice still farther to the southward, it was not thought expedient to proceed farther, and the ship's head was accordingly turned westward, once more towards the Greenland ice. As to the hope of the Barentz Sea ever becoming a whaling-ground, Capt. Gray, in his log, says:—"I am now fully convinced, from the quantity of ice lying east of Spitzbergen this year, that no open passage up or near to Franz Joseph Land is practicable. I am also convinced that Franz Joseph Land can only be reached in very exceptional seasons, and also that it can never be of any value as a resort of whalers, the passage to and from Franz Joseph Land being far too uncertain to allow whaling vessels to reach their cruising ground off the S.W. and N.W. coasts ; for, unless our ships can reach their cruising ground at least in nine seasons out of ten it would be impracticable—in short, incompatible with successful commercial enterprise." That the Barentz Sea is not the resort of *B. mysticetus* is almost certain, the shallow water being perfectly impracticable with its habits ; nevertheless, far removed from the open ocean as the shores of Franz Joseph Land are, the bays of its western coast may be annually visited by migrants from the Greenland Sea.

On the 22nd Saddle Seals were very numerous ; a good many Looms and one flock of Brent Geese were also seen. At noon Hope Island bore N.W., distant about thirty miles ; a few "bergs" were passed in the evening. As on our passage eastward, so on our return journey across the Spitzbergen water, *B. sibbaldii* was seen daily, sometimes very numerous ; twenty or even more might have been counted blowing at one time on several occasions. But the observation I have here to make is that during the day few or none were to be seen, and that every night they were more or less numerous, always appearing to be in greatest numbers about 4 a.m. If, then, these cetaceans are nocturnal in their habits, where do they obtain rest during the day ? It may be said by some that *B. mysticetus* would be able to find a snug corner amongst the ice, where it would escape observation. Without admitting this,

can the disappearance of *B. sibbaldii* and *H. rostratus* be explained otherwise than by their sleeping under water? Why, of course, with just a small part of their heads above the surface,—incapable, although passive, of being disturbed by wave-motion, exceptions to the laws of hydrostatics,—they thus enjoy perfect rest, and those men who for their livelihood depend on their capture have seldom, if ever, been able to see them in this position.

As to the northern distribution of *B. sibbaldii*,* I should like to say a few words. It has already been shown that this whale may be seen in water little above freezing-point; that it is seen in water under 32° Fahr. as frequently as in water of a warmer temperature. It may be safely assumed, therefore, that—other circumstances being favourable—Sibbald's Rorqual, insensible or indifferent to a few degrees of warmth, may extend its migrations as far to the northward as it is inclined; like *B. mysticetus*, it is therefore essentially a "cold-water whale." While passing over that part of the Spitzbergen Sea belonging to the North Greenland whaling-ground, already defined, the number of these whales seen daily reminded us that only a few weeks ago this part of the sea was covered with ice, and that *Balæna mysticetus* most probably occupied the ground. As in the early part of the season, so now also, the water was found to contain an abundance of Crustacea and Medusæ, *Calanus finmarckicus*, as usual, being by far the most abundant. The question naturally suggested itself whether these minute forms of surface-life affording support to the Greenland Right Whale constitute also the food of these "finners." It is certainly in accordance with the economy of Nature to suppose that as the ice breaks up and dissolves with the warmth of the summer sun, and *Balæna mysticetus* is enabled to advance northwards to occupy pastures new, some form of life will be provided to occupy the ground left vacant. The bulk of the two animals being nearly the same,†

* See A. H. Cocks on "The Finwhale Fishery on the Coast of Finmarken" (Zool. 1884, pp. 366, 417, 455).

† *B. sibbaldii* is admittedly the longer; yet I venture to think what the Right Whale loses by its length it almost gains by its great girth; and that the difference between the two in bulk is not so great as is generally supposed. The correct girth of a large whale is very difficult to ascertain, apart from the size of the animal, owing to the rapidity with which the body

or, in other words, requiring about the same quantity of food for their support, it follows that, both being supplied with an apparatus of a similar nature for its capture, the draining power of the apparatus in both cases must be the same. Both are inoffensive, the Right Whale depending on its diving powers for its survival, is short and robust, adapted to withstand a great pressure, and to remain a considerable length of time under water. Along with these powers, great speed is unnecessary, perhaps impossible. Accordingly we find this animal provided with a draining apparatus (if I may use a convenient expression) of enormous size, its baleen-plates of great length, slow in its movements, and sluggish in its habits. *B. sibbaldii*, on the contrary, presents reverse characters, depending on its speed for its survival; we find it an animal of exceeding length, flattened laterally, and greatly prolonged hindward—characters all calculated to suggest speed. Witness also the great vertical strength of the rump, the draining apparatus necessarily small, and its baleen-plates short, swift in its movements, and active in its habits. Thus it becomes evident that, great as is the difference in length of the baleen-plates of *B. mysticetus* and *B. sibbaldii*, and consequently also in the size of their draining apparatus, this difference may be equalised by slowness of motion on the one hand, by swiftness on the other—in short, that the power of the draining apparatus of the one is about equal to that of the other.

If, then, the above reasoning is correct, these two huge creatures, depending on the same source of food for their existence, differ from one another essentially only in one im-

distends after death, a phenomenon to be accounted for apparently, in the first place, by the relaxation of the respiratory muscles on the cessation of *rigor mortis*, and the consequent increase in the size of the chest thereafter, but mainly by the generation of gases. In the course of a few days a Greenland Whale will resemble a balloon rather than a cetacean. One killed by Capt. Gray in the 'Active,' in the year 1866, was found to measure, only six days after being killed, 43 feet across the chest from tip to tip of the fins; the girth was most probably greater than the entire length of the animal (about 55 feet). Thus it is probable that the great girth (46 ft.) of the Finner stranded at Longniddry was likewise largely owing to this latter cause, and that the girth, and consequently also the bulk, of Sibbald's Rorqual may have been somewhat over-estimated.

portant point, *viz.* the mode of their survival. Both find it necessary to retire from the surface to obtain their food; therefore each must be able to exist in a state of activity for a longer or shorter period with the respiratory organs secluded from the atmosphere. Provision to permit this therefore becomes necessary, suited, however, to different requirements and circumstances. In the first instance, we find that a large store of blood, and perhaps a sluggish circulation, are perfectly compatible with the slowness of motion of the Greenland Right Whale; that this is the case we have only to regard the robustness of the animal and its clumsy appearance. In the second instance, however, a large store of blood, and necessarily also great bulk, are not compatible with the active habits and swift movements of the Blue Whale. Although undoubtedly the fullest possible advantage of this alternative is taken, yet if provision so obtained were alone inadequate, we should expect to find some other alternative taken advantage of to the extent required. If so, then some trace of this in the organization of the creature will be found. I allude, of course, to dermal respiration, the possibility of such playing the part required has only to be remembered to lead us to expect that such a simple and convenient means of effecting her end would not be overlooked by stature. The numerous *plicæ* along the under surface of the body, of which no reasonable explanation has yet been given, have evidently the function of increasing the surface of the skin exposed to the surrounding medium, and these are, I venture to think, simply an adaptation to the additional respiration carried on by the dermis, as rendered necessary by the circumstances already explained.

Regard now all the Whalebone Whales, and to them as a class apply the same argument. Living upon food of the same nature, all the members of this group agree in so far as they are supplied with a similar apparatus for its capture, *viz.* the characteristic baleen-plates. As we have already seen, however, some for their survival depend upon their ability to withstand pressure, others on their speed. Accordingly, as some belong to the former class and may be called "divers," others belong to the latter and may be called "non-divers;" they differ from one another essentially only in the special characters rendered necessary. With the first group, the smooth whales (*Balenidæ*)

correspond, with the second, the furrowed whales (*Balænopteridæ*). Finally, in relation to the size of the animal, according to the above argument, the length of the baleen-plates should be in accordance with the degree of activity characteristic of the particular species (or even individual) and the *plicæ* or folds of the skin will necessarily be proportionately developed.

In the following table I have arranged several of the different species of Whalebone Whales to which the foregoing observations apply, with their characters in relation to their size stated only generally. The conclusions arrived at with regard to the degree of activity of each species, I venture to think correspond sufficiently with our knowledge in regard thereto, as otherwise obtained, to establish the probability of this explanation of the mysterious *plicæ* of the Fin Whales being correct.

Species.	Length of baleen.	Number of Plicæ.	Degree of activity.
<i>Balæna mysticetus</i> . .	Very long.	None.	Sluggish.
„ <i>biscayensis</i> . .	Long.	None.	Less sluggish.
<i>Monodon longimana</i> .	Short.	Numerous.	Active.
<i>Balænoptera sibbaldii</i> .	Shorter.	More numerous.	More active.
„ <i>musculus</i> .	Ditto.	Very numerous.	Very active.
„ <i>rostrata</i> .	Very short.	Ditto.	Ditto.

Reaching the West Ice on the 26th of July, the ice was found to be but little improved; nevertheless, we immediately commenced cruising for whales. *B. sibbaldii* seen frequently, the Finners having now apparently obtained complete possession of the South Greenland whaling-ground. Narwhals, Floe-rats, and old Saddle Seals were very numerous; an occasional Bladder-nose Seal (*P. cristata*) was also seen; a few Bears were shot. The water was nearly always green in colour, but, strange to say, contained little or no food; the tow-net might have towed an hour and more without collecting half the quantity it would have done in a few minutes in the early part of the season. Not so strange perhaps after all, for, like every other food-supply in Nature, these “lanks” most likely become exhausted towards the end of summer, and the winter’s frost is necessary to enable them to become restocked before the next spring. Diatoms were, of course, there,—perhaps this was their time of rest; the

grass on the fields, as it were, was growing, the pastures were becoming renewed before they should again be required to produce a vast quantity of minute creatures which would, in their turn, be called upon to support the huge whale. On August 1st I obtained a small fish* with bright golden scales swimming about at the surface of the water. On the 3rd a specimen of Buffon's Skua, *S. longicaudatus*,† was obtained; a good many others were also seen.

August 5th. Bore up for Lerwick. While passing Jan Mayen, some fifty miles to the eastward, birds were numerous, Brent Geese, Rotches, and Looms,—the latter with their young; this was on the 8th. The day following, Rotches were seen with their young, and one Humpback Whale, *B. longimana*, was seen on the 9th. The first Gannet was noticed on the 13th. The same day a great school of Killer-whales, perhaps fifty in number, made their appearance on our lee-bow, and, passing underneath the ship, were again seen on our weather-quarter, continuing their course to the N.W. Birds were very numerous some fifty miles north of Lambaness,—Kittiwakes, Black-headed Gulls, Skuas, Mother Carey's Chickens, Gannets, Looms (?), and several times a strange bird was seen, quite unknown to me, but recognised immediately by several of our seamen as a Cape-hen.

Called at Lerwick on the 16th, and, having landed the Shetland portion of our crew, we proceeded to Peterhead, which we reached in due course.

* This fish was brought home, and has been identified as *Scopelus muleri* by Dr. Day (see 'Nature,' Oct. 14th, 1886).

† This specimen, as well as the Chimney Swift and Wheatear mentioned before, were brought home; they are now in the hands of Mr. George Sim, A.L.S., Aberdeen, who confirms their identity.

In the following Table (continued from p. 57) will be found the position of the s. s. 'Eclipse,' the surface temperature of the sea, and the temperature of air, at noon, on the different days on which any event of zoological interest is recorded as having occurred:—

DATE.		SHIP'S POSITION.		TEMPERATURE.		
		Lat.	Long.	Sea.	Air.	
		°	'	°	°	
June	5 . . .	79	53 N.	4 0 E.	33·5	24
"	6 . . .	79	26	2 19 E.	31	23·5
"	8 . . .	78	50	1 16 E.	29·5	23
"	11 . . .	79	26	1 54 E.	31	28
"	12 . . .	79	33	3 0 E.	34·5	30
"	13 . . .	79	29	4 12 E.	32	33
"	19 . . .	78	50	0 E.	31	32
"	21 . . .	78	28	0 52 W.	33	32
"	24 . . .	78	33	2 21 W.	34	34
"	25 . . .	78	23	1 10 W.	32·5	36
"	28 . . .	76	45	3 25 W.	34	35
"	30 . . .	75	50	9 0 W.	31	33
July	2 . . .	74	55	13 13 W.	31	30
"	3 . . .	73	54	14 52 W.	35	40
"	4 . . .	73	26	15 16 W.	36	41
"	5 . . .	73	21	14 59 W.	34	40
"	7 . . .	72	56	16 21 W.	33	32
"	12 . . .	74	28	4 36 W.	36·5	41
"	15 . . .	75	53	15 37 E.	42	43·5
"	17 . . .	76	4	25 40 E.	36	40
"	18 . . .	76	25	31 11 E.	38·5	42
"	19 . . .	76	7	36 0 E.	33	35
"	22 . . .	76	26	27 23 E.	36	39
"	26 . . .	75	7	5 15 W.	37·5	37
Aug.	1 . . .	73	12	14 28 W.	35	35
"	3 . . .	73	9	14 40 W.	35	33·5
"	8 . . .	72	56	5 20 W.	38	39
"	9 . . .	71	17	2 57 W.	45	43·5
"	13 . . .	63	36	2 7 W.	49·5	48·5

The above observations have been extracted from the ship's meteorological log, taken therefore with the best instruments supplied by the Meteorological Office.

APPENDIX.

Some particulars relating to the capture, size, &c., of the seven Greenland Right Whales captured by the s.s. 'Eclipse' in 1886:—

No.	Date.	On being harpooned remained under water.	Sex.	Length.	Length of longest plate of baleen.
1	May 26	25 minutes ...	Cow	47 ft.	9 ft. 1 in.
2	„ 27	—————	„	—	6 „ 5 „
3	„ „	20 minutes ...	„	—	5 „ 8 „
4	„ 28	—————	„	30 ft. (about)	4 „ 6 „
5	„ „	30 minutes ...	Bull	—	6 „ 10 „
6	„ 31	25 „ ...	„	—	7 „ 2 „
7	June 6	18 „ ...	„	—	5 „ 2 „

After the vessel's arrival in port it was found that these seven whales yielded 36 tons of oil (252 gallons per ton), and 36 cwts. of whalebone. By the following table it will be seen how unfavourably this result compares with those of the two preceding seasons, 1884 and 1885:—

Season.	No. of whales.	Sizes.			Yield of oil (tons).		Yield of bone (cwts.)	
		Smallest.	Largest.	Average.	Total	Average	Total.	Average
1884	Seven	8 ft. 9 in.	10 ft. 8 in.	9 ft. 10 in.	105	15	10·5	15
1885	Seven	8 ft. 4 in.	11 ft. 6 in.	10 ft.	95	13·5	98	14
1886	Seven	4 ft. 2 in.	9 ft. 1 in.	6 ft. 4 in.	36	5·1	36	5·1

The question naturally arises whether the 1886 whales are to be regarded as exceptionally small, or those of 1884 and 1885 as exceptionally large. By way of an answer it may not be out of place here to state that Capt. D. Gray has ascertained from the comparison of some two hundred individuals captured under his supervision in the Greenland Seas and in Davis Straits during the last forty years, that the measurements, &c., of an average full-grown male Greenland Right Whale are as follows:—

Of the entire body—

Length, measured between perpendiculars raised from the tip of the lower jaw and the centre of a line joining the tips of the caudal fin ... 51 ft.

Greatest girth, about 3 ft. behind the pectoral fins	35 ft.
Bulk (about)	2500 cubic ft.
Weight (about)	70 tons.
Of the head—	
Length, from the articulation of the lower jaw ...	17 ft.
Girth round the eyes	32 ft.
Greatest breadth across lower jaw	10 ft.
Gape	11 ft.
Of the baleen—	
(a). The longest lamina attached to each side of the upper jaw (known as the "sample slip")—	
Length	10 ft. 6 in.
Breadth across its attached end	11 in.
Length of the "hair" at its free extremity ...	1 ft. 6 in.
Weight after removal of the pulp and hair, and after being thoroughly dried	6½ lbs.
(b). The number of the laminæ—	
Total number exceeding 6 ft. in length (known as "size slips")... ..	400.
Total number under 6 ft., but long enough to be considered marketable, the shortest being about 12 in. in length (known as "under size") ...	190.
Total number too short to be marketable, being the laminæ dwindled towards the extremities of the jaws, about	50.
Grand total	640.
Of the pectoral fins—	
Length	7 ft. 6 in.
Greatest breadth	5 ft.
Of the caudal fin—	
Breadth from tip to tip	20 ft.
Greatest length	6 ft.
Such an animal producing—	
Of oil	15 tons.
Of whalebone (baleen)	15 cwts.

The female attains greater proportions than the male, reaching, when full-grown, an average length of about 53 ft., from which the various other measurements given above (except the number of the laminæ, which is the same; the yield of oil, which is 18 tons, and the yield of whalebone 18 cwts.) may be estimated, these appearing to be in the same relative proportion to the extreme length, as in the male.

I have now to explain how the bulk and weight given above have been found, and how the number of the laminæ of baleen have been ascertained. First, with regard to the bulk and weight. In 1885 a model was made on board the 'Eclipse,' according to the directions of Capt. Gray; it was compared frequently during the voyage with the animal itself as it lay alongside the ship in the recent state, and the model was intended to represent an animal of typical proportions rather than one of very unusual size (see Plate II.). After having been exhibited at the meeting of the British Association in Aberdeen it was finally presented to the Natural History Department of the British Museum. Before its leaving Aberdeen, however, Dr. Struthers, of Marischal College, obtained an exact copy, and through his kindness I was enabled to obtain a photograph of his model, and to find the volume of water it displaces, *viz.* 2661 cub. in., the model being on a scale of one inch to the foot, 2661 cub. in. = 2661 cub. ft., being therefore the bulk of the animal of which the model is a representation. Barely floating when in the recent state, sometimes a little above water when seen asleep, the weight of a whale is fairly, perhaps exactly, represented by the weight of the volume of water which it displaces. A cubic foot of sea-water at its usual sp. gr. 1.030 weighs 1030 ozs. \times 2661 = 76 tons, which is therefore the weight of the animal itself.*

Next, with regard to the baleen-plates. Whalebone under six feet in length realises only half the price obtained for that exceeding that length; hence the distinction "size" and "under-size." For a number of years the owners of the Peterhead vessels have been in the habit of having the slips of bone brought home by their vessels counted, and from results so obtained the average number of slips per whale has been found. A number of these results are given below, with the "size" of the whales from which they were derived. Now, considering that the number of the slips, too small to be worth bringing home (which I have called "not marketable"), must be greater in a small whale than in a large, it will be seen that, after adding a number (greater in the

* This estimate is only approximate, depending on a model of $\frac{1}{17\frac{1}{2}}$, and on the assumption of the sp. gr. of the body being equal to that of its surrounding medium.

case of small whales, less in the case of large), a total will be obtained, which, after allowing for individual variability, will clearly and conclusively prove that the number of the laminae does not increase with growth, but remains constant. It follows, therefore, that with increase in the length of the jaw the spaces between the laminae must become greater.

Brought home by	From	Year.	No. of whales.	Size or average.	Totals.			Averages.			*	Grand Total.
					Size.	Under size.	Total.	Size.	Under size.	Total.		
Hope	Greenland ..	'85	1	4 6	—	602	602	—	602	602	80	682
Erik	" ..	'86	7	6 2	930	2865	3795	132	409	542	70	612
Eclipse	" ..	"	7	6 4	1068	2700	3768	152	385	537	70	607
Hope	" ..	'83	1	8 5	356	212	568	356	212	568	60	628
Eclipse	" ..	'84	7	9 10	2852	1341	4193	407	191	599	50	649
"	" ..	'85	7	10 0	2771	1343	4114	395	191	587	50	637
Windward	" ..	'79	1	12 0	446	164	610	446	164	610	40	650
"	Cumbland. Glf.	'86	1	12 6	446	125	571	446	125	571	40	611

* Numbers assumed to represent non-marketable slips or slips not brought home.

A few measurements (taken a few hours after death) of two male Narwhals, *Monodon monoceros*, killed July 4th, 1886:—

	ft.	in.	ft.	in.
Length between perpendiculars erected at extremes	12	6	14	1
Girth just behind pectoral fins ...	5	9	7	4
Transverse measurement of tail ...	2	7	3	4
Antero-posterior measurement of ditto	—		1	5
Least girth of rump	1	0	—	
Length of horn projecting beyond skin	2	6	4	4
Thickness of blubber on the body ...	—		0	2½
Dermis	—		0	0½—¾
Length of intestine	67	0	—	

BIRDS' NESTS AND EGGS.

BY HENRY SEEBOHM.

THE philosophy of birds' nests and eggs involves questions far too profound to be settled in an hour's lecture. The extreme partisans of one school regard birds as *organic automata*. They take a Calvinistic view of bird-life: they assume that the Hedge-sparrow lays a blue egg because, under the stern law of protective selection, every Hedge-sparrow's egg that was not blue was tried in the high court of Evolution, under the clause relative to the survival of the fittest, and condemned, a hungry Magpie or Crow being the executioner. The extreme partisans of the other school take an entirely opposite view. They regard the little Hedge-sparrow, not only as a free agent, but as a highly intelligent one, who lays blue eggs because the inherited experience of many generations has convinced her that, everything considered, blue is the most suitable colour for eggs.

Perhaps the first generalisation that the egg-collector is likely to make is the fact that birds that breed in holes lay white eggs. The Sand Martin and the Kingfisher, which lay their eggs at the end of a long burrow in a bank, as well as the Owl and the Woodpecker, which bred in holes in trees, all lay white eggs. The fact of the eggs being white, and consequently very conspicuous, may have been the cause, the effect being that only those Kingfishers which breed in holes survived in the struggle for existence against the marauding Magpie. But the converse argument is equally intelligible. The fact that Kingfishers breed in holes may have been the cause, and the whiteness of the eggs the effect; for why should Nature, who is generally so economical, waste her colouring-matter on an egg which, being incubated in the dark, can never be seen? The fact that many Petrels and most Puffins, which breed in holes, have traces of spots on their eggs, while their relations the Auks and the Gulls, who lay their eggs in open nests, nearly all lay highly-coloured eggs, suggests the theory that the former birds have comparatively recently adopted the habit of breeding in holes, and that consequently the colour being no longer of use is gradually fading away. Hence, we assume that the colour of the egg is probably the effect of the nature of the locality in which it is laid.

The second generalisation which the egg-collector is likely to make is the fact that so many of these birds which breed in holes are gorgeously coloured, such as Kingfishers, Parrots, Bee-eaters, &c. The question naturally arises, Why is it so? The advocates of protective selection reply, Because their gay plumage made them so conspicuous as they sat upon their nests, that those that did not breed in holes became the victims of the devouring Hawk, exactly as the conspicuous white eggs were eaten by the marauding Magpie. But the advocates of sexual selection say that all birds are equally vain, and wear as fine clothes as Nature will let them, and that the Kingfisher is able to dress as gorgeously as he does because he is prudent enough to breed in a hole safe from the prying eyes of the devouring Hawk. The fact that many birds, such as the Sand Martin and the Dipper, which breed in holes, are not gorgeously coloured, whilst others, such as the Pheasants and Humming-birds, are gorgeously coloured, but do not breed in holes, is evidence, as far as it goes, that the gorgeous colour of the bird is not the effect of its breeding in a hole, though the white colour of the egg probably is. It must be admitted, however, that the latter cases are not parallel. Whilst the hen Kingfishers and Bee-eaters are as gorgeous as their mates, the hen Pheasants and the hen Humming-birds are plainly, not to say shabbily, dressed. If birds be as vain as the advocates of sexual selection deem them, it must be a source of deep mortification to a hen Humming-bird to have to pass through life as a foil to her rainbow-hued mate. Whilst the Kingfisher relies for the safety of its eggs upon the concealed situation of its nest, the Humming-bird depends upon the unobtrusiveness of the plumage of the sitting hen.

A very large number of birds, such as the Grouse, the Merlin, most Gulls and Terns, and all Sandpipers and Plovers, rely for the safety of their eggs upon the similarity of their colour to the ground on which they are placed. It may be an open question whether these birds select a site for their breeding-ground to match the colour of the eggs, or whether they have gradually changed the colour of their eggs to match the ground on which they breed; but, in the absence of any evidence to the contrary, it is perhaps fair to assume, as in the previously mentioned cases, that the position of the nest is the cause, and the colour of the egg the effect.

Many birds make their nests in lofty trees, or on the ledges of precipitous cliffs. Of these the Eagles, Vultures, and Crows are conspicuous examples. They are, for the most part, too powerful to be afraid of the marauding Magpie, and only fear the attacks of beasts of prey, amongst which they doubtless classify the human race. They rely for the safety of their eggs on the inaccessible positions of the nest. Many of them also belong to a still larger group of birds who rely for the safety of their eggs upon their ability, either singly, in pairs, or in colonies, to defend them against all aggressors. Few colonies of birds are more interesting than those of Herons, Cormorants, and their respective allies. These birds lay white or nearly white eggs. Nature, with her customary thrift, has lavished no colour upon them because, apparently, it would have been wasted effort to do so; but the eggs of the Guillemot are a remarkable exception to this rule. Few eggs are more gorgeously coloured, and no eggs exhibit such a variety of colour. It is impossible to suppose that protective selection can have produced colours so conspicuous on the white ledges of the chalk cliffs; and sexual selection must have been equally powerless. It would be too ludicrous a suggestion to suppose that a cock Guillemot fell in love with a plain-coloured hen because he remembered that last season she laid a gay-coloured egg. It cannot be accident that causes the Guillemot's eggs to be so handsome and so varied. In the case of birds breeding in holes secure from the prying eyes of the marauding Magpie, no colour is wasted where it is not wanted.

The more deeply Nature is studied, the more certain seems to be the conclusion that all her endless variety is the result of evolution. It seems also to be more and more certain that natural selection is not the cause of evolution, but only its guide. Variation is the cause of evolution, but the cause of variation is *unknown*. It seems to be a mistake to call variation spontaneous, fortuitous, or accidental, than which expressions no adjectives less accurate or more misleading could be found. The Athenian philosophers displayed a less unscientific attitude of mind towards the Unknown when they built an altar in its honour.*

* Abstract of a lecture delivered at the London Institution.

ORNITHOLOGICAL NOTES FROM NORTH NORFOLK.

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

THE following notes relate to ornithological occurrences in this county between July 1st and December 31st, 1886. The mildness of the past autumn was as remarkable as the effect it had upon many species of birds, which recommenced nesting operations as if spring had returned.

On October 14th a Thrush was sitting on four eggs, and a few days previously a Yellowhammer's nest with eggs was found at Cley. About the middle of the month a tame Goose began to lay eggs, and several leverets, little bigger than rats, were seen. Several curious varieties of common species were obtained, some of which may be worth mentioning. Amongst others a Wheatear, *Saxicola œnanthe*, was shot at Blakeney during the first week in August, which had the whole of the crown and back pure white, the under parts being not much whiter than usual. During September Wheatears were very numerous among the sand-wort and salt-wort bushes and among the marram hillocks. A Wren, *Troglodytes europæus*, with pied wings, made its appearance at Northrepps on December 9th, but was not seen again. On Sept. 1st I shot a white variety of the Ringed Plover, *Ægialitis hiaticula*, at Cley. On the mud it appeared to be snow-white, but on closer examination proved to have a little brown on the collar, tail, and primaries. It certainly could not have arrived many hours, for so conspicuous an object could hardly have escaped attention.

It seems probable that the Bittern mentioned at p. 393 of last year's volume, as seen several times in June, found a mate at Ludham Fen and nested there; for a young one was sent to Mr. Cole, of Norwich, from that place about August 16th. Though fully feathered, and able to have crossed the sea, it is not very likely to have done so at that time of year.

Four Black Terns, *Sterna fœssipes*, were shot at Cley in August last. They were all young birds, differing a good deal in plumage; one of them indeed differing so much that it may possibly be a White-winged Black Tern, as the webs are slightly more incised—a mark of distinction noted by Mr. Saunders (Yarrell's 'British Birds,' iii. p. 526); but the

immature plumage of these two species requires an expert to distinguish them. An immature female specimen of *S. fissipes* was obtained at Barton about the same time.

About October 19th two Little Gulls, *Larus minutus*, were killed at one shot, at Blakeney, one of them an adult bird, the other in an intermediate state of plumage between old and young. About December 20th an Egyptian Goose was shot at Rockland, and another was obtained elsewhere about the same time. A Red-breasted Merganser, *Mergus serrator*, was found on the shore at Overstrand on October 27th; and, as I learn from Lord Lilford, a white Scoter, *Ædemia nigra*, was seen in Lynn Deepes by Capt. J. Vipan on December 10th.

It seems likely that more than two pairs of Shelduck, *Tadorna vulpanser*, nested at the point of coast alluded to in my last Notes (Zool. 1886, p. 393). Two eggs of this species were taken from a rabbits' hole, which, according to the finder, must soon after have been filled with water by the tide, and one of them was hatched under a hen. The young bird lived a short time in my garden, and became so tame that it would take worms out of the hand. Some more young ones were found dead at high-water mark, probably drowned. They were not all of the same size, and probably formed part of two broods. Col. Hawker mentions that different broods will associate in the same flock, sometimes to the number of 100 birds. On September 15th a family party of young Shelducks, sheltering under Salthouse sea-wall from a N.E. wind, allowed a near approach, and one of their number was easily shot. It showed the white face and other marks of immature plumage; but the family, having once learnt wisdom by experience, could not be approached again.

Mr. Seebohm, in his 'British Birds' (vol. iii. p. 520), states that the Shelduck is provincially known in Norfolk as the "Bargander," but I have never heard it called anything but "Burrow-duck" in this county, and believe it invariably selects a burrow to nest in. In the last published volume of the 'Encyclopædia Britannica' (p. 788) there is an admirable article on the Shelduck by Prof. Newton, in which it is stated that the name "Bergander" is now almost obsolete, which, so far as this county is concerned, is I think the case. [The Editor has heard the name "Bargander" applied to the Shelldrake by professional

fishermen and wild-fowlers on the Sussex coast, where it is an occasional visitor in autumn.]

About August 10th a young Red-necked Grebe, *Podiceps rubricollis*, was shot on a little pool inside the sea-wall at Salthouse. I never saw a more immature example as to plumage, the black stripes on the throat being very strongly marked; but of course there is no reason to suppose that it was bred in Norfolk. The Red-necked Grebe has occurred in Norfolk in every stage of plumage, even to the most perfect breeding-garb. I saw a "variety," nearly white, with a sandy tinge, some time ago at Cambridge, which had been killed in the Eastern Counties. A perfectly white one, obtained at Eastbourne (Zool. 1879, p. 377), is now in the collection of Mr. Marshall, of Belmont, Taunton.

As varieties among Grebes are so very rare, it may be worth digressing to say that in the collection of Mr. J. G. Barclay, of Leyton, is a sandy-coloured Great Crested Grebe, obtained in Leadenhall Market. Mr. E. T. Booth, in his Catalogue of the Birds in the Brighton Museum, mentions a white Slavonian Grebe.

A Diver, believed to have been a Black-throated, *Colymbus arcticus*, was seen by Messrs. F. C. and O. V. Aplin at Cromer on November 20th.

An immature Black Guillemot, *Uria grylle*, was shot at Cley on December 20th.

NOTES ON BATS IN NORTH LINCOLNSHIRE.

BY G. H. CATON HAIGH.

For several years past I have paid some attention to Bats in North Lincolnshire, and have succeeded in identifying five species (the same number as recorded by Lord Lilford (pp. 61 - 67) from Northamptonshire); only three of these, however, can be considered at all common. The five species which I have obtained in North Lincolnshire (using the nomenclature of Bell's 'British Quadrupeds') are:—

Scotophilus noctula. — This fine species is by no means uncommon. It is usually the first of the Bats to come abroad in the evening, frequently appearing before the sun has set. At

this hour, if the evening be fine, it flies at a great height, but as the darkness increases it is usually seen at a lower elevation. In cold or windy weather also it seldom flies high. It generally selects a hollow tree for a resting-place during the daytime, but last summer I often noticed the appearance of several of these Bats about a rookery composed chiefly of young trees, on which I could detect no holes. The old gamekeeper, to whom I mentioned the circumstance, said that he thought they came out of the rooks' nests, as he had several times found Bats among the loose sticks forming their foundations. The Noctule is, I believe, the first of the Bats to retire in the autumn, and is not often seen abroad after the end of August; but during the very hot weather of last autumn (1886) I saw several individuals of this species almost every evening up to October 4th. This is the latest date I have noted, though it has been recorded to have been seen in November ('The Field,' Nov. 19th, 1881). The loud harsh squeak of this Bat when flying overhead is well known. I have heard it utter another note—a sort of prolonged chirp—not unlike that of the Long-eared Bat. This is always uttered when near the ground, usually when entering or leaving its diurnal retreat.

Scotophilus pipistrellus.—This little Bat is excessively abundant, greatly outnumbering all the other species put together. It comes abroad early in the evening, though, unlike the Noctule, it is seldom seen before sunset. The Pipistrelle is occasionally seen abroad in winter, even in very cold weather. One was observed flying round a cottage in the village of Grainsby on January 10th last, a bright moonlight night with deep snow on the ground. Yet, although a few may be seen abroad in every month of the year, the majority disappear in October.

Vespertilio nattereri.—The Reddish-grey Bat is apparently very rare in this district, as I have only met with it once. A single specimen was picked up by one of the gamekeepers in a grass-field near the village of Grainsby in July, 1876. It was alive, but unable to fly, and died on the following day. Although I have ever since looked out for this Bat, I have failed to meet with it again.

Vespertilio daubentonii.—This species ought probably to be described as local rather than rare, though at present I only know of one locality where it is not uncommon. As many as

a dozen may be seen there at once flying over the surface of a large pond partly overhung with willows. It appears more sensitive to cold than other Bats are; on a slight fall in the temperature not a single individual is to be seen out, sometimes for days together. It comes abroad rather late in the evening.

Plecotus auritus.—The Long-eared Bat is generally distributed and fairly common, though I have never seen it in any abundance. It is usually the last of the Bats to come abroad in the evening, seldom appearing till it is nearly dark. From this circumstance it might easily be overlooked were it not for its peculiar cry, which differs considerably from that of all the other Bats with which I am acquainted. I have only once seen this species abroad before sunset. In Bell's 'British Quadrupeds' (2nd ed.) it is stated that "the Long-eared Bat appears to frequent open country more than many other species." My own observations in North Lincolnshire lead me to the conclusion that here, at least, the reverse of this is the case, for I cannot recall a single instance in which I have met with this Bat away from the vicinity of trees or buildings. It generally flies low, amongst the tree-trunks and branches, and appears to take its insect-food from the bark and leaves rather than on the wing. The lime-tree, when in flower, seems to afford it great attraction.

I have reason to believe that there is at least one more species to be added to this list, for I have frequently observed a rather large dark-coloured Bat flying low over grass-land, so low as only just to clear the higher stalks of grass. It moves heavily with slow flaps of its wings, and is generally seen in the neighbourhood of trees. I hope that this may prove to be the Barbastelle, but from its mode of flight it is difficult to obtain a specimen.

The Whiskered Bat, mentioned by Lord Lilford (p. 66) as occurring in Northamptonshire, and also recorded from Yorkshire by Clarke and Roebuck in their 'Handbook of Yorkshire Vertebrates,' I have been unable to identify in Lincolnshire, though I have looked for it carefully, and am well acquainted with the species, which is not uncommon in some parts of North Wales.

I hope Lincolnshire naturalists may be able to add to this short list, for there may be several species as yet unrecorded. The Whiskered Bat may possibly occur; the Barbastelle, as stated above, probably does so. It would also be interesting to hear of other localities for *Vespertilio nattereri* and *V. daubentonii*.

NOTES AND OBSERVATIONS ON BRITISH
STALK-EYED CRUSTACEA.

BY EDWARD LOVETT.

(Continued from vol x., p. 177.)

Nika edulis, Risso.

THIS remarkable crustacean, belonging to a genus of which only two species are known on our shores, is also very rare, except in isolated localities, where it is sometimes fairly abundant. It may, however, probably occur more generally than is supposed, for, having a general resemblance when boiled to one of the prawns, it may often pass and be even eaten unnoticed and uncared for. As it occurs in such spots as are frequented by prawns, it may be looked for with a prospect of success amongst the "catch" of a prawn-fisher. Its general description is as follows:—Carapace in appearance somewhat like that of the Lesser Prawn, but with this striking difference—the rostrum, instead of being large, serrated, and curved, is simple, straight, and very small; there is a spine on either side of it protecting the eyes. The antennæ are very long and slender, and the legs are also rather long; the first pair are so remarkable that Bell, in his standard work, says that by this peculiarity this genus may be distinguished from every other form of crustacean. The one is a pincer-claw, similar in this respect to the primary legs of crustaceans in general; the other a simple terminal hook-joint; or, in other words, one foot is didactyle and the other monodactyle. So far as I have been able to examine specimens, I have found the right foot to be the one armed with a pincer, and the left the one-fingered limb in every case; I was, however, prepared to find exceptions to this rule, and they may occur, as in the case of species already referred to; the right or left is the "large" claw, though generally the right, and I consider the irregularity in this species corresponds to the difference in size of claws in other species and genera. This disparity in the sizes of corresponding limbs I have already discussed in former notes.

The colour of this species is a bright transparent pink, becoming, however, an opaque but bright red when boiled, even

brighter than the Thames "shrimp," which, by the way, is not a shrimp.

My own specimens of *Nika edulis* are all from Jersey, where it occasionally occurs in sufficient numbers to be offered in the market in small lots for sale as "shrimps." I have seen about twenty or thirty of this rare crustacean exposed on a cabbage-leaf, prawns or shrimps being certainly less abundant as a rule in the Channel Islands than they are in many of our own south-coast towns; hence, when anything of the sort occurs in the market, the chances are it is something rare. Fish-markets afford a good hunting-ground in this respect for the marine zoologist, though a minute examination of the specimens elicits a somewhat annoying response from the fish-wives, who imagine the naturalist is probably a large purchaser. I have never been able to obtain specimens of *Nika edulis* alive, and have therefore never seen them in their native haunts; but I have been informed by fishermen that they capture them generally at about one or two o'clock in the morning; indeed, there are two or three crustaceans to which the seemingly remarkable rule applies, and I think it must be correct. I know the Jersey fishermen are on the coast at all hours, because when they are working their crab-pots they have to go out to them whenever the tide is favourable, and, as they often take a push-net with them to work any sandy reach on their way, they soon come to know when and where any particular species may be procured.* More than one crustacean which I had hitherto regarded as very rare has turned up in comparative abundance in the small hours of the morning at a certain spot known to one of these fishermen. This is very likely their feeding-time, and I consider that they probably pass most of their time just below the surface of the wet sand; hence the reason of their being so seldom seen.

Bell states that Leach's original specimen was obtained by Montagu at Torcross; his own type-specimen from Bognor, where it was served up to him for breakfast amongst some prawns; and that, according to Mr. W. Thompson, there are

* Mr. Sinel, of Jersey, who has been fortunate enough to obtain *Nika edulis* alive and to have kept it for a short time in an aquarium, informs me that towards night-time it emerges from concealment and becomes very lively indeed, and that its eyes gleam like rubies in the dark.

specimens in the collection made in the South of Ireland by Mr. Vaughan Thompson. Besides these localities it has been recorded from Shetland, as very local and in deep water; Galway, rare; Cornwall, occasionally on stony ground in thirty fathoms; and also from the Adriatic Sea.

Nika Couchii, Bell.

The second British species of the genus is described by Bell from one specimen sent him by Mr. Couch, after whom he named it. I have never met with it myself, nor have I ever heard of any one who has; indeed in the 'Annals and Magazine of Natural History,' 1868 (vol. ii. p. 120), it is considered to be a variety of the last-named species, in which I am inclined to concur after what I have seen of the extreme variability of crustaceans generally. Bell was an exceedingly careful observer, but, although he claims some fairly distinct features for his species,—such as the didactyle hand being shorter than the wrist, the former slightly, the latter more considerably, curved, middle plate of tail attenuated towards the extremity and not furrowed, and the whole animal being longer in proportion to its other dimensions,—still he only examined a single specimen of this, and does not appear to have seen any number of the previous species. I think therefore that until its specific identity is proved by, at any rate, a fair series of examples, it is preferable to regard it as a variety, especially as variation is so constantly observable.

Athanas nitescens, Leach.

This very beautiful crustacean is much like a young lobster, or, as Bell remarks, a young *Astacus*. Its carapace is smooth and slightly compressed laterally; the antennæ are scarcely more than half the length of the whole animal, and the first pair of legs are furnished with robust pincers, which are, however, nearly always equal in size,—a somewhat unusual occurrence. The external plates of the tail have a transverse division one-third of their length from their termination; this feature is strongly marked in the *Astacidae*, so that this resemblance is interesting. The tail-plates are beautifully fringed with setæ.

The colour of *Athanas nitescens* is somewhat variable, being sometimes of a warm reddish brown, and at others of a decidedly dark green tinge. Bell, who was not fortunate enough

to see many of this species, and who probably never examined one alive, writes, "Colour light buff?" As this is the tint of a much dried and bleached specimen, he evidently felt the necessity for making this statement in doubt. He also states that the length of Leach's specimens is rather more than half an inch, whereas, judging from the number of specimens that have passed through my hands, I should say that the length of the mature animal, from the tip of the rostrum to the tip of the tail-plate, was nearer an inch.

The usual habitat of this species is under little stones or bits of shell that have collected in the hollows often formed under some large boulder; but, so far as I have been able to ascertain, it is never found upon a sandy or muddy bottom. Favourite spots may be seen among the low-tide pools of St. Clement's Bay, or Grouville Bay, Jersey; and here, with a little careful search, may be found this uncommon crustacean, at times in considerable numbers. Mr. Sinel informs me that he has taken it with ova from January to September.

Bell states that this species was discovered by Montagu and sent to Dr. Leach, who asserts that it occurs in rock-pools left by the tide on the Devon and Cornwall coasts. It has also been recorded from Galway, from "the coast of France," and from the Adriatic Sea.

Hippolyte spinus, Sowerby.

This is a genus about which I can say but little, since I have unfortunately had very little opportunity of seeing many specimens of it. There are moreover a few species described in various reports, &c., which were evidently unknown to Bell when he published his work on the Stalk-eyed Crustacea, and his genus has since been subdivided, so that it is now difficult, without further examination of specimens, to say much that would be of use to the student.

As regards this particular species, however (*H. spinus*), it may be described as follows:—The general form is very robust, the cephalothorax particularly so, and armed with a powerful rostrum, which springs from a serrated ridge commencing at the juncture with the abdominal segments. These abdominal segments are humped in the middle, the third segment forming in its centre a strong spine, curved downwards towards the tail,

whence probably the name of the animal. The first pair of legs are short, with small rounded claws. The length is about an inch to an inch and a half, and the colour, I believe, similar to a shrimp, but variable; those I have seen being only dead specimens.

It is stated by Bell to be exclusively a northern species, but I obtained all my specimens from off Harwich, where they were taken in shrimp-nets. Milne-Edwards says it is found in the seas of Iceland and Greenland. It has also been recorded from the Isle of Man (deep water), St. Andrews (deep water), and the Firth of Forth.

Hippolyte varians, Leach.

This species has, I believe, been removed to the genus *Caradina*. It differs from the preceding by the absence of the spine on the third segment, by a smooth carapace and slender rostrum, and also in being smaller and much less robust in form. It is undoubtedly one of the most beautiful of the smaller crustaceans, and is often of a lovely transparent green tint, which enables it to pass almost unnoticed in the Algæ-lined rock-pools, where it lives; it is quite common in our southern and warmer localities, Jersey, of course, being a specially good locality. It is also recorded from Devon and Cornwall, eastward as far as Poole Harbour, Dorsetshire, as well as from the coasts of Connemara and Dublin.

According to Bell, it loses its lovely green colour soon after death, but with careful preparation I find that it can be almost entirely retained.

Hippolyte Cranchii, Leach.

In this species the carapace is short and rounded, the rostrum has three serrations, and the whole animal is shorter and slightly more robust than the last mentioned. The central or spine-plate of the tail is sharply spinous on either side. The length of the animal is from half an inch to three-quarters of an inch.

It has been recorded by Bell from Torbay, Salcombe Bay, Poole, and Loch Fyne; and has since been recorded from Ardbear Bay, West Coast of Ireland, in four fathoms; Dublin, not uncommon; Galway, common; Belfast; South Devon and Harwich (in shrimp-nets).

Hippolyte Thompsoni, Bell.

This species is characterised by its describer as differing in a few minor details from some of the other species. He states that he saw but one specimen, and, as his figure is in general details very like that of *H. spinus*, I think it probable that this is merely a variety of that species.

Hippolyte Prideauxiana, Leach.

This species has been described by Bell as being like *H. varians*, but much smaller, and of a reddish brown colour. The rostrum is straight and smooth on the upper surface, and the abdomen is much bent at the third segment. It has been recorded from the coast of Devonshire.

Hippolyte pandaliformis, Bell.

Under this name Bell described two specimens which were obtained from Loch Fyne. He states that it bears a remarkable resemblance to *Pandalus annulicornis*, but that at the same time it is in all its essential characters a true *Hippolyte*.

It has, I believe, been since taken in the Hebrides in 1866, and in Shetland in 1868.

Hippolyte cultellata, Norman.

In the British Association Reports, 1866 and 1868, this species is recorded from the Minch and Shetland.

Hippolyte securifrons, Norman.

In the 'Transactions of the Tyneside Naturalists' Field Club,' 1863, this species is noticed, and is stated to have been taken at St. Andrews, Shetland, Berwick, and the Dogger Bank. It is said to closely resemble *H. spinus*. *Hippolyte fascigera* and *H. pusiola* have been both recorded, but I am unable to give any details with certainty.

In a genus like *Hippolyte* we find a large number of described species, some of which are clearly distinct, others doubtful. I have no practical acquaintance with the species under notice, but it is worth remarking that whereas some of the species are clearly southern in their distribution, others are as distinctly northern, while others again are generally distributed. Now,

considering the vast difference in the surrounding conditions of even North and South Britain, and considering also the interesting and curious diversification of the several species above described, we may reasonably conclude that five good species probably represent the genus in this country, the remainder being merely varieties.

(To be continued.)

NOTES AND QUERIES.

MAMMALIA.

Mares and Foals versus Wolves.—When in the Asturias in 1885, I was told of a very curious case of animal instinct, which may be worth recording. Wolves are by no means infrequent in the Asturias, and often attack the young foals which are sent up to pasturage with the mares in the mountains. The experienced danger seems to have begotten a precautionary instinct of a very intelligent kind. It is said that, on an alarm of Wolves, the mares and foals congregate for mutual protection and common defence. The mares form themselves into a sort of cordon, heads outwards, surrounding a space enclosing the young foals, and are ready for attacking with their fore feet the Wolves on their approach. My informant gave me a graphic account of such an attack, of which he was an eye-witness for nearly an hour, and described to me how the Wolves circled round and round the defenders, first at some distance, then gradually approaching nearer and nearer, seeking an opening into the inclosure, till at last they came within striking distance, and he saw one Wolf rolled over dead by a blow from the fore foot of one of the mares. The fore foot is not commonly used for defence by any equine species; but it is obvious that the more powerful hind-leg blow would be of little service against the spring of a Wolf from behind, without the directing eye to guide the stroke. Of what a long experience must this mutual protection have been the result! We can scarcely understand it, without councils of war having been held, the dangers discussed, and signals for concerted action arranged; but now all this instinct may merely be the inheritance of the experience of former generations.—GEORGE MAW (Benthall, Kenley, Surrey) in '*Nature*.'

Natterer's Bat and the Barbastelle in Sussex.—It may interest some of your readers to know that a specimen of *Vespertilio nattereri* was taken near here in the early part of last year, and was brought to me. I tried my best to keep it alive, but failed, as it refused all food. Last year

also my brother sent me a specimen of *Barbastellus communis*, which he shot at Horsham. It was flying only a few feet from the ground in the sunshine in the afternoon. Three years ago I had sixty-two Noctules brought me, which were taken from the hollow of an old elm in Preston Park. Many of these lived for weeks feeding on flies and raw beef.—C. W. BRAZENOR (Lewes Road, Brighton).

Lesser Horse-shoe Bat in Herts and Kent.—The Lesser Horse-shoe Bat is probably more generally distributed over the southern counties of England than the data arranged by Mr. Kelsall might lead one to expect. Last summer (1886) a fresh example was sent up from Herts to Spalding, of Notting Hill, and he told me at that time that he had previously received one or two specimens from the neighbourhood of London. It has also occurred in Kent, specimens having been both shot and caught alive in the neighbourhood of Sevenoaks.—H. A. MACPHERSON.

Lesser Horse-shoe Bat in Wales.—To the localities mentioned by Mr. J. E. Kelsall for the occurrence of *Rhinolophus hipposideros* (p. 89) I am pleased to be able to add North-West Merionethshire, where it occurs sparingly in many places. I have also found it in Denbighshire in a cave in the neighbourhood of St. Asaph. In Carnarvonshire I have reason to believe it occurs, though as yet I have not obtained a specimen. Probably this species will be found to be generally distributed in North Wales.—G. H. CATON HAIGH (Aber-ia, Penrhyndendraeth, Merionethshire).

Albino Specimen of the Short-tailed Field Vole.—I have seen a pure white specimen of this little animal, which was taken here in February last, and another was caught about the same time and on the same spot. They both had pink eyes.—HENRY LAMB (Maidstone).

BIRDS.

Distribution of the White-bellied Brent Goose.—In 'The Zoologist' for January (p. 29) the Rev. H. A. Macpherson asks for information as to the distribution of the White-bellied Brent during its stay on our coasts. The only Lincolnshire-killed Brent I have handled during the winter were three, shot during the last week in January on the edge of the "fitties" just south of Tetney Haven, all three belonging to the white-bellied or Atlantic type. The skin of one I have now added to my collection. Some years since Col. Russell sent me a fine White-bellied Brent shot by himself on the Essex coast, accompanied by some interesting and exhaustive notes as to the two races and their comparative abundance and scarcity in various years.—JOHN CORDEAUX (Great Cotes, Ulceby).

[If Col. Russell has no objection to allow the notes above-mentioned to appear in 'The Zoologist' we have no doubt they would be acceptable to many.—ED.]

The alleged existence of Ptarmigan in Cumberland.—In his excellent article on the distribution of the Ptarmigan (pp. 81—89), Mr. Robert Service goes out of his way to try to prove that this species was once a native of the English Lake District. The only shred of evidence adduced is an incidental remark, apparently founded on oral tradition, that two young Ptarmigan had been obtained in England, together with the vague inference that they might have come from Skiddaw. Mr. Service appears to forget that the enquiries instituted by Capt. K. Dover, on behalf of Mr. A. G. More, were made among the men best qualified to know the fauna of the lakes, and that he failed to find any evidence or tradition of their former presence. More recently the subject was investigated afresh by the writer and his colleague, when preparing 'The Birds of Cumberland,' with a similar result. Certainly no one was better qualified to know than Jerry Smith, of Bassenthwaite, who died last year. A native of the district, a keeper by calling, a naturalist *con amore*, and latterly stuffing birds and mounting "pads" for all the country side,—possessed, too, of a reserved disposition, together with a retentive memory,—Jerry Smith possessed the most intimate knowledge of the fauna of the Skiddaw district, and to such congenial spirits as Mr. Senhouse, Mr. Duckworth, and the writer, he was willing to unburden himself freely. The question about Ptarmigan was put to him again and again, but he always maintained that the alleged existence of the species was purely imaginary, though he himself was well acquainted with the bird, and recollected the introduction of some from Scotland. He also informed the writer that he had, as a boy, heard old men say that a few Capercaillie existed in the district.—H. A. MACPHERSON.

Supposed occurrence formerly of Ptarmigan in Cumberland.—With reference to the remarks on this subject by Mr. Service (pp. 81—89), I may state that in 1841 there was in the Museum at Keswick a Ptarmigan said to have been killed on Skiddaw; but I remember no other particulars.—H. T. FRERE (Burston Rectory, Diss). [Those on Skiddaw were introduced from Scotland. *Vide supra*.—ED.]

The Hawfinch at Harrogate.—On February 25th I saw a pair of Hawfinches, *Coccothraustes vulgaris*, in the Hydropathic Gardens. This is, I think, a very unusual place for this bird, but a few have been seen in several places in the town this winter. During the last summer a pair bred in the grounds at Ripley Castle. I communicated this to Mr. W. Eagle Clarke, who wrote me in reply that he knew of a pair nesting at Pannel, near Harrogate, during the previous year. During the last week of February Mr. Basil T. Woodd, of Conyngham Hall, wrote me that last winter several Hawfinches used to come and feed on the crumbs thrown out of his window for the bird, and that he had reason to believe that some of them nested in his grounds.—F. R. FITZGERALD (Harrogate).

Plumage of the Kestrel.—The sex of the Kestrel mentioned by me (Zool. 1886, p. 180) was not tested by dissection, which I now regret, though at the time I did not think it necessary. I may add, however, that it was its small size, combined with its female plumage, which induced me to examine it closely; that I took it to Mr. John Sayer, the well-known birdstuffer, of Norwich, who confirmed my opinion; and that a hawk, male or female, kept flying about and calling near the place whence the nest was taken for some time afterwards, making the third which seemed to belong to the nest.—H. T. FRERE (Burston Rectory, Diss).

Great Grey Shrike in Kent.—A male specimen of *Lanius excubitor* was shot near Maidstone on January 19th, and was preserved by Mr. S. Brent, of this town. Two others were seen here last winter.—HENRY LAMB (Maidstone).

[This bird is a pretty regular winter visitor, and in the eastern and south-eastern counties of England is by no means so uncommon as many suppose.—ED.]

REPTILES.

Adders in Winter.—One day early in January last a friend of mine killed an Adder in Parson's Copse at Rowner. I made him promise to give it me, as the occurrence of reptile life in the winter is at least unusual; so last week it came into my possession. It is a small specimen, normally coloured, with very numerous confluent spots. The mossy oak stump whereon we found it was not particularly sheltered, and I feel sure that the viper was not dug up or brought there. The creature was very sluggish, and permitted its finder to cut the stick leisurely, with which a very slight blow despatched it. The parish of Rowner abounds with Adders, and they have their favourite basking places. For several weeks I used to look for one very handsome light grey, or almost white specimen, with black markings, and it was almost always on the same little heap of dry fern beneath a wild apple tree. Once while sitting sketching I heard a rustle beneath the camp-stool, and looked down to see a fine brown Adder very slowly passing between my feet; it went at the same pace straight ahead until it disappeared beneath the ferns. All creatures apparently get accustomed to a motionless figure, and treat it with indifference. Among birds I found Jays and Chaffinches, especially young Chaffinches, the boldest; the first would come very close indeed, attracted, I suppose, by curiosity, while the second would pick up the crumbs from my frugal lunch, which had fallen beneath the easel. The colour-box serves occasionally for collecting purposes. A Ringed Snake, unfortunately slain in my clumsy attempts at capture, was put amongst the colour-tubes, and attracted in half an hour an extraordinary number of flies. A specimen of *Triton cristatus*, consigned to the same receptacle on account of its size and beauty,

perished there, to my great regret. It was not there long, but long enough for the skin to dry and to resist all attempts at resuscitation.—MARTIN SNAPE (Spring Garden Cottage, Forton, Gosport).

FISHES.

Plain Surmullet on the Devonshire Coast.—At the latter end of the year 1885 a present of some thirty Red Mullet was sent me by a friend at Dartmouth. Being struck by their evenness and smallness of size,—no fish measuring more than six inches,—and vividness of colouring, I sent specimens to Mr. Thomas Cornish, of Penzance, who kindly identified them for me as being the Plain Surmullet, *Mullus barbatus*. On referring to Yarrell's 'British Fishes' (1859), I find this particular fish described as a rare visitor to our shores. Last winter I again received specimens from Torbay, and now, a few days ago, I had others sent with an accompanying note that "those sent are a sample of numbers just caught by a Brixham trawler, the bulk of which have gone to supply other markets." Can you explain why this once uncommon fish on our shores now appears in comparison plentiful, and at this season of the year only?—EDMUND ELLIOT (Tresillian, Kingsbridge, South Devon).

[In the opinion of many ichthyologists *Mullus barbatus* is merely the male of *Mullus surmulletus*, and always smaller than the female. See Dr. Günther's 'Introduction to the Study of Fishes,' p. 404. The number of small-sized individuals caught together, as above stated, suggests that the shoals in question were probably composed of immature fish.—ED.]

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

March 3, 1887.—WM. CARRUTHERS, F.R.S., President, in the chair.

The following gentlemen were elected Fellows of the Society:—B. S. Dyer, Right Hon. Sir E. Fry, S. G. Klein, C. Maries, E. S. Marshall, R. Morgan, J. B. Stone, and A. W. Tait.

No zoological papers were read, but two on botanical subjects dealt with the genetic affinities and classification of the *Algæ*, by A. W. Bennett, and a fungoid disease of *Colocasia esculenta*, by G. Massie and D. Morris.

March 17, 1887.—WM. CARRUTHERS, F.R.S., President, in the chair.

Mr. Francis J. Briant, Mr. J. Errington de la Croit, and Mr. W. West were elected Fellows of the Society.

Mr. C. B. Clarke, F.R.S., was elected into the Council in the place of Dr. H. Trimen, resigned.

The following recommendations of the Council were submitted to the Fellows:—"That the Carpological Collection be disposed of, as being of no practical value to the Society, or of any intrinsic value, a few specimens belonging to the Wallichian Herbarium excepted. That representatives of the National Collections, British Museum, and Kew be invited to select such specimens as may be desired by those institutions, and the residue be offered to the Oxford Botanic Gardens, where a Museum is in course of formation. That the small earthenware vase in the Carpological Collection be offered to the Ethnological Department, British Museum." On the ballot being taken, however, these recommendations were not approved by the Fellows present.

Mr. Alfred O. Walker read a paper on the Crustacea of Singapore, the collection in question having been made by Surgeon-Major Archer during 1879—83. The species were chiefly dredged in 15—20 fathoms, or got on shallow sand-banks. A full list is given of all the forms identified, and several new species are described. Among the new forms are *Doclea tetraptera*, *Xanthe scaberminus*, *Maii Miersii*, and *Caphyra Archeri*.

A paper by Dr. George King on the Indian Figs was read, in which it was shown that insects play a considerable part in the fertilisation of certain forms. Dealing with the structural peculiarities of the flowers in the genus *Ficus*, he specifies (1) male, (2) pseudohermaphrodite, (3) neuter, and (4) female fertile flowers. Besides these occur a set of flowers originally named by him "Insect-attacked females," but for which he has since adopted Count Solms-Lambach's term "Gall-flowers" (*Bot. Zeit.* 1885), this botanist having anticipated him in publication, though his own researches were of earlier date. As to the question of these gall-flowers, Dr. King states that the pupa of an insect can usually be seen through the coats of the ovary. The pupa when perfected escapes into the cavity of the receptacle by cutting its way through, and fully winged developed insects are often to be found in considerable numbers in the cavity of the fig. The pupa of the insect must become encysted in the ovary of the gall-flower at a very early period, for about the time at which the imago is escaping from the ovary the pollen of the anthers of the male flower is only beginning to shed. Thus Dr. King holds that through the interposition of insects the malformed female flowers doubtless become functionally important in the life-history of the fig-trees.

—J. MURIE.

ZOOLOGICAL SOCIETY OF LONDON.

February 15, 1887.—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 January, and called special

attention to two Blakiston's Owls, *Bubo blakistoni*, from Japan, presented by Mr. J. H. Leech; three Hooker's Sea-Lions, *Otaria hookeri*, presented by the Hon. W. J. M. Larnach, C.M.G., Minister of Marine of New Zealand; and a Blue Penguin, *Eudyptula minor*, from Cook's Straits, New Zealand, presented by Mr. Bernard Lawson.

Prof. F. Jeffrey Bell read a report on a collection of Echinodermata made in the Andaman Islands by Col. Cadell, V.C. The collection was stated to contain one hundred examples referable to fifty species.

Mr. G. A. Boulenger read a paper on a collection of Reptiles and Batrachians made by Mr. H. Pryer in the Loo Choo Islands. The author observed that exceptional interest attached to this collection, seeing that it was the first herpetological collection that had reached Europe from that group of islands. Two new species were described, viz. *Tachydromus smaragdinus* and *Tropidonotus pryeri*.

Mr. Oldfield Thomas read a paper on the small Mammals collected in British Guiana by Mr. W. L. Sclater. The collection contained thirteen specimens belonging to eight species, of which one was new; this the author proposed to describe as *Hesperomys (Rhipidomys) sclateri*.

Mr. G. A. Boulenger pointed out the characters of a new Geckoid Lizard from British Guiana. The specimen in question was contained in a small collection of Reptiles made by Mr. W. L. Sclater on the Pomeroon river. The author described it as *Gonatodes annularis*.

A communication was read from Mr. Charles O. Waterhouse, containing an account of a new parasitic Dipterous Insect of the family *Hippoboscidae*. The author stated that this insect had been found on a species of Swift, *Cypselus melanoleucus*, by Dr. R. W. Shufeldt, at Fort Wingate, New Mexico. It was closely allied to *Anapera pallida*, a European Dipterous parasite found on *C. apus*, and was proposed to be named *Anapera fimbriata*.

Mr. John H. Ponsonby communicated, on behalf of Mr. Andrew Garrett, the first part of a paper on the Terrestrial Mollusks of the Viti or Fiji Islands.

Mr. F. E. Beddard read a paper on the structure of a new genus of Lumbricidæ, *Thamnodrilus*, discovered by Mr. W. L. Sclater in British Guiana, which he proposed to characterise as *Thamnodrilus gulielmi*.

March 1, 1887.—Prof. W. H. FLOWER, LL.D., F.R.S., President, in the chair.

Prof. Jeffrey Bell read extracts from a communication sent to him by Mr. Edgar Thurston, Superintendent of the Government Central Museum, Madras, containing observations on two species of Batrachians of the genus *Cacopus*.

Mr. O. Salvin (on behalf of Mr. F. D. Godman) exhibited a pair of a large and rare Butterfly, *Ornithoptera victoriæ*, the male of which had been hitherto undescribed. These specimens were obtained at the end of May, 1886, by Mr. C. M. Woodford, at North-West Bay, Maleita Island, one of the Solomon group.

Mr. E. B. Poulton read a paper containing an account of his experiments on the protective value of colour and markings in insects (especially in Lepidopterous larvæ) and their relation to Vertebrata. It was found that conspicuous insects were nearly always refused by birds and lizards, but that they were eaten in extreme hunger: hence the unpleasant taste failed as a protection under these circumstances. Further, conspicuous and unpalatable insects, although widely separated, tended to converge in colour and pattern, being thus more easily seen and remembered by their enemies. In the insects protected by resembling their surroundings it was observed that mere size might prevent the attacks of small enemies. Some such insects were unpalatable, but could not be distinguished from the others. In tracing the inedibility through the stages, it was found that no inedible imago was edible in the larval stage; in this stage therefore the unpleasant taste arose.

Mr. G. A. Boulenger read a paper descriptive of the fishes collected by the late Mr. Clarence Buckley in Ecuador. The set of all the species in the collection acquired by the British Museum in 1880 contained a large number of highly interesting and well-preserved specimens. Amongst them were representatives of ten species described as new to Science.

Mr. Richard S. Wray, B.Sc., read a note on a vestigial structure in the adult Ostrich representing the distal phalanges of the third digit.

Mr. John H. Ponsonby communicated (on behalf of Mr. Andrew Garrett) the second and concluding part of a paper on the Terrestrial Mollusks of the Viti or Fiji Islands.

Mr. Edgar A. Smith gave an account of a small collection of shells from the Loo-Choo Islands made by Mr. H. Pryer.

March 15, 1887.—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 February, and called attention to a Burmeister's Cariama, *Chunga burmeisteri*, received in exchange Feb. 24th; a White-fronted Heron, *Ardea novæ-zealandiæ*, from Australia, presented by F. B. Dyas, Esq.; a young specimen of a Black-winged Kite, *Elanus cæruleus*, taken from the nest by Mr. R. Southey, of Southfield, Plumstead, Cape of Good Hope, and received Feb. 28th; and two Gloved Wallabies, *Halmaturus irma*, received in exchange from the Zoological and Acclimatization Society of Melbourne, Feb. 28th.

Mr. Howard Saunders exhibited a young male Harlequin Duck, *Cosmonetta histrionica*, shot off the coast of Northumberland on the 2nd December last, and remarked that it was the second authentic British-killed specimen in existence. [For further details, see p. 70.—ED.]

Mr. Oldfield Thomas read a paper on the Bats collected by Mr. C. M. Woodford in the Solomon Islands. The localities at which Mr. Woodford collected were chiefly Alu, in the large Shortland Island, and the adjoining small island of Fauro. The collection contained twenty-three specimens belonging to ten species, of which two were new to Science. One of these, which represented also a new genus of Pteropine Bats, was proposed to be called *Nesonycteris woodfordi*.

A communication was read from Mr. W. R. Ogilvie Grant, containing an account of the birds collected by Mr. C. M. Woodford at Fauro and Shortland Islands, in the Solomon Archipelago, and in other localities of the group. Mr. Grant proposed to name a new Crow of the genus *Macrocorax*, obtained in the island of Guadalcanar, after its discoverer, *M. woodfordi*.

A communication was read from Mr. G. A. Boulenger, containing a second contribution to the Herpetology of the Solomon Islands. It gave an account of a collection made chiefly at two localities, Fauro Island and Alu, Shortland Island, by Mr. Woodford. Seven species were described as new to Science, amongst which was a new genus and species of Batrachians of the family Ranaidæ, proposed to be called *Batrachylodes vertebralis*.

Mr. Oldfield Thomas read a paper describing the milk-dentition of the Koala, *Phascolarctos cinereus*, which was shown to be in the same state of reduction as had been described by Prof. Flower in the case of the Thylacine.

A second communication from Mr. Boulenger contained a description of a new Gecko of the genus *Chondrodactylus* from the Kalahari Desert, South Africa, based on a specimen which had been presented to the Natural History Museum by Mr. J. Jenner Weir. The author proposed to call it *C. weiri*.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

March 2, 1887.—Dr. D. SHARP, President, in the chair.

The Rev. T. W. Daltry, M.A., F.L.S., of Madeley Vicarage, Staffordshire; Dr. Neville Manders, of the Army Medical Staff, Mooltan, India; Mr. Alfred Sich, of Chiswick; and Mr. J. T. M'Dougall, of Blackheath, were elected Fellows.

Mr. Slater exhibited, on behalf of Mr. Mutch, two specimens of *Arctia caja*, one of which was bred from a larva fed on lime-leaves, and the other from a larva fed on low plants, the ordinary pabulum of the species. The object of the exhibition was to show the effect of food in causing variation in Lepidoptera.

Mr. H. J. Elwes exhibited a large number of Lepidoptera-Heterocera, caught by him in the verandah of the Club at Darjeeling, in Sikkim, at an elevation of 7000 feet, on the night of the 4th of August, 1886, between 9 p.m. and 1 a.m. The specimens exhibited represented upwards of 120 species,—which was believed to be a larger number than had ever before been caught in one night,—including Bombyces of the genera *Zeuzera*, *Stauropus*, *Dasychira*, *Lophopteryx*, &c.; Noctuæ of the genera *Diphthera*, *Graphiphora*, *Gonitis*, *Plusia*, &c.; and Geometræ of the genera *Boarmia*, *Odontoptera*, *Urapteryx*, *Cidaria*, *Acidalia*, *Pseudocoremia*, and *Eupithæcia*. Mr. Elwes stated that Mr. A. R. Wallace's observations on the conditions most favourable for collecting moths in the tropics were fully confirmed by his own experience during four months' collecting in Sikkim and the Khasias. The conditions referred to by Mr. Wallace were a dark wet night in the rainy season; a situation commanding a large extent of virgin forest and uncultivated ground; and a whitewashed verandah, not too high, with powerful lamps in it. He said that on many nights during June and July he had taken from sixty to eighty species, and during his stay he had collected between 600 and 700 species.

Mr. Elwes also made some remarks on the Khasia Hills, the southern slopes of which he believed to be the true habitat of the greater part of those insects described many years ago by Prof. Westwood and others as coming from Sylhet, which was situated in a flat cultivated plain, under water during the rainy season, and not many miles distant from these hills. In consequence of the unhealthy and extremely hot and wet climate of these hills no Europeans had done much collecting there, but the specimens were chiefly caught by the natives and brought into the town of Sylhet for sale.

A discussion ensued on the remarks made by Mr. Elwes, in which Mr. McLachlan, Dr. Sharp, Mr. Champion, Mr. Kirby, and others took part.

The Rev. W. W. Fowler exhibited a specimen of *Cathormiocerus socius*, taken a few years ago at Sandown, Isle of Wight.

Mr. S. Stevens exhibited specimens of *Cathormiocerus maritimus* and *Platytarsus hirtus*.

Mr. F. Grut said he was requested by Mons. Péringuey, of Cape Town, to announce that the latter was engaged on a monograph of the genus *Hipporrhinus*, and that he would be glad to receive specimens and other assistance from British entomologists.

Mr. Gervase F. Mathew, R.N., communicated a paper entitled "Descriptions of new species of Rhopalocera from the Solomon Islands."

Mr. George T. Baker communicated the following papers:—"Description of a new species of the Lepidopterous genus *Carama*, together with a few notes on the genus"; and "Description of a new genus of Rhopalocera allied to *Thecla*."—H. Goss, *Hon. Secretary*.





G. E. Lodge.



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REMARKS ON BRITISH BATS.

BY THE EDITOR.

PLATE III.

IT is satisfactory to note the increased attention which is being paid to the British Bats by several of our esteemed correspondents. Respecting many of the species, indeed in regard to the majority of them, it must be confessed there is still a great deal to be learnt which time only will disclose; but should success attend our efforts to procure and figure *from the life* every one of our British species in turn, so as to render their appearance familiar to our readers, we may hope ere long with their assistance to place on record a far more satisfactory account of them than at present exists.

According to the best authorities, there is reason to believe that at least fifteen species of bats are to be found in the British Islands, although in regard to one of them at least, *Vespertilio murinus*, Schreber, the evidence of its occurrence in this country is of an extremely slender character.*

* In the second edition of Bell's 'British Quadrupeds,' 1874, it is stated (p. 49) that *V. murinus* "has hitherto only been taken in the gardens of the British Museum," and the author adds that he has "failed in meeting with any other record of its appearance than that given, which is not altogether satisfactory." In our annotated copy of this work we have a marginal note to the effect that the following additional localities have been reported for *Vespertilio murinus*, namely, Sherborne, Dorset (C. W. Dale), Epping (Doubleday), and Freshwater, Isle of Wight (Hadfield); with the further

Another species, called by Bell the Particoloured Bat, *Vesperugo discolor*, Natterer, has been included in the British list on the strength of a single example in the British Museum, which was taken many years ago at Plymouth by Dr. Leach.* To this, however, we may add that Mr. John Hancock has a second example of this species which was captured in Yarmouth Roads in 1834.†

Bechstein's Bat, *Vespertilio bechsteini*, Leisler, is of quite a rare occurrence in this country, being, as Bell states (p. 52), 'only known as British from the occurrence of specimens taken by Mr. Millard in the New Forest, and now in the British Museum.' We have the excellent authority of our old friend Mr. Bond for stating that two specimens of Bechstein's Bat have been taken at Preston, near Brighton. The impression that it had also been met with at Godstow in Berkshire (Zool. 1884, p. 483) has been corrected by Mr. J. E. Kelsall (Zool. 1885, p. 146), who identified the specimen in question as *V. nattereri*.

Of the fifteen British species above referred to, fourteen only are noticed by Bell. The fifteenth is *Vespertilio dasyncneme*, Boie, which is reported to have been captured on the banks of the Stour.‡ It is thus described by Dr. G. E. Dobson, whose valuable Catalogues of Asiatic Chiroptera, and of the Collection of Bats in the British Museum form the latest and best text-books on this subject:—

"*Vespertilio dasyncneme*, Boie, Isis, 1825, p. 1200. The ears are comparatively shorter than in *V. daubentonii*; laid forwards they do not reach the end of the nose; the inner margin of the ear is straight in its lower ascending portion for about one-third its length, then regularly convex to the tip, which is obtusely rounded off; the outer margin is straight beneath the tip for about one-third of its length, becoming gradually convex and

remark that "Mr. Blake Knox also has received Irish specimens." We confess, however, to have considerable misgivings whether the species in any of these cases has been correctly determined, and we should be very glad if any reader of these lines could enable us to clear up the uncertainty with which the subject is attended.

* Cf. Rep. Plymouth Inst. p. 43, and Bellamy, Nat. Hist. S. Devon, p. 193.

† Cf. Trans. Norfolk Nat. Soc. 1873-74, p. 80.

‡ Cf. Buckton, Proc. Linn. Soc. 1853, p. 260, where the species is treated as a variety of *V. daubentonii*. Tomes (Zool. 1854, p. 4361) considered it to be *dasyncneme*.

terminating abruptly opposite the base of the inner margin. The tragus terminates in an obtuse rounded point; the inner margin is slightly concave, the outer convex.

“Thumb armed with a very large claw. Wings from the distal extremity of the tibia; the point of origin of the wing-membrane is very sharply defined. The calcaneum extends rather more than half way between the ankle and the tail.

“Fur above dark at the base, the hairs with light brown extremities; beneath black at the base, the extremities white.

“Both the first and second upper premolars are drawn inwards, owing to the proximity of the third large premolar to the canine; the second premolar is extremely small, and more internal than the first. The lower incisors are not crowded; the second lower premolar is about half the size of the first premolar; the third premolar is less than the canine in vertical extent.

“Length: head and body, 2·4 in.; tail, 2 in.; head, 0·75 in.; ear, 0·6 in.; tragus, 0·3 × 0·09 in.; fore arm, 1·8 in.; thumb, 0·35; second finger, 3·1 in.; fourth finger, 2·4 in.; tibia, 0·8 in.; calcaneum, 0·65 in.; foot and claws, 0·4 in.”

Adopting Dr. Dobson's nomenclature, but taking the species in the order named by Bell, for greater convenience of reference, it may be observed that the fifteen species of bats now regarded as British belong to two very distinct families, *Vespertilionidæ* and *Rhinolophidæ*, and are referable to five genera, namely, *Vesperugo* (five species), *Vespertilio* (six species), *Plecotus* (one species), *Synotus* (one species), and *Rhinolophus* (two species). Of these the first four genera belong to the family

VESPERTILIONIDÆ.

The members of this family are easily distinguishable by their simple nostrils terminating the conical moderately elongated muzzle, by the long tail wholly contained within the interfemoral membrane, and by the upper incisors which are separated by a wide space and placed near the canines. Their eyes are minute; and the inner margins of the ears arise from the sides of the head, not from the forehead.

Genus 1. *VESPERUGO*, Keyserling & Blasius, Wiegmann's Archiv. 1839, p. 312.

Muzzle generally very broad and obtuse, the glandular pro-

minences between the eyes and the nostrils well developed, increasing the width of the face; crown of the head flat, or very slightly raised above the face-line; nostrils opening sublaterally by simple crescentic apertures on the front surface of naked extremity of the muzzle; ears separate, generally much shorter than the head, broad and triangular, the outer margin extending forwards beyond the base of the tragus, the internal basal lobe rounded; tragus generally short and obtuse, the outer margin straight or concave. Tail less than the length of the head and body; the calcaneum generally supports on its posterior margin a small rounded cutaneous lobe (the post-calcaneal lobe), which in this genus reaches its greatest development; feet short and broad; membranes thin.

Dentition.—Inc. $\frac{2-2}{6}$; c. $\frac{1-1}{1-1}$; p.m. $\frac{2-2}{2-2}$ or $\frac{1-1}{2-2}$; m. $\frac{3-3}{3-3}$.

Outer upper incisors unicuspidate and shorter than the inner incisors, often minute, rarely absent; first upper premolar minute or absent; first lower premolar in the tooth row, not crowded, its summit slightly outwards.

Species, *noctula*, Schreber; *leisleri*, Kuhl; *discolor*, Natterer; *pipistrellus*, Schreber; and *serotinus*, Schreber. The descriptions of all these will be found in Bell's work.

Genus 2. VESPERTILIO, Keyserling & Blasius; Wiegmann. Archiv. 1839, p. 306.

Muzzle long; glandular prominence between the nostrils and eyes small, scarcely increasing the width of the face; nostrils opening sublaterally by simple crescentic apertures; crown of the head vaulted, slightly elevated above the face-line; ears separate, oval, longer than broad, generally equalling at least—often exceeding—the length of the head; the internal base lobe angular, the external margin terminating opposite the base of the tragus or very slightly in front of it; tragus long, generally acute; the inner margin slightly convex or straight; the outer margin convex below, straight or slightly concave above. Tail less than (or very rarely equal to) the length of the head and body; post-calcaneal lobe absent or very small. Face hairy.

Dentition.—Incisors $\frac{2-2}{6}$; the upper incisors nearly equal; the summit of the outer incisor on each side directed vertically

downwards or curved slightly outwards, that of the inner incisor directed forwards and inwards; the inner incisor on each side generally with a distinct second cusp placed posteriorly and externally; premolars $\frac{3-3}{3-3}$; first and second upper premolars very small, the second premolar often minute and pressed inwards; molars $\frac{3-3}{3-3}$; the last upper molar rather less than half the antepenultimate molar.

Species:—*murinus*, Schreber; *bechsteini*, Leisler; *nattereri*, Kuhl; *daubentonii*, Leisler; *mystacinus*, Leisler; *dasycneme*, Boie. The descriptions of these (with the exception of *dasycneme*, given on p. 162) will be found in Bell's work.

Genus 3. PLECOTUS, Geoffroy, Descript. de l'Egypte, ii. p. 112 (1812).

Crown of the head elevated above the short and flattened muzzle. Nostrils opening on the upper surface at the extremity of the muzzle, in front of semilunar naked depressions. Ears united above the forehead, very large, the outer margin ending opposite the base of the tragus, the inner margin with an abrupt rounded projection directed inwards above the base; tragus very large, tapering upwards, with a lobe at the base of the outer margin. Feet slender; toes more than half the length of the whole foot. Tail equal in length to the head and body, contained (except part of the last caudal vertebra) within the interfemoral membrane. Post-calcaneal lobe distinct. Skull considerably vaulted; bones forming the brain-case very thin; occipital and sagittal crests scarcely developed.

Dentition.—Inc. $\frac{2-2}{6}$; c. $\frac{1-1}{1-1}$; p.m. $\frac{2-2}{2-2}$; m. $\frac{3-3}{3-3}$.

Species:—*auritus*, Linn. Described by Bell.

Genus 4. SYNOTUS, Keyserling & Blasius, Wiegmann's Archiv. 1839, p. 305.

Crown of the head distinctly elevated above the short and obtuse muzzle. Nostrils opening on the upper surface at the extremity of the muzzle, in front of a naked space, bounded laterally by the raised edges of the very prominent sides of the face; anteriorly the upper lip is divided on each side by a deep

groove passing down from the nostril; and in the intervening space between and below the nostrils is prominent and rounded. Ears confined at the bases of their inner margins, which meet on the forehead slightly in front of the eyes; the outer margin is also carried forward in front of the eyes, terminating on the face above the upper lip, so that the eye is contained within the external ear; tragus triangular above and attenuated towards the tip. Feet slender with long toes. Tail nearly as long or longer than the body. Skull considerably vaulted behind the short muzzle.

Dentition.—Inc. $\frac{2-2}{6}$; c. $\frac{1-1}{1-1}$; p.m. $\frac{2-2}{2-2}$; m. $\frac{3-3}{3-3}$.

Species:—*barbastellus*, Schreber. Described by Bell, who, however, has created some confusion by describing it (p. 81) as *Barbastellus daubentonii*, this specific name belonging to a very different species, *Vespertilio daubentonii* (*op. cit.*, p. 60).

RHINOLOPHIDÆ.

The bats belonging to this family are readily distinguishable by the curious form of their foliaceous nasal appendages, and by their rudimentary premaxillary bones supporting two minute, usually bilobed incisors; their molars are acutely tubercular, and enable them to crush with ease the hard cases of coleopterous insects which (from remains found in their stomachs) appear to constitute a large proportion of their food. Their eyes are minute, and often with difficulty discovered in spirit specimens; the eye-ball is extremely small, and the optic nerve reduced to the thickness of a very fine thread, contrasting remarkably with the development of the auditory and olfactory nerves in the same animals.

Genus 5. RHINOLOPHUS, Geoffroy, Desm. *Nouv. Dict. d'Hist. Nat.* xix. p. 383 (1803).

Nose-leaf very complicated, consisting of three distinct portions—anterior, central, and posterior; the anterior horizontal portion is horse-shoe-shaped, usually angularly emarginate in front, containing within its circumference the nasal orifices and the central erect nasal process; the posterior nose-leaf is triangular, erect, with cells on its anterior surface; the central process rises between and behind the nasal orifices, is flattened

anteriorly, and posteriorly sends backwards a vertical laterally compressed process, which is either connected with the front surface of the nose-leaf or free. Base of the outer side of the ear expanded, forming a large antitragus. Wings very large; metacarpal bone of fourth finger exceeding that of second in length. Basioccipital very narrow between auditory bullæ, in most species linear; cochleæ prominent, deeply grooved externally; foramen rotundum united with sphenoidal fissure.

Dentition.—Inc. $\frac{2}{4}$; c. $\frac{1-1}{1-1}$; p.m. $\frac{2-2}{3-3}$; m. $\frac{3-3}{3-3}$.

Second lower premolar generally minute and placed outside the teeth-row; first upper premolar minute, pointed, standing in the teeth-row, or lying in the outer angle between the closely approximated canine and second large premolar.

Species:—*ferrum-equinum* and *hipposideros*. Both described by Bell.

Arranged in tabular form the British species of Chiroptera stand thus:—

Fam. VESPERTILIONIDÆ.	Gen. <i>Vesperugo</i> .	<i>noctula</i> .
		<i>leisleri</i> .
	Gen. <i>Vespertilio</i> .	<i>discolor</i> .
		<i>pipistrellus</i> .
Fam. RHINOLOPHIDÆ.	Gen. <i>Plecotus</i> .	<i>serotinus</i> .
		<i>murinus</i> .
	Gen. <i>Synotus</i> .	<i>bechsteini</i> .
		<i>nattereri</i> .
Gen. <i>Rhinolophus</i> .	<i>daubentonii</i> .	
	<i>mystacinus</i> .	
		<i>dasygneme</i> .
		<i>auritus</i> .
		<i>barbastellus</i> .
		<i>ferrum-equinum</i> .
		<i>hipposideros</i> .

The species, of which a figure is now given, *Vesperugo noctula* (Plate III.), is doubtless the best known of the larger bats in this country, and is very widely dispersed. Regarding its distribution in the British Islands, Bell states that it is confined to England, the northernmost locality known to him being Northallerton in Yorkshire, a statement repeated by Alston ('Fauna of Scotland,' 1880, p. 7), and by the authors of the 'Handbook of Yorkshire Vertebrates,' 1881. But, although it seems pretty clear that it does not occur in Scotland, or at least

has not been satisfactorily identified there,* the case is apparently otherwise in Ireland. For there is reason to believe that some specimens of a large bat taken at Tandragee, Co. Armagh, and reported to be *Vesperugo leisleri*, were in reality *V. noctula*. To be more explicit. In 'The Zoologist' for July, 1874, Mr. R. M. Barrington gave a very interesting account (pp. 4071 - 4074) of the discovery, in June, 1868, of a colony of large bats in the demesne of the Duke of Manchester at Tandragee, Co. Armagh, and of the subsequent capture of several (presumably of the same species) at the same place in May, 1874. Mr. Barrington identified them as *V. leisleri*, observing (p. 4072) "they were all of the hairy-armed species. I have presented two specimens to the British Museum." These two specimens, at our particular request, were examined by Dr. Dobson in 1876, when preparing his Monograph of the Asiatic Chiroptera, and he pronounced them to be immature examples of *V. noctula*. Considering his intimate acquaintance with this order of mammals, it seems to us that this circumstance establishes the fact of the occurrence of the Noctule in Ireland, while it does not necessarily invalidate other records of the occurrence in the same country of Leisler's hairy-armed bat.† We would earnestly invite the attention of Irish naturalists to this matter, and beg them to re-examine such specimens as they may possess, or have access to, and favour us with their conclusions. It may be useful to add, in the words of Dr. Dobson, that in all respects, except in the relative size and position of the incisors, *V. leisleri* resembles *V. noctula*, and appears on an external examination to be but a small form of that species. But while the outer incisor on each side in *V. noctula* is but half the transverse diameter at its base of the inner incisor, in this species it is equal to it; the lower incisors also stand in the direction of the jaws, and are not crowded. Length of an adult male *V. leisleri* (preserved in alcohol), head and body, 2·3 in.; tail, 1·65 in.; head, 0·7 in.; ear, 0·6 in.;

* Fleming (Brit. An., p. 6) identified the *Vespertilio auriculatus* of Walker's 'Fauna Scotica' with *V. noctula*, and this species is stated by Sir Wm. Jardine to have been "seen" near the River Annan in Dumfriesshire (New Stat. Acct. Dumfries, p. 175), but its occurrence in Scotland has not been confirmed.

† Cf. Bell, p. 27. Zool. 1874, pp. 4071, 4236; Zool. 1875, pp. 4419, 4532; Zool. 1883, p. 116.

tragus, 0·2 × 0·15 in. ; forearm, 1·5 in. ; thumb, 0·25 in. ; second finger, 2·7 in. ; fourth finger, 1·8 in. ; tibia, 0·65 in. ; foot and claws, 0·3 in. Or, to compare the measurements of the two species :—

Both males.	Length.	Tail.	Head.	Ear.	Tragus.	Fore-arm.	Thumb.	2nd finger.	4th do.	Tibia.	Foot & claws.
<i>V. noctula</i> ..	3·0	2·0	0·9	0·75	0·25	2·0	0·3	3·7	2·1	0·75	0·45
<i>V. leisleri</i> ..	2·3	1·65	0·7	0·6	0·2	1·5	0·25	2·7	1·8	0·65	0·3

To show how easily a mistake may be made, even by a practised observer, without a very careful comparison, we may remark that *V. leisleri* has been recorded to have occurred in Norfolk, near Norwich (Paine, Ann. Nat. Hist. ii. p. 181, 1839), where fourteen were said to have been taken from a hollow tree ; but it was subsequently stated (*tom. cit.*, p. 481) that the specimens in question had been examined by the Rev. L. Jenyns, who was of opinion that the species was not *V. leisleri*, though he was uncertain whether it was the young of *V. noctula* or a distinct species.

Bell states (p. 18) that the Noctule is a tree-loving species, and that not a single instance had come to his knowledge of its retirement *to buildings* during the day. Doubtless hollow trees usually afford it shelter, but, as an exception to the rule, we may remark that in West Sussex we have known these bats to resort to the roofs of old thatched cottages, and have seen them go up under the eaves.

Mr. W. Harcourt Bath, referring to the abundance of this species in the midland counties ('The Field,' Oct. 9th, 1886), states that in the day-time they conceal themselves in holes of trees, *and among ivy*.

Gilbert White remarked that he never saw the Noctule on the wing till the end of April, nor later than July. This is curious ; for, unless the habits of the animal have changed, he might have observed it in a parish which he occasionally visited (the parish of Harting, on the borders of Hampshire and Sussex) during the months of August and September. We have repeatedly seen them on the wing there during these months, and well remember shooting two of them for a friend during the first week of September. A marginal note in our annotated copy of Bell's work indicates that John Wolley saw the Noctule in Cambridge-shire as late as the first week of November.

Another observation of Gilbert White was to the effect that this bat emits a very offensive odour, a circumstance which must have been remarked by every one who has handled a living specimen. Mr. D'Urban, of Exeter, states that it possesses two large glands *in the mouth*, from which this odour is emitted. It is much infested with parasites, as indeed is the case with other species of bats which we have examined in a living state. An experiment of putting a minute drop of prussic acid on the tongue of a Noctule, in order to kill it speedily, resulted in the unlooked-for effect of causing all the parasites to die and drop off before the animal itself had ceased to live. While on the subject of parasites, it may be well to direct attention to Prof. Westwood's paper on the parasites of bats, published in the 'Transactions of the Zoological Society,' vol. i. pp. 275 - 294. This paper, which is illustrated, will be found useful by those who wish to learn something on this subject.

It is well known that the Noctule is gregarious, and that large numbers are sometimes found clustered together in hollow trees. Mr. Gurney states that the sexes live in separate colonies, the females being more numerous. Upon this we may remark that in February last an old and decayed tree was felled in the Bishop of London's park at Fulham, in the hollow of which were found clinging a solitary pair of Noctules. They were brought to us alive the following day, and proved to be male and female. From one of these the accompanying portrait was drawn by Mr. G. E. Lodge. Note the position in which the tail is carried as compared with that of *R. ferrum-equinum* (Plate I.)

We have no information as to the occurrence of this species in Wales, although it is met with as far to the south-west as Cornwall (*cf.* Cocks, 'Naturalist,' i. (1851), p. 37). We should be glad also to receive some confirmation (or refutation) of the statement (Bell, p. 23) that in England the northernmost locality from which specimens have been received is Northallerton, in Yorkshire. Certainly it is not included in the excellent Catalogue of the Mammalia of Northumberland and Durham (Trans. Tyne-side Nat. Field Club, vol. vi. (1864), pp. 111 - 177),* although, strange to say, a single specimen of *V. serotinus* (usually regarded as more southern in its distribution) is stated by them to have been taken at Cleadon, and to be preserved in the museum at

* Mr. R. B. Lee informs us that it occurs at Kendal.

Newcastle-on-Tyne. Is this possibly *V. noctula*? The "rich chestnut colour of the fur" particularly alluded to by the authors of the catalogue cited is a description not inapplicable to *V. noctula*.

A SYNOPSIS OF THE SNAKES OF SOUTH AFRICA.

BY G. A. BOULENGER.

HAVING received several applications for information respecting the nomenclature of South African Snakes, I have thought that the publication of the following list would be welcome not only to naturalists in the colony but also to herpetologists elsewhere. The grand work of Sir Andrew Smith (1838—49) is an imperfect guide to the identification of South African reptiles, for the reason that the species described are not arranged in systematic order, and that a great number, often the commonest, are either entirely left out or alluded to by name only, without any definition of their characters. The standard ophiological works of Duméril and Bibron, Günther, and Jan, to which I have constantly referred in the following list, as being almost indispensable to the student, are likewise incomplete and out of date. I have therefore added an artificial key (the characters selected applying only to South African forms) to genera and species, which I hope will greatly facilitate their recognition, and perhaps lead to the discovery of some that may be new to science, or hitherto unrecorded from South Africa. I have also indicated the localities whence specimens have been received by the British Museum, and drawn attention to the desiderata. I have taken the 25° lat. S. as the northern limit of the S. African district.

SYNOPSIS OF THE FAMILIES AND GENERA.

- I. STENOSTOMATIDÆ. Blind, worm-like burrowing snakes, with the belly scaled like the back; the shield under which the eye is situated borders the lip.
A single genus. - - - - - STENOSTOMA.
- II. TYPHLOPIDÆ. Blind, worm-like burrowing snakes, with the belly scaled like the back; the shield under which the eye is situated does not reach the lip.
A single genus. - - - - - TYPHLOPS.

- III. BOIDÆ. A spur (rudiment of hind limb) on each side of the vent.
Scales very small, more than fifty across the body; belly shielded.
Pupil linear, erect.
A single genus. - - - - - PYTHON.
- IV. COLUBRIDÆ. Head with large symmetrical shields. Belly shielded.
No grooved maxillary fangs anteriorly.
- A. Subcaudal shields in a single row, like the ventrals; eye very small,
with round pupil. - - - - - URIECHIS.
- B. Subcaudals divided.
1. Scales smooth, equal; pupil round.
- a. Rostral shield very large, with horizontal cutting edge.
TEMNORHYNCHUS.
- b. Rostral without cutting edge.
- α. Nostril pierced between two shields, the second of which
touches the eye. - - - - - CHORISTODON.
- β. Two or more shields on a line between the nostril and
the eye.
- * Loreal shield (between nasal and præocular) not much
longer than deep.
- 15 scales across the middle of the body. - - - HOMALOSOMA.
27 or 29 scales across the middle of the body. - - - CORONELLA.
17 or 19 scales across the middle of the body. PSAMMOPHYLAX.
** Loreal shield at least twice as long as deep; 15 or 17
scales across the middle of the body.
- Snout pointed and strongly projecting beyond the lower lip;
tail not five times the length of the head. RHAMPHIOPHIS.
Snout long and obtuse; tail long; frontal (interorbital) shield
narrow. - - - - - PSAMMOPHIS.
Snout obtuse; colour green. - - - - - PHILOTHAMNUS.
2. Dorsal scales keeled.
- Eye extremely large, with round pupil; vertebral scales broader
than the others, unicarinate. - - - - - BUCEPHALUS.
Eye very large, with horizontal pupil. - - - - - DRYOPHIS.
Eye moderate; vertebral scales broader than the others,
bicarinate. - - - - - HETEROLEPIS.
Eye moderate, with vertical pupil; scales equal. DASYPELTIS.
3. Scales smooth; pupil vertically elliptic.
- a. Head broad, considerably broader than the neck; 19 scales
across the middle of the body. - - - - - LEPTODIRA.
- b. Head not very distinct from the neck.
- Nostril in a single nasal; 17 scales across the middle of the
body. - - - - - LYCOPHIDIUM.
Nostril between two nasals; 19 to 23 scales across the middle

of the body; anterior maxillary teeth but slightly larger than the others. - - - - - LAMPROPHIS.

Nostril between two nasals; 23 or more scales across the middle of the body; anterior teeth considerably larger than the others. - - - - - BOODON.

V. ELAPIDÆ. Head with large symmetrical shields. Belly shielded. Long grooved or canaliculate maxillary fangs anteriorly. *Poisonous.*

A. Eye large or moderate.

1. Rostral shield not of unusual proportions.

a. Dorsal scales smooth.

Anal shield single. - - - - - NAIA.

Anal divided; colour green. - - - - - DENDRASPIS.

b. Dorsal scales keeled.

Two labial shields enter the eye; scales strongly keeled.

SEPEDON.

Eye separated from the labials by a subocular shield; dorsal scales feebly keeled, laterals smooth. - - - - CAUSUS.

2. Rostral shield enormous, triangular. - - - - ASPIDELAPS.

B. Eye very small.

13 or 15 scales across the body. - - - - ELAPS.

21 or more scales across the body; colour uniform blackish.

ATRACTASPIS.

VI. VIPERIDÆ. Upper surface of head covered with small scales. Pupil vertical, linear. *Poisonous.*

A single genus. - - - - VIPERA.

I. STENOSTOMATIDÆ.

1. *Stenostoma*, Wagl.

1. *Stenostoma nigricans*, Schleg.; Dum. & Bibr. vi. p. 326; Smith, Ill. pl. li. fig. 4, pl. liv. figs. 21, 25; Jan, Icon. 2, v. & vi. 8. *S. conjunctum*, Jan, Icon. 2, v. & vi. 9. "Inhabits the interior of South Africa, and is generally found under large flat stones, or other bodies lying on the surface of the earth."—*Smith*. Port Elizabeth (B. M.)

II. TYPHLOPIDÆ.

2. *Typhlops*, Schn.

A. 28 to 32 scales round the middle of the body; snout with angular edge.

Eye entirely under the ocular; edge of snout sharp, cutting. - *delalandii*.

Eye under the suture between the ocular and the præocular. - *bibronii*.

B. 20 to 26 scales round the body; snout rounded.

Upper part of rostral shield broader than the contiguous (nasal) shields; nasal semidivided; eye entirely under the ocular. - - *verticalis*.

Upper part of rostral broader than the contiguous shields; nasal completely divided; eye under the suture between the ocular and the præocular. - - - - - *mossambicus*.

Upper part of rostral not or scarcely wider than the contiguous shields; 20 scales round the body. - - - - - *capensis*.

2. *Typhlops delalandii*, D. & B. *Onychocephalus delalandii*, Dum. & Bibr. vi. p. 273; Smith, Ill. pl. li. fig. 1, & pl. liv. figs. 1—4. *Typhlops smithii*, Jan, Icon. 1, v. 5. *Typhlops lalandii*, Jan, Icon. 4, iv. 1. "Is pretty widely distributed over the southern parts of Africa, and is generally found under large stones and trunks of decayed trees, or in soil broken up by the plough, or otherwise displaced by the spade or pick-axe."—*Smith*. Cape, Karroo (B. M.)

3. *Typhlops bibronii*, Smith. *Onychocephalus bibronii*, Smith, Ill. pls. li. fig. 2, & pl. liv. figs. 5—8. "Inhabits the country to the northward of Latakoo."—*Smith*. King William's Town, Port Natal, Lessouto (B. M.)

4. *Typhlops verticalis*, Smith. *Onychocephalus verticalis*, Smith, Ill. pl. liv. fig. a. "Inhabits the interior districts of South Africa."—*Smith*. B. M.

5. *Typhlops mossambicus*, Peters; Jan, Icon. 5, v. 3. Delagoa Bay (Jan).

6. *Typhlops capensis*, Smith. *Onychocephalus capensis*, Smith, Ill. pls. li. fig. 3, & liv. figs. 9—16. "Inhabits the interior of South Africa."—*Smith*. Cape Town (B. M.)

III. BOIDÆ.

3. *Python*, Cuv. -

7. *Python natalensis*, Smith, Ill. pl. ix. *P. sebæ*, var. *natalensis*, Jan, Icon. 8, iv. "This snake was formerly an inhabitant of the district now within the Cape Colony. At present it is not to be found within hundreds of miles of the boundaries of the colony, and few specimens have been obtained nearer than Port Natal."—*Smith*. Natal (B. M.)

IV. COLUBRIDÆ.

4. *Uriechis*, Peters.

15 scales across the middle of the body; pale yellowish brown, head and neck black. - - - - - *capensis*.

25 scales across the body; uniform black. - - - - - *microlepidotus*.

8. *Uriechis capensis*, Smith. *Elapomorphus capensis*, Smith, Ill., App. p. 16. *Aparallactus capensis*, Smith, l. c. *Uriechis capensis*, Jan, Icon. 15, i. 5. "Inhabits Kaffirland, to the eastward of the Cape Colony."—Smith. Kaffirland (B. M.)

9. *Uriechis microlepidotus*, Günther, Ann. & Mag. Nat. Hist. (3), v. 1860, p. 168, pl. ix. Natal (B. M.)

5. *Choristodon*, Smith.

10. *Choristodon concolor*, Smith, Ill., App. p. 18. "Inhabits Kaffirland to the eastward of the Cape Colony."—Smith. Not in the British Museum.

6. *Temnorhynchus*, Smith.

11. *Temnorhynchus sundevallii*, Smith, Ill., App. p. 17. *Rhinostoma cupreum*, Günth. Col. Sn. p. 9. "Inhabits Kaffirland, to the eastward of the Cape Colony."—Smith. Orange River (B. M.)

7. *Homalosoma*, Wagl.

12. *Homalosoma lutrix*, L. *Homalosoma arctiventris*, Smith, Ill., App. p. 16. *Homalosoma lutrix*, Dum. & Bibr. vii. p. 110; Günth. Col. Sn. p. 20; Jan, Icon. 13, iii. 3. "Inhabits the whole of Southern Africa, and is generally observed among dry grass or in loose soil, more especially near the roots of shrubs."—Smith. Cape, Natal (B. M.)

8. *Coronella*, Laur.

13. *Coronella cana*, L. *Coluber canus*, Smith, Ill. pls. xiv.—xvii. *Coronella cana*, Dum. & Bibr. vii. p. 613; Günth. Col. Sn. p. 40. Cape, Cape Cook (B. M.)

Black variety, *Coronella phocarum*, Günth. Proc. Zool. Soc. 1872, p. 836. Robben Island (B. M.)

9. *Psammophylax*, Fitz.

Rostral shield not deeper than broad, not extending between the internasals. - - - - - *multimaculatus*.

Rostral deeper than broad, wedged in between the internasals. *rhombeatus*.

14. *Psammophylax multimaculatus*, Smith. *Amplorhinus multimaculatus*, Smith, Ill. pl. lvii. *Dipsas smithii*, Dum. & Bibr. vii. p. 1162. *Coronella multimaculata*, Günth. Col. Sn. p. 38.

Psammophylax multimaculatus, Jan, Icon. 19, i. 1. "Rarely obtained in South Africa; found in arid barren localities."—*Smith*. Cape (B. M.)

15. *Psammophylax rhombeatus*, L. *Trimerorhinus rhombeatus*, *Smith*, Ill. pl. lvi. *Dipsas rhombeata*, Dum. & Bibr. vii. p. 1154. *Psammophylax rhombeatus*, Günth. Col. Sn. p. 31. N. vulg., "Shaap Sticker." "Occurs throughout the whole of South Africa, and is generally found in dry barren situations, but not unfrequently also in grassy districts."—*Smith*. Cape (B. M.)

10. *Rhamphiophis*, Peters.

16. *Rhamphiophis multimaculatus*, *Smith*. *Coronella multimaculata*, *Smith*, Ill. pl. lxi. *Dipsina multimaculata*, Jan, Icon. 19, ii. 1. "Country of the Bushmen, near to the Orange River. Burrow in the sand."—*Smith*. Damaraland (B. M.)

11. *Psammophis*, Schleg.

17 scales across the middle of the body. - - - - *sibilans*.
15 scales across the middle of the body. - - - - *crucifer*.

17. *Psammophis sibilans*, L.; Günth. Col. Sn. p. 136; Jan, Icon. 34, iii. *P. moliniger*, Dum. & Bibr. vii. p. 891. In sandy localities. Cape, Port Natal, Kaffraria, Orange River (B. M.) Curiously, this as well as the next species are omitted from *Smith's* work.

18. *Psammophis crucifer*, Merr.; Dum. & Bibr. vii. p. 892; Günth. Col. Sn. p. 135; Jan, Icon. 34, iv. 3. Cape, Namaqualand (B. M.)

12. *Philothamnus*, *Smith*.

Ventral shields without a lateral keel. - - - - *hoplogaster*.
Ventral shields with a lateral keel. - - - - *natalensis*.

19. *Philothamnus hoplogaster*, Günth. *Ahetulla hoplogaster*, Günth. Ann. & Mag. Nat. Hist. (3), xi. 1863, p. 284. Port Natal, Damaraland (B. M.)

20. *Philothamnus natalensis*, *Smith*, Ill. pl. lxiv. "Frequents shrubs and trees at and in the neighbourhood of Port Natal."—*Smith*. Cape, King William's Town, Port Natal, Orange River, Damaraland (B. M.)

13. *Bucephalus*, Smith.

21. *Bucephalus capensis*, Smith, Ill. pls. x.—xiii.; Günth. Col. Sn. p. 143. *Bucephalus typus*, Dum. & Bibr. vii. p. 878; Jan, Icon. 32, iv. N. vulg., "Boom-slange," Tree Snake. Port Natal (B. M.)

Uniform bright green variety: *B. viridis*, Smith, pl. iii. Old Latakoo.

14. *Dryophis*, Boie.

22. *Dryophis kirtlandii*, Hallow. *Thelotornis capensis*, Smith, Ill., App. p. 19. *Dryiophis kirtlandii*, Günth. Col. Sn. p. 156. *Thelotornis kirtlandii*, Peters, Reise n. Mossamb. iii. p. 131. "Inhabits Kaffirland and the country towards Port Natal."—*Smith*. Arboreal. The British Museum has not yet received this species from South Africa.

15. *Lycophidium*, Fitz.

23. *Lycophidium capensis*, Smith. *Lycodon capensis*, Smith, Ill. pl. v. *Lycophidion horstockii*, Dum. & Bibr. vii. p. 412; Günth. Col. Sn. p. 197; Jan, Icon. 36, iii. 3. Kurichane, lat. 25° S. (Smith). Cape, Port Elizabeth, Natal (B. M.)

16. *Lamprophis*, Fitz.

23 scales across the middle of the body, those of the vertebral series larger.	- - - - -	- - - - -	<i>aurora</i> .
23 scales across the middle of the body, equal.	- - - - -	- - - - -	<i>fiskii</i> .
19 scales across the middle of the body.	- - - - -	- - - - -	<i>rufulus</i> .

24. *Lamprophis aurora*, L.; Smith, Ill., App. p. 19; Dum. & Bibr. vii. p. 431; Günth. Col. Sn. p. 195. "Occurs throughout South Africa, but nowhere in abundance. In the Colony it is, from its moving much during the night, known, like *Aspidelaps lubricus*, by the name of 'Nacht Slang.'"—*Smith*. Cape, King William's Town, Orange River (B. M.)

25. *Lamprophis fiskii*, Blgr.; Boulenger, Proc. Zool. Soc. 1887. Touw's River.

26. *Lamprophis rufulus*, Licht.; Smith, Ill. pl. lviii.; Jan, Icon. 17, iv. 1. *Ablabes rufulus*, Günth. Col. Sn. p. 30. "This snake has an extensive range, being found in damp localities throughout the entire of South Africa. It is generally discovered in marshy

spots, and on the banks of rivers, and is occasionally observed actually in water trying to capture frogs, &c., which form its favourite food."—*Smith*. Cape, King William's Town, Natal (B. M.)

17. *Boodon*, D. & B.

27. *Boodon lineatus*, D. & B. *Lycodon geometricus* (non Schleg.), *Smith*, Ill. pl. xxii. *Boædon lineatum*, Dum. & Bibr. vii. p. 363; Günth. Col. Sn. p. 199. *Boædon capense*, Dum. & Bibr. vii. p. 364. *Boædon quadrilineatum*, Jan, Icon. 36, ii. 2 & 3. "Rarely seen in S. Africa; resorts to dry and arid situations."—*Smith*. Cape, King William's Town, Natal, Orange River, Damaraland (B. M.)

Black variety: *B. infernalis*, Günth. l. c. p. 199. Port Natal, Port Elizabeth, Damaraland (B. M.)

18. *Heterolepis*, *Smith*.

8 upper labials, 4th, 5th, and 6th entering the eye. - - - *capensis*.
7 upper labials, 3rd and 4th entering the eye. - - - *gueinzii*.

28. *Heterolepis capensis*, *Smith*, Ill. pl. lv. Eastern districts of the Cape Colony (*Smith*). Desideratum in the British Museum.

29. *Heterolepis gueinzii*, *Peters*, Mon. Berl. Ac. 1874, p. 163, pl. —, fig. 2. Port Natal. Likewise a B. M. desideratum.

19. *Leptodira*, *Fitz*.

7 upper labials, 3rd and 4th entering the eye; a single anterior temporal. - - - - - *punctata*.
8 upper labials, 3rd, 4th, and 5th entering the eye; a single anterior temporal. - - - - - *rufescens*.
9 upper labials, 3rd, 4th, and 5th entering the eye; two superposed temporals behind the postoculars. - - - - - *semiannulata*.

30. *Leptodira punctata*, *Ptrs*. *Crotaphopeltis punctata*, *Peters*, Mon. Berl. Ac. 1866, p. 93. S. Africa, no precise locality.

31. *Leptodira rufescens*, *Gm*. *Crotaphopeltis rufescens*, *Smith*, Ill., App. p. 18; Jan, Icon. 39, ii. 1. *Heterurus rufescens*, Dum. & Bibr. vii. p. 1170. *Leptodeira rufescens*, Günth. Col. Sn. p. 165. "Inhabits most parts of S. Africa, but specimens are most easily obtained near Cape Town and on the south-eastern coast."—*Smith*. Cape, Port Elizabeth, Natal (B. M.)

32. *Leptodira semiannulata*, Smith. *Telescopus semiannulatus*, Smith, Ill. pl. lxxii. Loc.? Not represented in the British Museum.

20. *Dasypeltis*, Wagl.

33. *Dasypeltis scabra*, L.; Smith, Ill., App. p. 20; Günth. Col. Sn. p. 142. *Rachiodon scaber*, Dum. & Bibr. viii. p. 491; Jan, Icon. 39, ii. 4. "Inhabits the more southern parts of Africa, and consumes with avidity the eggs of birds."—*Smith*. Cape (B. M.)

Variety, uniform brown above: *D. palmarum*, Leach; Günth. l. c. *D. inornatus*, Smith, pl. lxxiii. Port Natal (B. M.)

V. ELAPIDÆ.

21. *Naia*, Laur.

34. *Naia haie*, L.; Smith, Ill. pls. xviii.—xxi.; Dum. & Bibr. vii. p. 1298; Günth. Col. Sn. p. 225; Jan, Icon. i. 2. Cobra de Capello. South African specimens are desiderata in the British Museum.

22. *Dendraspis*, Schleg.

35. *Dendraspis angusticeps*, Smith. *Naia angusticeps*, Smith, Ill. pl. lxx.; Dum. & Bibr. vii. p. 1301. *Dendraspis angusticeps*, Günth. Col. Sn. p. 238. "This species occurs about Natal and in the country to the eastward, towards Delagoa Bay."—*Smith*. South African specimens are desiderata in the British Museum.

23. *Sepedon*, Merr.

36. *Sepedon hæmachates*, Merr. *Naia hæmachates*, Smith, Ill. pl. xxxiv. *Sepedon hæmachates*, Dum. & Bibr. vii. p. 1259. *Aspidelaps hæmachates*, Jan, Icon. 44, vi. 4. "Ring Hals Slang" of the Cape colonists. "Specimens have been found in almost every district of South Africa which has yet been explored. It appears to prefer localities in which the soil is loose, sandy, and coated with brushwood."—*Smith*. Cape, Namaqualand (B. M.)

24. *Aspidelaps*, Fitz.

Frontal shield longer than broad; 3rd and 4th upper labials entering the eye. - - - - - *lubricus*.
Frontal not longer than broad; 4th upper labial entering the eye. *scutatus*.

37. *Aspidelaps lubricus*, Merr.; Smith, Ill., App. p. 21; Jan, Icon. 44, vi. 2. *Elaps lubricus*, Dum. & Bibr. vii. p. 1218.

Cyrtophis scutatus (non Smith), Günth. Col. Sn. p. 227. "Nacht Slang" of the Cape colonists. "Inhabits South Africa, more particularly towards Cape Town."—*Smith*. Cape, Kaffraria (B. M.)

38. *Aspidelaps scutatus*, *Smith*. *Cyrtophis scutatus*, *Smith*, Ill., App. p. 22. *Aspidelaps scutatus*, Jan, Icon. 44, vi. 3. "Inhabits Kaffirland and the country towards Port Natal."—*Smith*. Natal (B. M.)

25. *Elaps*, Schn.

A. 15 scales across the body.

3rd upper labial much larger than first and second; belly yellowish with a black median band, or blackish with yellowish spots or transverse bars. - - - - - *hygiæ*.

The three anterior upper labials subequal; blackish above, with a yellowish vertebral streak, uniform yellowish inferiorly. - - - *dorsalis*.

B. 13 scales across the body. - - - - *sundevallii*.

39. *Elaps hygiæ*, Shaw; *Smith*, Ill., App. p. 21; Dum. & Bibr. vii. p. 1213; Günth. Col. Sn. p. 232; Jan, Icon. 43, ii. 3. "Kouseband" of the Cape colonists. "Found in all parts of South Africa."—*Smith*. Cape (B. M.)

40. *Elaps dorsalis*, *Smith*, Ill., App. p. 21. "Inhabits Kaffirland, and the country towards Port Natal."—*Smith*. King William's Town (B. M.)

41. *Elaps sundevallii*, *Smith*, Ill. pl. lxxvi. "Inhabits South Africa to the eastward of the Cape Colony."—*Smith*. Does not appear to have been rediscovered since the description was published by *Smith* from a specimen belonging to *Sundevall*, of Stockholm.

26. *Atractaspis*, *Smith*.

42. *Atractaspis irregularis*, Reinh. *A. bibronii*, *Smith*, Ill. pl. lxxi.; Jan, Icon. 43, iii. 2. *A. irregularis*, Günth. Col. Sn. p. 239; Jan, Icon. 43, iii. 1. "Inhabits the eastern districts of the Cape Colony."—*Smith*. *Smith*'s original specimen is now in the British Museum.

27. *Causus*, Wagl.

43. *Causus rhombeatus*, Licht. *Sepedon rhombeatus*, *Smith*, Ill., App. p. 21. *Causus rhombeatus*, Dum. & Bibr. vii. p. 1263.

“Frequently found in the Cape Colony.”—*Smith*. Port Natal, Port Elizabeth (B. M.)

VI. VIPERIDÆ.

28. *Vipera*, Laur.

A. Lower surface of tail with a well-developed double series of sub-caudal shields, as in the innocuous snakes.

1. Nostrils directed upwards, their distance from the lip equalling the distance from the eye to the lip - - - *arietans*.

2. Nostrils lateral.

11 or 12 shields border the upper lip on each side, the fourth being considerably larger than the others - - - - - *atropos*.

13 subequal labial shields on each side; head thick and globular, nearly twice the diameter of the neck - - - - - *atropoides*.

13 or 14 subequal labial shields on each side; head much longer than broad; coloration uniform yellowish brown - - - - - *inornata*.

B. Lower surface of tail with feebly differentiated, feebly-keeled scales.

No horn-like tubercle above the eye - - - - - *schneideri*.

A horn-like erect tubercle above the eye - - - - - *caudalis*.

Two or more erect horn-like tubercles above the eye - - - - - *cornuta*.

44. *Vipera arietans*, Merr. *Echidna arietans*, Smith, Ill., App. p. 21; Dum. & Bibr. vii. p. 1425. *Vipera arietans*, Jan, Icon. 45, vi. 3 & 4. “Puff Adder” of the Cape colonists. “Has been observed in all the districts of S. Africa which have been visited by Europeans.”—*Smith*. Cape, Natal (B. M.)

45. *Vipera atropos*, L. Smith, Ill. pl. lii.; Jan, Icon. 45, iv. 1 & 2. *Echidna atropos*, Dum. & Bibr. vii. p. 1432. “Berg Adder” of the colonists. “Has been found in every district of S. Africa.”—*Smith*. Cape (B. M.)

46. *Vipera atropoides*, Smith, Ill. pl. liii. “The only specimen procured [which is now in the British Museum] was from the vicinity of a missionary institution about forty miles to the eastward of Cape Town.”—*Smith*.

47. *Vipera inornata*, Smith. *Echidna inornata*, Smith, Ill. pl. iv. “This snake [now in the British Museum] was killed in the Sneeubergen, or Snow Mountains, which are situated immediately behind the village of Graaff Reynet.”—*Smith*.

48. *Vipera schneideri*, Boettger, Ber. Senckenb. Ges. 1886, p. 8, pl. i. fig. 1. Angra Pequeña.

49. *Vipera caudalis*, Smith, Ill. pl. vii. *Cerastes ocellatus*,

Smith, pl. iv. (text). Restricted to dry sandy districts. Cape, Damaraland (B. M.)

50. *Vipera cornuta*, Daud. Smith, Ill. pl. xxxii. *Vipera lophophrys*, Smith, Ill. pl. xxxiii. *Cerastis lophophrys*, Dum. & Bibr. vii. p. 1444. "Hornsman" of the Cape colonists. Cape (B. M.)

NOTES ON THE SEAL AND WHALE FISHERY OF 1886.

BY THOMAS SOUTHWELL, F.Z.S.

WE must go back many years in the history of the Seal and Whale Fishery before we shall find so disastrous a season in all respects as the past has been; certainly it is unparalleled in the history of the Dundee fishery: a season of great severity has resulted in poor catches, still poorer prices for produce, and in the loss of one ship at Newfoundland and four in Davis Straits. It is not likely, with the present prospects, that any of these will be replaced, and it is even doubtful whether all the vessels which returned from last season's fishing will repeat the venture in 1887; in addition to which there are rumours of a partial desertion of the northern fishing-grounds for the purpose of exploring the Polar seas of the Southern Hemisphere.

The first disaster occurred on March 27th, when the Dundee steamer 'Resolute' was crushed in the ice in Notre Dame Bay, her crew having barely time to save themselves by jumping on the ice, where they suffered intensely from cold and exposure, having to travel seventy miles over ice before they reached a place of safety; three of their number, at first believed to have been lost, were subsequently picked up by the sealer 'Hector,' and landed safely at St. John's. The 'Resolute,' at the time of her loss, had 20,000 Seals on board. Another Dundee vessel, the 'Aurora,' had a narrow escape. Four days after leaving St. John's she discovered the main pack of Seals, and had every prospect of securing a full cargo, but a gale of great violence coming on, which continued for several days, she was driven before its force a distance of about one hundred miles, ultimately to be stopped by an iceberg off Cape Bonavista, where she remained in a position of great danger from the falling ice. Soon after, a second iceberg floating down upon her crushed one of her

boats, and injured the ship so much that she began to leak ; all this time the weather was of great severity, and the snow and mist blinding. Ultimately the ice eased, to the intense relief of her crew, and with the loss of one of her men the 'Aurora' returned to St. John's to refit. On her second trip she secured 640 old Seals.

The total result, so far as the twenty-one British vessels which took part in the Newfoundland fishery were concerned, was one lost, two clean ; and amongst the remaining eighteen vessels a take of 195,396 Seals (against 211,587 for nineteen British vessels last year); of these the 'Ranger' took 35,894, the 'Falcon' 24,768, the 'Wolf' 19,521, the 'Leopard' 15,954, and the 'Greenland' 15,000. Of the remaining thirteen vessels, the total catch was 84,259, or an average of 6481 ; the average of the whole eighteen being 10,855 Seals, the produce of which was worth about £18 10s. per ton.

Taking the Dundee portion of the above fleet alone, which consisted of six vessels, one—the 'Resolute'—as before said, was lost, and the remaining five vessels brought home only 41,606 Seals (as against 71,272 the previous season), or an average of 8321 each. It will thus be seen that for the whole of the Dundee vessels, and ten of the St. John's fleet, the voyage, so far, must have been a most unprofitable one, even if the price of produce had been much higher than it now is ; practically only the five vessels enumerated as having taken 15,000 Seals and upwards made paying voyages.

The Greenland sealing has this season been an entire failure, not so much, perhaps, from the absence of Seals as from the severity of the weather, and the state of the ice preventing an approach to the breeding pack. The passage out was a fair one, and the Seals were found on April 2nd, in lat. 74° N., long. 2° E. ; but the weather proved so tempestuous that it was not until the 7th they could be reached, and the strong gales had then broken up the ice into small patches, and thus dispersed the Seals. Three Scotch vessels only were present, the 'Erik,' 'Hope,' and 'Earl of Mar and Kellie' (the 'Eclipse' did not take part in the young sealing), and they captured about 4500 'white-coats;' there were also twenty-one Norwegians, who secured some 31,500 others, in addition to which there were also about 4000 old Seals killed, making a total of, say, 40,000 old

and young Seals. In consequence of the lateness of the season the young Seals were in very fine condition, and probably sixteen days old, as the parents generally take to the ice about March 22nd. The old sealing, later in the season, was equally bad. The total number of old and young Seals brought in from the Greenland and Davis Straits fishery was 7964, against 32,302 in the season of 1885.

I regret that in my last year's notes by an error I stated that there were eighteen Scotch vessels present at the Greenland sealing: this was the total number both at Greenland and Newfoundland. I should have stated that ten Scotch vessels took part in the Greenland and Davis Straits sealing, capturing 26,448 Seals, and that the proceeds of 5852 other Seals were brought home by the 'Germania' from a station in the Cumberland Gulf.

At Newfoundland and Greenland together, the thirteen Scotch sealers last season killed 49,570 Seals (against 103,574 in the season of 1885); these, at 6s. per skin, would represent a sum of £14,871, and the yield of 582 tons of oil, at £20 per ton, a further sum of £11,640; gross total, £26,511, against an estimate in 1885 of £57,412, a sad falling off, which in this branch of the fishery must represent a considerable loss to those engaged in it.

In the article "Seal Fishery," in the 21st vol. of the 'Encyclopædia Britannica,' p. 582, are some remarks with regard to what is there termed the "Jan Mayen Seal Fishery," which are calculated to be very misleading. It is stated that the British, Norwegian, Swedes, Danes, and Germans, all take part in the fishery, and that the number of Seals taken by the British vessels "about equals that taken by all the others together." If by the "Jan Mayen fishery" the author means the capture of young Saddle Seals at the Greenland west ice, this is certainly not correct; the foreign vessels at present greatly outnumber the British, and the number of Seals taken by them is proportionately larger; it will be seen that in the season of 1886 the numbers of British and foreign vessels present were respectively three of the former and twenty-one of the latter, and for many years past the disparity has been almost equally great. The Norwegians, who did not commence sealing till 1845, now outnumber all the other nationalities. Previous to that time

there were more Germans, Danes, and Dutch, than there are Norwegians at present. The author is also incorrect in stating that the Scotch steamers are chiefly manned by Shetlanders. It is usual for the whalers to complete their crews at Lerwick, and last season the 'Eclipse' added to her crew of forty men fifteen Shetlanders, bringing the number up to fifty-five, and this, I believe, is about the usual proportion. Again, although it is stated that a close time has been established in the "Jan Mayen fishery," the writer goes on to say that "the vessels make the ice from the 15th to the 20th March, and commence the chase in the destructive way already described." The way "already described" happily refers to what has since 1877 become a thing of the past; in that year the close time came into operation, and now, within an area included between the parallels of 67° and 75° N. latitude, and between the meridians of 5° East and 17° West longitude from the meridian of Greenwich, not a Seal is killed till April 3rd. That date is still believed by some to be too early, but this restriction has completely revolutionised the mode of sealing; the mother Seals are no longer killed without mercy when they come to suckle their young, and the latter left "to die in thousands of starvation." As a matter of fact, it is the young "white-coats" which are now so much valued. The German vessels made a business of sealing many years before the English took any decided part in it, the latter only picking up a few Seals occasionally; but about the commencement of the present century Seals begin to figure largely in the returns of the British ships. It was not, however, till the year 1840 that the port of Dundee first sent out ships to the Greenland sealing, but this date by no means coincides with the commencement of the Jan Mayen Seal fishery as stated by the writer in the 'Encyclopædia Britannica.'

The Davis Straits whaling voyage was a very disastrous one. On April 5th, during a most terrific gale, the 'Triune' was forced upon a reef in lat. 66 N., where she remained frozen up till the 18th, when she was released, but in steaming through the ice-floe she received a very severe nip, which ultimately resulted in the crew being compelled to abandon her off Scott's Island in 71 N. lat. on the 16th August. At the same time and place as the 'Triune,' the 'Jan Mayen' was also caught in the squeeze, and sank shortly afterwards. The 'Star' was likewise

lost in Cumberland Gulf, making, with the 'Resolute' before mentioned, four Dundee vessels which fell victims to the "thick-ribbed ice" last season. Nor was this all, for the 'Catherine' of Peterhead, a sailing brig of 190 tons, after various adventures on reefs and rocks, was finally beached and abandoned on the 30th September in Cumberland Gulf. Fortunately the crews in all cases were rescued.

In the Davis Straits plenty of Whales are reported to have been seen both in the early and late fishing; but the weather was so bad, combined with heavy seas and ice floes of a very dangerous character, that fishing was impossible; and during the summer months, when the best fishing is usually met with, the young Whales which, as a rule, are then found in Lancaster Sound, although the ships were through Melville Bay in good time to meet them in passing, were altogether absent, having, it is conjectured, taken some other passage.

The Davis Straits and Cumberland Gulf vessels, ten in number, killed nineteen Whales. These are said to have yielded 380 tons of oil, and 290 cwt. of bone, giving an average of 20 tons of oil and 15 cwt. of bone each, a very high average for the Straits Whales, which is probably to some extent accounted for by the summer fishing of the young Whales being a failure, those taken being in consequence all adults. Of this I shall have something more to say presently.*

The Seal fishery offering no temptation for an early start, and consequent greater outlay on the voyage, Capt. Gray, of the 'Eclipse,' deferred his departure from Peterhead until April 20th, with the intention of devoting his energies to whaling and shooting old Seals; of the latter he obtained 700, and of the former 7. Of the incidents of this voyage some account has been contributed to these pages by Mr. Robert Gray; there is no need, therefore, for me to dwell upon this part of the subject. In the Greenland Seas the 'Eclipse' and 'Erik' from Peterhead,

* The disparity between the quantities of bone and oil as stated above is certainly too great; there is always a remarkably constant proportion of one cwt. of bone to each ton of oil, and this holds good with Whales of all sizes. The 'Traveller' brought home from Cumberland Gulf some Whale oil which had been left out last season; but in addition to this I think there must be some inaccuracy in the reported quantity of oil; possibly some of the White Whale oil has been accidentally entered as Whale oil.

and the 'Pole Star' from Dundee, captured 15 Whales, yielding 88 tons of oil, and 80 cwt. of bone—the Whales averaging just over $5\frac{3}{4}$ tons of oil, and $5\frac{1}{3}$ cwt. of bone. The 'Hope' and 'Aurora,' as also the 'Earl of Mar and Kellie,' which paid a short visit to the Greenland whaling, were unsuccessful. Fourteen of the above Whales were taken early in the season, and in about the same locality, the remarkable feature about them being their small size.

The relative size of the Whales taken in Davis Straits and Cumberland Gulf, compared with those usually taken in Greenland, has in the past season been quite reversed. A large number of Davis Straits and Cumberland Gulf Whales, taken over a period of years, produced an average of $9\frac{1}{2}$ cwt. of bone each; whereas the Greenland Whales, captured during the same period, yielded 11 cwt. each; but in the past season the averages have been 15 and $5\frac{1}{3}$ cwt. respectively.*

This may at first sight appear very remarkable, but it is quite intelligible to those acquainted with the habits and seasonal distribution of these creatures. We have seen that the Straits fishermen, owing to circumstances of weather and ice, missed the young Whales, which would have reduced their average; whereas the Greenland fishermen likewise, from force of circumstances, could only get amongst young Whales early in the season; and later on, owing in a great measure to the ice being so closely packed and its edge so far west, they missed the south fishing altogether. But this is not all: from long experience of the habits and migration of the Whales, the regularity of which is remarkable, the Whalers know precisely where they should be found, under favourable circumstances, at certain definite periods; and not only so, but also the age and size which may be expected. I am not at liberty to enter more fully into this subject, fearing to commit a breach of confidence, as it is the application of accumulated experience on such points which enables one man to succeed in capturing Whales when a less accurate observer would fail; but I may add—to show that the migratory habits of

* As before stated, the yield of bone is more reliable than that of the oil for purposes of comparison; I therefore prefer to give that of the bone only, but each cwt. of the latter may be taken as representing an equivalent of one ton of the former.

the Whales have not changed—that the celebrated capture of forty-four Whales, by Capt. Suttar, of the 'Resolution,' in 1814, was effected in the same latitude as produced the Greenland Whales of the past season. Capt. Suttar's average was 5 tons 13 cwts.; and fourteen of the Greenland Whales last season, taken by two vessels fishing together in the same latitude as Suttar's, gave precisely the same average.

It is difficult to say what is the value of commodities which are hardly marketable; but at £20 per ton the 477 tons of oil brought home by the Dundee and Peterhead vessels would be worth £9540, and the 18½ tons of bone, at say £1100 per ton all round,* another £20,350, or a total of £29,890, against £31,800 in the season of 1885.

There has been a further considerable falling off in the British Bottle-nose fishery, only 23 Whales, yielding 22 tons of oil, having been brought in against 84 killed in 1885; but I am informed that the Norwegians have in the past season killed the enormous number of 1600 or 1700 of these creatures, which has so flooded the markets of London and Glasgow with their oil that it has been sold as low as £17 or £18 per ton,—a circumstance which will account for the neglect of this branch of the fishery by the Scotch vessels, the owners of which not many years ago realised £50 or £60 per ton for the same oil.

Some of the vessels brought home very miscellaneous cargoes—1033 White Whales, 320 Walruses, and many Narwhals and Bears—scarcity of "big game," I presume, rendering the pursuit of such small deer the more keen.

During his voyage to the Greenland fishery, when in lat. 70° N. 16° W., or about half-way between Jan Mayen and Greenland, Capt. Fairweather, of the 'Aurora,' reports a singular phenomenon. On August 16th, about mid-day, his vessel received a sudden shock, caused by what he considers must have been an earth- (or sea-) quake. The "sensations," he says, "felt by those on board were as if the ship were moving

* Some "size-bone" (*i.e.*, bone the slips of which are six feet and upwards in length) has recently been sold at £1550 per ton; but as the "undersize" bone produces only half the price of the "size," the price for the average is largely reduced. This must have been particularly the case in the past season, many of the Whales being very small, and the proportion of undersize bone being consequently unusually large.

over a rocky bottom with great velocity." The officers and crew immediately rushed on deck, thinking a boiler had burst, or that the ship had gone aground, but the boilers were all right, and the lead failed to find bottom at 100 fathoms. The weather was foggy, with slight rain and wind from E.S.E. ; no upheaval of the water was noticed, the sea being unusually calm. About two hours later, a second but much lighter shock was experienced, which, however, only caused the vessel to tremble.

NOTES AND QUERIES.

MAMMALIA.

Change of Habits in the Brown Rat.—The way in which animals change their habits and mode of life in adapting themselves to new or altered conditions of existence is very remarkable. In some cases doubtless the change is so gradual that it is not detected for a long time, but in others a divergence of habit under exceptional circumstances is so marked that it at once strikes the observer as noteworthy. Some years ago the Rev. J. S. Whitmee, then resident in the Samoan Islands, noticed a remarkable change of habits in that curious bird the so-called "Little Dodo," *Didunculus strigirostris*, which, from being almost entirely terrestrial in its habits, and breeding also on the ground, became gradually arboreal, roosting and nesting in trees, to escape the destruction which threatened it from attacks by cats, dogs, rats, and pigs, which had been introduced by the colonists (*cf.* Proc. Zool. Soc. 1875, p. 495). The Rat itself, so active a destroyer of life, has likewise had to alter its habits continually in its struggle for existence under adverse conditions in New Zealand. Capt. Johnstone, of Te Haroto, Raglan, New Zealand, referring to *Mus decumanus*, in a letter to Capt. Hutton, subsequently communicated to the Auckland Institute (Proc. N. Z. Inst. 1870, p. 47), writes as follows:—"At this season of the year [June] there is a sort of annual migration of Rats, where there are uncultivated lands in the neighbourhood of houses. This year the migration is excessive, both in the country and in the village of Raglan. The habits of the Rat have greatly changed since its introduction. It is amphibious. At low water they go to eat shell-fish on a rock near here, and when the tide rises swim back to the land. They have almost extirpated the delicious little crayfish (*Paranephrops*), which twenty years ago were, as I well remember, plentiful in my creek. Even the fresh-water mussels (*Unio*) are not safe from them, as they dive for them and open them on the bank. The climate is wet and the ground hard, so instead of burrows they make nests in trees

and hedges. Some time ago Mr. J. Graham, of Raglan, showed me a perfect 'rattery' in a thorn-hedge in the village. There were from fifteen to twenty large nests, into which it was necessary to insert a pitchfork to eject the occupants, in order to show that they were not birds' nests." The habit of feeding upon Crustacea is confirmed by another observer in New Zealand, who writes:—"Wild Ducks were particularly numerous in this district (Lake Taupo, North Island) on my arrival here: you saw them by dozens—you hardly see them now by twos. I have no doubt we owe this to the Norway Rat. There is a place on the Waikato River, some twenty miles below Taupo, where the chiefs occasionally assembled to act out two important matters—to discuss politics and eat *kouras* (crayfish). A few years after the Norway Rat fully appeared, the *kouras* were no longer plentiful, and as the New Testament made Maori politics rather unnecessary, the usage of meeting no longer exists. The natives assured me that the Norway Rat caught the crayfish by diving. Rowing up the rivers you see the little deposits of shells. Upon enquiry I found they were the selections of the Norway Rat, who, by diving for these fresh-water *pipis*, provide a *kinaki* (relish) for their vegetable suppers." I have elsewhere commented upon the observed fact that Rats will greedily devour snails, and in this way may do some good in gardens where snails are numerous ('Rambles in search of Shells,' 1875, pp. 73, 74). In the case referred to, however, they were apparently impelled to this change of diet from necessity rather than from choice, the Rats in question belonging to a colony which had taken up their quarters in some new houses while in course of erection, where there were no larders to visit. They were observed to climb the hollyhocks in the garden, clear off several snails, bring them down in one paw, like an armful, and run with them on three legs to their holes.—J. E. HARTING.

Marten Cat in Breconshire.—This animal is so rare in Wales at the present time that it may be worth while noting that one was seen in a large wood near this town in September last. Attention was drawn to it by the noise made by five or six Jays, who were evidently mobbing something, and my informant, who got within twenty yards of it, described it so minutely to me as to leave no doubt in my mind as to its identity. In past years the Marten was common here, and I know of four stuffed specimens killed in this county within the last thirty years, and doubtless many others have been unrecorded. I have also the very much torn skin of a Marten killed some twenty years by the late Mr. Gwynne Vaughan's hounds near Llanwrtyd, in this county. The old rough Welsh hound hunts it with great keenness and determination, and in former years it was its legitimate quarry.—E. CAMBRIDGE PHILLIPS (Brecon, S. Wales).

Common Rorqual at Skegness.—Seeing the usual announcement of a "Greenland Whale" having been stranded at Skegness on April 3rd, I

wrote to Mr. Storr of that town, who was mainly instrumental in its capture, and from his replies, thinking it possible the animal might be *Balænoptera borealis*, I took an early opportunity of visiting Skegness, and was somewhat disappointed at seeing on the beach a young female of the Common Rorqual or "Razorback," *Balænoptera musculus*. The animal measured 47 ft. in length, and the only remarkable feature about it was the unusually light colour of the baleen, which showed much less of the characteristic slate colour veined with darker and lighter shades of the same than in any specimen of this species which I have seen. This may have been owing either to the juvenility of the animal, which was little more than two-thirds grown, or it may have been sexual, or even the result of individual variation. There seems to have been the usual misunderstanding with the authorities, who claimed the whale on behalf of the Crown, but it was eventually handed over to its captors, who, after exhibiting it during the Easter holidays, sold it by auction for thirty guineas.—T. SOUTHWELL (Norwich).

[We learn from another correspondent, Mr. Degen, who personally examined it, that, being half buried in soft sand and ooze, it was impossible to take all the measurements that were desirable. He could only ascertain that the extreme length was 47 ft., the length from centre of dorsal fin to end of tail 13 ft., width of tail 8 ft., and circumference at dorsal fin 11 ft. 8 in. He arrived at the same conclusion as did Mr. Southwell, namely, that it was an immature female of *Balænoptera musculus*.—ED.]

The West India Seal.—It will probably be of interest to the zoological portion of your readers to learn of the re-discovery—or the full discovery—of the West Indian Seal, *Monachus tropicalis*. The history of this pinniped is in brief as follows:—It was noticed by Columbus in his account of his second voyage (1494) as having been found in some numbers on the rocky isle of Alta Vela, off the southern shore of Hispaniola, where his sailors killed eight of them for food. Later—in 1675—Dampier found this Seal in abundance on the Alacram reefs, about eighty miles north of Yucatan. At that time it was killed there in great numbers for its oil. The Seal then remained unnoticed for over a century and a half, having no place whatever in the writings of zoologists until 1843. Then Mr. Richard Hill published an account of it in the 'Jamaica Almanac,' calling it the Pedro Seal, from the Pedro Keys, some sixty miles south of Kingston, Jamaica, where he had found it. A few years later Mr. P. H. Gosse obtained an imperfect skin (without skull), which he sent to the British Museum, where it was described by Dr. Gray in the 'Proceedings of the Zoological Society of London,' 1849. Dr. Gray gave it then no name, probably by reason of its imperfect characters. Later—in 1850—('Catalogue of Mammals in the British Museum') he described the same specimen as *Phoca tropicalis*, and afterwards ('Catalogue of Seals and Whales,' 1866) as *Monachus tropicalis*. But

so imperfect was the specimen on which the description was founded, and the animal itself was so little known, that even its generic relations were in doubt, and its reference to the genus *Monachus* was considered provisional. From thence on to the present, rumours of the existence of this Seal have been not infrequent, but nothing seemed trustworthy and positive, and no specimens were obtained, if we except a young skin, without bones or skull, which came from Cuba to the National Museum at Washington, in 1884, without any indication as to locality. It has long seemed to the writer, as doubtless to many others, that the certain presence in our [*i. e.* American] waters of so important a mammal lying *perdu* in regions which our naturalist collectors are yearly visiting, was the opprobrium of American zoologists. We made inquiries and collected notes from many sources, which showed clearly that this Seal existed at isolated points—on small islands and keys—not only in the Caribbean and among the Bahamas, but also in the Gulf of Mexico. Last summer, while on a visit to the western shore of the Gulf of Mexico, we were so fortunate as to “locate” this seal with much certainty. This was upon the Triangles (Los Triangulos), three little keys, hardly above the water-level at high tide, and lying some 100 miles north-west off the Campeachy coast, in latitude N. 20° 50', and longitude W. 92° 10'. Following this clue, my son, Mr. Henry L. Ward, last December visited the Triangles in company with Senor F. Ferrari Perez, naturalist of the Mexican Geographical and Exploring Expedition. His hunt was highly successful, and he has during the present month returned with nearly twenty specimens—skeletons and skins of all ages, from a suckling to the fully adult male, seven feet in length. This ample material has just been carefully studied by Prof. J. A. Allen, the well-known zoologist, and author of a ‘Monograph of North American Pinnipeds.’ Prof. Allen has given a preliminary notice of the specimens in ‘Science,’ January 14, 1887, and promises an elaborate account, with plates, in an early issue of the Bulletin of the American Museum of Natural History, New York. It is a fact of rather peculiar interest that this, the first large mammal ever discovered in America, should, by the strange mishaps of natural-history collecting, be the very last one to become known satisfactorily to science.—HENRY A. WARD (Rochester, New York).—*In ‘Nature.’*

[A second communication on the subject, from Mr. Allen, appeared in ‘Science,’ Jan. 21, 1887. Mr. Ward is mistaken in supposing that the skin of the Seal, which came from Cuba to the National Museum at Washington in October, 1883 (not 1884, as above stated), was without bones or skull. It contained the skull and the bones of the fore and hind flippers, and these have been described (with three figures of the skull) by Messrs. Trew and Lucas in the Smithsonian Report for 1884, pt. ii. pp. 331-335.—ED.]

BIRDS.

Reported occurrence of *Emberiza melanocephala* in Scotland.—When visiting the Crystal Palace Bird Show on February 15th, I was surprised to find that, in Class 66, the first prize had been won by No. 1317, a male Black-headed Bunting, *Emberiza melanocephala*, in winter dress. On enquiry its owner, Mr. T. Crossley, of Kendal, wrote to me at some length regarding the bird, which “was caught near Dumfermline, on or about the 5th of November last, while flying in company with some Snow Buntings.” Mr. Crossley subsequently informed me that he purchased the bird from a dealer while on a visit to Scotland on the 3rd of January. Mr. Crossley amusingly maintains that his specimen is an immature Ortolan. He has no doubt as to its capture as above stated.—
H. A. MACPHERSON.

[See a note on the occurrence of this species in Nottinghamshire (Zool. 1886, p. 73), and its previous occurrence near Brighton (Ibis, 1869, p. 128). Since described and figured in the 4th edition of Yarrell’s ‘British Birds,’ vol. ii. p. 64.—ED.).

Albino Birds in Co. Wicklow.—Mr. J. R. Fitzgerald’s note on albino birds (p. 110) reminds me of some curious albinos which have occurred about here. Two, a Jackdaw and a Blackbird, are in the possession of Mr. D. M’Kellar. The Jackdaw is of an uniform creamy white, except the top of the head, which is grey. It is a young bird of the first year, and was shot near Carnew, in December, 1883. It came from a nest in one of the houses of that village, and had the white plumage from a nestling, having been frequently seen before it was shot. The albino type is, I think, not so common among Jackdaws as among many other species. The Blackbird is a very curious and beautiful specimen, white, lightly tinged with shades of buff and pale brown. It was shot near Shillelagh in February, 1886. In November last, on Slievebuidhe Hill, a Magpie was seen which was all white, except a black collar round the neck, extending into a large patch on the shoulders, and some black spots on the wings. It was in company with two other Magpies of the ordinary type. Some years ago a white-winged Wren frequented the roadside near Park; and a cream-coloured Sparrow was seen in the village of Shillelagh.—ALLAN ELLISON (Shillelagh, Co. Wicklow).

Wood Pigeons casting up Pellets.—When hawking in Cambridge-shire, on December 15th, I went from the open land through a wood frequented (at that season) by hundreds of Wood Pigeons. Among their droppings I saw some oval-shaped “castings,” about an inch in length. I have noted this in the Shrikes, Rooks, and Swallows, but never in this form in the Pigeon. I am aware of the manner they feed their young, but

I must say I was ignorant of the fact of Pigeons ejecting castings such as I found composed of husks of barley and beech-nuts, grass, or clover, and small stones.—T. J. MANN (The Grange, Bishop's Stortford).

Blackbird laying in Thrush's Nest.—Whilst rambling over the Sewage Farm, during April last, I observed a Blackbird fly from a holly-bush, and, thinking it might have a nest, I went to see, and to my great surprise found that the Blackbird had laid four eggs in a Thrush's nest, which I suppose the Thrush must have deserted. On my telling Mr. Thomas, who owns the adjoining land, of the occurrence, he said that a similar case was observed by one of his sons near the same place during the previous year. Mr. Wm. Storey tells me that an instance of the above has come under his notice in Nidderdale.—F. R. FITZGERALD (Harrogate).

The Ptarmigan in South-West Scotland.—The remarks of Mr. Service regarding local specimens of *Lagopus mutus* in the Museum at Dumfries remind me that one or more specimens exist in the Carlisle Museum. I therefore wrote to Mr. W. Duckworth, suggesting that the Carlisle birds were probably from Dumfriesshire, and asking him to refer to the old Museum Catalogue, with a view, if possible, to trace their history. This he has kindly done, and finds that three specimens of *L. mutus* (two in summer and one in winter dress) were included in a series of birds presented many years ago by Mr. J. D. Murray, of Murraythwaite, Dumfriesshire. In all probability these were local birds: at least the presumption is favoured by the facts which Mr. Service has recently set forth in connection with his own district.—H. A. MACPHERSON.

Woodcock and Pheasant laying in the same Nest.—On the 12th April last I was taken to see a Woodcock's nest, about two miles from my house. There had been four eggs, but one was broken to pieces, and another had a hole in it. In the same nest with these were two Pheasant's eggs. The Woodcock's eggs had been laid some time, but were only slightly incubated. I suppose the Pheasant had turned the Woodcock out, but the keeper stated that two days afterwards he saw the Woodcock sitting on the two Pheasant's eggs. From this it would seem that the Pheasant had deserted and the Woodcock had gone back to the nest. On April 16th the two eggs were found to have been sucked by a Jay.—F. H. BIRLEY (Dorman's Land, East Grinstead).

House Martins nesting in October.—A pair of Martins, *Chelidon urbica*, built their nest at the Harrogate Hotel, Starbeck, and successfully reared their young, in the latter end of October, 1884. The old birds were observed feeding their young during a blinding snow-storm. Last year Mr. William Storey, of Pateley, observed on October 8th a nest of the House Martin containing four young. The last Swallows observed in

this district (so far as I am aware) was on October 25th, when Mr. Rowling saw one in High Harrogate, and I observed three in Low Harrogate.—F. R. FITZGERALD (Harrogate).

The Green-backed Porphyrio (*Porphyrio chloronotus*).—I should be much obliged if any correspondent, who may happen to know its whereabouts, will say where a Porphyrio, shot at Grange in Furness, Lancashire, on September 25th, 1876, now is. It was recorded in 'The Zoologist' by Mr. Harting (1877, p. 228), and by Mr. E. T. Baldwin, p. 381. Robert Allen, the keeper who shot it, died in America last May, and it is possible that he took the bird to America with him, but it is much more likely, I think, that he sold it to some collector before crossing the Atlantic. About ten days before this bird was killed a Green-backed Porphyrio, showing no trace of confinement, and now in Mr. J. G. Millais's collection, was shot at Errol, in Perthshire (Drummond Hay, 'Scottish Naturalist,' 1877, p. 37); while about fifteen days afterwards a third was killed in Norfolk (Zool. 1877, pp. 96, 228). These facts point to wild migrants, and not to prisoners escaped from any aviary, especially as it was just the migratory season, and the three localities are so far apart, assuming that the Lancashire bird was the green-backed species, which is what I wish to ascertain. Unfortunately that cannot now be proved, unless the specimen can be examined. Two of the witnesses who saw it think its back was green, and two others think it was blue. The Green-backed Porphyrio apparently has a good claim to be considered a visitant to the South of Enrope. Mr. Dresser says, on the authority of Baron von Müller, that six were caught at once in the South of France ('Birds of Europe,' vol. vii. p. 303); and I learn from Prof. Giglioli that in the autumn of 1865 four were taken at Messina, and that, including these, there are twelve well-authenticated instances of its capture in Italy, Sicily, and Sardinia. Of some of these he has given particulars ('The Ibis,' 1881, p. 211), but does not suggest that they may have escaped from confinement.—J. H. GURNEY, JUN. (Keswick Hall, Norwich).

White-eyed Pochard and Bewick's Swan in Norfolk.—An adult male White-eyed Pochard (*Anas nyroca*) was shot at Potter Heigham on Dec. 29th ult.; it was flying singly down the river. Three Bewick Swans were shot here (at Heigham) last winter.—M. C. H. BIRD (West Rudham, Swaffham, Norfolk).

The Sheldrake or "Bar-goose" on the Essex Coast.—This bird is still called "Bar-goose" by Essex shore-shooters and punt-gunners. It appears to be a late breeder. One killed off Canvey Island a few years ago on May 9th had no down off the breast, although the feathers there were dirty, as if she had been burrowing, and the most fully-developed egg in the ovary was not so large as a pea. I have not heard the term "Bar-

gander" applied to the male, but both sexes are indiscriminately spoken of in Essex as "Bar-geese."—M. C. H. BIRD (West Rudham, Swaffham, Norfolk).

Harlequin Duck on the Northumbrian Coast.—The editorial note (p. 159) under a notice of the exhibition of a Harlequin Duck before the Zoological Society by Mr. H. Saunders has a tendency to mislead, as any one referring to that notice would naturally conclude that the bird exhibited was the Rev. Julian Tuck's specimen, which was not the case. It was the companion bird which I had received, and which is now in my collection. To obviate any confusion which might arise at a future date in tracing the destination of the two specimens which were obtained, I should feel obliged if you will allow me to state that I possess the specimen which was exhibited by Mr. H. Saunders.—ROBERT W. CHASE (Edgbaston).

It may be well to point out that the young Harlequin drake exhibited by Mr. Saunders at the second March meeting of the Zoological Society (Zool. p. 159) was not my specimen recorded on p. 70, but its companion in misfortune. The two must, I suppose, be "bracketed second" as British examples. I forwarded the body of the one I received to Professor Newton, and at his request the trachea has been prepared for the Cambridge Museum.—JULIAN TUCK (St. Mary's, Bucknall, Stoke-on-Trent).

Paired Varieties of the Jackdaw.—A pair of Jackdaws are at present nesting in one of the old trees close to my house. I see them frequently on the lawn and in the field near. Both these birds are exactly alike, and have the whole of the wings and tail of a dull mottled yellowish brown colour, much like that of a hen Pheasant. The remarkable point in this is that both the pair should thus vary. Probably they are the produce of some one brood of a former season?—O. P. CAMBRIDGE (Bloxworth, near Blandford).

Black Redstart in Co. Waterford.—I have to record the occurrence here of a young male of this species on the 4th November, 1886. The specimens of this bird captured in Ireland have, I believe, occurred on the sea coast, or at a short distance inland. Coolfin is about ten miles from the nearest sea. Like the bird mentioned by Lord Clermont (Zool. 1884, p. 78), this little straggler was engaged in capturing flies at my bed-room window.—WILLIAM W. FLEMING (Coolfin House, Portlaw, Co. Waterford).

FISHES.

Cyclopterus lumpus at Scilly.—I have received (April 12th) from St. Mary's, Scilly, a Lump-sucker, *Cyclopterus lumpus*. It is a male of unusual size, being as large as the ordinary female. The belly and lower sides are bright crimson, the back is of the usual dull leaden blue; but

the remarkable thing about the fish is its sucker. Instead of being attached to the pectorals it was distinctly detached, and (although the fish was quite fresh when it was brought to me) the sucker was hard and apparently useless for the purpose of adherence. The fish being in good condition, the state of the sucker could not be attributed to disease. It may possibly have been the result of age, but I have seen the male of this species so rarely that on this point I am not able to offer an opinion. Since writing the above, another very large male Lump-sucker has been taken (April 14th); this time in Penzance Bay in a trammel, in about twelve fathoms of water. It measures sixteen inches in length, and has the same peculiarity about the sucker which I noted in the other. It was alive when I received it.—
THOMAS CORNISH (Penzance).

INSECTS.

Scarcity of the Black-veined White.—In an article in the 'Entomologist's Monthly Magazine' for March, Mr. Herbert Goss raises the question whether *Aporia crataegi* is dying out in this country. At one time this butterfly was common in Kent, Sussex, Hampshire, Huntingdonshire, Northamptonshire, Herefordshire, Monmouthshire, and Glamorganshire. Now it has disappeared, apparently, from all these counties. Mr. Goss does not think that this can be attributed to the rapacity of collectors, and he holds that it can be accounted for only in some localities by cultivation and drainage. It seems to him more probable that the extreme scarcity or total extinction of the Black-veined White may be due to a succession of wet ungenial summers and mild winters.

SCIENTIFIC SOCIETIES.

ZOOLOGICAL SOCIETY OF LONDON.

April 5, 1887.—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, 1887, and called special attention to two Long-tailed Grass-Finches, *Poëphila acuticauda*, from N.W. Australia, presented by Mr. Walter Burton; and to a Fisk's Snake, *Boodon fiskii*, and a Narrow-headed Toad, *Bufo angusticeps*, from South Africa, presented by the Rev. G. H. R. Fisk.

Mr. F. Day exhibited and made remarks on a specimen of a Mediterranean fish, *Scorpana scrofa*, taken by a trawler off Brixham early in March last, and new to the British Fauna.

Mr. J. H. Leech exhibited some specimens of new Butterflies from

Japan and Corea, and gave a short account of his recent journeys to those countries in quest of Lepidoptera.

The Secretary read a letter addressed to him by the Rev. G. H. R. Fisk, of the Cape Colony, respecting the killing and eating, by a Shrew, of a young venomous Snake, *Sepedon hæmachates*.

Prof. Flower communicated, on behalf of Messrs. J. H. Scott and T. Jeffery Parker, of the University of Otago, New Zealand, a paper containing notes on a specimen of a young female *Ziphius*, which was cast ashore alive at Warrington, north of Dunedin, New Zealand, in November, 1884.

Mr. Richard S. Wray read a paper on the morphology of the wings of birds, in which a description was given of a typical wing, and the main modifications which are found in other forms of wings were pointed out. One of the principal points adverted to was the absence, in nearly half the class of birds, of the fifth cubital remex, its coverts only being developed. The peculiar structure of the wings in the *Ratitæ* and the *Sphenisci* was also commented upon.

A communication was read from the Rev. H. S. Gorham on the classification of the Coleoptera of the division *Languriïdes*. The author pointed out the characters which, in his opinion, were available for the systematic arrangement of this family of Coleoptera, and for its division into genera. The subject had hitherto not received the attention it deserved, and several errors had gained currency, owing to the hasty and insufficient way in which the structure of these insects had been examined. He added an analytical table of about forty genera, many of those proposed being new. Further notice of the American genera would soon appear in Messrs. Godman and Salvin's 'Biologia Centrali-Americana.'

April 19, 1887.—OSBERT SALVIN, Esq., F.R.S., Vice-President, in the chair.

The Secretary called attention to a set of eleven photographs representing the principal objects of Natural History collected by the celebrated traveller Prejevalski during his four expeditions into Central Asia, and to an accompanying Catalogue of them which had been presented to the Society's Library by Dr. A. Strauch, of the Imperial Museum, St. Petersburg.

Mr. T. D. A. Cockerell exhibited and made remarks on some specimens of rare British Slugs taken at Isleworth, Middlesex.

The Secretary read some extracts from a letter addressed to him by Mr. A. A. C. Souef, giving an account of a successful attempt to keep the Duck-billed *Platypus*, or Water-Mole, alive in captivity in the Zoological Gardens at Melbourne.

Mr. J. Bland Sutton exhibited some specimens of diseased structures taken from Mammals that had died in the Society's Gardens, and made

comments thereon. He also read a paper on the singular arm-glands met with in various species of the family *Lemuridae*.

Mr. F. E. Beddard read a paper on the anatomy of Earthworms, being a further contribution to his researches on that subject. The present paper treated of the structure of *Endrilus sylvicola*, the reproductive organs of *Acanthodrilus*, and the genital setæ of *Pevichæta houletti*.

A communication was read from Mr. A. D. Bartlett, Superintendent of the Society's Gardens, containing remarks upon the mode of moulting of the Great Bird of Paradise, *Paradisæa apoda*, as observed in a captive specimen.

A communication was read from Mr. J. Douglas Ogilby, of the Australian Museum, Sydney, containing the description of a rare Australian fish, *Girella cyanea*. A second paper by Mr. Ogilby contained the description of an undescribed fish of the genus *Prionurus*, obtained in Port Jackson, which was proposed to be called *P. maculatus*.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

April 6, 1887.—Dr. DAVID SHARP, M.B., F.Z.S., President, in the chair.

Mr. Francis Galton, M.A., F.R.S., of 42, Rutland Gate, S.W.; Mr. John Henry Leech, B.A., F.L.S., of 10, Hyde Park Terrace, W.; and Mr. George S. Parkinson, of Percy Cross, Fulham, S.W., were elected Fellows.

Mr. Samuel Stevens exhibited specimens of *Arctia mendica*, collected in the county of Cork, in Ireland, by Mr. M'Dowall, of Manchester. The peculiarity of the Cork form of the species is that the majority of the males are as white as the female of the English form; and although smoky-coloured specimens occur intermediate between the Irish and English forms, the typical black or English form appears to be unknown in Cork.

Mr. M'Lachlan exhibited a zinc box used by anglers for the purpose of keeping living flies in, which he thought might be adapted to practical entomological use in the field.

Mr. George T. Porritt exhibited a large number of specimens of *Hybernia progemmaria*, bred from moths collected at Huddersfield last spring. All the females and a large proportion of the males were of the dark variety *fuscata*, which formerly was almost unknown in Yorkshire, but which now seemed likely to replace the paler and original type.

Mr. Jenner Weir and Lord Walsingham both remarked that the number of melanic forms appeared to be on the increase in the north, and suggested explanations of the probable causes of such increase.

Mr. Gervase F. Mathew, R.N., exhibited several new species of Rhopalocera taken by him in the Solomon Islands during the visits to those

islands of H.M.S. 'Espieg'le' in 1882 and 1883. Amongst the specimens exhibited were species of *Euplœa*, *Mycalesis*, *Messarus*, *Rhinopalpa*, *Cyrestis*, *Diadema*, *Parthenos*, *Lampides*, *Sithon*, *Pieris*, *Papilio*, &c.

Mr. E. B. Poulton exhibited a large and hairy lepidopterous larva—apparently of a *Bombyx*—brought from Celebes by Dr. Hickson, and made remarks on the urticating properties of the hairs of the species, which were said by the natives to produce symptoms similar to those of erysipelas if the larva was handled.

Lord Walsingham, Mr. M'Lachlan, Dr. F. A. Dixey, Mr. Jenner Weir, Dr. Sharp, Mr. Slater, and Mr. Poulton took part in a discussion as to whether urtication was due to the mechanical action of the hairs in the skin, or to the presence of formic acid, or some other irritant poison, in glands at the base of the hairs. There appeared to be no doubt that in some species the irritation caused by handling them was merely due to the mechanical action of the hairs.

Mr. P. Crowley exhibited a collection of Lepidoptera recently received from West Africa, including specimens of several new or undescribed species of *Mylothris*, *Diadema*, *Harma*, *Rhomaleosoma*, &c.

Mr. H. Goss reported the capture by Mr. G. D. Tait, at Oporto, in September last, of a specimen of *Anosia Plexippus*, and remarked that, although some twenty specimens had been caught in the South of England, only two specimens had been previously recorded from the continent of Europe.

Lord Walsingham read a paper entitled "A Revision of the Genera *Acrolophus* (Poey) and *Anaphora* (Clem.)"; and he exhibited about twenty new species of these and allied genera. Mr. Stainton made some remarks on the genus *Anaphora*, and said he was glad Lord Walsingham was working at it and its allies. The paper was further discussed by Mr. M'Lachlan, Mr. Champion, and Dr. Sharp.

Mr. Poulton read "Notes in 1886 on Lepidopterous Larvæ, &c." In the discussion which ensued, Lord Walsingham referred at some length to instances of protective resemblance in larvæ, and alluded to the existence in certain species, especially of the genus *Melitæa*, of prothoracic glands. Further instances of protective resemblance were cited by Mr. Jenner Weir.

Dr. F. A. Dixey remarked on the extraordinary powers of contraction which appeared to be possessed by the retractor muscle of the flagellum in *D. vinula*, and enquired whether any corresponding peculiarities of minute structure had been observed in it. The discussion was continued by Mr. Gervase Mathew, Mr. W. White, Dr. Sharp, Mr. Porritt, and others.—H. Goss, *Hon. Secretary*.





The long-tailed Field-mouse.
Mus sylvaticus.

L. Hutchinson lith.

West, Newman & Co. imp.



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ON THE HABITS OF THE LONG-TAILED FIELD MOUSE.

BY G. T. ROPE.

PLATE IV.

OF the large and widely-spread genus *Mus*, five species only are known to inhabit the British Islands; the two larger, *M. decumanus* and *M. rattus*, being commonly known as Rats; the rest, *M. musculus*, *M. sylvaticus*, and *M. messorius*, as Mice. A third species of Rat, *M. alexandrinus*, is sometimes brought to our shores by vessels from Egypt and various ports in Southern Europe, but has not at present succeeded in permanently establishing itself. It appears doubtful, however, whether this last is really specifically distinct from *M. rattus*.

Of the latter group, or "mice," the Long-tailed Field Mouse, *Mus sylvaticus*, is the largest, and is very numerous as a species. Though a singularly beautiful little creature, it has a bad reputation both with the farmer and the gardener. No sooner does the sowing season come round and the first early peas are put into the ground, than the Field Mice find them out, and, taking up their abode close by, carry on their depredations during the hours of darkness. From observations made on this species in captivity, I believe it to be more strictly nocturnal in its habits than either the common House Mouse or the Harvest Mouse, *M. messorius*; and the much larger and more prominent eyes seem to indicate the same thing.

The Long-tailed Field Mouse has some little resemblance to the Common Mouse, the chief points of difference being some-

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what analogous to those distinguishing the Hare from the Rabbit; thus both the ears and the hinder limbs are longer, and the general colour of the fur of a warmer tint. The relative difference in size is also about the same, or perhaps rather less: besides which the eyes are much larger and more prominent, the whole head, and especially the muzzle, more elongated, and the tail longer. The dimensions given in Bell's 'British Quadrupeds' are as follows:—Length of the head and body, 3 in. 8 lines; of the head, 1 in. 1 line; of the ears, 7 lines; of the tail, 3 in. 6 lines.

For the sake of comparison, the following measurements, taken from ten adults from this locality, may perhaps be worth recording:—Average length of the head and body, 3 in. $9\frac{1}{2}$ lines; of the tail, 3 in. 5 lines. By far the largest example was a female, the total length of which was 8 in. 2 lines, the head and body occupying 4 in. 6 lines, the tail 3 in. 8 lines. In one instance the tail measured exactly half of the entire length, but its proportionate length, as seen above, was in these examples less than in Bell's table of dimensions. In this respect, indeed, I have found great variation, but need hardly add that in making the above measurements abnormally short-tailed specimens—which might possibly have lost a portion of that appendage—were, of course, excluded.

The upper parts are fawn, interspersed with numerous darker hairs, the general effect being yellowish brown with a slight greyish tinge. Under parts white, with a small patch or streak of fawn between the fore legs. Darkest colour extending along the back from occiput to root of tail, the fawn tint purest where it borders on the white. Posterior margin of hams bright orange-fawn. Feet and fore legs white up to the wrist, the pink skin showing through the soft and somewhat scanty hair on the feet. Hinder feet and legs white up to the hocks, which are dark grey behind, fading into pale fawn next to the white, the white in front being carried up so as to join that of the rest of the under parts of the body. Inner surface and anterior margin of thighs white, the rest of the same colour as the back. All the fur slate-colour at the base. Ears very large, beautifully formed, and sparsely clothed with very short brown hairs. Eyes of great size and remarkably prominent. Whiskers abundant and very long. The hinder feet are large in proportion to the fore feet, the three middle toes long, the claws white. The tail is long and

flexible, brownish grey above, whitish below; rather less than half the entire length of the animal, but varying considerably in this respect. The colour of the upper parts varies in different individuals, some showing but little of the yellow tint. The young are much greyer than the adults. Fatio ('Faune des Vertébrés de la Suisse') states that he has remarked considerable variation in the shape and extent of the yellow pectoral spot in Swiss examples, some having it so produced as to form a complete collar, while in others he has found it entirely absent.

Albinos now and then occur in this country, an instance of which will be found recorded in 'The Field,' Jan. 18th, 1873, by Mr. H. De F. Cox; and in 'The Zoologist,' June, 1884, p. 226, Mr. A. H. Cocks, describing an albino variety picked up dead in the garden of Dropmore Vicarage, near Great Marlow, Bucks, says, "It was a true albino, the eyes being pink; there was the slightest possible tinge of colour on part of the back and flanks. It was a female; and its unusual colour had—from the look of the teats—proved no obstacle to its finding a mate, and becoming the mother of a family." According to Lord Clermont ('Quadrupeds and Reptiles of Europe'), varieties occur of white, brown, and dull yellow, the belly, however, being always white.

The large and well-developed ears appear capable of detecting the slightest sound, and twitch convulsively at a chirp or whistle so faint as to be barely audible to human ears. The sense of smell, too, is probably well developed, and is doubtless the principal guide to the whereabouts of food—accounting for the great readiness with which corn, seed, bulbs, &c., are discovered, whether in the ground or stored in outhouses.

This species, according to my experience of its habits in this neighbourhood, does not, like *M. musculus* and *M. messorius*, inhabit stacks of corn, nor have I ever succeeded in finding a single individual of the Field Vole, *Arvicola agrestis*, either in a granary or a stack of any kind, though the latter animal is said by Bell to frequent such situations. A few may be carried in now and then at harvest time among the sheaves of corn, but must either soon die or else make their escape; for, setting aside rats, the little rodents found often in such immense numbers when the corn is threshed are all (with the exception of a small but varying proportion of Harvest Mice) of one species, viz., *Mus musculus*. Doubtless the habits of this little animal would vary a good deal

according to circumstances, and I ought to add that these observations have been confined to a rather limited area.

The Long-tailed Field Mouse devours corn and pulse of all kinds; also acorns, nuts, bulbs and roots of various sorts; and from Mr. Barrington's interesting account of the habits of this animal in confinement (Zool., April, 1882) it appears that the leaves as well as the roots of certain plants are eaten by it. He says, "The leaves of clover, and especially dandelion, were greatly relished, and for an unexpanded flower of dandelion nearly everything else would be deserted." They also ate arbutus berries, gooseberries, apples, grapes, &c., but almonds were not much liked. One I kept would eat the berries of the butcher's-broom. In a wild state they are particularly fond of carrots. Though abroad and active throughout the year, these mice, as is well known, store up underground during the autumn vast quantities of food for winter use, when the hard frozen ground would otherwise prevent them from obtaining a sufficient supply. For this purpose acorns are often chosen. Prof. Bell mentions also nuts, corn, and various seeds, and even roots, as having been found in their winter hoards. Possibly these supplies are sometimes exhausted before the return of spring; for, like rabbits, they will in severe weather, when the ground is covered with snow, devour the bark of young trees. The last-mentioned writer, in his account of the destruction wrought by mice and voles among young trees in the Forest of Dean and in the New Forest during the years 1813 and 1814, states that among the enormous number of small rodents taken in pitfalls, &c., though the greater part consisted of Field Voles, *Arvicola agrestis*, a considerable number of Long-tailed Field Mice were also caught. The present species, like most of the smaller British rodents, is to a certain extent carnivorous, preying when hard pressed on young birds, &c., and even occasionally on members of its own species. Fatio mentions insects as forming a part of its diet.

This animal breeds several times during the year, beginning as early as March, and continuing till late in the autumn. Mr. Barrington's experiments prove that a pair of these mice are capable, in a state of confinement, of producing as many as four litters in the space of ten weeks. He found the average number of young in nine litters to be four, five being the

maximum; in a wild state, however, the litters are probably larger. From seven to ten is the number stated by Bell, while Fatio gives it as four to six. It seems probable that more than one pair sometimes jointly occupy a burrow, several mice being at times bolted at once when water is poured into a hole. Buffon gives an instance where twenty-two were found in a single hole, *viz.* two females and twenty young. Mr. Barrington estimates the period of gestation to be about three weeks.

Their burrows, which are their usual retreats during the day, and in which the young are born, are to be found in woods, orchards, gardens, hedge-banks, &c.; they are also often made in the open fields, especially where peas or beans have been recently sown, also at harvest time, remaining till the stubbles are ploughed. From the quantity of earth thrown out at one or more of the openings (of which there are seldom less than three) they are often conspicuous objects, looking at a little distance like mole-hills. Old manure-heaps, probably from the warmth generated in them, are favourite spots with these little animals; and they not unfrequently make their abode in sheds and out-houses attached to gardens, where bulbs, seeds, &c., are kept.

The singular tenacity with which the young mice cling to their dam when she is surprised and put to flight was, as far as I am aware, first observed—or at any rate recorded—by the Rev. Gilbert White, the instance on which his attention was drawn to this circumstance occurring during the removal of the lining of a hot-bed. He says, “From out of the side of this bed leaped an animal with great agility, that made a most grotesque figure; nor was it without great difficulty that it could be taken, when it proved to be a large white-bellied Field Mouse, with three or four young clinging to her teats by their mouths and feet. It was amazing that the desultory and rapid motions of this dam should not oblige her litter to quit their hold, especially when it appeared that they were so young as to be both naked and blind!” Fatio witnessed a similar occurrence: a female was ploughed out of the ground with young ones clinging to her, but not, as in the instance given by White, *to the teats*, but “*accrochés par les pieds antérieurs et par les dents à sa queue et à ses poils.*” As regards the manner of attachment, Mr. Barrington’s observations are in accordance with those of the author of the ‘Natural History of Selborne’; for, after remarking that the mothers

seemed to have hardly any cessation of suckling, he says, "So fast did the young attach themselves that the females could scarcely move without pulling two or three after them." Although the present species does not establish itself permanently in the dwellings of man, after the manner of that pretty and amusing little pilferer the common House Mouse, I have known several instances of its having been caught in houses; and it often visits dairies for the sake of the milk, of which it is particularly fond. One which had escaped from its cage here was caught a fortnight afterwards in the same room, looking as sleek and well as ever.

I have on two separate occasions, in July and November, seen this little animal among the tall marram-grass on the sea-beach between Dunwich and Sizewell, on the Suffolk coast. Nests of the Harvest Mouse, *M. messorius*, have also been found on the beach at Kessingland, a few miles farther to the north, as recorded in Mr. Southwell's 'Mammalia and Reptilia of Norfolk.' The never-failing supplies of food cast up or left bare by the waves, as is well known, attract to the sea-coast various creatures other than those of purely littoral habits. Possibly, however, these beach-mice, instead of deriving the principal part of their food directly from that source, may subsist chiefly on the seeds of this grass and of the various plants growing on that wild and uncultivated tract. The beach being cut off at this spot from cultivated soil by a wide belt of marshes, ill adapted to the requirements of these animals, it seems probable that they may be permanent residents there. Rats, Rabbits, and a few Hares frequent the place; and even Weasels and Stoats in small numbers here find a temporary refuge from their relentless enemies the keepers.

Long-tailed Field Mice and Bank Voles, *Arvicola rufescens*, often make use of the same runs, and in trying to procure specimens of the latter I have frequently been balked by the Field Mice, which spring the traps and imprison themselves with the greatest readiness. They are particularly abundant here, and on going out at night with a lantern are sometimes to be seen bounding along in their peculiar zigzag and erratic manner. Their leaping mode of progression occasioned by the comparative length and power of the hinder limbs, and in fact the appearance in general of these mice, reminds one of the Kangaroos, or perhaps even more so of their near relatives the Gerboas. When moving

slowly about in a cage their movements are very kangaroo-like. In burrowing, the snout is used for shovelling the earth away in front of them. In captivity they have—as far as my experience goes—rather a dull and listless manner, and, in spite of their beauty, make less interesting pets than the common House Mouse. The skin of the tail, as with the Dormouse, is but slightly attached, and if seized by that appendage the mouse generally escapes, leaving the skin between the finger and thumb of its would-be captor.

THE FINWHALE FISHERY OF 1886 ON THE LAPLAND COAST.

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

THE Finwhaling season of 1886 off the N. coast of Norway and Russia proved a good one as far as the number and size of the Whales obtained goes, but, owing to the continued low prices of oil and baleen, it is not every company that is satisfied with the result; and I think everyone concerned is ready to acknowledge that they are treading seriously on one another's heels.

Rudolphi's Rorqual, which in 1885, for the first time on record, appeared in such large numbers to the eastwards of the North Cape, last year confined itself again to its usual habitat, only eight individuals being taken by ships of the companies having their stations to the east of that headland, and it is quite likely that some, and possibly all, even of this small number were actually killed to the *westward* of it. None were even *seen* by the Russian boats.

The Blue Whale reappeared last year in more like its former numbers, but, as will be seen by anyone who will take the trouble to compare the numbers caught by each company last season with those killed in 1884 (published in 'The Zoologist' for 1885), there was an appreciable falling-off in this species as regards the Norwegian coast, though apparently this was not the case in the eastward portion of the Russian waters.

A similar comparison for the last three years (1884, 1885, 1886) of the numbers of Common Rorquals killed will show a steady increase each succeeding year, the totals for each company in 1886 averaging more than double the number obtained in 1884.

The total of Humpbacks killed in 1886 was as nearly as possible the same as in 1885, and if, as in the preceding species, we reckon the totals for the three years, only of those companies of which I had returns in 1884, we find the figures so nearly alike that, without complete returns, it would be impossible to show any difference.

On my outward passage over the North Sea, when about 152 miles from the Spurn, on the afternoon of August 6th, or, roughly speaking, in about $55^{\circ} 33'$ N. lat., and $1^{\circ} 52'$ long. E. G., we passed tolerably close to some Rudolphi's Rorquals. There were, I am nearly certain, three of them, though it is possible that there were, as conjectured by some of the other spectators, only two. They kept blowing for some minutes, as we crossed their track, and occasionally putting their heads out of the water. The position indicated would be about the latitude of Bamborough, on the Northumberland coast, and inside the forty fathom line, clear of the N.W. margin of the Dogger Bank. I saw them well enough to feel confident in my identification, though it was not a species one would expect to meet with thereabouts, and to see any species of Whale there is an exceptional incident. The Whales were heading about W.N.W., and as that course (or within several points of it) would bring them before very long to the Scotch coast, I lost no time, after landing in Thronthjem, in writing to apprise Mr. Southwell of the likelihood of a visit being paid to the British coast by this rather rare species, and begging him to keep a look-out in the newspapers in case any arrival should be chronicled. Mr. Southwell was good enough to take a great deal of trouble in the matter, and in a few days heard of a Whale ashore, which is worth putting on record here, although it was probably not one of the individuals he was on the look-out for. On August 14th, three fishermen off the Island of Bernera, on the west coast of Lewis, heard a tremendous noise proceeding from a small creek called Sandy Cove. On getting nearer, they found a Whale fixed across the entrance. One of them, named Angus M'Arthur, landed and aimed a blow at its head with an oar. The Whale lunged to one side, and brought down upon itself a piece of rock estimated at over a ton in weight. The fishermen then attacked it, and with much difficulty, after a prolonged resistance during which it brought down several more pieces of rock in its struggles, they succeeded in killing it.

The men tied a rope to its tail, but it broke it and nearly wrecked the boat. Its length is said to have been about fifty-four feet, and, from the only description Mr. Southwell succeeded in obtaining in answer to his enquiries, it was evidently either a Common or Rudolphi's Rorqual, as it had "longitudinal folds of a whitish colour on the lower part" of the body; if it had been a Humpback, the remarkable flippers would almost certainly have been mentioned. It had been seen for about fourteen days previously in Loch Roag "pursuing small herrings," accompanied by a smaller one. It was purchased by Mr. J. N. Anderson, of Stornoway, who had it towed there.

When "Indenskjærs," that is, inside the barrier of the skerries, in the neighbourhood of Bergen, on August 8th, we saw a Lesser Rorqual; and a good many Dolphins, probably *D. tursio*. As I proceeded north, numerous Dolphins (? *D. tursio*) between Rörvig and Fjeldvig, and a single one in Porsanger Fjord, were the only cetaceans seen. Vest Fjord was passed earlier than I expected,—during the small hours of the morning,—and though exceptionally calm, no Whales were seen by the watch. In Öxfjord (West Finmarken), on August 15th, I saw the krang of a young male Bottlenose (*Hyperoodon rostratus*), which, I was told, measured from 2 to $2\frac{1}{2}$ fathoms, and had been picked up in Sörö Sund about three weeks previously, then recently dead, and with no mark externally to account for death.

When returning from visiting the whaling establishments, Capt. Horn kindly gave me a passage on the 'Murmanetz,' when she and the 'Welda' started homeward bound from Yeretiki on September 10th; and I proceeded in her all the way down to Throndhjem, where she and her consort were laid up for the winter. In spite of very heavy weather, we saw several Whales on the passage. On the 14th, in a heavy sea off Bryniln, between the islands Loppen and Lögö, we passed a small Whale. On the morning of the 15th, near the head of Vest Fjord, about three-quarters of an hour's run south of Lödingen, blowing hard W.N.W., passed a Humpback to starboard of us; and about ten minutes later, on the opposite side of us, we passed a school of from ten to twenty "Sværd Fisk" (Sword-fish). They were, I suppose, Killers (*Orca gladiator*), although, so far as my observations went, their appearance did not correspond well with that species; but as such a mass of widely divergent descriptions

have been given of what is after all, so far as we yet know, only one species, I think it best not to add to the existing confusion by publishing a fresh description which I am not able to substantiate.

Ten minutes later we saw another Humpback to starboard. Less than half an hour later, a Blue Whale was blowing very strongly on our starboard side; and half an hour later, again, what were probably three "Sildehvale" (the "Herring-whale" variety of the Common Rorqual) to port of us; and then another Whale was sighted just beyond these by one of the men, which, presently coming rather close to us, proved to be a Common Rorqual. A little farther on, again, far away to port, another Whale, which blew frequently, but too far off to identify, was supposed to be either a "Sildehval" or a Humpback; and in the evening, about an hour's run (nine knots) south of Bodö, we passed a small Whale. Capt. Horn coming through Vest Fjord on his way south, on Oct. 1st, passed four "Sildehvale" within a short distance of Lödingen.

The last Whale I met with was only about fifty miles from the Yorkshire coast, as we were running towards the Humber on the morning of October 10th. On the fishing ground known to trawlers as the "Great Silver Pits" (20 to 40 fathoms) we passed close to a Dutch fisherman from Schlevingen, in the act of hauling in his net. About fifty Gannets were in attendance overhead, while below a small Whale—perhaps a Lesser Rorqual—was steadily breakfasting on the fish that managed to escape from the meshes of the net.

With regard to the time when the different species of Finwhale appear on the North European coast, I have the following observations of some of the whalers this last season to offer (the actual date of the killing of the first and last example of each species being stated farther on under the respective species). Probably the first Whale killed last year was a Humpback, yielding six and a half tons of oil (about thirty-nine barrels), killed by Capt. Selliken as he entered Syltefjord on February 24th. Humpbacks are said to arrive on the E. Finmarken coast every February, but the weather was so bad this year as to hinder the fishing; but it is probable that their numbers are recruited towards the end of the fishing season. Capt. H. Ellevsen came "Indenskjærs" all the way up the coast in the spring, that is, inside the outer belt

of islands, and therefore saw nothing; it was too rough while he was crossing Vestfjord to see anything. Herr Wiborg saw a few Common Rorquals on March 24th between Nordkyn and Vardö, and had seen none previously on his passage. Capt. Berg saw none on his passage north. Capt. H. Ellevsen saw several Common Rorquals on March 23rd between Tanafjord and Syltefjord; and between May 25th and June 26th Whales were numerous between Tanafjord and North Cape. Capt. Berg says, "From May 27th to June 20th there were, off and on, great quantities of Whales between North Cape and Tanahorn, especially about the Nordkyn; these Whales were Common Rorquals or Whales resembling the so-called hybrids (Bastarder). We had first in July a large show of Whales N.E. of Syltefjord; these were typical Common Rorquals; at the same time there were also sundry Blue Whales off Syltefjord, though no remarkable number. In April there was a stray Common Rorqual, off and on, between Tanahorn and Vardö, but the weather was then stormy, so that it hindered the fishing." Capt. Sörensen reports, "During the month of June there were often a quantity of Common Rorquals collected about Nordkyn and North Cape." Herr Wiborg says, "A quantity of Common Rorquals were seen in the middle of June between North Cape and Nordkyn. About the middle of July there were not a few Blue Whales about eight (sea) miles (= thirty-two English land miles) N.E. of Vardö, on their passage eastwards. A few days later there were a quantity of Blue Whales congregated off the Seven Islands (Sem Ostrova), on the Murman coast." Capt. S. A. Nilsen, of the 'Murmanetz,' told me that, with the exception of 1885, when the extraordinary arrival of Rudolphi's Whales took place, he had seen more Whales this season than in any previous year.

Mr. Robert Gray's very interesting notes on last year's voyage of the 'Eclipse,' in the present volume of 'The Zoologist,' help to show the distribution of the Blue Whale during the spring and early summer, and he corroborates the opinion I expressed in these pages in 1884, that the statement in Nordenskiöld's 'Arctic Voyages,' that the "Finners" never live in colder water than 2·5° C., is an error. Capt. Castberg, jun. (commanding a Norwegian Greenland whaler) also reported seeing, in 1886, Blue Whales among Bottlenoses off Grimsey (an island off the N. coast of Iceland), in 67° N. lat., and between the 17th and

18th degree long. W. G.; and that off Langenæs (the N.E. headland of Iceland), on May 28th, he saw quantities of this species.

The following particulars, kindly supplied to me by the managers whose names are affixed, will, I believe, be considered well worth recording. With one or two exceptions, the original statements were given me in Norwegian; these I have endeavoured to translate as accurately as possible. The lengths, except where otherwise stated, are in Norwegian feet and inches (the Norwegian foot = almost exactly 1 ft. $0\frac{1}{2}$ in. English, and therefore the Norwegian inch = about $1\frac{1}{4}$ in. English). But as most of the measurements are given in feet, omitting inches, it would have been absurd for me to have reduced them to English feet, plus the odd inches.

HUMPBAC. — Capt. Horn obtained: Males (June 19), 43, 41, 42, 53, 28, 42 (Aug. 2); females, (July 1) 45, with male foetus 13 in. long, flipper 3 in., width of flukes 3 in., gape $2\frac{7}{8}$ in. (much milk); 48 (July 28). Average: (6) males, $41\frac{1}{2}$ Eng. ft.; (2) females, $46\frac{1}{2}$ Eng. ft. In 1885 he obtained: (Aug. 14) 31 and 36 (Aug. 15) 38. Average: 35 Norw. ft.

Capt. Andreëff obtained: Males (July 9), $38\frac{1}{2}$, 32; females (Aug. 21), 35. Average: (2) males, $35\frac{1}{4}$; (1) female, 35.

Herr Wiborg obtained: 1 male (Aug. 2). 3 females (Aug. 6-16).

Capt. Castberg obtained: Males (June 19), 30, 20, 30, 28, 20, 30. No females. Average: (6) males, $26\frac{1}{3}$ Norw. ft.

Capt. Berentsen obtained: Males (Aug. 3), 30 and 30; females (June 9), 30; (July 14) 46. Average: (2) males, 30; (2) females, 38 Norw. ft.

Capt. Sörensens killed 4 and found 1 dead between August 2nd and 6th. Length, about 40 Norw. ft.

Capt. H. Ellevsens's 5 were obtained between July 28th and August 17th. Four were males, and only one a female.

Capt. Berg obtained 4 males, and no females. (July 23) 47, 40, 44, 38 (Aug. 7). In 1885 he killed 2 as late as Aug. 19. In 1884 he killed no Whale of any kind in August, although his ship cruised until the end of that month. In 1883 he obtained 1 on Aug. 30. In 1882 his last Whale was a Blue Whale, killed Aug. 21.

Capt. Seliken took 6; the first was as he came to Syltefjord at the commencement of the season; it gave $6\frac{1}{2}$ tons oil (= about 39 barrels). One of his ships harpooned a small individual in the

head (apparently penetrating to the brain). It towed the ship straight towards land, and the crew were in imminent danger of being shipwrecked on the rocks. Presently it reared its head right out of the water, and nearly toppled over on deck. Despite all their efforts the crew could not succeed in killing it, and at last they lashed it head and tail alongside and proposed to tow it ashore, still alive; but it broke the lashings, and was only finally secured after a great amount of trouble. A fœtus found on July 28th measured $17\frac{1}{2}$ Norw. in.; flipper, $4\frac{3}{4}$.

Herr Andresen obtained: Males, 35, 42, 39, between July 7 and 29, and no females. Average: (3) males, $38\frac{2}{3}$ Norw. ft.

On August 25th I saw the 'Varanger' with one alongside, not much more than 20 ft; it was black-bellied. The great apparent excess of males over females of this species has struck me since I first visited the Whale-factories; this season, out of 37 of which the sex is recorded, 28, or over two-thirds, were males. This is evidently not to be accounted for by supposing that male animals are selected where there is a choice, on account of greater size, for the exact contrary is the case. The average for all the males whose length is given above is under $35\frac{1}{6}$ Eng. ft., while that of the females is just over $40\frac{1}{3}$ Eng. ft.*

Herr Wiborg informs me of a Humpback seen this season, accompanied by two calves, each about 10 Norw. ft. long. "This Whale was very shy, so that, so far as I am aware, it was not captured. Several whalers state that they have seen what was probably the same Whale. It was seen off Vardö, about six (sea) miles (= 24 English land miles) from land."

BLUE WHALE. — Capt. Horn obtained some extremely large Whales. Males: May 25, 80 Eng. ft.; June, 80 Eng. ft.; July, 76, 81, 68, 84, 77, 81, 72, 78, 75, 80, 63, 76, 83; Aug., 80, 72, 85. Females: June, 80, 81 (containing fœtus 5 ft. 7 in. long); July, 87 (accompanied by young one between 50 and 60 ft. long), 80 (containing fœtus 15 ft. 6 in. long), 71; Aug., two of 77 ft. Total (18) males, average, $78\frac{7}{8}$ Eng. ft.; (7) females, average, 79 Eng. ft. The Blue Whales taken by Capt. Horn in 1885 were: June (1st), 68 Norw. ft.; (6th) female, 72; July, 67, 77; female, 81; Aug., 83, 71; female, 82 (with milk running); male, 75; female, 81 (Aug. 9). Average length (irrespective of sex) of 10 = $75\frac{7}{10}$ Norw. ft.

* Reckoning 1 ft. $0\frac{1}{2}$ in. English, to the Norwegian foot.

Capt. Andreeff, at Arra Guba, obtained: Males, 62 (middle of June), 64, 73, 67, 51, 60, 72; females, $70\frac{1}{2}$, 75, 52, 77, 70, 67, 79. Average: (7) males, 66 Eng. ft.; (7) females, $70\frac{1}{4}$ Eng. ft.

Herr Wiborg, of Kiberg, obtained, on June 21, a female containing foetus 9 ft. In July, 5 males, and 2 females, one of which (killed 10th) was accompanied by a calf about 40 ft. long; and on Aug. 20, a female, with foetus 8 ft. The length of these Whales was from 65 to 80 Norw. ft., and most of them were extremely fat. Herr Wiborg writes as follows (translated):—"Manager Amlie of this place (Christiania), who carries on Whale-fishing at Iceland, told me a few days ago that he had this year shot a *poor* Blue Whale, which had a shell lodged in the back part of the head, near the blow-holes, of the kind we use in Finmarken. Herr Amlie supposes that the Whale was shot or wounded by the Finmarken whalers, which is also the opinion of Herr Amlie's harpooner. The wound was thought to be a year old." Herr Wiborg also noted that about the middle of July, about eight sea miles N.E. of Vardö, there were a good many Blue Whales travelling eastwards; and some days later there were a quantity of this species congregated outside the Seven Islands (Sem Ostrova), on the Murman coast. Capt. Berg noted the appearance of some Blue Whales off Syltefjord during the early part of July, "though no remarkable number."

Capt. Castberg obtained, on June 2, a female 78 Norw. ft., containing foetus $3\frac{1}{2}$ Norw. ft.; July 1, female 78 ft. 6 in. Norw.; and on the 23rd a male 72 ft. Average: (1) male, 72 ft.; (2) females, 78 ft. 3 in. Norw.

Capt. Berentsen obtained, on June 8, a male 76 Norw. ft.; 30th, female 76 ft.; in July, 1 male, 2 females, each 74 ft., in August, a female 75 ft.; this last was in lean condition, and only yielded about 40 barrels of oil. Average: (2) males, 75 ft.; (4) females, $74\frac{3}{4}$ Norw. ft.

Capt. Sörensén obtained 7 between June 30 and July 15, and they measured between 70 and 75 Norw. ft.

Capt. H. Ellevsen obtained 10 between June 8 (77 Norw. ft. long) and Aug. 7, when one was found floating dead.

Capt. Berg obtained: Males (June 30), 61; (July), 74, 70; females (June 28), 68; (July), 68, 67, 68, 74. Average: (3) males, $68\frac{1}{2}$; (5) females, 69 Norw. ft.

Capt. Selliken's largest Whale (of 4) was a male, 82 Norw. ft.

Herr Andresen obtained, between June 10 and July 17: Males, 74; females (June 10), 72, containing foetus 50 Norw. in., 68, 84. Average: (1) male, 74 Norw. ft.; (3) females, 74 $\frac{2}{3}$ Norw. ft.

The sex of a Blue Whale (and in a less marked degree it is, I believe, true of other species of *Balænoptera*, and possibly of other whalebone Whales) may be distinguished by the shape of the baleen plates, which in a male are long (up to 4 ft., including gum) and narrow, but thick; while in a female they are short and broad, but thinner.

While at Mehavn (where we had to take shelter in heavy weather on our way south in the whaler 'Murmanetz'), I found quantities of the copepod, *Balænophilus unisetus*, on baleen of the Blue Whale. Capt. S. A. Nilsen, of the 'Murmanetz,' told me that on August 5th he saw two males of this species making overtures to a female. He harpooned one of the males, on which the other supposed male sprung clean out of the water head first, and nearly fell on board the ship!

COMMON RORQUAL.—That this species is extremely variable is only too well known, for it has led to the multiplication of species and great confusion; but, according to the reports of the Finwhalers, who have had during the last few years opportunities never before accessible of examining in a fresh state large numbers of these animals, it seems as if these differences might perhaps be classified under three constant varieties—although it must be allowed that these varieties are not as yet as clearly defined as could be wished; however, I here quote the descriptions as given me. Capt. Sørensen says, "On the western and southern coasts of Norway a sort of Whale is met with during the herring-fishing, often in great numbers, which is called Herring Whale (Sildehval). This Whale is most like the Capelan Whale (Loddehval), but smaller than it, rarely longer than 50 to 55 ft. It is black on the back, white on the belly, and the baleen like the Common Finwhale's (*i. e.*, the Capelan Whale). Its dorsal fin is somewhat higher and more pointed than the Finwhale's, and it yields less oil than that kind." He adds that the "Sildehval" is the southern kind, and the "Loddehval" is the common Finwhale of the north.

Capt. H. Ellevsen says, "The common Fin- or Capelan-Whale

disappeared at the end of April; it is white under the belly. The Finwhale which then came has more or less dark grey colour among the white, especially on one side; its snout is generally more pointed, and the Whale is more slender and longer"; and adds that the Finwhales that eat Lodde (Capelan) are only in Finmarken waters in the spring, and that those that eat Kril (*Calanus finmarchicus*) come later.

Capt. Castberg described the "Herring Whale" as much resembling the Blue Whale; the head like a Blue Whale's; the line of the back much bowed posterior to the dorsal fin; the furrows on the belly are after the pattern of a Common Finwhale, except that they are narrower (the furrows in the Blue Whale are shallower and narrower, and more numerous than in the Common Rorqual); the flukes more like those of the Blue Whale than the Common Fin.

Capt. Horn has only seen one Whale answering the description given by Capt. Castberg of the "Sildehval"; it was a male 63 Eng. ft. long, killed August 21st last; it was almost black on the back (blacker than a Blue Whale); at a very short distance behind the dorsal fin the line of the back bent abruptly down (as if humpbacked); the dorsal fin was farther aft than usual; the difference in colour caused it to look very different; it was extremely tough and hard; an example of 49 ft. probably produced more oil than this one.

A Norwegian who was one of the first colonists to settle on the Murman coast told me that he knows the "Sildehval"; it is like the Whales found about Bergen, and is black on the back; it arrives on the coast with the herring, for which there is no fixed time.

Nearly universally recognised among the Finwhalers is the so-called "Bastard," from its having been supposed to be the offspring of mixed parentage—of a Blue and Common Rorqual. This variety appears to attain to larger dimensions than the typical form, and is described as *grey*, rather than the usual white, on the under side; on one side the baleen plates are for a short distance at the anterior end entirely white, while the remaining portions are darker than the normal colour. The following lengths of specimens of *B. musculus* were given me; I have kept the "Bastards," where mentioned, distinct from the common form:—

Capt. Horn obtained: (measured in English feet) Males, April (4), Fin, 64, 65, 66, 68; Bastard, 67; May, Fin, 62; Bastard, 72; Fin, 65; June, Bastard, 71; July, Fin, 65; Aug., Fin, 63, 64, 49, 63 (this last was the Herring Whale before mentioned). Females, April (6), Fin, 71; Bastard, $80\frac{1}{2}$ (very fat), 64; May, Fin, 64 (containing foetus about $15\frac{1}{2}$ in. long, gape of mouth 3 in., length of flipper $1\frac{3}{4}$ in., across flukes $2\frac{1}{2}$ in.); June, Fin, 64 (foetus 3 ft. 8 in.); July, Fin, $68\frac{1}{2}$, 69; Bastard, 70 (foetus $22\frac{7}{8}$ in. long, gape of mouth 4 in., length of flipper $2\frac{3}{4}$ in., base of dorsal fin $1\frac{5}{8}$ in., across flukes $4\frac{3}{4}$ in., on upper mandible 7 hairs on left side, 8 on right, and 17 on the lower mandible). Average: (14) males, $64\frac{1}{4}$; (8) females, $68\frac{7}{8}$ Eng. ft. It will be seen from the above figures that of 16 typical Common Rorquals, only 1 reached 70 ft.; while out of 6 of the "Bastard" variety, 4 were 70 ft. and upwards, 1 reaching the remarkable length of $80\frac{1}{2}$ Eng. ft. This Whale was shot by the 'Murmanetz' on April 9th, the harpoon going well in just behind a flipper, that is, somewhere very close to the heart, and the shell exploded. The wound, instead of proving almost immediately fatal, seemed to madden the victim, and it rushed away at great speed and towed the steamer, with the propeller working full speed astern, for four hours; when the 'Welda' being sighted, she was signalled to assist, and this vessel, steaming up at an angle, succeeded in lodging a harpoon just behind the flipper on the opposite side to the first; this shell also exploded properly. The Whale in this mortally wounded condition actually towed the *two* steamers steaming full speed astern, with a boat from each constantly lancing it, for two hours before it succumbed.

Capt. Andreeff obtained: (measured in English feet) Males (June), 49, 62, 61; females, (April 13) 65, 63, 71, 70, 63, 60, 60, 68, 69, 64, 62, 54, 61 (Sept. 8). Average: (3) males, $57\frac{1}{3}$ ft.; (13) females, $63\frac{11}{16}$ ft.

In 1885 Capt. Horn obtained: (March 20) Fin, 64, 65, 60, 58; Bastard, 71; Fin, 59, 62 (female with foetus 4 ft. long), 58, 64, 59, 62, 56, 63, 58, 58, 61, 55, 57, 61, 58, 59; Bastard, 70; Fin, 63, 58, 54, 57, 57, 64. Average: (28) $60\frac{11}{16}$ Norw. ft.

Herr Wiborg obtained between April 6 and Aug. 2: Males (including a Bastard about 70 Norw. ft., killed June 2), 13; females, 10. On May 20th a female contained a foetus 4 Norw. ft.; on the 28th he found one of 3 ft.; on June 9th, one of 5 ft.; and on July 26th, one of 7 ft.

Capt. Castberg obtained: Males (April 4), 70, 58, 61, 62, 62, 55, 50, 58, 64, 65, 64, 69, 63 ft. 6 in., 67, 58, 67, 60, 65, 65, 63, 63, 45 ft. 5 in. (Aug. 5); females (My 9), 40, 65 (killed May 21, containing foetus 5 Norw. ft.), 63, 73, 60, 70 ft. 3 in., 66, 63, 59, 60 (July 5, foetus 5½ ft.), 53, 65 (July 7, foetus 6½ ft.), 67 (July 8, foetus 6 ft.), 66 (July 9, foetus 6½ ft.), 65, 63, 65 (July 24, foetus 7 ft.), 62, 64, 65, 60, 67 (Aug. 18). Average: (22) males, 61½ Norw. ft.; (22) females, 62 ft. 9 in.

Capt. Berentsen obtained: Males, (April 12) 60, 58, 60, 54, 59, 60, 67, 62, 60, 64, 63, 57, 67, 57, 60 (July 24); females, (April 6) 58, 61, 63 (May 2, foetus 4 ft. 4 in. Norw.), 68 (May 26, a great quantity of milk, probably recently calved), 67, 62, 56, 62, 62, 67, 59, 70 (July 5, foetus 6 ft.), 68, 62, 59, 66 (July 11, foetus 6 ft.), 68, 66, 69, 60, 70, 60 (Aug. 7). Average: (15) males, 60½ Norw. ft.; (22) females, 63 ft. 9 in. Norw.

Capt. Sørensen's 20 specimens were from 60 to 65 Norw. ft. The first was killed April 5, the last July 28. On July 10 he found a foetus 4 ft. 8 in. Norw. long.

Capt. H. Ellevsen obtained 57 between March 29 and Aug. 18, and found 4 foetuses: on June 18, in a Whale 56 Norw. ft., a foetus 2 ft.; on the 20th, in a Whale 54 ft., a foetus 3 ft.; on the 24th, in a Whale 58 ft., a foetus 4 ft.; and on July 7, in a Whale 66 ft., a foetus 8 ft. 1 in.

Capt. Berg obtained: Males (April 6), 62, 60; Bastard, 58; Fin, 59, 64, 58, 62 (June 20); females, (April 15) 70, 56; Bastard, 61 (June 4, foetus 3 ft. 3 in. Norw.); Fin, 55, 74 (June 10, foetus 8 ft.), 53, 65, 59 (July 1, foetus 5 ft. 5 in.), 60 (July 12, foetus 1 ft. 5 in.), 67, 69 (July 27). Average: (7) males, 60¾ ft.; (11) females, 62¾ Norw. ft.

Capt. Selliken captured a Common Rorqual this season 76½ Norw. ft. long in a straight line.

Herr Andresen obtained: Males (April 12), 50, 56, 66, 64, 62, 66, 60, 64, 64, 62, 62, 60, 63, 63, 58, 57, 61, 62, 50 (Aug. 17); females, 52, 66, 66, 68, 62, 68, 64, 62, 59, 66, 64, 64. Foetus in Whale 68 ft., on June 29, 8 ft.; and in a Whale 64 ft., on July 24, 9 ft. Average: (19) males, 60½ ft.; (12) females, 63½ Norw. ft.

Capt. S. A. Nilsen, of the 'Murmanetz,' says that he sees Common Rorquals pairing during May, up to about June 1st every year; and that in the spring they have calves by their sides not more than 8 or 9 ft. long. He thinks the young Whales (first calf) pair in the autumn.

RUDOLPHI'S RORQUAL. — Capt. Castberg's single example of this species was a male 45 Norw. ft. long, killed on June 19th; it was one of a school numbering about 20.

Herr Andresen obtained (June 8) female 42 Norw. ft., female 50, male 40, male 42; (July 3) female 48, with foetus 2 ft. 1 in. Nor.; female 44, female 48 (July 26). Average, (2) males, 41; (5) females, 46 $\frac{1}{2}$ Norw. ft. On July 18, 1885, a female Rudolphi was brought in to his factory at Tufjord (close S.W. of North Cape) 45 Norw. ft. in length, in which were found two foetuses of opposite sexes; the male measured 6 ft., and weighed 48 kilograms; the female measured 4 ft., and weighed 30 kilograms.

Capt. H. Ellevsen's ships reported seeing some Rudolphi's on June 2nd, off Nordkyn.

One of Capt. Selliken's whalers cruising about fifty English miles north of Kongsfjord (the next Fjord to the westward of Syltefjord) during splendid weather in April, the sea perfectly calm, fell in with thousands of Seals (? sp.). If, as I believe to be the case, this is well out of their usual track, it would perhaps be the result of an unusual condition of the ice to the north, the edge being reported very low down off these coasts this season.

While staying in Syltefjord, I walked over from Capt. Selliken's to Capt. Berg's factory on Aug. 18th, and as I approached the first batch of Whale-krangs near the latter's I put up no less than twenty Ravens in a flock from them. I do not recollect to have previously seen quite so many together. All the factories have an inclined plane from the ground to the upper part of the boiling-house for the trolley to run up with the "blanket pieces" of blubber. The angle formed by the last few feet at the bottom is usually boarded in, to form a tool shed or sort of boatswain's locker. A pair of White Wagtails (*M. alba*) had found out a crevice at the top of one of these boards, and had built a nest inside, in the dark, and immediately under the rumbling trolley. The store of empty barrels was kept on the beach, enclosed by a turf wall (forming exactly what would be called a "Tun" in Iceland). In the interstice between some of the sods another pair of Wagtails built a nest, but, as it was entirely exposed to the rain, the cooper fixed half of a cask-head over it to form a roof, which, I was told, the birds had much appreciated. The young had flown from both nests at the time of my visit, but the nests remained; they were formed of very fine root-fibres and a little

moss, lined with reindeer-hair, and a few horse- and cow-hairs, and very fine fibres. The fibres of the nest under the inclined plane were coarser than those used in the sod bank.

With regard to the average yield of oil from each species of the *Balænopteridæ*, I made further enquiries this season on the subject, and the general opinion among those whom I consulted was that the estimate published in 'The Zoologist,' 1886, p. 122, is rather a low one; but in answer to that I would point out that the total yield of oil this year, inclusive of the 4th quality obtained from the krangs by those companies that have guano-factories, is, according to the returns given me, about 29,959 petroleum-casks. Calculating the yield from the Whales obtained, even according to this low estimate, the amount would be 28,510 petroleum-casks of the first three qualities of oil, and if we add to this, say, 3000 more for the 4th quality oil, the result is much above the actual amount said to have been obtained. But from the differences between the individual results, it seems difficult to arrive at any figures that would give a true average.

The average boilers in use in the factories hold about 2000 gallons; but more than about 1700 gallons of Spæk cannot be boiled in them, and this latter amount produces up to about 18 petroleum-casks of oil (say, 750 gallons).

The following prices offered for baleen about the middle of the season show the relative values per ton in each species; each plate to be not under 35 centim. long (= $13\frac{3}{4}$ in.):—Blue Whale, £65; Rudolphi's Rorqual, £40 to £45; Common Rorqual, £30; and Humpback, about £30.

Some idea of the size of the harpoons used may be gathered from the weight of one. Including the wire grummet, the cord, and spunyarn lashings, but without the shell or whale-line, it scaled 56 kilo. (that is, over 123 lbs.). The cost of each is 80 Kr. (= £4 9s.) as it leaves the blacksmith, and nearly 100 Kr. (more than £5 10s.) when ready for use. In an old volume of the 'Ny illustreret Tidende' (Christiania, May 11, 1884, p. 174) there is some account given of Capt. Svend Foyn and the Finwhaling: it is there stated that the shell-carrying harpoon is said to have cost him 160,000 Kr. (over £8800), when the various experiments undertaken are included!

I have to thank several of the managers whose names are mentioned in the preceding pages for the information they kindly

gave me; and especially are my thanks due to Capts. Selliken, Berg, and Horn, who put me up most hospitably at their respective factories, and the latter in addition gave me a passage in one of his whalers all the way from Yeretiki to Throndhjem. Capt. Sörensen, in addition to other information, filled up, as in previous years, some gaps in the table given at the end, of the Finwhaling Companies and their takes in 1886.

There is one more Rudolphi's Rorqual to be added to last year's list, obtained by Herr Gjæver, of Tromsö; and Herr Goebel on the Murman coast was credited with one Blue Whale too many, leaving the grand total of Whales killed during the season the same.

In the following table the new names are as before, printed in italics. The establishment at Baadsfjord is not exactly a new Company, being the one which was formerly at Akerfjord on Söröen; Capt. Foden, the manager, was formerly captain of Capt. Selliken's whaler, the 'Skytten.'

In the following table the column giving the approximate amount of oil obtained by all the companies is a new and I think interesting feature, which I was requested by some of the managers to publish. I have replaced the second "r" in Arra, as the word signifies a Guillemot in Russian, and is likely to be the meaning in this instance. (Cf. *Alca arra*, one of the synonyms for Brunnich's Guillemot, which is simply two onomatopœic names for a Guillemot—Alka, Swedish (Alke, Norwegian), and Arra, Russian.

In the annexed table, the Tromsö establishment being the only one from which I have learnt no particulars as to the species of Whale, I have divided the total of 22 by guesswork, and put in the details in Roman figures, in order to arrive at an approximate total of each species.

Since the above was in print, a paragraph has been published in the evening papers of March 28th, stating that the 'Vardöhus' started from Sandefjord for this season's whaling on the 23rd of that month, and was wrecked during the night off Mandal. "Only two men were saved out of her crew of about fifty." I have written to make enquiries, but up to the present have learnt no particulars of this disaster.

COMPANY.	MANAGER.	PORT OF REGISTER.	WHALEERS.	BLUE WHALES.	COMMON RORQUALS.	RUDOLPH'S RORQUALS.	HUMPBACKS.	TOTAL.	PETROLEUM CASKS OIL, ALL QUALITIES.*	WHALEERS' NAMES.
<i>Murmanski Coast</i> : Yeretiki	P. A. Horn ...	Petersburg...	2	25	22	0	8	55	2040	Welda, Murmanetz.
Arra Guba	Andreeff (Capt. Imp. Russ. Navy)	Do.	2 & a tug.	14	16	0	3	33	About 1000	{ Helena, Pokrof, Vlady- mir (tug).
<i>E. Finmarken</i> : Kobholmfjord ...	Fredriksen ...	Sandefjord...	2	6	15	0	5	26	950	Skjold, Værgø.
Stokke, Pasvig	A. Ellevsen ...	Tönsberg ...	2	15	49	0	6	70	2207	Varanger, Pasvig.
Jarfjord	Evensen	Do.	2	8	36	1	1	46	1400	Jarfjord, Hvalen.
Do., Madvig	L. Hansen ...	Christiania...	2	4	22	0	7	33	850	Fridtjof, † <i>Ellida</i> .
Do., Tamasjok	C. Bruun	Tönsberg ...	1	4	7	0	0	11	408	Emanuel.
Kiberg.....	T. Wiborg	Throndhjem.	2	9	23	0	4	36	About 1050	Kiberg, Nidaros.
Busse Sund—Christiania Co....	Castberg	Christiania...	2	3	44	1	6	54	2230	Alfa, Beta.
Do., Laurvig Co.	Berentsen.....	Laurvig	2	6	37	0	4	47	1320	Fiskeren, Nimrod.
Do., "Thekla"	I. Bryde	Sandefjord...	1	3	22	1	0	26	650	Thekla.
Do., Bugten	A. Grønn	Do.	1	3	24	1	2	30	750	<i>Tana-horn</i> .
Do., "Haabet"	G. Sörensen ...	Do.	2	8	22	0	5	35	1750	{ Vardöhus, Haabet (only used about first two months). Emma (hired 2½ mths. May to July).
Do., Skjærnaes	H. Ellevsen ...	Tönsberg ...	2	10	57	0	5	72	2057	Nora, Othar.
Syltefjord, Dahl's Exors.	L. Berg	Do.	1	8	18	0	4	30	1060	Victoria.
Do., Bergen Co.	M. A. Selliken.	Bergen	2	4	50	0	6	60	1775	Skytten, <i>Cornelius</i> .
<i>Baadsfjord</i>	<i>Foden</i>	Arendal	2	3	15	0	2	20	500	Neptun, <i>Jupiter</i> .
Mehavn	S. Foyrn.....	Tönsberg...{	2	4	36	4	4	48	About 1700	Spes-fides, Arctic.
<i>W. Finmarken</i> : Böle, on Söroen }	M. C. Bull.....	Do.	2	6	42	4	4	56	" 1800	Gratia, Providentia.
Sörvær, do.....	T. H. Andresen	Do.	2	3	43	40	13	99	" 2400	Fin, Frey.
Tufjord	J. Gjæver	Tromsö	2	4	31	7	3	45	" 1200	Nordkap, Nordkyn.
Tromsö			1	II	XV	III	II	22	" 862	Duncan Grey.
			39	152	646	62	94	954	29,959	

* Most of the figures in this column are only approximate.

+ Formerly the 'Madvig.'

ON THE STRUCTURE AND LIFE-HISTORY OF SPONGES.

BY R. VON LENDENFELD, PH.D., F.L.S.

SPONGES are exceedingly variable in shape. Their primordial form is the same as that of the higher Cœlenterates, the Gastrula. The wall of the originally simple Gastrula-sac is folded considerably in the higher sponges. Great quantities of mesodermal ground-substance are produced and occupy these folds; thus the massive body of the sponge is formed. The gastral cavity becomes the oscular tube which communicates with the surrounding water by the oscula or vents. The terminal opening of large tubular sponges is generally not an osculum, but a pseudosculum. In that case the true oscula are situated in the inner wall of the tube.

The sponges which are regular in shape are mostly radially symmetrical, without distinct anti- or metameres. There are, however, also forms known with a definite number of antimeres, but these are rare. Only one bilaterally symmetrical sponge, a tree-shaped *Halichondrine* (*Esperiopsis challengerii*, Ridley), has been described hitherto. This consists of a slender cylindrical stem, to the sides of which regular bilaterally symmetrical, kidney-shaped fronds are attached by long peduncles. The *Hexactinellidæ* and *Syconidæ* are distinguished by their regular radially symmetrical shape. These are sac-shaped. The *Tethyidæ* are pretty regularly spherical. A great many of the *Chondrospongiæ* and most *Cornacuspongiæ*, particularly the Horny Sponges, are quite irregular in shape. The distinctive features of the species appear as combinations of peculiarities which are very unimportant in themselves, but which combined characterise the form and enable one to identify the sponges.

The size of sponges is, like their shape, subject to great variation. The smallest sponges, excepting the doubtful *Physemaria*, are the most simple forms of calcareous sponges, the *Asconidæ*. The largest forms we find among the *Chondrospongiæ* and *Cornacuspongiæ*. There is in the British Museum a fragment of a cylindrical *Suffaria* from the West Indies, which is nearly $1\frac{1}{2}$ metres long and 20 cm. thick. The specimens of *Euspongia* from the Bahamas, particularly the flat, cake-shaped forms, sometimes attain a breadth of 1 metre and a height of 25 cm. The largest sponges known are the species of *Poterion* described by

Harting. They are high, elegantly vase-shaped sponges, which attain a breadth of $\frac{3}{4}$ and a height of $1\frac{1}{2}$ metres. Mr. Ramsay dredged a massive *Raphyrus*, which weighed several hundred-weight, on the east coast of Australia.

The colour of sponges is also very variable. Hexactinellid and Calcareous sponges are colourless, and appear brilliantly white, in consequence of the lustre of their spicules. Most other sponges have brilliant colours. Mimicry is rare. Only the forms which possess a sand cortex correspond in colour to the sea-bottom on which they grow. Most *Chondrospongiae* and *Cornacuspongiae* possess glaring colours, presumably for the purpose of warning and frightening other animals.

The changes of colour exhibited by certain sponges shortly after death are very interesting. Nardo drew attention to this fact in the case of *Aplysina aërophoba* as early as 1833. This sponge is bright sulphur-yellow in the living state, but when exposed to air, or fresh water, it changes this colour to dark blue.

The body of the higher sponges appears as a mass of mesodermal ground-substance, in which cells of various kinds are found. This mass is pervaded by a complicated system of frequently branching canals. All free surfaces are covered with epithelia. The canal system is transgressing, and is essentially different in this respect from the cæcal gastrovascular system of higher Cœlenterates. On the surface there are numerous small pores which lead into this canal system.

The entrances to the inhalent canals proper are not to be sought for in the pores of the skin, but lie in the floor of extensive subdermal cavities, into which the inhalent pores lead. Whilst the different parts of the subdermal cavities communicate with each other, the inhalent canals and their branches do not form any anastomoses in the interior of the sponge. They lead into the ciliated chambers, which are spherical or sac-shaped extensions of the canals, clothed with a peculiar epithelium of collared cells. The ciliated chambers possess very small inhalent pores, through which the water passes from the inhalent canal system; that is to say, the canals are very much constricted just before widening to form the ciliated chambers. The inhalent pores are more or less opposite to the exhalent pore, which is much larger and always single.

The canal system of different sponges is very differently developed. The form described above is that of the most highly developed sponges, the *Chondrospongiæ* and *Cornacuspongiæ*. The entodermal as well as the ectodermal epithelia of sponges always consist of one single layer of cells only. In this character the main difference between sponges and higher Cœlenterates is to be found. In the latter the epithelia always consist of several layers of cells, from the lower subepithelial layer of which all the organs are developed.

The epithelial cells of sponges are of two kinds only—flat pavement-cells and collared cells. Each epithelial cell possesses a cilium. In the most simple sponges, the sac-shaped *Asconidæ*, the ectoderm consists of a single layer of flat cells on the outer surface of the sponge, and the entoderm forms a single layer of collared cells on the inner surface of the sponge; flat entodermal cells do not occur in these sponges. Whilst in all, even the most highly developed forms, the ectodermal epithelium invariably consists of flat pavement-cells, we find in all sponges, with the exception of the above-mentioned group, two kinds of entodermal cells—collared cells and flat entodermal pavement-cells. The collared cells are confined to the ciliated chambers, whilst the whole exhalent canal system and the oscular tube are clothed with a low epithelium of flat pavement-cells.

In the *Hexactinellidæ* the collared cells are connected with each other by basal processes; but, as a rule, they are isolated. Their shape is very constant—long, cylindrical, with a long, projecting, more or less cup-shaped, hyaline collar, which appears as a marginal extension of the free end of the cell. The long flagellum is inserted in the middle of the cup formed by this collar. Whilst the collared cells always appear to be filled with readily stainable granular protoplasm, the hyaline plasma of the low, flat cells is confined to a mass surrounding the nucleus, from which protoplasm-threads radiate to the protoplasmic coating of the cell-wall. It seems that the only difference between the ectodermal and entodermal pavement-cells is their difference of height. The former are mostly slightly lower than the latter.

The function of the pavement-cells does not appear at first sight to be a very important one, because these cells are not completely filled with protoplasm. The collared cells in the ciliated

chambers, on the other hand, appear to be active elements which perform an important function.

The mode and process of nourishment in sponges is very doubtful. Feeding experiments with carmine have shown that not only the collared cells, as was previously believed, but all the epithelial cells indiscriminately possess the power of taking up fine particles. Infusoria, &c., have been observed in the amoeboid wandering cells in the interior of the body; but nothing definite is yet known concerning the mode of nourishment. It is quite certain that the sponge must extract organic substances and oxygen out of the surrounding water somehow, and that the epithelial cells, being the only elements in contact with the water, must perform that function. It is also evident that sponges cannot devour large animals, as the extremely fine sieves which cover the inhalent pores, and the very small pores which lead from the inhalent canals into the ciliated chambers, make it impossible for large animals to enter the sponge.

Even small Infusoria and Diatoms must encounter difficulties before they can reach the ciliated chambers. Great precautions are evidently taken to prevent all solid bodies from entering the canal system, and particularly the ciliated chambers. It is further quite clear that no nourishment can be taken up through the oscula, through which the water is continually flowing out. It seems to me most probable that the food of sponges is dissolved in the water, and that the sponge procures its nourishment from the water in the same way that plants absorb their nourishment from the solutions circulating in the soil.

Now the question arises, which cells perform the function of nutrition—the flat pavement epithelium of the canal-walls, or the collared cells of the ciliated chambers. The collared cells seem, from their situation and structure, best fitted for such a function. But it must be considered that, although none of the higher Cœlenterates possess nephridia, yet the ciliated chambers resemble kidneys so closely that it is not impossible they really are such. They can hardly have to perform the combined functions of segregating urea and of taking up nourishment. If we consider the chambers as nephridia we must assume that the flat, pavement-epithelium, and particularly the ectodermal clothing of the inhalent canals, performs the function of taking up nourishment. My own observations have brought me to this

conclusion. That nourishment can be taken up by indifferent ectoderm cells is shown by the tapeworm, which may be here used in illustration on account of its highly-developed nephridia.

The most probable explanation of the functions of the epithelia of sponges seems to me to be the following:—A constant current of water passes through the sponge. At the entrance to the canal system there are numerous inhalent pores, which are covered by very fine sieves; at the opposite end a few large oscula, through which the water is expelled, are observed. If the sponge fed on solid substances floating in the water the current would of course enter by the wide open oscula, and would be ejected through the small pores. Many experiments have shown that the water invariably enters through the small pores and passes out through the oscula. At the entrance to the ciliated chambers there is a further filtering arrangement, and the water current, caused by the movements of the cilia in the whole canal system, is here impeded. The water in the inhalent canals, outside the ciliated chambers, is consequently under slightly higher pressure and enters the canal-epithelium; here the substances necessary for the life of the sponge are taken up. Behind the pores which lead into the ciliated chambers—that is to say, in the chambers themselves—there is a lower pressure, in consequence of the increase in width of the canals towards the osculum. This facilitates the secretory function of the collared cells. As the sponge does not take up any solid substances there are no fæces, and the expulsion of useless substances devolves on the ciliated chambers. The epithelium of the inhalent canals is probably also respiratory in function. In this case the inhalent canals would represent digestive and respiratory organs, and the ciliated chambers nephridia.

As the process of nourishment is carried on endosmotically, a great quantity of useless material is probably absorbed together with the nutrient substances, and all this, together with the whole of the material oxidised in the sponge, must be extracted and expelled by the cells of the ciliated chambers. This may account for their high development in sponges, just as it accounts for the high development of nephridia in the tapeworm.

Sponges are distinguished from other Cœlenterates by their highly developed mesoderm, and the degree of differentiation attained by its elements. Whilst all the organs of the *Hydro-*

medusæ, Corals, and *Ctenophora* are ectodermal or entodermal, those of the Sponges are mesodermal. In the former the cells of the epithelia are differentiated; the epithelium of sponges is always simple. The muscles, nerves, gland-cells, &c., which we find in sponges are not modified epithelium cells, but differentiated elements of the mesoderm. There is no subepithelium in sponges. The same kinds of cells which we find in the *Epithelaria*, with the exception of the cnidoblasts, are also found in sponges. But here all cells which do not clothe the surface are of mesodermal origin.

Movements in adult sponges were observed by Aristotle. These movements are performed by cells which are called contractile fibre-cells by F. E. Schulze. They are elongated, spindle-shaped elements, which are mostly found around the pores. I have also found such cells in other parts of the sponge, and Sollas describes similar elements in the sphincters which divide the subdermal cavities of the *Geodidæ* from the inhalent canals.

The skeleton of the Sponges which belong to the order *Cornacuspongiæ* appears as a network of fibres, which are composed of series of spicules cemented together by spongin. *Reniera*, *Halichondria*, &c., possess only a very small quantity of spongin. In the *Chalininæ* and *Desmacidonidæ* the number and size of the spicules decreases, and the spicules are replaced by the spongin-cement more and more. In the Horny Sponges the siliceous spicules have disappeared entirely from the supporting skeleton, which consists exclusively of spongin—a substance identical with the cement of the *Halichondria* skeleton. There may be foreign bodies imbedded in the spongin-fibres. The spongin of different *Cornacuspongiæ* is not always the same; according to Ridley and Vosmaer it differs in different cases in its behaviour towards polarised light. The colour of the spongin is very variable; the cement of many *Halichondridæ* is hyaline, that of many *Desmacidonidæ* and *Spongidæ* light brown, of *Aplysillidæ* light orange and sometimes black. The horny fibres of the *Spongelidæ* appear light yellow and transparent.

The spongin of dry skeletons is, as a rule, darker than that of living sponges or spirit specimens; it is very tough and elastic. According to Krukenberg, the chemical composition of spongin is $C_{30}H_{46}N_9O_{13}$, and is thus similar to that of chitin, conchionin, and cornein. Spongin is dissolved by boiling acids, and,

according to Passelt, is decomposed when heated in air without first becoming sticky. My own experiments show that it becomes soft and sticky in superheated water (200°).

The spongin always appears in layers. It surrounds in concentric layers, of different refracting powers, the spicule-bundles of *Halichondridæ*, as it does also the axial thread or pith cylinder of Horny Sponges. It is secreted by gland-cells. These elements are pear-shaped, and similar to the gland-cells of the skin; the protoplasm is dense and granular, the nucleus large and spherical. The cells are attached by a slender peduncle to the surface of the fibre, they are pretty closely packed, and form a more or less continuous mantle investing the growing parts of the skeleton fibres. These cells have been termed "spongoblasts" by their discoverer, F. E. Schulze. They occur only on those parts of the fibrous skeleton which are still growing, and disappear as soon as the fibres attain their full size. The solid reticulate skeleton of the *Spongidæ*, known to everyone as the Bath Sponge, consists of a few thick, radial, so-called main fibres, between which a fine network of connecting fibres is spread out. In all the fibres we can distinguish an axial thread which consists of a granular substance, and which is surrounded by spongin. At the joining points of the fibres we see that the layers are not continuous, and that all the axial threads are not in connection with each other. The main fibres grow principally at the ends in length, and afterwards in thickness; the connecting fibres rapidly reach their full thickness, and do not grow in length at all. The axial threads, on the surface of which the spongin is precipitated, form a network, but they are in no connection with the axial threads of the main fibres. In the latter, foreign bodies are often found which are used by the sponge as material to build up its own skeleton, and which are cemented together with spongin. They are selected from the bodies which accidentally fall on the surface of the sponge, chiefly sand-grains, Foraminifera-shells, and siliceous spicules of other sponges.

Spermatozoa and ova are observed in sponges. The spermatozoa possess rounded or sharp-pointed, slender heads. They are formed by the continued fission of spherical mesoderm cells, derived from amœboid wandering cells. In the Calcareous Sponges these cells divide first into two—a sperm mother-cell and a covering cell. By continued division the spermatozoa

are formed from the former; the latter does not change, and surrounds the ripening sperm-ball. The mature spermatophores are often found in the walls of the ciliated chambers. In the Silicea no such structures are observed. The sperm mother-cells form by continued division sperm-balls without covering cell. The spermatozoa lie radially in the extended wall of the sperm mother-cell. In *Aplysilla* and many other sponges the sperm-balls accumulate in certain parts of the body, particularly in the trabeculæ and membranes, which are spread out in the basal or central lacunæ. They are often surrounded by a peculiar endothelium, clothing the cavities in which they are contained. This endothelium consists of irregular, flat cells, which lie in several layers one over the other. Farther outward these cells become more irregular, and appear to be separated by layers of intercellular substance, becoming very similar to the common connective-tissue cells. At the time of ripening, the spermatozoa pass into the canals and swarm out through them.

The ova are also derived from wandering cells. As they mature, they lose their mobility, increase in size, and become spherical, while the nucleus increases in size. The ripe ova are destitute of a thick cell-wall, and lie scattered or in groups in the mesodermal ground substance. They are often surrounded by endothelial capsules similar to those of the sperm-balls. In some cases the ovum appears to be attached by a special peduncle—a differentiated endothelial cell—to the capsule.

In the hermaphroditic sponges the ova and spermatozoa, to prevent self-fertilisation, do not mature at the same time. They are fructified within the body of the mother, where the first stages of development take place.

The most interesting and the least known organ system in sponges is their nervous system. The first person who pointed out that the sponges were sensitive was no other than Aristotle. A few years ago Prof. Stewart demonstrated Palpocils of *Grantia* at a meeting of the Royal Microscopical Society, but did not publish a description of them at the time. Subsequently I described certain elements in Calcareous Sponges, which I considered as nervous elements, and since then I have found similar sensitive cells in a number of species belonging to various groups.

Recently also Prof. Stewart has published a figure of his Palpocils, and as he has courteously allowed me to examine his

slides, I can now sum up our knowledge on this subject as follows:— In the circumference of the inhalent pores, or scattered irregularly over the outer surface, or in the membranes which traverse the lacunar cavities in the interior of the sponge, or also round the pores in the cribriform plates which cover the pseudoscula of certain tubular species, nerve-cells are found. They are rarely single, much more frequently in groups of from three to six. In *Grantia* high and slender conical processes are found on the outer surface. In the widened basal portion of these, oval cells are situated from which irregular processes radiate. One of these processes is much larger than all the others, and extends upwards in the form of a fine thread to the distal end of the organ. The other processes of the cell extend downwards. In each organ several such cells are found. These organs are the Palpocils of Stewart, who, not noticing the fact that they are polycellular, gave them that name. Possessing this extraordinary and most important peculiarity, I have termed them Synocils. It is remarkable that these structures have escaped observation hitherto, but it appears highly probable that the sponge has the power of retracting them, so that they are visible only under exceptionally favourable circumstances. It is very likely that the groups of cells previously observed by me, and described as sensitive, are nothing else than retracted Synocils.

The nervous system appears to be most highly developed in *Euspongia canaliculata*, where continuous zones of nervous tissue — sensitive cells above and ganglion cells below — are observed surrounding certain lacunose areas below the surface.

The collections made during the voyages of the 'Alert' and 'Challenger,' as well as my own labours in the Australian Seas, have extended our knowledge of the geographical distribution of sponges so that we are now able to form a general idea of it. Sponges occur in all seas. Those living at great depths are mostly cosmopolitan, while those which occur in shallow water are very different in various localities. The Tropical and Polar zones possess not nearly so rich a sponge fauna as the Temperate zone.

Besides thirteen families of *Hexactinellida* and *Lithistida*, which, being deep-sea sponges, are mostly cosmopolitan, there are thirty-three families of marine sponges which live mostly in shallow water, the distribution of which I will discuss. Of these, twenty-five are cosmopolitan, two occur in the North Atlantic, and

six in the Australian Seas only. The number of cosmopolitan genera is about twelve: 90 per cent. of the genera are limited to small districts.

The Australian Seas are the richest in peculiar genera and families, principally belonging to those groups which we consider as the most highly developed. Of the *Calcispongiæ*, the *Teichonidæ* and *Sylleibidæ* are confined to Australia, and the *Leuconidæ* are very plentiful. In the same way the highest *Chondrospongiæ*, the *Tethydæ*, are represented in the Australian Seas by seven genera, whilst from all other parts of the globe only three genera are known. The number of species of Australian *Chondrosidæ* and *Chondrillidæ* is likewise greater than from other parts. The *Keratosa*, the most highly developed *Cornacuspongiæ*, are represented by thirty-three genera, with more than two hundred species, in the Australian Seas; whilst only nine genera, with about fifty species, are known from other parts of the globe. The lower forms of *Cornacuspongiæ* are distributed pretty equally.

The *Ectyoninæ* and *Chalininæ*, which are rich in spongin, are prevalent in the Australian Seas, whilst the *Esperellinæ*, which possess very little spongin, are rare. The latter, as well as the *Choristidæ* and *Suberitidæ*, are most abundant in the North Atlantic Ocean. Australia, the land-fauna of which appears an age behind that of other continents, harbours on its shores the most highly developed sponge-fauna.

The localisation of the different groups of marine sponges appears particularly remarkable, considering that the fresh-water sponges are more or less cosmopolitan. The family *Spongillidæ* is represented in all quarters of the globe, and the common English fresh-water sponge, or very insignificant varieties of it, occurs everywhere. This is particularly remarkable in the case of Australia. Whilst the marine sponges on its coast are entirely different from those of the North Atlantic, the fresh-water sponges found in the isolated rivers of Australia are the same or very similar to those of our English streams, although the physical conditions are as different as they can be. This shows that the continued inbreeding of the fresh-water sponges caused by their isolation destroys their variability, whilst the continued hybridisation of the marine sponges causes a continual renewal of their variability, and further demonstrates that the efficient cause of the variability of species must be sought in their hybridisation.

NOTES AND QUERIES.

Death of Mr. John Gatcombe.—As an old contributor to this Journal the name of Mr. John Gatcombe, of Plymouth, will be familiar to our readers, and we regret to have to announce his death, which took place, at the age of 68, on the 28th April last. He was born at Knowle, in Somersetshire, but spent the greater part of his life at Plymouth. As might be inferred from the notes which he contributed from time to time to these pages, Mr. Gatcombe was a naturalist who delighted in the out-door observation of the habits of birds, and his intimate acquaintance with a large number of species rendered his notes always reliable. He was once lucky enough to meet with and secure a pair of the Alpine Accentor near Plymouth (Yarrell, i. p. 297). The keen interest which he took in Ornithology made him always willing to assist others with information, and the Editor can recall with gratitude many acts of kindness on his part in helping to clear up doubtful points, especially in connection with the seasonal changes of plumage in sea-birds, to which he had paid considerable attention. Should anyone be found to undertake a work on the Avifauna of Devon, Mr. Gatcombe's scattered notes will be found of material value in its preparation, and their republication in a collected and condensed form would furnish a pleasing memorial of a very worthy naturalist, who in a quiet way continually strove to further the interest of Ornithology in his own county.

MAMMALIA.

Hedgehog attacking a Hare.—A neighbour has recently (April 29th) told me of a strange capture of a Hare. He was crossing one of his fields late in the evening when he heard a Hare crying. He went in the direction, expecting to find one in a trap, but was astonished to come across one attacked by a Hedgehog, which was holding on to one of its hind legs. The Hare, a fully-grown one, seemed paralysed by fear, and allowed itself to be lifted up. Directly the Hedgehog was shaken off it died in my informant's hands, although the injury it had received from the bite of its assailant was but slight. Such a curious fact as this seems worthy of record.—MURRAY A. MATHEW (Stonehall, Wolfscastle, Pembrokeshire).

A Pied Hare.—In January last one of my friends shooting with me here in the big wood killed a Hare which had the whole of one side from nose to rump pure white, and on the other side a patch of white as big as one's hand behind the shoulder. I never before heard of a variety occurring in the woods here, even when they were full of hares and more than 150 were shot in a day. Now, when not more than thirty are killed in a day, the appearance of a variety is more curious.—J. WHITAKER (Rainworth, near Mansfield).

The supposed Serotine in the Newcastle Museum.—In 1884 I communicated to the Norfolk and Norwich Naturalists' Society a list of the Mammalia of the county of Norfolk, and, in instituting a comparison between the various published lists for the eastern portion of England from the Thames to the Tweed, I ventured to express an opinion (like yourself at p. 171 *supra*) that the Serotine mentioned in Messrs. Mennell and Perkins's 'Catalogue of the Mammalia of Northumberland and Durham' as having been killed at Cleadon would prove to be a Noctule. In August of the same year I paid a visit to the Newcastle Museum, and, through the kindness of Mr. J. Hancock, had an opportunity of examining the specimen in question, which proved to be, as you suggest, a Noctule. A note on the subject, contributed by Mr. W. D. Roebuck, will be found in the 'Naturalist' for April, 1885, p. 202. This is, I believe, the first recorded occurrence of the Noctule in the county of Durham, but Mr. Roebuck states that it is a common and widely diffused species throughout Yorkshire. In my notes on this species I find the earliest record I have of its appearance is March (no day), on one occasion only, but in most years about April 20th; whilst in 1871 I saw several on the evening of Sept. 19th; on another occasion others on Oct. 23rd; and in 1872 Mr. Frank Norgate sent me a specimen which he shot at Sparham on Nov. 5th.—T. SOUTHWELL (Norwich). [Some further notes on this subject unavoidably stand over.—ED.]

Reported Occurrence of *Vespertilio murinus* in Dorsetshire.—In your remarks on British Bats (p. 161) I am credited with having noted this species amongst the Bats occurring in Dorsetshire, but I cannot recollect having ever reported it. It has occurred to me, however, that you may have seen *Vespertilio murinus* recorded in my father's remarks on the 'Fauna of Dorsetshire' (first series, vols. 2, 3, and 4). If so, his notes are intended to refer to the Common Pipistrelle. The following I believe to be a correct list of the Bats found in Dorsetshire:—*Vesperugo noctula*, which is common (I found several some years ago in a hole of an old walnut tree); *Vesperugo pipistrellus*, which is also common; *Vespertilio nattereri*; *V. daubentonii* (abundant); *V. mystacinus*; *Plecotus auritus* (not common); *Synotis barbastellus*, also not common, though a few were found in the tower of the church when it was restored in 1875; and lastly *Rhinolophus ferrum-equinum*.—C. W. DALE (Manor House, Glanvilles Wootton).

[The occurrence of *R. ferrum-equinum* in Dorsetshire is mentioned in Bell's 'British Quadrupeds' (2nd ed. 1874, pp. 92, 93), in a communication from Mr. James Salter, who saw several and captured one in the haunted room at Tomson Manor House in September, 1865.—ED.]

Change of Habits in the Brown Rat.—The habits of the Brown Rat in England are sometimes very similar to those which it is said (p. 180) to have assumed in New Zealand. This is especially the case in summer, at

which season it is very fond of taking up its abode by the water side. It then feeds greedily on all the dead fish it can find, thus causing the Otter to be accused of much destruction of which it is not guilty. Pollard willow trees are very favourite abodes of the Brown Rat; I once found the remains of a full-grown Partridge in one of these dwellings. It also frequently makes its nest in thorn fences, not only in low-lying and wet lands, but even on high ground. The Brown Rat can dive and swim very expertly. It is far more common by the water side in summer than in winter, probably finding the water too cold at the latter season.—E. W. H. BLAGG (Cheadle, Staffordshire).

BIRDS.

Nesting of the Stock Dove in East Lothian.—Having been informed by Mr. McDonald, gamekeeper, Hailes, that a pair of Pigeons had taken up their abode among the crags of Traprain Law, and that he was certain that it was not the Ring Dove or the Rock Dove, I suspected it was the Stock Dove (*Columba anas*). On visiting the spot on April 9th I found my suspicion confirmed. The birds were very shy, but I managed to get a very good view of them. A number of Jackdaws were persecuting them unmercifully. Twice we saw one of the Stock Doves disappear among the rabbit-burrows on the steep face of the hill, and have no doubt that they were breeding there. We climbed up as far as possible, and observed one of them issue from the place where we saw it disappear. I picked up a feather, which I sent to Mr. Evans, of Edinburgh, and he pronounced it to be undoubtedly one of the wing-coverts of the Stock Dove. Mr. McDonald will, so far as he is able, see that the strangers remain unmolested. A specimen—the first obtained in East Lothian—was exhibited by Mr. Evans at a meeting of the Royal Physical Society on March 17th, 1886. It was shot near Longniddry in January, 1886, while feeding in company with a number of Ring Doves. A second specimen was netted, along with Ring Doves, in the same locality on March 5, 1886.—G. Pow (Dunbar, N.B.)

Plumage of the Tufted Duck.—Mr. Macpherson, writing under this heading (p. 112), says, "Perhaps Mr. Whitaker can throw some light on the subject." I can only say I have often noticed young birds of this species marked with white or dirty white about the face, these markings being usually small white patches at the base of the upper and lower mandibles. Others have the white extending from the bill to the eyes. These markings are invariably lost during the autumn, and are not reassumed till the bird is very much advanced in years, and then only in the females, so far as I have noticed. This marking in old birds must be very rare, as in the many hundreds I have seen I have only noticed it once; and Mr. Hall, who has shot these ducks for fifty years, was very much struck with it, he never having seen one before. I shall (all being well),

during the coming summer and autumn, have the opportunity of seeing a good many of these ducks, and will ascertain the percentage of these varieties. The Tufted Ducks are in full breeding plumage at the end of March, and have a very pleasant note, or number of notes, during the pairing-time. As nearly as I can render them they are "*tuc, tuc, tuck; quit, quit, quitta; wheeou, whit; quit, quit, quee.*"—J. WHITAKER (Rainworth, near Mansfield).

Blackcap in Co. Waterford in January.—I can supplement Mr. Ussher's note in the January number of 'The Zoologist' (p. 27). Since January 19th a male Blackcap frequented a garden in the suburbs of Waterford. He came several times daily to a window-sill of the adjacent house for food in the shape of crumbs and scraps of meat, which were spread there for small birds. With these he kept up a constant warfare, and with such success that they forsook the sill which he generally frequented. This bird was found dead on a gravel-path, close to its usual haunts, on February 13th, though there was no appearance of injury of any kind.—J. N. WHITE (Rocklands, Co. Waterford).

Wood Pigeons casting up Pellets.—Referring to Mr. Mann's note under this head (p. 193), I would suggest that probably the Wood Pigeon casts up "pellets" only at certain seasons of the year, *i. e.*, when it has been feeding upon certain kinds of food. A few days ago (May 14th) I found several "castings" of this bird, composed chiefly of the husks of oats. Rooks at this season eject a vast number of "pellets," composed of grain shells, and they never cast up pellets, I believe, when their diet does not consist chiefly of grain, unless possibly they reject the wing-cases of beetles, and other similar substances.—E. W. H. BLAGG (Cheadle, Staffordshire).

A new Egg-drill.—I have forwarded an egg-drill which was made for me by the Dental Manufacturing Company, 6, Lexington Street. I believe they call it a "burr," but it has to be specially made, for in a similar instrument used by dentists the point is not sharp (its use being, I believe, to enlarge cavities for filling). It is certainly far and away the best drill I have ever used, as an infinitesimal amount of pressure is sufficient to make the necessary hole. I may mention, not as an example of any skill on my part, but in commendation of the instrument, that I have bored a moorhen's egg with 175 holes without breaking the egg. I have also had a similar drill made, half an inch in diameter, for embryotomy in large eggs.—HERBERT LANGTON (115, Queen's Road, Brighton).

[We have tested the drill in question, for which we are much obliged, and have found it a very efficient instrument. It is so well balanced that with ordinary care fracture of an egg when drilling it is well-nigh impossible.—ED.]

REPTILES.

Varieties of the Viper.—I have just seen four Vipers, *Pelias berus*, which were killed on the hills in the neighbourhood of Reigate. In three of them the dorsal line was of a brickdust colour, but in one of them it was very nearly black. In all the specimens the ground colour was brownish yellow. The country folks here—and I daresay elsewhere—regard these varieties as distinct species, and call them the “red” and the “black” adder respectively. The “red adder” is credited with red eyes, and a greater fierceness of disposition and a deadlier poison-fang than the black variety. The difference of colour is also sometimes regarded as indicating a difference of sex, the “black adder” being the male. Is there any ground for this supposition? In the case I have mentioned the “black” specimen was undoubtedly smaller than any of the red ones. A full-grown mouse, perfectly undigested, was found inside the former.” These snakes were killed on account of their fat, for which chemists give—or used to give—five shillings an ounce. The fat is supposed to be a specific not only for adder-bites, but for all wounds and sores.—E. P. LARKEN (Gatton Tower, Reigate).

[If our correspondent would kindly procure some of these varieties, and forward them in “pickle-bottles” filled with spirit, they would be very acceptable for the Natural History Museum, South Kensington.—ED.]

CRUSTACEA.

Axius stirhynchus in Cornwall.—Mr. Fortescue Millett in March last obtained on Marazion beach, from under a stone just above low-water mark, a specimen of *Axius stirhynchus* (a female, in berry), which was placed alive in his aquarium. The occurrence (or rather the observation) of this crustacean on our coast is exceedingly rare.—THOMAS CORNISH (Penzance).

INSECTS.

Practical Entomology at South Kensington.—The Natural History branch of the British Museum in Cromwell Road has just received a most important donation from Lord Walsingham, consisting of a collection of Lepidoptera with their larvæ, mainly British butterflies (*Rhopalocera*) and certain families of moths (*Heterocera*), including *Sphingidæ*, *Bombyces*, *Pseudobombyces*, *Noctuæ*, *Geometridæ*, and *Pyrilidæ*. There is also a fine series of Indian species, collected and preserved at Dharmasala, in the Punjab, by the Rev. John H. Hocking, and specimens of Exotic silk-producing Bombyces, in various stages of their development, obtained mostly from Mons. Wailly. With very few exceptions, the British larvæ, which retain a most life-like appearance, and are placed upon models of the plants upon which they feed, have been prepared and mounted by Lord Walsingham

himself; the process adopted having been inflation of the empty skin of the caterpillar by means of a glass tube and india-rubber spray-blower over a spirit-lamp guarded by wire gauze. This has been found a simpler and quicker process, and one admitting of more satisfactory manipulation, than the alternative system of baking by means of heated metal plates or ovens. The specimens have mostly retained their natural colour, but in the case of the bright green species it has been found necessary to introduce a little artificial dry pigment. The whole collection consists of 2540 specimens of larvæ, belonging to 776 species, together with a series of the perfect insects of each species. As continued exposure to light is, unfortunately, most detrimental to the colour of insects, this collection cannot be exhibited permanently; but, for the advantage of those who would like to see it without any restriction, it has been placed in the entrance-hall of the Museum for a period of six weeks, from May 16th to June 25th, so as to include the Whitsuntide holidays and the Jubilee week.

Bees occupying a Bird's Nest.—When taking a walk through some woods near Taunton I came across a nest of the Long-tailed Tit, *Acredula caudata*, which was quite new, but when I came to look for the entrance I could not find one anywhere; so I removed the top of the nest (which was fully lined with feathers and ready for eggs), and found in the middle a piece of comb about the size of a plum, together with several wild bees. I have not unfrequently found old nests of the Wren occupied by Bees, but I have never before discovered newly-built nests tenanted by them. Has anybody else noticed this unusual habit?—A. H. BUCKLAND (4, East Street, Taunton).

SCIENTIFIC SOCIETIES.

ZOOLOGICAL SOCIETY OF LONDON.

May 3, 1887.—Dr. E. HAMILTON, 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 attention to two Polar Bears, *Ursus maritimus*, presented by Mr. Joseph Monteith; and to two Crested Ducks, *Anas cristata*, from the Falkland Islands, presented by Mr. F. E. Cobb.

Extracts were read from a letter addressed to the Secretary by Mr. Roland Trimen, respecting the obtaining of a second example of *Laniarius atrocroceus* in South Africa.

Mr. J. Jenner Weir exhibited and made remarks on a skull of a Boar from New Zealand.

A communication was read from Mr. G. A. Boulenger, containing the description of a new Snake of the genus *Lamprophis*, based on a specimen

living in the Society's Gardens, which had been presented to the collection by the Rev. G. H. R. Fisk.

A communication was read from Mr. J. H. Leech, containing an account of the Diurnal Lepidoptera of Japan and Corea, based on a collection recently made by the author during a recent entomological expedition to those countries. The total number of species in Mr. Leech's list was 155. In Japan Mr. Leech had discovered one new species, *Papilio mikado*, and in Corea four others.

Mr. R. Bowdler Sharpe gave an account of a second collection of birds formed by Mr. L. Wray in the mountains of Perak, Malay Peninsula. This collection contained examples of about fifty species, of which ten were described as new to science.

Mr. H. J. Elwes pointed out the characters of some new species of Diurnal Lepidoptera, specimens of which had been obtained by him during his recent visit to Sikkim.

A communication was read from Mr. Lionel de Nicéville, containing an account of some new or little-known Indian Butterflies.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

May 4, 1887.—Dr. D. SHARP, F.Z.S., President, in the chair.

The Rev. C. Ellis-Stevens, B.D., of Brooklyn, New York, U.S.A.; Mr. Frederic Merrifield, of 24, Vernon Terrace, Brighton; Mr. Henry Rowland Brown, B.A., of Oxhey Grove, Stanmore; and Mr. Coryndon Matthews, of Ivybridge, Devon, were elected Fellows.

Mr. Wm. Warren exhibited specimens of *Stigmonota pallifrontana*, *S. internana*, *Asthenia pygmaæana* (Hüb.), and *A. abiegana* (Dup.) (*subsequana*, Haw.).

Mr. Stainton remarked that the two last-named species, *Asthenia pygmaæana* and *A. abiegana*, both had white underwings, and were in other respects very similar. It was formerly thought that Haworth's *subsequana* was identical with the species previously figured by Hübner as *pygmaæana*; but now that the two allied species were critically examined it appeared that the species described by Haworth as *subsequana* was not Hübner's *pygmaæana*, but another species known as the *abiegana* of Duponchel, dating only from 1842, so that Haworth's name *subsequana* had priority by 30 years.

Mr. F. Pascoe exhibited a specimen of *Diaxis Taylori* (Wath.), taken out of the stem of an orchid—*Saccolabium caeleste*—growing in an orchid-house at Croydon, and received from Moulmein, in Burmah.

Mr. M'Lachlan exhibited nearly two hundred specimens of Neuroptera, in beautiful condition, collected by Mr. E. Meyrick in various parts of Australia and Tasmania, comprising about seventy species. There were between forty and fifty species of Trichoptera, including moth-like forms

from Western Australia, allied to *Plectrotarsus*, Kol.; and other species belonging to a group represented by *Hydropsyche Edwardsii* (M'Lach.). Among the Plauipennia the most remarkable insect was a new species of the singular genus *Psychopsis* (Newm.), from Mount Kosciusko, where it was common. Of Pseudo-Neuroptera there was a species of *Embiidæ* from Western Australia, and certain curious *Psocidæ* and *Perlidæ*. The Trichoptera appeared to be exclusively confined to *Sericostomatidæ*, *Leptoceridæ*, and *Hydropsychidæ*. Mr. Meyrick made some remarks on the localities in which he had collected the species.

Mr. M. Jacoby exhibited three specimens of a new species of *Xenarthra*, collected by Mr. G. Lewis in Ceylon; also a species of *Loxoprosopus* from Brazil.

Mr. C. O. Waterhouse exhibited a living example of an Ichneumon—*Ophion macrurum*—bred from a larva of *Callosamia promethea*, a North-American species of *Saturnidæ*. He also exhibited a number of wings of Lepidoptera denuded of the scales, in order to show the neuration for study, and explained the method he had adopted for removing the scales. The wings were first dipped in spirit and then placed in *eau de javelle* (potassium hyperchlorite). Mr. Waterhouse said he had sometimes substituted peroxide of hydrogen for *eau de javelle*, but the action was much less rapid, although the results were satisfactory.

Mr. Poulton observed that, although the pigment had disappeared, he thought the scales were not removed, but were merely rendered transparent; and he remarked that the discovery of some chemical for softening chitine had long been wanted to prepare specimens for the microscope. The discussion was continued by Mr. M'Lachlan and Dr. Sharp.

Mr. Slater read a note, extracted from the 'Medical Press,' on the subject of the poison used by certain tribes of African Bushmen in the preparation of their arrows. It was stated that a poison was prepared by them from the entrails of a caterpillar which they called "N'gwa."

The Rev. W. W. Fowler read a note received from Mr. J. Gardner, of Hartlepool, in which it was stated that *Dytiscus marginalis* possessed the power of making a loud buzzing noise like that of a humble bee.

Dr. Sharp said he was familiar with the humming of *Dytiscus marginalis* previous to flight, and thought it might perhaps be connected with an inflation of the body for the purpose of diminishing the specific gravity of the insect; he had noticed also that it was occasionally accompanied by the discharge of fluid from the body.

Mr. Wm. White read a paper "On the occurrence of anomalous spots on Lepidopterous larvæ." A discussion ensued, in which Mr. Poulton, and others took part.

Mr. Waterhouse read "Descriptions of new genera and species of *Buprestidæ*."—H. Goss, *Hon. Secretary*.



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FACTS IN THE LIFE-HISTORY OF THE POLLACK, *GADUS POLLACHIUS.*

By MATTHIAS DUNN.*

WHEN full-grown, Pollack have very peculiar traits, apparently combining in one species the habits of more than one of the *Gadidæ*, sometimes showing the intense love of locality of the Bib, and at another evincing all the wild and roving disposition of the Hake. Thus for months together in spring and summer Pollack generally live in a uniform hunt-and-rest life, congregating by day around the rocky ledges of the sea-bottom near the deepest water, circling around a certain spot, and often in such numbers as to appear like a living column standing in the sea. At such times these creatures seem to be resting or sleeping (as most fish sleep), probably with one half or more of their senses and functions of the body really at rest. When in this state Pollack will not attack or prey on the smaller fishes unless they come very near or within the circle.

With the night the scene changes; then, thoroughly awake, every Pollack leaves the circle, and, hungry and ravenous, each steals away to hunt on his own account. But few living fishes come amiss to their stomachs. With the morning light all return to their old haunts.

* Communicated to the Polytechnic Society, Falmouth. The names of fish adopted are those employed by Couch.

In the autumn this systematic life may be broken up at any time by the passing near to the reef of a shoal of Sprats, Pilchards, or Anchovies. The sight of these calls forth all the wolfish propensities of the Pollack, which steal away after them, leaving the ledge probably for ever to gorge on these small fry.

The autumn migrations of the Pilchard afford a grand time for the Pollack. Then almost every circle on the coast is broken up, especially in the undisturbed haunts around the Land's End and Scilly Isles, and they continue to follow the shoals along the coast, and often far up the English Channel, keeping to the high ground when seeking rest, but always with their eyes on the object of their pursuit, and seldom taking to settled life again until some time after spawning in March.

When catching prey the habit of the Pollack is to sneak along quietly until within darting distance of their object; then calling into use their powerful fins they dart like arrows on their victims. This is also their habit in taking the bait. There is no coaxing or waiting on the part of the fisherman for them to swallow it, as with the Hake or Conger; as a rule, they rush like a Salmon taking a fly.

As to the question whether the food of the Pollack is swallowed head or tail first, I think that all dead and wounded fish are taken into the stomach as they are found, but all live food is swallowed head foremost, those not caught in this way being turned in the mouth. There is more readiness with the mouth of fish than is generally supposed. I have seen Pollack stop short in their dart at food, and play it in and out of their mouths, as if tasting it, finally leaving it—such food being probably stale, or sodden with water. The chief reason why the Pollack swallows live food head downward is that it does not bite or tear its food in pieces like the Carnivora, but simply swallows it alive, often without a scratch. If the head were upwards in the stomach, no doubt the little fellows would force their way out again while the Pollack was in the act of securing other prey. How long they remain alive in the stomach of the larger *Gadidæ*—for all take their food in the same manner—it is difficult to say. I have known Pollack drawn up from a depth of eighty feet, and taken into the boat and killed, and on being opened I have seen Pilchards and Herrings taken alive from their

stomachs. These fishes must have been secured and swallowed some time before the Pollack took the fatal bait.

Young Pollack do not take to circling until above four pounds weight, probably in the third year of their existence. Before that time they may be found on any rocky bottom, but more especially where the ground is very rough near the shore.

When shoals of Sprats or Launces appear, the Pollack will congregate also in shoals, and with a rush attack them. An evening rout once seen will hardly be forgotten, for they will dart against the sides of a boat, if in the line of their attack, when on their hungry errand.

When about four months old, before taking the bait, they may often be seen to put their lips against the line, and in this manner to swim along and trace it up to the surface of the sea; they are seldom caught after tracing the line.

Again, on some of the extensive ledges off our coasts, it has been found that all Pollack do not concentrate on one spot, but several circles may be found on one ledge. That each fish in these circles has a knowledge of locality and of its own haunt may be learnt from the fact that the practical fisherman, in some instances, knows where these circles may be found, and will fish on the best of them when it suits his purpose; and although he may catch all the fish in one circle, and days may pass between his fishing on the other parts of the reef, it will be found that this has in no way lessened the numbers living in the other circles. Although, being night-feeders, the fish must of necessity, when hunting the ledge, pass by and over this depopulated haunt, the old associations are too strong for them to think of occupying it.

Many fishes have the power of changing their colour, and adapting themselves to the nature of the ground on which they are living. This has been noticed in the Pollack. Those living on the reefs where the long dark *Laminaria* sea-weed abounds will be found to be of a dark olive, varying very little from the colour of the weeds; while those found in deeper water, where the rocks are lighter, will be very much of their colour. This is also observable in young Pollack, which, when food is scarce, will entirely leave the rocky and weedy sea-bottom, and hover around the brown sands in which the Sand Launce takes up its night-quarters. It will then be seen that these Pollack are quite

brown in colour—in fact, are the very shade of the sand over which they have been swimming.

In the spring of the year the little red Pollack may be found inshore. They have a decided tinge of red in the fins, and sometimes streaks of red running down through the olive of the belly; while others are dark orange along the sides and belly, mottled with blue spots and streaks. Couch, in his 'British Fishes,' remarks on small Pollack being bright orange on the sides, caused by living in the shelter of the rocks clothed with sea-weeds. But this red colour can scarcely arise from this cause, seeing that three had a decided tinge of red when caught, and these were from the surface of the sea, not from the rocks. I have seen Pollack as much as seven pounds weight with a red tinge in the fins and red markings running down their sides.

A coating of transparent mucus envelopes the whole fish; in summer it is reduced to a very thin film; in winter it increases to more than the sixteenth of an inch in thickness, and no doubt protects the fish in cold weather.

DISEASES.—These seem to be very few in the Pollack. One form is the wasting of the liver, caused by the boring though it of the parasite, *Filaria piscium*. Another disease is like that which is so common to the Cod, Bream, Mackerel, and Garfish, *viz.*, curvature of the spine. Pollack affected with this disease seldom reach five pounds in weight, while full-grown, well-fed fish have been known to attain to twenty-four pounds.

PARASITES.—Very few of these are found on the Pollack, probably from their living so near to suitable places for scraping them off: the large close-standing stems of some of the olive sea-weeds and the projecting points of rock are admirably suited for this purpose. A very common expression with fisher-boys, when fishing for young Pollack near shore in clear water and expecting a bite, is, "Look out! I saw a Pollack turn bright side up." The idea conveyed is that a Pollack is close by, and may be expected to take the bait; and this turning "bright side up," which they often do, by scraping their backs along the weeds and rocks, is no doubt the act of raking off the parasites. I only know three parasites common to this species—the *Lepeoptheirus*; the young of a sessile-eyed crustacean belonging to a species of *Cirolana* (the latter is also found in great numbers in the Red

Mullet); and *Filaria piscium*, discoverable in the cavity of the belly.

ENEMIES.—Gulls and Guillemots destroy immense quantities of Pollack when very young—just after being hatched. When a month old they live on the surface of the sea, keeping close to all kinds of floating *débris*. At such times the sea-birds scarcely ever leave them. Porpoises also often attack them. It is nothing uncommon in clear water close to shore to see the Porpoises dart along the sides of the rocks and devour them. In the summer of 1878, when the fishing-boat 'F. H.,' of Mevagissey, was passing over the high ledges off the Gribben Head, Cornwall, the crew saw a shoal of Porpoises attack a circle of large Pollack, killing scores of them. They tacked the boat, and took up quantities of large fish, the Porpoises having destroyed more than they could eat. Sometimes when going at full speed a Porpoise will seize a Pollack, and play with it as a cat will with a mouse, and by some power unknown to me throw it three or four feet out of the water forward, the next instant catching it again in its jaws. I have known this done four or five times in succession with a Pollack of about three pounds weight. A Porpoise will sometimes seize a large Pollack by the middle with his powerful jaws, and other Porpoises will swim around and eat the poor victim alive from the mouth of the holder.

These savage creatures, no doubt, are the cause of the skulking habits of the Pollack, so annoying to the amateur fisherman; for this fish when hooked will, if possible, rush away from his enemies in among the large sea-weeds, or into some sheltered hole in the rocky sea-bottom, so that the amateur with his fine gear is often unable to draw him out. Our fishermen, when after large Pollack, go in the day-time where the fish are circling. The crew consists of two men, each provided with sixty fathoms three-quarter pound lines, with snooding six feet long. One of these is used without a sinker, the other with it. The lines used in this way will cover a greater amount of ground than any other from a stationary boat, and thus enable the fishermen to correct any slight error made in anchoring on the circling ground, as it is impossible to be successful in fishing by day unless the baits go right into the circle. The baits should be Mackerel, Pilchards, Cuttles, or young Bream.

A fisherman can always tell the kind of fish he has to his line

by its actions on the hook. Every fish has its own peculiar action: thus the Pollack when hooked starts off at a sharp angle for the sea-bottom, and if prevented from reaching it, will then try to get away by force, and acts very much like a flying kite on being pulled to the ground. The fishermen call it "shearing about." After failing to free itself by this mode, it suddenly turns and darts towards the boat, at the same time disgorging the contents of its stomach by turning it inside out, hoping by these means to clear out the hook.

For small Pollack the most successful mode of capture is "whiffing." This operation is carried on by two men; one rowing a small boat about two miles an hour, the other attending to one or two lines towed without sinkers over the stern. The bait should be a thin slice cut from the tail of a Mackerel or Pilchard; worms from the sea-beach or small eels; or artificial baits, as supplied by Header or Brooks, of Plymouth. The most successful "whiffer" I ever knew fished with an angling-rod over the quarter of the boat with the line weighted, the snooding entirely of catgut, and with artificial baits. Small fish are also often caught in trammels, ground-nets, and seines, when used for Mackerel and Red Mullet. Pollack a few months old will rise to the fly.

BREEDING.—In many fishes the procreative instinct is active some months before actual spawning commences, as in the Herring and Pilchard. This has been noted under two aspects. The first is extreme restlessness and change of locality, until a suitable spawning-ground is found. The second is a state of quietude, and only the taking of such food as will keep the body in its normal condition. These phases of life may be discerned in more than one species of fish. We can scarcely trace the former in the Pollack, but we believe we can the latter. For although so active and voracious in autumn, but little is seen of them in February and March, although from long observation we are certain March is the general time of those fish spawning off our coasts. That they are then living not far from land may be concluded from the fact that they may be found only a few miles off the coast in April, thin and hungry; while about the middle of the same month young Pollack, just escaped from the egg, may be seen on the surface of the sea, close to land. That the eggs float on the surface when shed seems probable, seeing

that the liver of a full-grown Pollack is very large, and contains several ounces of oil, all of which escapes among the eggs at the time of spawning, and no doubt helps to float them. It is also a fact that the oil leaves the liver of all the fish of the species at the time of spawning. Like all the *Gadidæ*, the Pollack carries a large number of eggs. I have found as many as four millions in the roe of a Pollack twelve pounds in weight. The time the eggs take to hatch cannot be stated with precision; but taking the 15th of March as the average date of the parent spawning, I have often seen young Pollack of a half-inch in length from the 15th to the 20th of April, which could not be more than from ten to fifteen days old. This will make the period of hatching from fourteen to eighteen days.

On the matter of spawning and incubation of fishes there is much to be said. Scientists tell us that the spawning of Salmon in the British Isles continues from September to January, and that the Herring may be found breeding off our shores in every month of the year. But this statement requires qualification; for although generally true, the facts do not apply to every coast, since each locality has its own especial time; thus it will be found that Herrings are always in spawn off Plymouth about the first of January, whereas at Mevagissey the great Atlantic Herrings do not spawn until the 10th of March. Possibly future researches may show that on other coasts the Pollack may spawn at some different time.

GROWTH.—On this subject I must refer to my specimens.

No. 1 bottle contains several young Pollack, from a half-inch to an inch long. These were caught in Mevagissey Bay on May 4th, about fifty yards from land, on the surface of the sea, close to some floating sea-weeds. The colours are not yet diffused, but held in spots and stars; the fins white and transparent; and no scales are found on them when under three-quarters of an inch in length. The largest are just an inch long, and two grains in weight. I estimate them to be about a month old.

No. 2 contains young Pollack caught near the same place, close to the bottom of the sea, on June 3rd. Taking the average of two of the largest, it will give a Pollack one inch and three-quarters long and eleven grains in weight. It will now be observed that they have all their fins and colours perfect, and are fairly on

the line of living as the parent fishes. These I estimate to be two months old.

No. 3 contains young Pollack caught at the same place as above, on July 6th. The two largest give an average fish of three inches long and sixty grains in weight, and estimated at three months old.

No. 4 contains young Pollack from the same place, caught on August 14th. These two give an average length of five inches, and 225 grains in weight, and are estimated to be four months old.

No. 5 bottle has two young Pollack caught at Mevagissey on the 25th of September, 1884. Average five inches and six-eighths in length, and 362 grains in weight. These are probably a little over five months old.

I give these lengths and weights with the greatest confidence, knowing they represent the monthly growth of the first Pollack which reached the shores around Mevagissey for the year 1885, and also, with very little change, in the same months for ten years past. These little creatures are as familiar to me as barn-door fowls are to the farmer. The figures show the increase in four months to be one hundred times their original weight.

I may here state that throughout my observations on these little fishes I have kept to those which first reach the shore, and these throughout the season, as a rule, are the largest. Some young Pollack do not float in for two or three weeks after the first, probably through contrary winds and tides, or later spawning; hence these will be behind the earlier examples in growth and condition throughout the season. Besides this there are the accidents of food, health, and other conditions, which keep some of the season's fish back to less than five inches in length up to November, and after this, like the Mackerel and Red Mullet, there is but little, if any, growth among the young Pollack until the following May. In further tracing their growth it will be seen that the summer is the time of their greatest development, and that some will reach maturity in the third and others in the fourth year of life.

NOTES ON THE ORNITHOLOGY OF NORTHAMPTONSHIRE
AND NEIGHBOURHOOD.

BY THE RIGHT. HON. LORD LILFORD.

Owing to the circumstances mentioned in my last communication on Northamptonshire birds (Zool. 1886, p. 465), and my leaving Lilford for Bournemouth (whence I now write) shortly afterwards, the following notes are given entirely upon the authority of correspondents, of whose good faith in every instance, and accuracy of identification in the great majority of occurrences quoted, I have not the slightest doubt.

October 8th, 1886. My brother saw two Golden Plovers on an old pasture near Aldwinkle. I heard reports of this species being seen in our neighbourhood in the latter half of September, but the above is the first appearance this autumn, of which I feel quite certain.

Oct. 15th. Four Teal were brought alive from our decoy, with twelve Wild Ducks.

Oct. 28th. Eight Fieldfares seen at Biggin, near Oundle, and Grey Crows,—“now in abundance since N.E. wind,”—at the same place, reported to me by my brother-in-law, Mr. T. H. Burroughes.

Oct. 30. Donald Mackay, gamekeeper at Aldwinkle, writes that one of Lord Lyveden's keepers flushed two Woodcocks near Brigstock on Sept. 26th.

November 1st. Colonel Irby wrote to me that he was assured by one of our game-watchers that he saw one of three Wild Ducks suddenly seized and taken under water by some invisible foe near Pilton Bridges, within a short distance from Lilford. I have no doubt that an Otter was the “secret agent” in this instance.

Nov. 5th. My falconer reported the sudden appearance about Lilford of a great number of Jays, the scarcity of which species till this date has been somewhat remarkable.

Nov. 6th. Sir Rainald Knightley wrote to me, under this date, from Fawsley, near Daventry, as follows:—“Last year we had a Night Heron—at least it was exactly like the picture of that bird in Gould. It remained here nearly all the autumn,

some two or three months, but left when the frost and snow came. But to my surprise, on my return from Scotland a few days ago, I found it (or another bird exactly like it) here again. I do not know how long it has been here, as I have been away from home for about five weeks." (Cf. my note of July 13th, Zool. 1886, p. 468). Sir Rainald adds, "Crested Grebe, *Podiceps cristatus*, have nested here last year and this."

Nov. 16th. I received a letter from Captain J. A. M. Vipan, of Stibbington Hall, near Wansford, in which he states, "Whilst out punting on the Wash, on October 28th, I killed a Red-throated Diver with the red-throat patch. I also killed a Black-throated Diver on November 12th—the first I have ever seen on the Wash."

In two letters, dated respectively Nov. 9th and 16th, Lieut.-Colonel G. Morgan, writing from his residence, Biddlesden Park, near Brackley, very kindly informed me that "The late Dr. Leith Adams once spent three days here. He was especially pleased with the Crested Tits, *Parus cristatus*, which we then had here, but I have not observed them for four or five years past." In the second letter he wrote, in reference to this species, "Curiously enough, my son saw one twice on Saturday last, and I believe I saw it myself on Sunday morning, but am not absolutely certain." Colonel Morgan's house stands in Buckinghamshire, close to the river Ouse, which there forms our county boundary, and as the post town (Brackley) is in Northamptonshire, I consider that I may fairly record this occurrence in these notes.

Nov. 14th. Thirty Wild Geese (sp.?) seen flying over Achurch in an easterly direction. Bramblings seen at Tichmarsh—first report of the species in our neighbourhood for this season.

Nov. 17th. Twenty-two Teal out of twenty-nine, and eighteen Wild Ducks, out of about one hundred, were taken in our decoy.

Nov. 18th. My falconer wrote under this date:—"I have seen eight Siskins and six Redpolls by the river (near Lilford) last week. These are not nearly so plentiful as they were last year."

20th. A Great Grey Shrike, *Lanius excubitor*, was picked up dead near Aldwinkle by Lieut.-Colonel Irby. My son,

who was present at the finding of this bird, wrote, "It had doubtless been taken with bird-lime, with which a twig close by was covered." This bird was sent for me to London to be preserved, and proved to be a young female.

December 9th. I received a very handsome and peculiar female hybrid of Common Mallard, *Anas boschas*, and Australian Wild Duck, *A. superciliosa*, from our decoy. The upper plumage, crown of head, back of neck, back, wings, and tail closely resemble those of the Common Wild Duck, but the characteristic buff superciliary streak of the Australian is strongly developed, and the whole of the lower plumage from chin to tail are of a rich creamy buff colour. I sent this interesting variety to the Natural History Museum, South Kensington. I may mention that I have for many years kept some of the Australian Wild Ducks upon the aviary ponds at Lilford, and that many of our Wild Ducks show "a strain" of that blood, but the specimen above described is the first *variety* of the cross that has hitherto come to my hands.

Dec. 30. Under this date my decoyman wrote:—"I caught seven Ducks on 29th, and left forty, and three Wigeon, in the decoy. There were three Red-headed Dunbirds, *Fuligula ferina*, in the decoy on 24th."

January 3rd, 1887. The Rev. W. Powys, Rector of Achurch, wrote, "I have just seen a Snow Bunting in my field." My falconer wrote:—"On December 27th a Peregrine Falcon soared over the courtyard for five minutes; her attention was taken up with the Kites and Buzzards (in the home aviary): she came within half gun-shot of me. I afterwards saw her chasing the Wild Ducks up and down the river."

Jan. 3rd. The decoyman reported fifteen "Grey Geese" (sp. ?), near Aldwinkle.

Jan. 5th. "Great flights of Sky Larks going southwards; snow seven or eight inches deep."—T. H. Burroughes, Biggin, Oundle.

Jan. 6th. Captain Vipan wrote to me from Sutton Bridge:—"My punter last Monday came across a *white* Mallard in a bunch of about 100. To-day some thousands of Larks passed over the Wash; all seemed very tired. There were also a good many Bramblings, one of which settled on my punter's head, fell off on to the floor of punt, and afterwards flew off;

some that I noticed on the floating ice seemed very brilliant in colour."

Jan. 7th. Colonel Irby wrote from Wadenhoe, "I saw a Redshank, *Totanus calidris*, on Wednesday." The Redshank visits our neighbourhood occasionally and irregularly, generally in August or September; but I consider its appearance there at this time of year, and in such severe weather, as well worthy of record.

Jan. 13th. A Waxwing, *Ampelis garrulus*, seen at Stoke Doyle, near Oundle, and reported to me on excellent authority.

Jan. 18th. My falconer wrote:—"About half-past four on the afternoon of 12th, when I went to take in the Goshawk from her block, I found her fighting with a Tawny Owl. I got hold of it at once, found that it was not much hurt, and placed it with the others (of the same species) in the Owl-house. I am glad to say it is quite well."

Jan. 24th. The same man wrote:—"I have often seen Tawny Owls on wing about here this winter before dark, which I think is very unusual for these birds."

February 1st. The decoy-man reported "quite 500 head of wildfowl—Ducks, Wigeon, Teal, and Pochards"—on our flooded meadows near Thrapston; the decoy impracticable from the depth of water and the floating ice.

Feb. 17th. One of my gamekeepers wrote:—"I have found six Green Woodpeckers dead of starvation from hard frost and snow. More Wild Geese than usual flying over this winter; I saw twenty-nine on Jan. 13th, and several more lots of eight or nine, of which I have not got the date."

March 16th. A young Puffin, *Fratercula arctica*, arrived alive at Lilford from the Rev. Sir F. Robinson, Bart., of Cranford, Kettering, who informed me that it was picked up near that place. This bird fed freely upon small fishes, and lived till April 2nd.

March 17th. Heard of Stock Dove sitting on her eggs at Lilford on 18th inst.

March 18th. The Hon. Thos. W. Fitzwilliam wrote:—"The Herons (at Milton, Peterborough) are about as numerous as usual, I think; about ninety-three nests now, but I do not think that all have built yet."

March 22nd. Chiffchaff first reported, by Colonel Irby.

March 25th. A male Pintail, which had been for many days apparently paired with a Wild Duck on our decoy-pool, disappeared.

March 26th. Tawny Owl's nest, with three eggs "hard set," found near Lilford.

March 29th. Sand Martin first reported near Lilford.

April 6th. My falconer wrote:—"Hearing that a strange bird had been shot at Winwick (about five miles from Lilford), on March 26th, I went over, and found it was a young female Peregrine. The shooter told me that he shot a Wood Pigeon, and before he had time to pick it up this hawk came from a great height, and was carrying her prize away when he shot, and slightly injured the first joint of her right wing. She looks well in health, and I think she will get all right in a short time." I purchased this Falcon, and heard from my man on April 13th that he put her on the wing (in a creance) on the previous day, and that there did not appear to be "much wrong" in her flight.

April 12th. Willow Wren first reported near Lilford. Mr. G. Hunt wrote to me from Wadenhoe:—"Towards the close of the proceedings (shooting Wood Pigeons over wooden decoy-birds), near Oundle Wood on 11th inst., a female Peregrine came flying high towards me, and seeing my lures, which were placed on a bare newly-sown field, made a terrific stoop at one of them, which was pegged firmly into the ground, and drove her hind claw into the neck of the dummy, knocked it some five yards off its peg, and then flew straight away, and I could see something was hanging from under her tail, and suspect she broke her foot with the violence of the collision. This was an old blue Falcon. I never in all my experience in 'coying' had a similar thing occur. On Easter Sunday I found a nest containing two young Stock Doves almost ready to fly; on the previous day I had seen some of this species in flocks—evidently travellers."

April 14th. A nest of the Barn Owl near Lilford contained four eggs. My decoy-man, who is an East Anglian, and ought to know the birds below mentioned well, wrote:—"I saw twenty Dotterel, *Eudromias morinellus*, on the 13th and three on the 14th April." This is the first well-authenticated occurrence of the Dotterel in Northamptonshire that has come to my know-

ledge, the only previous one being a somewhat hazy report of a bird of this species having killed itself against the telegraph-wires on the L. & N.W. Railway, near Thorpe, about forty years ago.

April 15th. My falconer wrote:—"I have ten young Wild Ducks hatched off on the 2nd, and since then two more sittings, all doing well. I heard young Rooks in the nests last evening, for the first time this year."

NOTES ON THE FAUNA OF ICELAND.

BY UNO VON TROIL, D.D.

[On taking up lately a somewhat scarce little volume entitled 'Letters on Iceland,' containing observations made during a voyage in 1772, by Sir Joseph Banks, Dr. Solander, Dr. Lind, and Dr. von Troil, we were struck by the remarks therein contained on the mammals and birds of Iceland, some of which, although written more than a century ago, are still of much interest at the present day. The alleged existence of the Wild Cat (doubtless a mistake), the herbivorous habits of the Fox, the introduction of the Reindeer from Norway in 1770, the breeding of the Wild Swan and the "Eider-bird," and the annual exportation of Eider-down, and of Iceland Falcons purchased by royal falconers, are matters on which some of our readers may be glad to have information. We accordingly give the following extract (pp. 140—147, ed. 1780) for their benefit. The "Letter" from which it is copied is addressed to Chevalier Ihre, and is dated "Stockholm, Oct. 3, 1774."—ED.]

BESIDES these [domesticated] animals, they have three kinds of dogs in Iceland, *fiar hundar*, or *lumbar*, shag dogs; and *dyrhundar* and *dverghundar*. As also tame and wild cats, which last are called *urdarkettir*; rats, white and brown foxes, some of which eat grass, and are on that account called *gras tofur*. To root out these animals, the king has set a premium of a rix-dollar upon every ten fox-skins that are sold to a merchant. The natives have likewise made an agreement, that whosoever destroys a fox's hole, together with the fox, the she fox, and their young, is to receive one rix-dollar, which the neighbours collect among themselves.

Reindeer were not known here formerly; but by Governor Thodal's order thirteen heads were sent from Norway in 1770,

by Mr. Perenson, merchant, ten of which died before they reached Iceland, for want of proper care; the three remaining ones thrive extremely well, and had calved three times before we came there; they do not want for food, as the country abounds with moss.

After having treated of their fishery and the breed of their cattle, I think this a very proper place to say something of their birds, which, particularly in regard to those of the aquatic kind, are very important to them.

They are found in great abundance everywhere on the coast; but the greatest number by far are caught in the few places where they breed. The eggs the Icelanders make use of themselves, as likewise the flesh, which is eaten by a great many of them; but with the feathers and down they carry on a very considerable trade.

It would be unnecessary to mention all the different sorts of birds, especially as there is scarcely any country where so many kinds, and such great numbers of them, are to be met with as in Iceland. Among the great abundance of geese, water-fowls, ducks, &c., &c., I will, however, say something of the Swan and Eider-bird.

It is known that the Swan belongs to the class of birds of passage; their numbers increase very much towards winter, though there is no scarcity of them at any time, as the greater part of the young breed constantly remain there. In spring we may often see an hundred of them in a flock, and frequently many more; and it is then thought that part of them advance yet further to the north, and make but a very short stay in Iceland. During the summer they resort to the lakes; but when winter approaches, and these begin to freeze, they remove to the sea-shores. Their eggs are gathered in the beginning of spring, which are large, and said to be very palatable. In August, when they lose their feathers, they are hunted on the lakes, where they are to be found at that time, with dogs trained to catch them alive. They are said to sing very harmoniously in the cold dark winter nights; but though it was in the month of September when I was upon the island, I never once enjoyed the pleasure of a single song. An old Swan has a fishy taste, but the young ones are reckoned among the best eatable fowls.

The Eider-bird is yet more useful to the natives, who consider it as a kind of treasure; and it is seldom heard that a prudent house-keeper shoots or kills any of them.

The Eider-birds generally build their nests on little islands not far from the shore, and sometimes even near the dwellings of the natives, who treat them with so much kindness and circumspection as to make them quite tame. In the beginning of June they lay five or six eggs, and it is not unusual to find from ten to sixteen eggs in one nest together, with two females, who agree remarkably well together. The whole time of laying continues six or seven weeks, and they are fond of laying three times in different places; in the two first both the eggs and down are taken away, but in the last place this is seldom done. Those to whom one of these places belong visit it at least once a week.

When they come to the nest, they first carefully remove the female, and then take away the superfluous down and eggs, after which they replace the female on the remaining ones, when she begins to lay afresh, and covers her eggs with new down which she has plucked from herself: when she has no more down left, the male comes to her assistance, and covers the eggs with his down, which is white, and easily distinguished from the female's; where it is left till the young ones are hatched, who in an hour afterwards quit the nest together with the mother, when it is once more plundered.

The best down and the most eggs are got during the first of their laying; and it has in general been observed that they lay the greatest number of eggs in rainy weather. As long as the female sits, the male is on the watch near the shore; but as soon as the young are hatched he leaves them. But the mother remains with them a considerable time after; and it is curious to see how she leads them out of the nest as soon as they creep out of the eggs, and goes before them to the shore, whilst they trip after her: when she comes to the water side she takes them on her back, and swims with them for the space of a few yards, when she dives, and the young ones, who are left floating on the water, are obliged to take care of themselves. [This mode of carrying the young to the water is adopted by the Razorbill, Guillemot, and other cliff-haunting birds, and it is remarkable that the Eider Duck should pursue a similar plan, instead of

imitating other ducks, which, as a rule, lead their young to the edge of the water, and, entering it before them, encourage them to follow in their wake. It may be observed, however, that when a Wild Duck, *Anas boschas*, nests, as not unfrequently happens, at a height from the ground (as, for example, in a pollard or on the top of a stack), she carries down her young when hatched either on her back between the uplifted wings, or else in her bill.—ED.] One seldom sees these birds on land afterwards, for they generally live on the damp rocks in the sea, and feed on insects and sea-weeds.

One female, during the whole time of laying, generally gives half a pound of down, which is, however, reduced to one half after it is cleansed. The down is divided into *thang-duun* (sea-weed down) and *gras-duun* (grass-down). The last sort is thought to be the best, and is cleansed in the following manner:—some yarn is streaked in a square compartment round a hoop, on which the down is laid. A pointed piece of wood is then moved backwards and forwards on the lower side of the yarn thus streaked, which causes the coarser feathers to fall through, while the fine down remains on the yarn.

Down plucked from dead Eider-birds is of little worth, because it has then lost the greatest part of its elasticity; for this reason it is of little value in Iceland. The other sort is sold at forty-five fish a pound when cleansed, and at sixteen fish when not cleansed. There are generally exported every year on the Company's account 1500 or 2000 pounds of down, cleansed and not cleansed, exclusive of what is privately exported by foreigners. In the year 1750 the Iceland Company sold as much in quantity of this article as amounted to 3745 banco-dollars, besides what was sent directly to Gluckstadt.

Among the land-birds that are eatable, Ptarmigans are not to be forgotten, and are caught in great numbers. Falcons, also, abound in the island, of which there are three sorts: they are purchased by the royal falconers, who give fifteen dollars a-piece for the white, ten for those that are darker, and seven for the grey.

ON THE SHEDDING OF THE CLAWS IN THE PTARMIGAN
AND ALLIED BIRDS.

BY LEONHARD STEJNEGER.*

THE fact of the Ptarmigans shedding their claws regularly every summer seems not to have been observed personally by any of the many excellent American ornithologists, and has therefore been comparatively little known to them. It may consequently not be without interest to demonstrate this process, as I have material at hand which shows the procedure very plainly.

The late Prof. Sven Nilsson, the famous Swedish zoologist, was the first to discover this peculiarity in the Ptarmigans. His countryman, Prof. W. Meves, afterwards confirmed his observations, and at the same time proved that this singular shedding of the claws also occurs in other birds of the family *Tetraonidæ*, as, for instance, in both sexes of *Bonasa bonasia*, *Urogallus urogallus*, and also, in the female at least, of *Tetrao tetrix*.

As will be seen in the specimens of the *Lagopus ridgwayi* (a new species which I was fortunate enough to detect on the Commander Islands, near Kamtschatka), shot in June and August, before shedding, the middle claw measures 18—20 mm., while in a specimen shot on the 23rd of August, and which has just thrown the old ones off, the length of the new claw is only 11 mm. More instructive still is a male, shot on the same day, as it has the claws only partially shed. The old claws have become loosened from their base, and are forced 2—3 mm. out, still covering the tip of the new ones, except on two toes, from which they have already dropped off. Hence it is obvious that the process is not a pathological one, in which the nail drops off as soon as it is perfectly separated from its bed, and has ceased to receive nourishment through the blood-vessels.

Most conclusive, however, is a specimen of a quite different species, *Lagopus albus*, a specimen collected by Dr. Bean, on Unga, one of the Shumagin Islands, Alaska. About this specimen Dr. Bean remarks, in his "Notes on Birds collected in Alaska," &c., in the Proc. U. S. Nat. Mus. 1882 (p. 163), as

* Reprinted from 'The American Naturalist,' vol. xviii. pp. 774—776 (1884).

follows:—"This specimen (shot on July 21st) corresponds very closely in most respects with number 33,548, a female from Norway, collected July 2nd, 1862; the claws, however, are considerably shorter than in the Norway example, and in all other specimens of *albus* in the Museum." Dr. Bean was kind enough to show me the specimen, when it was apparent that the extreme shortness of the claws was due to the fact that the bird had shed them just before it was shot, except on the right outer toe, on which the nail was so loose, however, that it dropped off, as I was a little too rough in handling it.

It will thus be seen that the shedding takes place in July or August, according to locality and other circumstances, at the time when the toes are most denuded—in fact, almost wholly naked—and the dark summer plumage is most complete. The claws grow very rapidly, however, and reach their full length long before the white winter plumage with the densely clothed toes is fully developed.

So far as is known, this process is confined to the members of the family of *Tetraonidæ*, mentioned above, when in the wild state, but Collett, in Christiania, has mentioned a case where a Quail, *Coturnix communis*, shed its claws in confinement, but this may have been due to some pathological process.

I am not aware that this peculiarity has been observed in any of the American *Tetraonidæ*, except *Lagopus albus*, but there seems to be no reason why it should not occur, at least in species living under conditions similar to those in Northern Europe and North-Eastern Asia. It is to be expected that we will soon hear of instances from this Nearctic Region also, when attention has once been directed to it.

No histological investigation has been made to ascertain the causes and the development of this unusual process (at least I am not aware that any results of such an investigation have ever been published), and consequently nothing is definitely known.

As to the use which the birds derive from this extraordinary elongation of the claws, I shall only quote Prof. Meves. He wrote in 1871 [Ofr. Sv. Vet. Acad. Forhandl. 1871, p. 772] as follows:—"They (*Lagopus* and *Tetrao*) have, all through the winter, to struggle with the snow upon which they are forced to walk. The snow is often loose, and with a foot like that of the

common fowl they would need much greater exertion of their strength in order to keep themselves on the surface. But as the Ptarmigan, by having the underside of the toes thickly coated with feathers, which can be spread out, and by means of the long and straight claws,—which may be compared with snow-shoes,—are enabled to run easily over the snow, the usefulness and the necessity of the lengthening of the nails is self-evident. In the genus *Tetrao* (= *Urogallus* + *Lyurus* + *Bonasa*) the lateral horny fringes of the toes render the same excellent service, and may fitly be regarded as a kind of snow-shoes. *During the summer this whole outfit becomes superfluous*, which may be the main cause of the periodical shedding." It may in this connection be mentioned that the horny fringes in Tetraones, and the thick feathers of the toes in Lagopodes, also moult during the summer, at which time the toes of the latter are almost wholly denuded of feathers.

NOTES AND QUERIES.

MAMMALIA.

Northern limit of the range of the Noctule in Great Britain.—In 'The Zoologist' for May (p. 170) attention was directed to the statement in Bell's 'British Quadrupeds' (2nd ed. 1874, p. 23) that the northernmost locality from which specimens of *Vesperugo noctula* have been received is Northallerton in Yorkshire, and it was suggested that the species named *V. serotinus* by Messrs. Mennell and Perkins in their 'Catalogue of the Mammalia of Northumberland and Durham' was more likely to be *V. noctula*. The specimen in question has been fortunately preserved in the Newcastle Museum, and both Mr. W. D. Roebuck and Mr. T. Southwell, who have examined it, agree in considering it to be undoubtedly *V. noctula*. The range of this species northward is therefore considerably extended beyond the limit assigned to it by Bell, and its occurrence in Durham, where the specimen in question was procured, has since been confirmed by the capture of another example in the same county, as reported by Mr. T. H. Nelson. Writing on this subject so recently as the 12th May last, Mr. Roebuck says:—"Referring to your remarks at p. 170 of 'The Zoologist' for May, I may mention that when in Newcastle in November, 1884, I was careful to examine the specimen which Mennell and Perkins recorded as *V. serotinus* in their 'Catalogue of the Mammalia of Northumberland and Durham,' and I came to the conclusion that it was

a Noctule, although the specimen had lost its colour and was much bleached. This view was apparently shared by Mr. Howse, the Curator of the Museum, and I believe also by Mr. Southwell, who drew my attention to the existence of the specimen, on hearing that I was about to visit Newcastle. I recorded my observations in 'The Naturalist' for April, 1885 (p. 202). It was taken in 1836 at Mr. Swinburne's house, between Harton and Cleadon, in Durham county, not far from Newcastle-on-Tyne. This occurrence is of interest as being the most northerly record for the Noctule, a species which is generally distributed and not uncommon in Yorkshire." Mr. Roebuck's remarks in 'The Naturalist' for 1885 (p. 202), to which allusion has been made, are as follow:—"In the Newcastle Museum there is a specimen of a Bat which was taken in the year 1836, at Mr. Swinburne's house, between Harton and Cleadon, in the county of Durham, and not far from Newcastle. It was recorded among the donations to the Museum as the Serotine, 'A species of Bat (*Vespertilio serotinus*), taken near Cleadon; Mr. A. Swinburne, 1836' (Trans. Nat. Hist. Soc., 4to, vol. ii.) It also figures as the Serotine in Messrs. Mennell and Perkins's 'Catalogue of the Mammalia of Northumberland and Durham.' The identification is, however, incorrect. Mr. Thomas Southwell, of Norwich, visited the Museum last year, and, after such inspection as can be given to a specimen in a closed glass case, considered it to be in all probability a Noctule (*Vesperugo noctula*). He wrote me to this effect in September. When, therefore, I visited Newcastle some weeks after, I was sufficiently interested to make inquiries on the subject, and found that Mr. Richard Howse, the Curator, had investigated the subject, and shared Mr. Southwell's view. He also showed me the specimen, and, after examination, I fully coincided in their opinion. The specimen is old and much bleached from exposure to light, but it seems to present all the external structural characters of the Noctule. The settlement of the correct name of the specimen is of interest from a geographical point of view from its being a northward extension of the range of the Noctule, which has not before been satisfactorily recorded for any locality north of the River Tees. Why it should not occur—and commonly, too—in the county of Durham is an enigma, for it is not only widely diffused throughout Yorkshire, but is a common species in that county." In a subsequent communication to the same periodical ('Naturalist,' 1886, p. 113), Mr. Roebuck remarked:—"The following item from the 'Durham County Advertiser,' February 26th, 1886, evidently refers to *Vesperugo noctula*, and is therefore of interest in view of the fact that Durham county forms the northernmost limit of its range. In the Duke of Cleveland's timber-yard in Winston Lane, near Barnard Castle, squeaks were heard while a workman was cross-cutting the trunk of a large oak near the roots. On the crevice being opened twenty-five 'rat bats' were found in a cluster.

The species is the largest known in this country. These measured, from tip to tip of the wings, from eight to ten inches, and the only sign of life was the exhibition of formidable teeth. Put into a cage and warmed they became animated, and were set at liberty." Supplementary to this notice, Mr. T. H. Nelson added the statement (*tom. cit.* p. 173) that Mr. C. E. Morgan, of the Flats, near Bishop Auckland, shot a Noctule while flying over the pond at the Flats during the summer of 1885. It remains to be ascertained whether any confirmation can be obtained of the reported occurrence of this species in Scotland.—J. E. HARTING.

Food of the Greater Horse-shoe Bat.—I send you some wings of Lepidoptera for identification from "the larder" of the Greater Horse-shoe Bat. The insects must have been captured on the wing or snatched off the leaves of trees (as is the habit of the Long-eared Bat), and after being carried to the captor's retreat (a cave near Tavistock) the wings, on being bitten off, fell to the ground, where they were picked up.—A. H. MACPHERSON (3, Kensington Gardens Square, W.).

[We have counted thirty-six wings belonging to four species of moth, namely, the Common Yellow Underwing, *Triphæna pronuba*, the Broad-bordered Yellow Underwing, *Triphæna fimbria*, the Pearly Underwing, *Agrotis saucia*, and the Herald Moth, *Scoliapteryx libatrix*. It seems a little curious that such large insects should be taken by so small a mouth, but the wings being clipped off, the bodies no doubt would be easily disposed of.—ED.]

Small Rorqual at Plymouth.—On May 16th a young female Lesser Rorqual, *Balænoptera rostrata* (Fabricius), was exhibited by some fishermen about the streets of Plymouth in a cart. It had been taken entangled in a mackerel drift-net by the Lowestoft fishing-smack 'Blue Bell' the previous week. The following are some of its dimensions:—Total length, from centre of tail to point of upper jaw around curve, 12 ft. 7½ in.; the mouth was propped open, but the men said the lower jaw projected four or five inches beyond the upper when closed, making it then fully 13 feet long; length of gape, 3 ft. 1 in.; width across mouth at gape, 1 ft. 9 in.; length of eyelids, 3 in., the eye being placed just above the angle of the gape; from point of snout to insertion of flipper, 3 ft. 4 in.; length of flipper, 1 ft. 10 in.; width of ditto, 6 in.; from point of snout to insertion of dorsal fin, 6 ft. 4 in.; width of dorsal fin, 8 in.; length of ditto, 8 in.; width of caudal fin, 3 ft. 1 in.; blowholes, two longitudinal slits 4 inches long and close together, situated at 1 ft. 8 in. from point of snout. The whalebone was only a few inches long, of a pale flesh-colour, fringed with whitish hair. The flippers were traversed by the white band which is distinctive of this species. The weight was estimated at 17 cwt. I have secured the skull and cervical vertebræ for the Museum of the Plymouth Institution. The

butcher who cut it up said that the gullet was not larger than that of a calf, and far too small to swallow a mackerel.—F. H. BALKWILL (3, Prince's Square, Plymouth).

BIRDS.

A Puffin in London.—On May 20th I received the skin of a Puffin, *Fratercula arctica*, which, strange to say, flew into one of the bedrooms of the house No. 45, Brook Street, Grosvenor Square, on the 16th of that month. It was alive when found, and the owner of the house, Sir John Walrond, Bart., had it killed, and presented it to a lady, who kindly forwarded it to me. It is curious that I rented this very house in the winters of 1884-5 and 1885-6, and no more distinguished visitor than a stray House Sparrow ever favoured me with a visit there.—LILFORD.

[From the nature of its haunts, and its strictly oceanic habits, the Puffin is one of the last birds one would expect to meet with in the Metropolitan county. Graves, in vol. ii. of his 'British Ornithology,' mentions the capture of a Puffin on the Thames, near Chelsea, in 1812, remarking:—"We are at a loss to conceive by what unaccountable accident this bird should have wandered so far from the coast, as the nearest place to which the species is known to resort is the cliffs at Dover."—ED.]

Puffin on the Thames in July.—I have in my collection a specimen of the Puffin, *Fratercula arctica*, which was shot on the Thames between Erith and Gravesend on June 12th, 1885. The beak of the bird is very abnormally shaped.—RILEY FORTUNE (Harrogate).

[See an article on the moult of the bill in the Puffin, published in 'The Zoologist' for July, 1878.—ED.]

The Missel Thrush occasionally a Bird of Prey.—During the dry weather which prevailed this spring, with easterly winds, I one day saw a Missel Thrush fly up to the nest of a common Song Thrush, take out a young one and carry it off to her own nest and feed her young ones with it. How she broke it up I could not see, but she appeared to be pecking it to pieces; and she continued her visits to the Song Thrush's nest until she had carried off every one of the four young birds which it contained. The old Song Thrushes made a great outcry while this was going on, which attracted my attention to the spot. I may add that the young Missel Thrushes were nearly fledged, and the young Song Thrushes only just hatched.—E. A. SANFORD (Nynehead Court, Wellington, Somerset).

Kestrel and Slow-worm.—My keeper's attention was recently directed to a small patch of gorse by a Blackbird's cry of alarm announcing the vicinity of some foe. He cautiously approached the spot, and found himself within a couple of yards of a male Kestrel in the act of dealing deadly blows upon the head and neck of a slow-worm, whose detached tail was wriggling about on the grass a few inches off, in contrast

to the body, which lay distended and motionless. The Kestrel was unaware of the keeper's presence until after an interval of some minutes, which gave him the opportunity of leisurely witnessing the scene. So precipitate was this bird's flight when it eyed the keeper that it did not give itself time to snatch up either the body or the tail-end of the Slow-worm, but went away empty-clawed. Such precaution was needless, as all winged "vermin" (Sparrowhawks excepted) enjoy full immunity here. They are all allowed to live and multiply. I sent for the remains on the day following, and on examination I found the upper parts of the head and neck had four deep wounds, each of which was sufficient to cause death. The broken extremity showed no marks of violence. It is possible the occurrence may have taken place through the natural contraction of the muscles and body, as occasionally happens, and from which habit it obtains the specific name of *fragilis*. The tail end, which the keeper was unable to find, had been taken away possibly by the Kestrel, which had a nest in the neighbouring covert. The length of the Slow-worm was thirteen inches.—J. C. MANSFIELD (Whatcombe, Blandford).

Nesting of the Marsh Warbler in Gloucestershire.—After the repeated occurrence of the Marsh Warbler (*Acrocephalus palustris*) at Taunton and at Bath, it is not surprising that it should turn up a little further north; and I have the pleasure of recording its nesting near Cirencester, in this county. The bird itself has not been noticed, but a nest was found about the middle of June, 1886. The finder was a son of Mr. Henry Plummer, farmer, of Liddington, near Cirencester, who cut out the nest, which contained five eggs. Working alone and without books on the subject, he had no idea of the prize he had found, until my attention was drawn to it recently. Two of the five eggs were sent me for comparison, and are of the common type of Marsh Warblers; indeed, but for the difference before blowing, I could hardly have picked them out again if once mixed with my stock of continental specimens. I have since visited the spot where they were taken, seen the other three eggs, and obtained the nest, which Mr. Plummer kindly gave me. It is about four inches in diameter externally, and barely three inches deep; the cup two inches in diameter, by one inch and three-eighths deep. It is composed almost entirely of fine roots and grass, with a few hairs in the lining, and one or two bits of wool and dead leaves outside. It was situated about three feet from the ground, and partly suspended from the lower shoots of a small elder bush and the undergrowth around it. This elder bush is one of several stunted bushes scattered through a long narrow withey bed on the bank of the Thames and Severn Canal. When I visited the spot a week ago, my companion found in close proximity a Reed Warbler's nest just completed, and a Reed Bunting's, containing four fresh eggs. The immediate neighbourhood I should consider highly suited to the species,

on one side being the almost disused Thames and Severn Canal, and, a few hundred yards off, the Thames, here a mere brook, having its source at Seven Springs, near Cheltenham, some fifteen miles to the north. The space between canal and brook is almost entirely occupied by meadows, with irrigation-ditches running over their surface. It may save trouble and disappointment if I state here that the above eggs are not for disposal. Mr. Plummer naturally desires to keep the three he has; the other two were given by him to Mr. Alfred Archibald, of Cirencester, through whose kind offices I was made aware of this interesting addition to our county avifauna.—H. W. MARSDEN (37, Midland Road, Gloucester).

Unusual Nesting-site for the Tree Sparrow. — On May 24th, whilst examining some exposed mole-burrows (many of which had been deepened or adopted by Sand Martins), in a brick-earth cutting at Kemsley, near Sheppy, I observed proofs that one of the larger holes had been taken possession of by some birds; in fact, at my approach a Tree Sparrow flew out almost in my face: on digging away the surface of the earth I exposed a nest lined with white feathers, and containing six perfectly typical eggs. It is well known that Tree Sparrows in this country usually select pollard willows as nesting sites, the nest being frequently placed in a hole between the young branches of the partly-decayed trunk; I have also found the nest in a hole in a large dead branch which had been cut off near to the trunk.—A. G. BUTLER (Natural History Museum).

Hawfinch nesting in Surrey. — On May 30th a nest of the Hawfinch (*Coccothraustes vulgaris*) containing eggs was found in the Leith Hill district of Surrey; the exact locality perhaps it is unnecessary to mention. The nest was built in the fork of an apple tree, about ten feet from the ground. Another nest of this bird was found here last year, but I am afraid it was robbed.—DAVID J. RICE (Coldharbour, near Dorking).

The "Grouse Disease." — Having lately had the opportunity of examining several dead grouse which were said to have died of the "grouse disease," I have been led to certain reflections which may possibly be of interest to your readers. I may divide the grouse fully examined into three groups:—(A). Two specimens examined on the 30th of last September, which were found dead on a moor in Yorkshire. These specimens were fairly nourished, exhibited no sign of disease, and had apparently no other parasite than the common tapeworm; the organs of these worms gave no indication of the cause of death. (B). One of several specimens sent from Ayrshire was particularly examined; in fair plumage, without marked signs of starvation, and with a well-filled crop, this bird showed an inflammation of the walls of the intestine of so marked a character, that—as I wrote to the Editor of 'Land and Water,' from whom I received the specimen—the cause of its death should be the study of a professed

pathologist; tapeworms were again found in the intestine. (c). A grouse received on May 24th from Sir W. Wallace, on whose moors the deaths have been terribly numerous, was in an extreme state of emaciation; its crop contained but three tops of heather, its liver was congested, and the contents of the intestine particularly fluid; tapeworms were present in rather stronger force than usual, and in the cæca I found the threadworm which was regarded by Dr. Spencer Cobbold as the cause of "grouse disease." Of A, then, it can only be said that they were dead; of B, that it was suffering from inflammation of the intestines; and of c, that it was starved, and contained Cobbold's worm. If, then, all three grouse died of "grouse disease," grouse disease must kill in at least three different ways, or under the term "grouse disease" more than one affection is included. The latter would appear to be the more reasonable supposition, and in that case it may be pointed out that the first thing to be done is to define much more strictly than has been done in the past what is meant by "grouse disease"; of all these birds, strict accuracy forbids our saying more than "they were dead." I have, however, been told more than once that there is a certain external diagnostic sign of the disease, and that is the loss of feathers from the feet; on that I should like to make two remarks. One follows the natural history of the group, and may be most briefly expressed in the words of Dr. Stejneger ('American Naturalist,' 1884, p. 776), "the thick feathers of the toes in Lagopodes also moult during the summer, at which time the toes of the latter are almost wholly denuded of feathers." [The article here quoted is of such interest to ornithologists that we have thought well to reprint it in the present number.—ED.] The other remark is, that a Ptarmigan, in which the denudation of feathers on the feet has gone on to a considerable extent, was examined by me this morning, and was found to be perfectly healthy, well-nourished, and free from helminth parasites. I conclude, therefore, that the loss of feathers from the feet is not, at this season of the year, to be taken as a diagnostic sign of any diseased condition of the bird. I cannot avoid the conclusion that the birds examined by me did not in any case primarily owe their death to helminth parasites; examination on the spot will best decide whether microbes play a part in the ætiology of the disease or diseases which are now causing such havoc in S.W. Scotland.—
F. JEFFREY BELL.

Hybrid Greenfinches.—Three more hybrid Greenfinches, in addition to those already recorded (*Zool.* 1883, p. 379), are worth mentioning, as proving the frequency with which this hybridism takes place in a wild state. The first of these was caught at Yarmouth in 1882, and may be seen stuffed and cased in the house of one of the birdcatchers there. It was noticed by Mr. G. Smith soon after being taken, and he agrees with me in considering that it is a hybrid between a Linnet and a Greenfinch, closely resembling Mr. Stevenson's hybrid (*Zool. l.c.*) of similar origin. The

second was sent alive to my father on the 15th November last from Cambridge, by Mr. F. Daggett, who states that he is quite familiar with this kind of hybrid from having obtained similar examples. This bird seems to be a male, like the Yarmouth one; it has the Linnet's head, but with rather a stouter beak than a Linnet; the colour of the head and neck is like a Linnet's, but the wings and tail are more like those of a Greenfinch. It is slightly darker than Mr. Stevenson's bird, and of rather a stouter build. The third specimen, which is also apparently a male, was caught with some Siskins at Taverham, near Norwich, on the 15th December last. It is a much yellower and more slender bird than the Cambridgeshire example, and in fact shows no colouring which can with certainty be assigned to the Linnet. In the opinion of its owner it is a hybrid between a Greenfinch and a Siskin. An instance of such a hybrid in captivity has been reported by the Rev. H. A. Macpherson (*Zool.* 1883, p. 339). I hesitate to express an opinion about it, but incline to think it is what the owner supposes. It must be borne in mind that the colour of the plumage in hybrids is not always a certain indication of parentage; this has been proved more than once in the case of hybrids bred in confinement, whose parents were known; but as the bird in question was caught with some Siskins there seems nothing improbable in the assumption that a Siskin was one of its parents. That the other parent was a Greenfinch is evident. I may add, for the benefit of those interested in Hybrid Finches, that a paper on the subject by Mr. Macpherson will appear in the forthcoming number of the 'Transactions of the Norfolk and Norwich Naturalists' Society,' in which every cross known to have bred in confinement will be noticed, with other particulars. — J. H. GURNEY, JUN. (Keswick Hall, Norwich).

Plover's Nests with five Eggs.—Plovers' nests containing five eggs are of sufficiently rare occurrence to be noticed, and amongst the large number of nests I have come across I have only found two with more than four eggs. One last year had five, all of which were of the same ground-colour, and the markings were so much alike that I am perfectly satisfied they were all laid by the same bird; the fifth egg was smaller than the others. Last week I found a second nest containing five eggs, four of which were long-shaped ones, rich dark cream-colour, with large dark blotches; the fifth was pear-shaped, very thick at the larger end, and with a paler ground colour and small spots. This egg was no doubt (as often happens) laid by a different bird.—J. WHITAKER (Rainworth Lodge, near Rainworth).

Jackdaw taking possession of Magpie's Nest.—On May 9th, whilst walking through a wood, I saw a Jackdaw leave what appeared to be a newly-built Magpie's nest, at the top of a tall larch-fir. Having ascended

the tree I found four eggs of the Jackdaw in the nest, which had evidently been built by Magpies this spring. The Jackdaws had much enlarged the hole in the roof, and had lined the nest according to their own ideas. About half a mile away another pair of Magpies have been ejected by a pair of Kestrels: this happened before the nest was completed.—E. W. H. BLAGG (Cheadle, Staffordshire).

Thrush's Nest without the usual Lining.—When birdnesting last week I found three Thrush's nests lined with grass instead of rotten wood; they all contained eggs, and were well made and much thicker than usual. I have seen many hundreds of Thrush's nests, but never one like these. If they had been on a moor, or in a town garden where rotten wood was scarce, I should not have been so much surprised, but they were in a wood of eight hundred acres, where abundance of the usual lining-material might be found.—J. WHITAKER (Rainworth, near Mansfield).

Habits of Rooks.—In 1885 my brother, Mr. J. S. B. Borough, reared a young Rook, which had fallen or been blown from a nest in the rookery in the park here. The freedom of this bird had never been in any way interfered with, but he is very tame with the few persons with whom he is on intimate terms, and rarely has missed coming daily to be fed in the outhouse in which he was reared. Last year we had every reason to believe that he nested and had a nest in the rookery in the park where he was hatched. This year, however, he and his mate belong to the thirty-six pairs or so which form the rookery round the house, and they built a nest in the smaller of two contiguous elms. I ought to say here that my brother and I know this tame bird when on the wing by a slight space about midway in his left wing, and on the perch by a small division in his tail-feathers, which prevents the tail from presenting the usual evenly rounded appearance. On April 11th my brother noticed that his bird carried food to and fed a bird sitting on a nest in the larger elm. He had also previously observed him carrying sticks to a nest other than his own. Since that day—which was I presume one of the first on which his second hen began to sit—the tame bird has fed both the sitting birds, as a rule, but not invariably, alternately. Yesterday (April 17th) I watched the two nests from 10 a.m. to 1.10 p.m., noting down all that occurred. During that time I observed that the tame bird fed his mates twelve times. His earlier mate, in the smaller elm, he fed seven times and the other five times. On four occasions certainly, and possibly on more, he took food—*i. e.*, raw meat or bread and milk—from the outhouse in which he is usually fed, but on one occasion I watched him fly into the meadows and return with a pouch full of food in a quarter of an hour's time. No other bird fed the two sitting hens or either of them during the whole of this time. On each occasion of his feeding them I identified our bird as he arrived or departed. The above facts show,

I think, that this tame Rook is polygamous or rather bigamous. I suppose that the "high living" which he has always enjoyed, and the ease with which he can procure food enough to satisfy two mates and himself, has caused him to undertake a task which would probably prove too much for the strength and food-providing powers of birds subject to natural conditions, and which is therefore seldom or never undertaken by them.—C. R. GAWEN (Chetwynd Park, Newport, Shropshire).

Young Dippers taking to the Water.—On April 11th I found a nest of the Dipper, *Cinclus aquaticus*, under a bridge near Chard. Some time afterwards, on my brother visiting the spot, one of the young ones deliberately dived from the nest, which was in the crown of the arch, and swam to the other end, a distance of several yards, and then landed and sat on the bank as if nothing had happened. As there seems to be some doubt whether Dippers readily take to the water or not this observation may perhaps be of interest to your readers.—A. H. BUCKLAND (4, East Street, Taunton).

Swallow in Somersetshire in December.—In 1885 I saw a Swallow on the down at Clifton, close to the river, in December. It was before the 7th—and I think on the 3rd—of that month. It was a clear day, and though there had been a sharp white frost the night before, there were a good many gnats about.—E. R. CLUTTERBUCK (Monks, Corsham, Wilts).

Cream-coloured Courser in Cardiganshire.—A specimen of the Cream-coloured Courser, *Cursorius isabellinus*, was shot by me on the 2nd October last, at Ymyslas, near Borth, Cardiganshire, on the estuary of the Dovey. As the skin has been seen and identified by Mr. Nelson, of Bishop Auckland, and Mr. Nicholson, of Manchester, there can be no doubt about the species.—A. HOOTON (Kersal Towers, Higher Broughton, Manchester).

Food of the Spotted Flycatcher.—In Latham's 'General History of Birds' (vol. ii. p. 323) I find the following remarks on the Spotted Flycatcher:—"This species frequents orchards where cherries grow, of which they are said to be very great destroyers. Hence in Kent are known by the name of cherry-suckers." Can any of your readers confirm this statement? I have always considered the Flycatcher to be, as its name implies, an insectivorous bird.—WILLIAM E. BECKWITH (Eaton Constantine, Ironbridge, Salop).

Norfolk Plover nesting in Nottinghamshire.—Within a few fields of this house, I am delighted to say, a pair of Norfolk Plovers, *Ædicnemus crepitans*, are nesting this year, and the owner of the farm they are on is taking every care that they may not be disturbed. I am glad to say a pair reared their young there last year.—J. WHITAKER (Rainworth Lodge, near Mansfield).

Autumnal Migration of Birds at Teesmouth.—By the middle of October (1886) the autumn migration was in full swing; Larks, Goldcrests, Blackbirds, and most of the regular winter migrants were constantly arriving. The first Fieldfares were seen on the 9th, Woodcock on the 11th, and Short-eared Owl on the 16th; while Hooded Crows were very late with us; I did not observe any until the 20th—generally they arrive during the first week of October. On the 14th, while out in a boat, I noticed great numbers of sea-birds—Gulls, Gannets, Skuas, Guillemots, and Razorbills. The Gulls were principally Kittiwakes, *Larus tridactylus*. Guillemots and Razorbills passed continuously to the south-east in small flocks of from three or four to fifteen or twenty, and all around us for miles we could see birds flying. Amongst others we shot an adult Gannet, three Richardson's Skuas, *L. parasiticus* (one adult and two immature), and a male Great Skua, *L. cataractes*. The last named is a rare bird in this district; Mr. Mussell, the birdstuffer at Redcar, tells me he has never before had one through his hands. It is many years since there was such a remarkable abundance of bird-life off Redcar; I never before remember having seen such a number and variety of species at one time. Several of the fishermen said they had not seen so many Skuas since the great flight on October 14th, 1879—just seven years previously. I saw one Pomatorhine Skua, and the next day several of these birds were flying over the rocks before a south-east gale. It is quite probable that the commotion amongst the birds at sea might be attributed to the impending storm: the Guillemots, particularly, seemed to be in great haste, hurrying away as though for dear life. I have frequently noticed that sea-birds seem to possess a remarkable instinctive knowledge of approaching change of weather, and there is a great deal of truth in the saying that "To be a successful wildfowler a man should be also a weather prophet." On October 15th, a strong south-east gale blowing, many Gulls and Skuas passed over the rocks to the north-west, as also a few Ducks; and, on the same day, I saw a large flock of Green Plover crossing from seaward and flying high to the south-west. On the 16th a Red-throated Diver, *Colymbus septentrionalis*, with part of the red-throat patch remaining, was shot off East Scar. On the 18th the wind was strong from the north-east, with heavy rain, and several Velvet Scoters, *Edemia fusca*, were swimming outside the breakers; two rose and flew past over the sands, when I secured one of them. In the afternoon I shot another Velvet Scoter from Redcar Pier; it came ashore with the flowing tide, and proved to be a young male. On the 19th it was still stormy; Ducks, Larks, Woodcocks, Owls, Goldcrests and other small birds, crossed in considerable numbers. In the afternoon a young male Scaup was shot near the pier. On the 20th great numbers of Hooded Crows and Larks crossed. On the 21st, at West Scar, I secured a young male Long-tailed Duck, *Harelda glacialis*. On the same day two female Long-tails were shot at East Scar. Hooded Crows and

Ducks passed during the morning. On the 22nd there was a great rush of Larks all day, and a few Hooded Crows. On the 23rd I saw a Great Northern Diver, *Colymbus glacialis*, outside Salt Scar, but could not get within a hundred yards of it. In the early part of November, Mr. A. E. Pease, M.P., killed a female Goosander, *Mergus merganser*, in a small runner near Guisbro', and about the middle of the month Mr. R. F. Chilton shot a large female Great Northern Diver at the Tees-mouth. Mr. Chilton informed me that it weighed close upon twelve pounds, which I can quite believe, judging from the size of the bird. There has evidently been a flight of Shore Larks, *Alauda alpestris*, on the coast. Twelve or fifteen were killed during the first week in December; on the 10th two more were shot on Coatham sands, and on the 11th Mr. Emerson shot three at the same place. I examined ten or a dozen examples, and found all of them to be young birds.—T. H. NELSON (North Bondgate, Bishop Auckland).

Food of the Smew.—It is generally admitted that all the Mergansers subsist chiefly on fish, and such has hitherto been the writer's experience. Smews, in particular, almost always contain remains of small fishes, less frequently aquatic insects; and though the diving ducks often yield on dissection no further results than a few small pebbles, the Smews are rarely obtained when fasting. On a recent occasion a Smew proved to have eighteen minnows in its gullet, while the stomach contained the remains of others. It may therefore be worth while to record that a Smew of the year, purchased in Leadenhall on March 25th, contained no remains of animal food, but the stomach held a small quantity of digested vegetable matter. An adult opened a month earlier contained a small eel, which was quite intact.—H. A. MACPHERSON.

The Ancestry of Birds.—If birds are developed from amphibians or pre-amphibians, and if Prof. Huxley is right, as I believe he is, in supposing that the connection of mammals with amphibians is neither through reptiles nor birds, we come to this: that amphibians or pre-amphibians have furnished the common stem whence reptiles, birds, and mammals have diverged. In that case there is an end of that group, "Sauropsida," which the birds are alleged by Prof. Parker to "culminate." But, further, amphibians are certainly more closely allied to reptiles than to either birds or mammals. Cuvier's system may therefore be justly reverted to, and the Amphibia or Batrachia be considered as the lowest division of the Reptilia, which I do not for one moment doubt is the true classification.—*Prof. Cleland in 'Nature.'*

REPTILES.

Colour and Size of Adders.—Is there any truth in the assertion, which I have often heard, that the colour of Adders depends upon the kind of soil on which they live? I am disinclined to accept this theory, as

I have seen Adders of very different colour living on the same kind of soil, and have seen them killed within a few yards of one another. I am speaking of the country about Dorking and Leith Hill, and there I used to see them of various colours—dull yellowish brown, with the dorsal spots dark brown; lighter yellow, with red spots; reddish grey, with red spots; very light greenish grey, with black spots; and some almost black all over. I never saw the handsome dark red variety. As far as I can recollect, they have all red-coloured eyes. I should much like to know the size that Adders have attained to. The largest I killed, and which I measured before it was quite dead, was 26 inches, and I saw two others killed about the same time and place, which were both 24 inches. These sizes are undoubtedly above the average, but I fancy that considerably larger ones have been obtained. The 26-inch one was dull yellow, with dark brown spots, and on being captured gave out a strong smell, which fact I have never seen alluded to in any book. One of the other two was a little darker in colour than the one just described, and the other was very light grey, with jet-black markings, just out of his old skin, and one of the handsomest I ever saw. When the yellowish red ones are “clean moulted” they look very like a gold bracelet, when coiled up, basking in the sun. I kept some alive for several months, and tried to entice them to eat with all sorts of dainties, such as small frogs, mice, young birds, slugs, lizards, and bread-and-milk; these—with the exception, of course, of the last-mentioned dish—I used to give them alive, but they refused everything except two unhappy lizards. These they certainly ate, although I did not witness the operation. I kept them in a large box, with perforated zinc in the sides and a sliding glass top; sand, stones, and moss inside. I used to let them out to have a run occasionally, and always picked them up by their tails to put them back into their box. When carried by the tail they are harmless, as they are unable to curl up to reach the hand, although they make strenuous efforts to do so. But I should be very sorry to attempt to pick up by the tail a wild Adder without first pinning him to the ground with a stick on his neck. Referring back to the Lizards which I gave them, I observed that they evinced signs of great terror on being introduced to the Adders, rushing about frantically in all directions, as if they very well knew what an Adder was; and I have no doubt that they are constantly preyed upon by Adders in a wild state. I hope that this will be borne out by others who have studied these interesting, and to my mind handsome, creatures, as I have not yet seen anything but mice reported as their food. In catching Adders on the move with a forked stick, one must aim well forward, or a clean miss will be the inevitable result. They can be carried home dangling to a string tied round their necks.—G. E. LODGE (5, Verulam Buildings, Gray's Inn).

FISHES.

Lumpsucker on the Welsh Coast.—The occurrence on this coast of the Lumpsucker, *Cyclopterus lumpus*, may be worth recording. Two examples were washed ashore, about the middle of May, in the Traeth back, a tidal estuary near Port Madoc. The smaller of the two, which appeared quite fresh, measured about thirteen inches in length. The other was considerably larger, but much damaged by sea-birds. A specimen of the Sea Wolf, *Anarchicas lupus*, about three feet long, said to have been taken off Barmouth, was obtained from a fishmonger at Port Madoc in May. I have not met with either of these fishes before on this coast, and believe they are not common here.—G. H. CATON HAIGH (Aber-iâ, Penrhyndendraeth, Merionethshire).

INSECTS.

Bees occupying Birds' Nests.—The occurrence mentioned by Mr. A. H. Buckland (p. 238) I do not think is very uncommon. I have frequently found birds' nests thus tenanted. Occasionally the nests have been new ones, but in these cases I have no doubt that they had been robbed and deserted by the birds previous to the bees taking possession. The nests I have usually found thus inhabited have been those of the Meadow Pipit, Hedgesparrow, and Robin, and, on one occasionally only, a Wren's.—RILEY FORTUNE (Alston House, Harrogate).

 SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

April 7, 1887.—WM. CARRUTHERS, F.R.S., President, in the chair.

The following gentlemen were elected Fellows of the Society:—Mr. Hunter J. Barron, Mr. James H. Dugdale, and Mr. Edward B. Poulton.

A series of photographs, taken instantaneously from life, of the White Stork, *Ciconia alba*, were exhibited by Mr. Edward Bidwell. These had been executed in Germany, and most accurately represented the birds during the breeding season. Not only were the nests, young thereon, and old birds well shown, but the remarkable attitudes assumed preparatory to alighting and commencing flight, as well as the peculiar twist of the neck in calling, &c., were most instructive.

Dr. Francis Day showed and described some malformed Trout in an early stage of development.

An important botanical paper on the Gentians was read by Prof. Huxley.

ZOOLOGIST.—JULY, 1887.

April 21, 1887.—WM. CARRUTHERS, F.R.S., President, in the chair.

Mr. W. Isaac Spencer was elected a Fellow of the Society.

Mr. Patrick Geddes read a paper "On the Nature and Causes of Variation in Plants and Animals." The fact of organic evolution is no longer denied, but its physiological factors have not yet been adequately analysed. Even those who regard natural selection as at once the most important and the only ascertained factor of the process admit that such an explanation being from the external standpoint—the adaptation of the organism to survive the shocks of the environment—stands in need of a complementary explanation which shall lay bare the internal mechanism of the process,—*i. e.* not merely account for the survival, but explain the origin of variations. The relative importance of the external and internal explanation will moreover vary greatly in proportion as variations are found to be "spontaneous,"—*i. e.* in some given direction continuously. Avoiding any mere postulation of an inherent progressive tendency common to both pre- and post-Darwinian writers, the definite analysis of the problem starts with that conception of protoplasm which is the ultimate result of morphological and physiological analysis,—*viz.* to interpret all phenomena of form and function of cells, tissues, organs and individuals alike in terms of its constructive and destructive ("anabolic and katabolic") changes. While the external or environmental explanation of evolution starts with the empirical study of the effect of human selection upon the variations of animals and plants under domestication, the internal or organismal one as naturally commences with the fundamental rhythm of variation in the lowest organism in nature. It also investigates the nature of the simple reproductive variation upon which the origin of species as well as individuals must depend, before attempting that of individual variation. The interpretation of all the phenomena of male and female sex as the outcome of katabolic and anabolic preponderance is shown largely to supersede the current one of sexual selection, and in some cases at least that of natural selection; *e. g.* the specially important one of the origin of such polymorphic communities as those of ants and bees. In such cases natural selection acts not as the cause of organic evolution, but as the check or limitation of it, and acquires importance rather as determining the extinction than the origin of species. The process of correlation, especially that between individuation and reproduction is mooted by the author, and its application to the origin and modification of flowers, &c., outlined. A discussion is given of the embryological and pathological factors of internal evolution, with an outlined application of the whole argument to the construction of genealogical tree of plants and animals.

A report was read "On the Gephyreans of the Mergui Archipelago," by Prof. Emil Selenka, of Erlangen; this communication, dealing chiefly with a technical description of the species, a few being new.

May 5, 1887.—WM. CARRUTHERS, F.R.S., President, in the chair.

Mr. Ernest W. Forrest and Mr. George Perrin were elected Fellows; Mr. W. Hadden Beeby, Mr. Adolphus H. Kent, and Mr. J. Medley Wood (Natal) were elected Associates; Prof. Dr. Geo. Aug. Schwenfurth of Cairo, Prof. Count Hermann Solms-Lanbach of Gottingen, Dr. Franz Steindachner of Vienna, M. le Dr. Melchior Treub of Buitenzorg, Java, and Prof. Dr. Augustus Weismann of Freiburg, were elected Foreign Members of the Society.

The Auditors elected to examine the Treasurer's accounts were Mr. F. Victor Dickins and Mr. George Maw on behalf of the Fellows, and Mr. J. Edmund Harting and Mr. A. D. Michael to represent the Council.

Mr. J. R. Willis Bund exhibited specimens in spirit of the Rainbow Trout, *Salmo iridens*, which had been reared at the Hatcheries of the Fish Culture Establishment at Delaford Park. He pointed out the great difference in size of members of the brood which were of the same age, having been reared from eggs of the same batch. He mentioned that circumstances tended to show that it was a migratory fish, hence as such the value of its introduction into this country as a Stream Trout would be materially diminished.

A Report on the Alcyonaria and Gorgoniæ of the Mergui Archipelago, by Stuart O. Ridley, was read, and in which a number of new forms were described. The author states that, looking at the Alcyonarian fauna of the Burmese coast generally, we find that it is in no way behind that of any other part of the Indian Ocean so far as known. Judging from the present collection, it would seem to be rich in the soft fleshy Alcyonid section—e. g. *Spongodes* and *Lobophyton*, &c.—while the Gorgonias are also fairly represented in new species, and one new member of the family *Melithaidæ* is now added, viz. *Mopsella planiloca*.—J. MURIE.

ZOOLOGICAL SOCIETY OF LONDON.

May 17, 1887.—Prof. W. H. FLOWER, LL.D., F.R.S., President, in the chair.

The President read some extracts from a letter which he had received from Dr. Emin Pasha, dated Wadelai, November 3rd, relating to some skulls of the Chimpanzee from Monbottu, to some portions of the skeleton of individuals of the Akka tribe, and to some other objects of natural history which he had forwarded (*via* Uganda) to the British Museum of Natural History.

Mr. A. Thomson exhibited some specimens of a rare *Papilio* (*P. porthaon*) from Delagoa Bay, reared in the Society's Gardens.

Prof. Howes exhibited a drawing of a head of *Palinurus penicillatus*,

received from M. A. Milne-Edwards, and remarked on the assumption of antenniform characters by the left ophthalmite shown in this specimen.

A paper was read by Mr. W. F. Kirby, Assistant in the Zoological Department, British Museum, entitled "A Revision of the Subfamily *Libellulinae*, with descriptions of new Genera and Species." The last compendium of this group was published by Dr. Brauer in 1868, in which forty genera were admitted. Mr. Kirby now raised the number to eighty-eight, all fully tabulated and described in his paper, which likewise included descriptions of fifty-two new species. Mr. Kirby gave a short sketch of the characters of the *Libellulinae*, and more especially of the neuriation, which he considered to be of primary importance.

Mr. R. Bowdler Sharpe read the third part of his series of notes on the Hume Collection of Birds, which related to *Syrnium maingayi*, Hume, and to the various specimens of this Owl in the British Museum.

A communication was read from Mr. A. Smith Woodward, on the presence of a canal-system, evidently sensory, in the shields of Pteraspidian fishes. Mr. Woodward described a specimen which seemed to prove that the series of small pits or depressions upon the shields of these ancient fishes, observed by Prof. Ray Lankester, are really the openings of an extensive canal-system traversing the middle layer of the shield.

A second communication from Mr. A. Smith Woodward contained some notes on the "lateral line" of *Squaloraja*, in which it was shown that the "lateral line" of this extinct Liassic Selachian was an open groove supported, as in the Chimæroids, by a series of minute ring-like calcifications.

June 7, 1887.—E. W. H. HOLDSWORTH, Esq., F.Z.S., in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of May, and called attention to a Tooth-billed Pigeon, *Didunculus strigirostris*, brought home from the Samoan Islands, and presented to the Society by Mr. Wilfred Powell; to two Red-spotted Lizards, *Eremias rnbro-punctata*, obtained at Moses' Well, in the Peninsula of Sinai, and presented to the Society by Mr. G. Wigan; and to a small scarlet Tree Frog, *Dendrobates tytophaphus*, from Costa Rica, presented to the Society by Mr. C. H. Blomefield.

Mr. Sclater called attention to examples of two North-American Foxes now living in the Society's Gardens, which he referred to *Canis velox* and *C. virginianus*.

A communication was read from Mr. A. O. Hume, C.B., containing some notes on *Budorcas taxicolor*, the Gnu-goat or Takin of the Mishmee Hills, and some remarks on the question of the form of the horns in the female of this animal.

A communication was read from Mr. E. Symonds, containing notes on various species of Snakes met with in the vicinity of Kroonstadt, Orange

Free State, specimens of which had been forwarded to Mr. J. H. Gurney, and determined by Dr. Günther.

Mr. Martin Jacoby gave an account of a small collection of Coleoptera obtained by Mr. W. L. Sclater in British Guiana.

Prof. G. B. Howes read a paper on an hitherto unrecognised feature in the larynx of the Anurous Amphibians. This was the existence in many individuals of various species of a rudimentary structure, which appeared to correspond to the epiglottis of Mammals, and which in some instances attained a remarkable development as an organ of voice.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

June 1, 1887.—DR. DAVID SHARP, F.Z.S., President, in the chair.

Mr. Philip Crowley exhibited the following specimens of Diurni, from the Kareen Hills, Burmah:—*Papilio Zaleucus*, Hew., *Papilio Adamsoni*, Smith, *Papilio* ? sp. (male and female), and *Nymphalis Nicholii*, Smith.

Mr. T. R. Billups exhibited several specimens of an ant found at Kew, frequenting a species of palm from Tropical Australia, and which had been determined as *Tapinoma melanocephalum*; also living specimens of *Carabus auratus*, from the Borough Market, and of a species of *Blaps* from Northern Africa.

Mr. Waterhouse exhibited a specimen of a Brazilian Locust, *Conocephalus* ? sp., which he had for some time preserved alive, and which had only died that same morning. He called attention to the change of colour which he had observed in the eyes of this insect; in a bright light they were dirty white or horn-coloured, with a black dot in the middle; but at night, or if the insects were confined in a dark box, they became altogether black; shortly after death, also, the eyes became black. Mr. M'Lachlan observed that he had noticed a darker spot in the centre of the eye in certain Ephemeridæ, and in other Neuroptera. The discussion was continued by Dr. Sharp and others, but no one seemed to be able to account for the alteration in question.

Lord Walsingham exhibited specimens of *Cateremna terebrella*, Zk., a species lately taken in Britain, which he had caught in Norfolk, and bred from fir-cones gathered in the same locality.

Mr. Meyrick read two papers, "On Pylalidina from Australia and the South Pacific" and "Descriptions of some exotic Micro-Lepidoptera." In these papers about sixty new species were described. A discussion ensued, in which Dr. Sharp, Mr. Stainton, Mr. M'Lachlan, and others took part. Mr. Meyrick stated that, as far as the Pylalidina were concerned, Australia could not be regarded as a separate region, for a large number were not endemic, but appeared to have been introduced from the Malay

Archipelago. The method of this immigration seemed doubtful. Mr. Meyrick was of opinion that the insects flew very long distances, and effected a settlement through their food-plants being widely distributed and common. He instanced the undoubted immigration of certain Australian species into New Zealand, a distance of 1200 miles. Mr. Stainton adduced the instance of *Margarodes unionalis*, which is a South-European insect, feeding on the olive, yet is occasionally found in Britain.

Mr. Meyrick exhibited, in connection with his papers, *Oxychirota paradoxa*, Meyr. (unique specimen representing the family Oxychirotidæ), *Epharpastis dædala*, Meyr., and *Mixophyla erminea*, Moore.

Mr. Meyrick also made some observations on the distribution of the insect fauna in the various regions of Australia; he said that it appeared to be more or less different in certain defined portions of the continent, which might be roughly regarded as oases in the midst of desert districts: all his observations, however, had tended to upset Mr. Wallace's theory that Eastern and Western Australia were originally separated, as the gradations in the insect fauna from east to west were quite gradual; in Western Australia the Tineina were the only group well represented by peculiar endemic forms.

Mr. Pascoe read a paper "On the genus *Byrsops*," a genus of Curculionidæ.

The President announced that Lord Walsingham's collection of Lepidoptera and larvæ, recently presented to the nation, would be exhibited in the Hall at the Natural History Museum, South Kensington, until the end of June.—W. W. F.

NOTICES OF NEW BOOKS.

A Nomenclature of Colours for Naturalists, and Compendium of Useful Knowledge for Ornithologists. By ROBERT RIDGWAY, Curator, Department of Birds, U. S. National Museum. 8vo, pp. 130, with ten coloured plates and seven plates of outline illustrations. Boston, U. S.

SOME five years ago the present writer, in advocating the desirability of adopting a standard of nomenclature for the description of the colours of natural objects, remarked:*

"In the Animal Kingdom the number of colours is very great. They often form the most striking feature in the external appearance of species, and hence have been considered by

* Proc. Zool. Soc. 1882, p. 391.

systematists as affording distinguishing characters of much value. But an object may be described as of one colour by one person, and be taken by another person for quite a different tint; for the names of colours are frequently misapplied, and one name is often indiscriminately given to many colours. Hence arises an uncertainty in reading and a perplexity in writing a description which would be obviated were some standard of nomenclature available for general reference.

“So long ago as 1821 there appeared a manual the utility of which seems to have been quite lost sight of, owing, perhaps, chiefly to the fact that it has long been out of print and difficult to procure, namely, Werner’s ‘Nomenclature of Colours,’ edited by Syme.”

This work, excellent in principle, was designed to meet the very want which he now ventured to express, but which was hardly experienced at the date of its publication, inasmuch as it was not then the general practice to publish the careful and detailed descriptions of species with which we are now familiar.

Assuming the want of such a standard nomenclature, and the desirability of satisfying it, the writer was of opinion that the publication of a new edition of Werner’s Manual, under the auspices of the Zoological Society, would ensure a speedy adoption of the standard, and would be the means of obviating in future the confusion hitherto prevailing for want of it.

The suggestion having been taken up by Mr. Ridgway, and carefully considered, has resulted in the publication of the volume now before us. It is not a new edition of Werner’s Manual, however, but an entirely original work, divided into two parts, and covering a much larger field than that traversed by Werner.

Part I., on the Nomenclature of Colours, contains remarks on the principles of colour; on colours required by the zoological or botanical artist; and includes a comparative vocabulary of colours, in seven languages; and a bibliography containing the titles of seven works only, the subject being one on which it would seem that very little has been published.

Part II., entitled the “Ornithologist’s Compendium,” includes a glossary of technical terms, and tables for converting millimetres into English inches and decimals, and *vice versa*. Seventeen plates show the various shades (which are named) of all the

primary colours with their combinations, and figures illustrating the internal anatomy and wing-surfaces of a bird, colour markings, egg contours, and a comparative scale of measurement standard—a veritable *multum in parvo*.

With regard to the patterns of colours, we find about twenty shades of each represented on each plate in small oblong squares, with the names immediately below them, and on the opposite page an indication of the colours which when combined will produce them. On the whole the result appears satisfactory, but we may point out that the plates being hand-coloured there must obviously be a risk of variation in different copies of the book—a difficulty which was obviated in Werner's Manual by having every shade of colour printed in sheets which were cut out into small pieces of the size required, and pasted on to the plates. In addition to this, and in order to illustrate his meaning better, Werner gave the name of such species in the animal, vegetable, and mineral kingdoms as have the particular shade of colour mentioned—an excellent plan to prevent misconception which Mr. Ridgway might have adopted with advantage.

Another point for criticism which occurs to us is this: in naming and figuring a particular colour, it seems to us that Mr. Ridgway's views do not always coincide with popular notions on the subject. To take various shades of *green*, for example: his "malachite-green" (No. 6) does not correspond to the colour of that mineral, which resembles rather what he names "viridian green" (No. 8), or "sea-green" (No. 5), while his "pea-green" (No. 9) reminds us rather of the dried than of the fresh pea, and his "emerald-green" (No. 16) is not the colour of an emerald. It may perhaps be said that these are really the shades which are known to artists and artists' colourmen by these particular names. If so the author must be absolved from blame, and we can only regret that the nomenclature has not been more accurately determined.

Mr. Ridgway's book in many respects will be found extremely useful to working naturalists, and the adoption by them of his standard of nomenclature, by securing uniformity, will obviate in future a deal of misconception which at present arises whenever the colours of a new species are loosely or inconsiderately described.



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THE SLEEP OF THE DORMOUSE, *MYOXUS GLIS*.

IN 'The Zoologist' for May, 1882, we gave a translation from the German of an interesting article on this subject contributed by Dr. A. Rabus to 'Der Zoologische Garten.' A further contribution to the subject by Prof. Forel has since appeared in the 'Révue de l'hypnotism,' and as this journal is not likely to come under the notice of many of our readers, they may perhaps be glad to see the article in question in an English dress. We have accordingly translated it, premising that while the observations of Dr. Rabus relate to our well-known *Myoxus avellanarius*, those of Professor Forel have reference to its congener, *Myoxus glis*, a common species in the South of Europe. Prof. Forel says:—

“While residing at Munich I was offered two Dormice, whose owner wished to get rid of them after having been bitten. He gave them to me in winter, and I was much astonished at not receiving them in a state of sleep. On the contrary, they were quite active—a circumstance which I attributed to the heat of the room. I put them in a large wire cage from five to six feet high, in the centre of which there was a small fir tree. I also allowed the little creatures the run of the room. Throughout the winter they continued lively and active, eating an enormous quantity of walnuts and hazel-nuts. As soon as one of them had laboriously gnawed one through, the other came stealthily and tried to take it away from him. They were always spiteful, ever ready to bite. After having been fed all through the spring they became very

fat, and I was not a little astonished to see them one after another, in the month of May, fall into their lethargic sleep, which, according to all I had read in books, ought only to have occurred in winter under the influence of cold. They became as slothful as little bears—their movements got slower and slower; finally they squatted in a corner and became completely lethargic.

“In this condition their temperature became lowered, their respiratory action became slower, and their lips presented an ashy appearance. The little animals, placed in the open air, and at first more or less rolled up, ended by remaining half extended on their backs; nevertheless on being pricked they made certain reflex movements, especially a feeble grunting or whistling, and by dint of exciting them I was able for a moment to instil a little life into them. But as soon as I left them quiet they relapsed into their lethargy. I then made a rather curious experiment: I took one of the Dormice and placed it on the top of the little fir tree in the middle of the cage. Although it was asleep it was sufficient to make it touch a slender branch with the plantar surface of its paws to excite a reflex contraction, which made it grasp the branch which it would instinctively have done if awake. I then let go, leaving him thus suspended to his branch. He relapsed by degrees into somnolency. The muscles of the grasping paw slowly relaxed, the plantar surface extended began to hold the branch only at its extremity near the claws, and I feared my Dormouse was going to fall; but at the moment of losing its equilibrium a sort of instinctive spasm shot through its nervous system, and another paw seized the lower branch next within reach in such a way that the animal only came down a peg. Then the same performance was repeated. The Dormouse relapsed into sleep at first, the foot slowly relaxed its hold up to the moment of letting go, when the other paw caught hold of a lower branch; thus it descended, sleeping without falling, the whole way down the fir tree from top to bottom, until it reached the floor of the cage, where it remained in a state of lethargy. I repeated the experiment several times with the two Dormice, always with the same result; neither of them ever allowed itself to fall.

“The sleep of these Dormice—occasionally interrupted by a day or a few hours awakening, more or less complete, during

which time they ate a little—lasted the greater part of the summer, and by degrees entirely ceased in the month of August: they had slept throughout the greatest heat of June and July. Towards the end of this lethargic sleep they became considerably attenuated, though less so, however, than one would have expected. Their body temperature taken during their lethargic sleep was from 20 to 22 degrees centigrade.

“From these facts it clearly results that the so-called winter-sleep of the Dormouse cannot be directly due to the lowering of its temperature; perhaps the state of their nutrition—the amassing of fat in their tissues—is the cause, or one of the principal causes. But it seems that this condition, whatever its cause, is akin to catalepsy and hypnotic sleep. On this account it seems to me that the study of hypnotism in the Dormouse possesses considerable interest, and I should be glad if the perusal of these remarks were to give rise to further useful experiments.”

ORNITHOLOGICAL NOTES FROM OXFORDSHIRE IN 1886.

BY OLIVER V. APLIN AND A. H. MACPHERSON.

JANUARY.—On the 2nd, besides fifty or sixty Mallard and Duck, sixty-five Pochards and five Tufted Ducks were seen upon Clattercutt Reservoir. A male Merlin was shot close to Oxford in the early part of the month. Sparrowhawks were common throughout the winter about Oxford, when they might almost be called winter visitors, as they are very scarce in summer. A variety of the Song Thrush, having the top of the head pure white, was shot on Headington Hill, and is now in M.'s collection. A male Lesser Spotted Woodpecker was shot at Great Bourton on the 9th. A Coot, frozen out, was captured in a garden on the outskirts of Banbury on the 21st. A grey Goose of some kind was seen flying over Banbury on the 23rd. A large flock of Fieldfares at the end of the month frequented the vicinity of Clattercutt Reservoir, coming down to drink at one or two unfrozen holes, the ice around being considerably discoloured by them. A rather light-coloured Short-eared Owl, the only one heard of during the winter, was shot near Wroxton on the 27th. Some very large flocks of Wood Pigeons were observed in the

north of the county at the end of the month; on the 30th, two flocks winging their way to roost in the Aynhoe Woods must have numbered two hundred each.

FEBRUARY. — A very dark-coloured male specimen of the Common Buzzard was trapped at Horton on the 5th. A male Bittern was shot at Merton on the 8th. A Waxwing was seen by Mr. W. Wyatt on the outskirts of Banbury on the 13th; he was able to get pretty close to it, and watched it for some time; Mr. Wyatt is well acquainted with the bird, having preserved two or three specimens. A specimen of that unusual visitor to Oxfordshire, the Dipper (now in F. C. A.'s collection), was shot by a small stream in the northern extremity of the county, near Farnborough, on the 20th. A pied variety of the Jackdaw was shot near Oxford this month. On the 9th, in a flock of about seventy Ring Doves near Oxford, M. saw one apparently nearly pure white. Throughout January and February Bramblings were unusually numerous about Oxford; a very richly-coloured specimen was shot there at the end of the latter month, which had almost assumed its full spring dress; another had its flanks of a reddish orange; the earliest we heard of was shot in the north of the county on January 10th; about the end of February a boy took forty in his bat-fowling nets near Wroxton.

MARCH.—The weather was excessively severe during the first half of the month, and all the Thrushes suffered greatly, but none so much as the Fieldfares; numbers of these were caught by the hand—too weak to fly. The supply of haws being exhausted, and the few remaining being in a dry and shrivelled condition, the birds had great difficulty in obtaining food; one shot on the 6th had been feeding upon half-rotten swedes in the sheep-pens, and the whole bird, the intestines especially, was thoroughly impregnated with the smell. During the summer, when looking for nests, it was quite a common occurrence to find the remains of a Fieldfare in the middle of the hedge. About 150 Bramblings were killed at three shots near Balscot in the first days of the month. Three birds received by A. from that place, shot on the third, had lost nearly all the brown feather-edges of winter; one had a black chin; two more were shot at Wroxton on the 4th. Mr. W. W. Fowler informs us that four Curlews were seen close to the village of Kingham about the 12th of the month. One Hooded Crow was seen by M. feeding with some Rooks in

Christchurch Meadow on the 13th. Two days after, one was shot about six miles from Oxford, and a third was killed near Banbury on the 30th; this is an usually late date for them to linger in Oxfordshire. A Great Crested Grebe in full nuptial dress was killed on the Isis at Sandford on the 7th; they were delayed by the ice from returning to Clattercutt Reservoir until the 28th; in mild seasons they appear a month earlier. Tufted Ducks having been frozen out since the early part of January (the ice bearing skaters up to the middle of this month), a male and female put in an appearance on Clattercutt on the 28th; they were evidently paired, the drake closely following his partner with an air of proud proprietorship; and it was hoped that they might remain to breed, but they disappeared shortly after.

APRIL.—A male Ring Ouzel was shot on Headington Hill early in the month. A pair of Nuthatches were observed by A. on the 14th, carrying nesting materials into a hole about thirty-five feet up in the trunk of an elm tree on Bloxham Grove, from which he had eggs more than twelve years before; the clutch of seven fresh eggs were taken at the end of the first week in May. Mr. W. Fowler observed a pair of Pied Flycatchers in a field studded with trees at Kingham on the 24th. On the same day a beautiful example of the Lesser Tern was shot close to the barges on the river at Oxford. One Black Tern was shot, on the 30th, on the canal above Banbury. On the night of the 24th a Nightingale flew against a window in Banbury, and was picked up dead. A Hoopoe was seen at Elsfeld on the 26th.

MAY.—We are able to record the third occurrence of the White Wagtail in the county, M. having observed one on the river-bank above Oxford on the 4th. A specimen of the Common Sandpiper was observed on the bank at Clattercutt on the 1st, but had disappeared the next day. On the river above Oxford four were seen on the 4th; they make but a very short stay with us at this season. The Turtle Dove was observed at Great Bourton on the 8th by both recorders; this is an early date for its arrival. Hirundines suffered greatly from the stormy weather in the second week (*vide* Zool. 1886, p. 300). An adult Black Tern was shot on the river at Oxford on the 7th. A female Whimbrel was killed at Thame on the 21st; although of not very uncommon occurrence upon the spring migration, it is extremely rare in autumn. On the 17th a curious light variety of the

Yellow Bunting was shot close to Oxford. An immature Lesser Black-backed Gull was shot on Port Meadow, Oxford, on the 12th. On the same evening a flock of Gulls, all immature and either *L. fuscus* or *L. argentatus*, passed over Oxford, flying north, high up. Heavy rain fell on and off from the 11th until the 14th; wind N.E., backing to N.W.; very large floods in the valleys. Mr. Warner reports that during a stormy week in May (probably the second) a flock of the Common Tern was noticed at New-bridge in company with Swallows and Martins, playing about over the surface of the water for a day or two. M. saw one in the distance at Oxford on the 12th, and a flock of eight were seen on the upper river near Godstow about the end of the month.

JUNE.—One specimen of the Lesser Tern was seen by M. flying about over the river above Oxford on the 2nd. Four immature specimens of the Common Gull were seen flying over Port Meadow on the 19th. On the same day two large Gulls, either *L. fuscus* or *L. argentatus*, were flying over the river at Sandford; weather cold, with wind in the east about this time. M. saw a Grey Wagtail on the banks of the Cherwell near Islip on the 26th; it is extremely rare with us in summer. Although common enough in the reed-beds of the Cherwell at Oxford, and spreading thence into the thickets and bushes of the "Parks," the Reed Warbler is decidedly rare in the north of the county. On the evening of the 27th A. heard one singing in a large bed of rushes at the upper end of Clattercutt, and in July detected its presence also in an osier-bed on the Swere where it flows into the Cherwell. A pair of Grasshopper Warblers probably nested in the mowing grass of a meadow between Bourton and Hanwell, as the male sung there nightly; they are found annually on the small remaining portion of Hanwell Heath, a short distance off. A pair of Bullfinches, forsaking their usual habit of seeking solitude in the breeding season, nested this year in a belt of thick yew trees which border a much-frequented path in Mr. F. C. Aplin's garden at Bodicote, within a dozen yards of the house.

JULY. — Mr. W. Fowler having seen a Red-backed Shrike at Kingham on the 8th, made a careful search for pellets, and found among other things two portions of the shrivelled skin of a Water Shrew (*S. fodiens*), each forming a complete ring. Mr. Warner reports that, on the 13th, a young specimen of the Long-eared Owl was seen in broad daylight perched on a fence near Stanton

Harcourt; as a resident it is decidedly rare with us. Two examples of the Egyptian Goose were shot near Cowley about the middle of the month; they had doubtless strayed from some ornamental water; though Mr. Darbey, from whom we received the information, could hear of none missing at that time, and found no marks of confinement on them. A white variety of the Swallow, a young bird, was shot at Hampton Doyle early in the month.

AUGUST. — A female Wheatear was seen by A. near Banbury on the 13th; may possibly have nested in the district, migrants being seldom seen until the first or second week in September. At the close of summer the disastrous effect upon Swallows and Martins of the cold stormy weather in May could be clearly traced in the small numbers to be seen in the air after the second broods had flown, and when in an ordinary year they should have swarmed.

SEPTEMBER. — When shooting near Nell Bridge this month, we noticed a large nest placed in one of a row of four trees in the meadows. The tenant told us that a pair of Herons came and built it just before haymaking time (end of June), and that being disturbed when the grass was cut, they left, but returned when the fields were quiet again; no young seem to have been hatched. There is no heronry in the neighbourhood, but the birds are constantly to be seen about there. The first Snipe was seen and shot there on the 13th. The Common Sandpiper was observed on the Cherwell near Nell Bridge on the 15th. A Hooded Crow was shot at the beginning of the month at Oxford; this is an early date for it to arrive in the county, and, considering that examples were observed up to the end of March, it seems possible that the species may have bred in the Midlands this year. A specimen of the Redshank was shot at Chorton, near Islip, in the early part of the month. An interesting variety of the Corn Bunting was shot at Marsden; it had evidently been entirely white, and was killed in the middle of its autumn moult while reverting to its normal plumage; a few normal feathers showed on the breast, and some of the new primaries had appeared; the majority of the new tail-feathers had also come in; the old primaries and rectrices were very much worn, and quite "hairy"; it is now in M.'s collection. A white variety of the Linnet tinged with buff was also shot during this month at Hinksey, and is now in M.'s collection.

Two varieties of the Stock Dove were shot on Shotover Hill, near Oxford, about the first week in September; one, a very pretty variety, mottled with cream-colour, has been described in 'The Field' (October) by Mr. J. Whitaker, in whose collection it now is; the other had nothing abnormal about it, except its primaries and rectrices, which were of a nut-brown. A Curlew was shot at Heyford during this month. A clutch of ten fresh eggs of the Quail was taken at Standlake at the end of the month.

OCTOBER. — Mr. Warner informs us that a Wheatear lingered until the early part of the month, and was seen by him at Standlake. A Redwing arrived in North Oxon on the 9th, and a Fieldfare at Oxford on the 21st. A male Grey Phalarope, in M.'s collection, was shot at Bletchington on the 18th. The Brambling was first seen on the 30th near Oxford. During the second week in the month large numbers of Common Terns visited Oxford, and many of them were shot. On the 26th, M. saw a Sedge Warbler close to the river above Oxford; it tried to sing, but could only manage a few notes, and looked the picture of misery, as the wind was very cold. A beautiful variety of the Ring Dove was shot near Banbury on the 27th, having been observed about the place since the previous winter, when it accompanied a large flock. The mantle and wings are dove-coloured, mottled with a little white; primaries light brown, marked with white; tail brownish; lower back a delicate lavender, otherwise normal. The man who shot it said it looked almost white on the wing. It is now in Mr. Whitaker's collection. At the end of the month we had a considerable flight of Snipe, about forty full birds and two Jacks being flushed from one or two meadows at Nell Bridge; two days after, they had all departed. Large numbers of Peewits on the 20th, and the meadows black with Starlings. Some Teal also at that time. Two Pochards had arrived at Clattercutt on the 30th, on which day a Crested Grebe was seen in full winter dress.

NOVEMBER. — A drake Shoveller was shot on Otmoor on the 12th, where a good many Teal were bagged in the middle of the month.

DECEMBER. — A fine male of the white variety of the Pheasant (with normal irides) was shot at Elsfeld on the 21st. A fine adult male Goldeneye and two in brown plumage, together with twelve Tufted Ducks, four Pochards, and some thirty or forty Wild Ducks, were seen on Clattercutt on the 11th.

THE PEARL FISHERIES OF AUSTRALIA.³

BY G. W. GRIFFIN,
U.S. Consul, Sydney, N.S. Wales.

THE pearl-shell fisheries of Torres Strait belong to the colony of Queensland, and are situated 1500 miles from Brisbane, and more than 2000 miles from Sydney. Torres Strait is about eighty miles in width, and separates Queensland from the island of New Guinea. The navigation of the Strait, although said to be safe and practicable, is in fact very difficult, on account of the innumerable islands, reefs, and shoals scattered about. The chief places at which the fisheries are conducted are Wai Weer, Albany Island, Jervis Island, Endeavour Strait, Friday Island, Prince of Wales Islands, and Possession Island.

WAGES OF THE MEN.—A good diver can earn from sixty to one hundred and fifty dollars per month. He usually signs shipping articles for a period not exceeding three years, at a fixed sum per month and an interest in the catch or lay. Mr. Bayne, of Sydney, the owner of an important station at Prince of Wales Islands, who for many years has been engaged in pearl-shell fishing, states that several divers in his employ have earned as much as three hundred dollars per month. The divers and crews are composed of South Sea Islanders, Malays, and a few Chinese and Lascars. The diver is the captain of the boat, and the other men obey his orders. The duties of the tender consist in waiting on the diver, helping him to dress, and looking after him while in the water. The pay of the tender is from ten to twelve dollars per month, with a small interest in the catch, generally from one-sixtieth to one-eightieth part of the value of the shells. Each of the vessels generally has one diver and four tenders, who compose the crew. The tenders are engaged on regular shipping articles, and are paid off like any other merchant seamen. Mr. Henry M. Chester, the resident magistrate at Thursday Island, says, in a recent report on the fisheries, that the natives are never overworked, and that they are always well fed and kindly treated. He further says that payment is usually made them in blankets, clothing, knives, hatchets, and beads, and that whenever they are

* Reprinted from the 'Bulletin U.S. Fish Commission,' vol. vi. (1887), pp. 433—435.

dissatisfied with what they receive they seek other employment. Mr. Chester is of opinion that the competition for their services is of such a character as to secure for them fair treatment. All the available adult population of the island are employed as swimming divers, under the "Masters and Servants Act," and while their pay is small, it is made in the presence of the local authorities, and all the old men, women, and children receive food in seasons of scarcity. Mr. Chester admits, however, that the occupation of a diver is dangerous, and not at all conducive to longevity, but adds that the loss of life among the natives from such causes is more than counterbalanced by the abundant supply of wholesome food given them, and by the decrease in infanticide and other savage practices to which they were formerly addicted.

METHODS OF FISHING.—The method pursued in pearl fishing is for a number of vessels to start out together and fish on the same ground. Each vessel carries supplies to last a fortnight. When in about eight fathoms of water, if the tide is slack, the diver will jump overboard. His boots are heavily weighted with lead, so as to hasten his descent. Upon reaching the bottom he walks leisurely along until he comes to a patch of shells; then he signals to the boat to cast anchor. He carries with him a sack or bag to hold the shells, and as soon as it is filled it is lifted up, emptied out, and sent down to him again, he being able to remain under water several hours at a time. Some divers remain down from nine o'clock in the morning until five in the afternoon. The Pearl-oysters lie on the ground, with the shells partly open, and great care is required in handling them, for if touched in the wrong way they will close upon the hand like a vice. Accidents of this kind not unfrequently happen to inexperienced divers, who are obliged to signal those above to lift them up and remove the Pearl-oyster from their hands. The monsoons which blow in the Strait from May until the end of September are often so severe that boats have to lay up for as much as ten days at a time. The average catch for each boat is from one ton to a ton and a half shells per month. Unlike the fisheries in Ceylon and the Persian Gulf, there is little or no difficulty in collecting the shells, for they either lie loose on the ground or are only partially buried in the mud or sand. The fisheries off the coast of West Australia, and especially at Shark Bay, produce

the true Pearl-oyster, *Avicula margaritifera*. For a long time this shell was supposed to be valueless on account of its thin and fragile structure, but now there is a great demand for it both in America and in Europe. It is especially prized by the French and German artists for fine inlaid cabinet work. The young or chicken shell is the best, and commands the highest price. When the Pearl-oyster is five or six years old the shells become blistered and wormy, and it is said the oyster dies about the age of seven years. The divers in fishing make no effort to select any particular shell, but take every one that they can get, even the dead shells, which have the least value of any, on account of various blemishes, rottenness, lack of lustre, &c. Pure-white silver-edged shells are the best. The oysters in the West Australia fisheries are generally obtained by passing an iron dredge over the banks, but divers are also employed. Pearl-oysters are gregarious in their habits, and whenever one is met with it is almost certain that numbers of others will be found in the immediate neighbourhood. Divers are expert swimmers, and they go down to a depth of four or five fathoms, where it is said some of them can remain two minutes. The occupation is an unwholesome one, and soon produces deafness and diseases of the chest and lungs. Blood not unfrequently flows from the mouth, ears, and nostrils after the usual dip of forty or fifty seconds, which is repeated fifty or sixty times a day. The men also run the risk of being eaten by Sharks, although death from this cause is not apt to occur except in untried fishing-grounds, as the noise of the divers is almost certain to drive the Sharks away.

THE PEARL STATIONS. — All the pearl-fishing stations in Torres Strait bear a close resemblance to one another, and consist of a small but nice-looking residence for the manager and one of less pretension for the men, a warehouse for storing provisions, &c., and several sheds for drying the shells. Before the shells are brought to the station the boats usually run into land, and the men open the oysters, take out the pearls, if any, and throw the soft parts overboard. The shells are then roughly cleaned and stowed under the hatches. At the end of the voyage they are taken to the station, where they are counted and thoroughly cleaned. The shells are then assorted and dried, and after the outer edges are chipped off they are packed in cases,

each case weighing from 270 to 300 pounds, and are ready for shipment. No systematic effort has yet been made to collect pearls at Torres Strait, and such as are found become the property of the men, who secrete them in various ways, often by swallowing them. Some very fine specimens of pearls about the size of a hazel-nut, and of remarkable beauty and clearness, have recently found their way to the market from Torres Strait. Other specimens of a much larger size have been found there, but they were imperfect in shape and colour.

FORMATION OF PEARLS.—In oysters aged four years—which are judged by the shells, weight, and appearance—the best pearls are found. The shell, like the pearl, is formed by the secretion of the animal, and is composed of animal matter and lime. The iridescent hues on the inside of the shell are occasioned by the edges of the thin, wavy, concentric layers overlapping one another and reflecting the light. The minute furrows, containing translucent carbonate of lime, produce a series of more or less brilliant colours, according to the angle at which the light falls upon them. Occasionally some of the finest pearls are found loose in the shell. As many as one hundred pearls have been found in one oyster, but of little or no value. The pearls of the young oyster are yellow, and in the older oyster are of a pinkish hue.

THE USE OF PEARL-SHELLS.—The pearl-shells shipped from Australia to the United States and Europe are used principally for the manufacture of knife-handles, shirt-buttons, &c. Considerable quantities are also used for papier-maché and other ornamental work. The pearl buttons, shirt-studs, &c., now made in the United States are said to be the best and cheapest in the world—a fact due in great measure to the care used in selecting the material and to the improved methods of cutting.

NOTES AND QUERIES.

To purify Water in an Aquarium.—In fresh-water aquaria the introduction of a few pond-snails (such as *Planorbis corneus*, *Paludina vivipara*, *Limnæa stagnalis*, *L. auricularia*, &c.), which scour the inner surface of the glass, is tolerably effective; but a better plan is suggested by a writer in the 'Norsk Fiskeritidende,' who recommends that to every 100 grammes of water there should be added 4 drops of a solution of 1 gramme of salicylic acid in 300 grammes of water. A gramme is equal

to rather more than 15 grains (apothecaries' weight), 480 grains to the ounce, and as a gallon of water weighs 10 lbs. or 70,000 grains, we get 1500 grs. : 70,000 grs. :: 4 drops : 186 $\frac{2}{3}$ drops; or, roughly speaking, we may add for every gallon of water in the aquarium 186 drops (or one dessert-spoonful) of the solution recommended. This recipe, it is said, will keep the water fresh for three months without renewal.

MAMMALIA.

The Cost of Rabbit Destruction in Australia.—The Hon. J. Salomon recently stated, in the Legislative Council of Sydney, that up to that time 7,853,787 Rabbits had been destroyed and paid for at a cost of £361,492. This represents the very large sum of 11 $\frac{1}{2}$ d. per rabbit, and, adding to this a proper proportion of the bonuses paid by stock-breeders, farmers, and others, each Rabbit killed is found to have cost about 1s. 3d. In other words, it costs as much, or more, to kill a Rabbit in Australia as to buy one in England.

On the Bats found in Merionethshire.—The following notes on the Bats inhabiting this part of Merionethshire may prove useful to those who are interested in the distribution of the British species. Up to the present time I have obtained specimens of six species, five of which occur more or less commonly, though none of them are very abundant. The sixth, the Lesser Horse-shoe Bat, is very sparsely distributed, although it can scarcely be called rare.

(1). *Vesperugo noctula*.—The Noctule is a common species, although it seems not to have been previously recorded from any part of Wales. It frequents most of the wooded parts of the district, especially such as have the hill-sides covered with oak trees. I have observed it plentifully in fine weather flying over the extensive marshes near Port Madoc.

(2). *Vesperugo pipistrellus*.—This bat is not nearly so abundant as in most parts of England, and, except in the immediate vicinity of houses, is probably outnumbered by several other species. Although the smallest of the British bats, the Pipistrelle frequently preys on rather large insects; the crane-fly, *Tipula oleracea*, commonly known as "daddy-longlegs," apparently forms a considerable portion of its food.

(3). *Vespertilio daubentonii*.—This is a common species in those localities where it occurs; but, from the nature of its haunts, it might easily be passed over unless specially looked for. It frequents pools of stagnant water, or slow-running rivers, giving a decided preference to the latter. On any still warm night it may be seen flying slowly and steadily as close as possible to the surface of the water, into which it frequently dips its nose, probably for the purpose of taking some floating insect. The cry of Daubenton's Bat is very weak and shrill, sometimes prolonged into a sort of chatter.

(4). *Vespertilio mystacinus*.—The Whiskered Bat is probably the most abundant species in this district, being found in all sorts of situations, in company with the Pipistrelle, which it very much resembles in some of its habits. It differs considerably, however, in its choice of a hunting-ground and in its flight, which is slow and steady as in *V. daubentonii*. The Whiskered Bat comes abroad earlier in the evening than the last-named species, and usually selects for its hunting-ground the sheltered ends of a high hedge or plantation, or even a cliff, along which it flies to and fro, seldom rising as high as the tops of the trees or rocks nearest to it. When crossing an open space it generally keeps close to the ground. I have never observed this species frequenting the open places in woods of which the Pipistrelle is very fond.

(5). *Plecotus auritus*.—Next to *V. mystacinus* this appears to be the commonest bat in the district. Early in April last I observed a number of Long-eared Bats frequenting a group of three tall silver-fir trees standing close together among stunted oak and hazel bushes. On warm nights these trees appeared full of bats, sometimes flying with the greatest rapidity through the branches and sometimes hovering like great moths at the extremities of the twigs. On going underneath the trees the bats presented a still more curious sight: generally upwards of a score might be seen moving about in the space of a few feet. They appeared frequently to come in contact with the branches, but whether by accident or not I was unable to ascertain. [They were doubtless taking insects off the leaves.—ED.] One which I shot at this place had a small leaf of the silver-fir in its mouth. The food of the Long-eared Bat consists chiefly of moths, and I believe small caterpillars are also taken by it.

(6). *Rhinolophus hipposideros*.—The Lesser Horse-shoe Bat, though generally distributed, is by no means a common species. It is apparently strictly nocturnal in its habits, never coming abroad till it is quite dark, and I can only recall one or two instances in which I have seen it on the wing. During the day it may be seen hanging from the roofs of caves and houses, always in the darkest part. I once saw several bats of this species in the lower level of an old lead-mine, to gain access to which they must have descended a shaft fifty feet deep into an upper level, and after traversing this, have passed through a small hole in the floor to the place where I found them. On the few occasions on which I have seen this bat abroad it was flying slowly close to the ground, somewhat in the manner of *V. mystacinus*.—G. H. CATON HAIGH (Aber-ia, Penrhyndendraeth, Merionethshire).

BIRDS.

Cliff-birds at Dover.—During the first week of July the fine chalk cliffs between Dover, the South Foreland, and St. Margaret's Bay, present a very animated appearance. Hundreds of Herring Gulls are nesting there,

and the young ones may be seen about their nests, attended by the parent birds. For some reason or other—probably for the want of suitable ledges—the Herring Gulls do not appear to nest on the abrupt faces of the cliffs, but in spots where land-slips have occurred, and where slopes more or less covered with verdure, but at a very steep incline, have formed amid the cliffs. In selecting such breeding-places the Herring Gulls have, as might be expected, selected the more inaccessible slopes, and as far as I could judge, walking below the cliffs, I did not notice any occupied nesting-places that an ordinary rock-climber should attempt without the aid of a rope from above. Great mortality occurs amongst the young gulls from the nests being placed on these steep inclines, for the young tempted from their nests lose their foothold on the slippery grass, and slide and fall on the beach below, where they are abandoned by the parent birds. In the first week of July, this year, my companion and I counted over fifty dead young ones in the course of our walk along the base of the cliffs, and we saw two young Herring Gulls lose their foothold and come down, trying to save themselves with expanded feet and their little apologies for wings extended; they reached the beach in safety, where we secured them, took them home, and they are now flourishing in my companion's garden. There is, however, one exception to the general rule of these gulls breeding on the cliff-slopes, and that is a few pairs making their nests on the gravel beach at the very base of the cliffs just above the line of ordinary high water. The spots available are very few and restricted in area, and as they can be reached at low-tide these nests are invariably plundered of the eggs. My companion informed me that during the past seven years he had on several occasions taken eggs from these nests on the shore. He is inclined to think that the very great increase in the number of the Herring Gulls since the Wild Birds Preservation Act came into force has led to the crowding of the securer breeding stations, and that the gulls that nest on the beach are the younger ones which have been unable to find nesting room in the safer positions. It was satisfactory to learn, from my companion's personal observation, that the number of Herring Gulls had largely increased during the past ten years. I should estimate roughly that not less than four hundred pairs of Herring Gulls nest in the cliffs between Dover and St. Margaret's Bay. To ornithologists who reside in the neighbourhood of London, and who may not have the opportunity of visiting the more distant great rock nurseries of sea-fowl along our coasts, I recommend a visit to these cliffs, but care must be taken to time it with due consideration of the tides, for a mistake might lead to an awkward predicament, as at high-water the sea rises to the cliff, except in a few spots where some of the gulls, as I have already mentioned, make their nests on the gravel. A visitor to the cliff immediately below the South Foreland Lighthouses will be further gratified by finding that a considerable colony of

Guillemots make it their breeding-station. It is a very bold perpendicular headland, and I should consider to be only accessible to experienced cragsmen with proper appliances. To stand below this cliff and watch the Guillemots shoot down from their lofty ledges to the sea is a very pretty sight. My eye could not discern any movement in their wings; the feet stretched out behind seemed to be the guiding power. I picked up one little downy black young one at the base of the cliff, which shows that the Guillemots breed there. A pair of Peregrine Falcons nest in the cliffs between Dover Castle and the South Foreland, and have, I believe, reared their young in safety this season. It has been a frequent source of pleasure to me during the past spring to visit these falcons' breeding-place, as I invariably saw one, sometimes both birds. The tiercel was wont to resent my intrusion, by flying overhead and screaming querulously; at times he would "wait on" within forty or fifty yards of me. These birds have shown me some good flights at pigeons this year. I was at first somewhat puzzled where these pigeons came from, because all I saw flown at were evidently home bred birds, and the falcons always intercepted them as they were flying over the Channel. Placed on the edge of the cliff, I have watched a pigeon flying with steady rapid flight over the Downs, heading southward across the sea. As the pigeon passes over the cliffs the falcon dashes out seaward from under the cliff, the pigeon sees its enemy and rises high in air, the falcon mounts as well; to the inexperienced eye the hawk appears to be flying in an opposite direction to the pigeon, but when he has gained the proper altitude down he swoops like a bolt from the sky, but the pigeon eludes him by dropping with incredible rapidity to the sea. Again the falcon rises, its evident intention being to drive the pigeon to the shelter of the Kentish cliffs; the pigeon, seeing its course across Channel barred by its mortal foe, seeks the shelter of the undercliff. The falcon now has it all its own way, and the wings and skeletons of pigeons which I have found at the base of the cliffs show what heavy toll the Peregrines levy on the Belgian and French homing-pigeons returning to the Continent; for in several instances I found the name of the owner stamped upon the inside of the primary wing-feathers of the pigeons, which proved to be trained birds belonging to Belgian owners.—H. W. FEILDEN (Dover).

Ornithological Notes from Mayo and Sligo.—Owing to the low temperature of the spring months, our summer birds were late and very irregular in the dates of their appearance in this locality, for with the exception of the Sandwich Tern and Whimbrel, none were up to their usual time of arrival. The Sandwich Terns were seen on March 28th, but I did not see or hear a Common Tern until May 15th. Of our land-birds the Chiffchaff, as usual, was the first to make itself known—on April 22nd. This bird, from the peculiarity of its song, attracted my attention at once, for at first I thought that a Willow Wren and Chiffchaff were singing in

defiance of each other,—as many small birds do at times,—and I could not be certain that these birds were not present until I caught sight of the Chiffchaff in a thorn-hedge, and had closely watched it for some time. It began its song with the first two soft notes of the Willow Wren and ended with the last two notes of the Chiffchaff—a combination of song that puzzled me, for although I had been acquainted with both the notes of the Chiffchaff and Willow Wren since I was quite a boy, yet I never heard anything similar to it before, for the notes of both birds are so unlike and are so well marked that no one can mistake one for the other. I was so struck with its strange song that I intended to shoot and examine the bird, but on the following day, when I went to look for it, it had disappeared from the plantations, and it was a fortnight after before I heard another individual singing in the usual manner. I should be glad to hear if any of your readers ever heard a Chiffchaff sing as the one above mentioned. On April 23rd I heard the first Willow Wren, but the cold weather stopped its song for several days, until the 29th, upon which day I heard some Whimbrels. The Cuckoo was not heard until May 2nd, and Swallows appeared on the same day. The Corn Crake was not heard in this neighbourhood until May 12th, nor Whitethroats until the 15th, and the first Spotted Flycatcher on the 22nd; the poor bird appeared very uncomfortable and cold-looking, owing to the stormy weather and heavy hail-storms of the previous four days, when the thermometer fell to 39° on the nights of the 19th and 20th. However, as if to make up for the low temperature of April and first half of May, the weather has now become very warm, the thermometer all through June never having been below 70°, by day, and on the 15th, 16th, and 17th it has been up to 74°, 79°, and 81°. On the 17th I was at Bartragh, and saw about a dozen Godwits, but all were in the pale plumage of winter, none exhibiting any red feathers. I saw some young Ring Plovers nearly able to fly, running about near their nesting-places, and as I was walking along the sands by the open bay at the north side of the island I was surprised at seeing a large flock of Red-breasted Mergansers, at least a hundred birds, closely packed together, swimming just outside the surf. There were very few birds with dark heads in the flock, the majority appearing to be females or immature males. It was a most unusual sight to me, for I never before observed Mergansers at this season flock on the sea; indeed the most I have ever come across would be perhaps half a dozen individuals fishing on the inside channels. It is probable that the Shoveller Duck nests regularly every season on Lough Conn, for a few years ago I saw an old male flying about a reedy bay on the lake near the old abbey of Errew, and from its not wishing to leave the place when disturbed, but continuing to fly round, I am sure it had its mate hatching close by; and this season, near the same part of the lake, a pair were seen and the male shot some time last April. Many Wild

Ducks, as well as Red-breasted Mergansers, breed on the islands in the lake, and there are several colonies of Black-headed Gulls and Common Terns also. Redshanks regularly frequent the lake to nest on the islands, and I have seen their eggs brought from an island near Cloghans.—
ROBERT WARREN (Moyview, Ballina).

Ornithological Notes from Breconshire.—Your readers will be pleased to hear that the Kite (*Milvus regalis*) is slowly increasing in this county. I not unfrequently see one soaring steadily along in places where years ago such a sight would have been a wonder. One of my boys, a good observer, tells me that in October last he saw five in one spot soaring in circles higher and higher, until they flew in a straight line towards the Beacons. They were probably two old birds and three young ones. A pair now frequent Vennyvach Wood, the first time for certainly a number of years. This increase may be accounted for in two ways, *viz.*, the almost total absence of trapping on the moors and in the wilder and more secluded parts of the county, and express protection of them by one of our largest hill-owners. Woodcocks were fairly plentiful last winter, especially (as is always the case here) in November and February. Wildfowl of all kinds were scarce. Two Scaup Ducks, *Fuligula marila*, were seen on the Gludy Lake, but I heard of nothing else worth mentioning. Last autumn my boy saw a male Sparrowhawk attack a Jay; they were rolling over and over on the ground; he picked the Jay up, but it had very little life left; the hawk flew off and pitched in a small oak tree close by, and then flew back to within a few yards of the dead Jay, evidently leaving it with great reluctance; the Jay had made a good fight for his life, as appeared by the numerous feathers scattered about. The Great Spotted Woodpecker is certainly increasing, while the Lesser Spotted Woodpecker is decreasing in about the same proportion; this is singular and at present inexplicable, but the fact remains. I also see the Stock Dove, *Columba anas*, more frequently than I did formerly. The Curlew, *Numenius arquatus*, appeared as usual about the middle of March; on the 23rd I saw a pair near Llangorse Lake, and two had been seen near here a week earlier; it keeps its time of coming with wonderful regularity, but now breeds in marshy places on the lowlands as well as on the hill, one of the good results of the enforcement of the Wild Birds Protection Act. A friend living on the borders of the county writes me on March 28th that “The Raven is sitting in Craiglas, and, I should say, nearly hatching. The Dipper, *Cinclus aquaticus*, is also nesting.” The last-named bird builds very early about here; one, with five eggs, sat on about a week, being found on the first Sunday in March, in the middle of that heavy snow-storm. Unfortunately the Barn Owl is getting very scarce; I never see one now, although my friend above quoted writes me on the same date, “I am glad to tell you that the White or Barn Owl is again to be seen about; they are very harmless, and it is a great

pity people are so ignorant about them"; in which expression of opinion I quite agree.—E. CAMBRIDGE PHILLIPS (The Elms, Brecon, S. Wales).

Unusual Nesting-site for the Wryneck.—In the last number of 'The Zoologist' (p. 265) I recorded the fact of a Tree Sparrow nesting in a mole-burrow in a brick-earth cutting in Kent. On July 9th I was examining the holes in the same cutting on the chance of finding a late nest, when I heard a sound, not unlike that made by shaking a handful of silver coins, issuing from one of the holes; after half an hour's hard work I was able to insert my hand, when I discovered that the hole was occupied by five full-fledged young Wrynecks. There appeared to be no nest, or, if there was, it was so completely concealed under a mass of malodorous guano that I did not discover it. I have never met with any recorded instance of the Wryneck breeding in a hole in the ground, and it may therefore be of interest to publish the fact.—A. G. BUTLER (Natural History Museum).

Hawfinch in Yorkshire.—This interesting bird is yearly becoming more common in this neighbourhood. There are at least half a dozen places where it nests, and at least three regularly. Mr. Storey, of Pateley Bridge, obtained a nest in Nidderdale last year, the first record of its nesting in the Dale; the birds have again nested this year. During the winter months an unusual number frequented the gardens in the town and on the outskirts. I am inclined to think that they had all been bred in the neighbourhood. On one estate great care is taken to protect them. The head gardener, a very intelligent man, instead of shooting them, as his predecessors had done, protects them carefully, but places nets over his fruit, and thus prevents any complaints being made as to the damage done by the birds to the fruit.—RILEY FORTUNE (Harrogate).

The Song of the Chaffinch.—In a recent number of 'The Ibis' (1887, p. 194), Mr. W. C. Tait remarks that in Portugal the Chaffinch begins to sing (as with us in England) in February; he adds that there it recommences to sing in September, and that he "has heard it as late as November 27th." I may be mistaken, but to my recollection the Chaffinch rarely sings during the autumn months in Great Britain. At any rate I have only a single record of the fact among my field notes, *i. e.*, on the 10th of September, 1882, I heard a Chaffinch singing lustily in a garden near Carlisle. I should be glad to learn from other readers of 'The Zoologist' whether our home Chaffinches are autumn songsters. If such is the case, it is curious that the fact should be unnoticed in our text-books.—H. A. MACPHERSON.

Black Tern near Gloucester.—On May 21st a specimen of the Black Tern, *Sterna nigra*, was shot at the "Lower Parting," on the Severn, just below Gloucester, and has been set up by a local taxidermist, in whose hands I saw it. It is an adult female bird, in perfect breeding plumage.

The only other recorded occurrence of the species in this county I know of is one reported from Avonmouth by Mr. Wheeler in the 'Proceedings of the Bristol Naturalists' Society' (vol. i., part 3). — H. W. MARSDEN (37, Midland Road, Gloucester.).

Mimicry of the Corn Bunting. — When birdsnesting on the Upper Rhine, near Mulheim, I found the Corn Bunting abundantly established on the lower grounds. During great heat the males sang incessantly (their mates were sitting), perching indifferently on the ground, on low bushes and rails, on the tops of walnut trees, and on the telegraph-wires. Their song seemed to be identical with the dialect of those I had met with at home, with a single exception. On June 19th a Corn Bunting perching on a telegraph-wire poured forth a liquid and sweet song, embodying the notes of the Crested Lark, which latter species is resident, though scarce, in that district. That the Reed Bunting has a good ear and can be trained to sing the Sky Lark's song I have recorded elsewhere, but I never suspected the Corn Bunting of a similar capacity.—H. A. MACPHERSON.

Spring Moults of the Wheatear.—It appears that Wheatears occasionally, if not always, moult their tail-quills after their arrival in this country on the spring migration. Many examples procured at that season are found to have the distal portion of these feathers of a brownish black, more or less worn at the extremity, the broad buff edges or tips carried on their departure after the autumn moult having either entirely or almost worn off; some again have broad, almost white, tips to the feathers, these being at the same time black and glossy; others have mixed tails, consisting of feathers in both conditions. A male in my possession, shot in Sussex on the 7th April, has the quills of the wings and tails very brown those of the latter being dark to the extremity, the buff feather edgings having worn off. Another, procured on March 18th, has blacker feathers (probably to be accounted for in this case by a difference of age), but still untipped. Of some three examples from North Wales, shot on April 29th, one is a female having three new tipped feathers; the others are males, one having an entirely old untipped tail, the other one new tipped feather, and all the rest old. A Sussex male, 7th April, has the first four on the right side tipped light, and another from the same locality, 19th March, which still retains much of the brown edgings to the dorsal plumage, has all the tail-feathers tipped, with the exception of the third and fourth on the right side. A third male, 5th May, has the four outside feathers on the right side dark to the extremities, the colour being rather brown and the feathers old and worn in appearance; the rest shorter than these, blacker in tint, new and glossy in appearance, and all tipped with white. This last bird was clearly moulting its tail, and I am inclined to think that all the examples showing mixed tails were similarly engaged at the time they were procured. The

old and worn appearance of the untipped feathers, and the glossy new-looking condition and blacker tints of those beaming light tips, is common to all the examples I have examined.—OLIVER V. APLIN (Bloxham, near Banbury).

Notes from Oxfordshire. — On the 3rd of December last a friend of mine shot a Snipe, which fell into the river and which began swimming towards the shore. Almost simultaneously with the shot my friend heard a noise behind him, and looking round observed a Heron rising from a very small pond which stands between this house and the River Isis. After the bird had ascended some sixty or eighty feet, he was seen to drop something from his beak to the ground. My friend went up to the spot, and found a Pike of over a pound in weight, alive, and apparently none the worse for the treatment it had received from the Heron. After the fish had been picked up, the Heron returned to the spot, evidently much disconcerted by the disappearance of its prey; as for the fish, it was brought home, and weighed, and eaten; it tasted somewhat muddy, but the flesh was firm and good. On several occasions a Fox has been observed located in a tree, a willow, close to the river; when the South Oxon Hounds came here some short time since, Reynard was knocked out of his retreat, and after a run across country he returned to his stronghold, which he still continues to occupy. Not very far from the same spot, and in a thorn bush fourteen feet from the ground, a Moorhen has made her nest, where she is diligently sitting; it is to be hoped she will bring off her brood. Birds and beasts of all sorts have but a poor chance of escape along the banks of this river, in spite of any assistance my keepers may be able to afford them here. There are other enemies, however, besides dogs and bipeds, which make the multiplication of birds somewhat precarious. I saw an example of this on May 26th last. Close in front of the house, where every sort of bird comes to claim protection, a Thrush had just hatched out her young; she had a neighbour, a Jackdaw, who was engaged in the same pursuit in an elm tree hard by. The Jackdaw had doubtless been anticipating the advantage of having such succulent young neighbours, and I happened to be looking out of the window when he made his assault. He lit on the grass plot and stalked in a dignified manner to the *Juniperus thurifera*, where the Thrushes were; he flew up to the nest, and brought down one of the little delicacies in his claws. The terror and despair of the poor parents was pitiable. They perched on an iron railing over and above where the operation was going on, and watched the dismemberment and the deglutition of their offspring in helpless agony. Ever and anon they both flew at the monster; the Jackdaw only deigned to turn his head and give a warning look, when the affrighted parents retired. One after another the brood was disposed of, and then the marauder disappeared. The poor Thrushes flew down to the ground when he was gone, but nothing was left. It is possible that the nest of a Sedge Warbler was robbed by a similar bird; one day

the nest contained three eggs of the Sedge Warbler and one egg of a Cuckoo; on the following day a portion of the shells of the eggs was alone remaining. It is worthy of remark that two Cuckoo's eggs were found in the nest of a Hedgesparrow, together with four of the Hedgesparrow's own eggs. A curious fate attended a Kingfisher which had built a nest in the bank of a small pond in the Park. The pond stands close to the head keeper's house; there are usually Ducks upon it, and the Deer and Scotch cattle are in the habit of going there to drink. The nest was known to be there, and the bird had been frequently seen going to the nest. One morning a person visiting the place found the bird with nest and eggs crushed as flat as a pancake, and a mark of the expanded foot of a bullock was very evidently imprinted on the surrounding mud. That Skye cattle are not entirely innocuous to birds is further proved by the fate of a Swan which died here in May last. These cattle, when they have calves, are apt to become very fierce. In this case a heifer had become troublesome, and had frightened several persons in the park. It was being driven near a small lake, and, finding a Swan on the bank, it deliberately tossed it up into the air. The Swan lived for several weeks, but at last died from the effects of the treatment.—G. W. HARCOURT (Nuneham Park, Oxon).

Grouse Disease.—With reference to my remarks on this subject in the last number of 'The Zoologist' (p. 265), I have received the following interesting communication from Lord Walsingham:—"June 9th, 1887. I read with much interest the extract from 'The Zoologist' which you were good enough to send me. Among the Grouse which you examined, I should be inclined to think (c) was the only one that had the real Grouse-disease—namely, that in which Cobbold's threadworm, *Strongylus per-gracilis*, was found in the cæca. It has certainly occurred in some places in the South of Scotland and in the North of England. The Duke of Roxburgh told me that, had he been asked to do so earlier, he could have sent up any number of birds from Berwickshire, where the disease has been very destructive. It has now ceased in places where it was most severe, but it must have been very partially distributed. My moors in Yorkshire have been quite free from the true epidemic, although a few birds died from some cause or other after last shooting season: perhaps a stray shot may have accounted for one or two. As I am on this subject, I send you two memoranda made after a conversation with Lord Ormathwaite a few days ago, one of which bears upon the question of featherless legs. He tells me that in August, 1872,—the great Grouse year,—when shooting at High Force, he well remembers Raine, the head keeper, after a day in which nearly 1000 brace were killed, holding up a fat plump bird, one of two killed that day, *with no feathers on the legs*, and saying, 'I shall not see any of you gentlemen here for three years to come.' This prophecy of the sweeping effects of the disease which he had detected was fulfilled

to the letter. Lord Ormathwaite also tells me that he once asked his old stalker, Donald Fraser, at Fannick, Ross-shire, how long ago he had first known the Grouse to die of disease in any large numbers. His answer was that 'he well remembered when he first knew it. He was herding cows in the Reay country, and saw packs (probably meaning large numbers) of Grouse all lying dead; and when he came home and told the people what he had seen, the same day the news of the battle of Waterloo arrived.' So here is pretty good evidence that the disease, or at least some very destructive epidemic, is no new thing. Moreover, this fixes the time of year as the same in which the present modified outbreak commenced."—F. JEFFREY BELL. [See Dr. Klein's Report on the Grouse Disease, in 'The Field' of July 23rd ult.—ED.]

Hybrid Greenfinch and Linnet.—The interesting notes on hybrid Greenfinches furnished to 'The Zoologist,' by my friend Mr. J. H. Gurney, jun., tempt me to record the fact that such a hybrid was interviewed by myself and two ornithological friends, while nesting on a moor near Aberdeen on June 29th. The bird in question was feeding, when first observed, upon a patch of growing turnips, of which some trusses bore yellow flowers, while others had run to seed. This hybrid was feeding so greedily upon the green seeds that we approached within a couple of yards before he took wing. He was solitary, and had probably been hatched the previous year. We revisited the spot the following day, but he had departed.—H. A. MACPHERSON.

Redstart laying spotted Eggs.—Never having seen, or heard of, a spotted egg of the Redstart, I was very much surprised last summer at taking a distinctly spotted variety of the egg of this bird. The hen Redstart was seen leaving the nest, which was built in a stone wall. This summer I have again taken a spotted egg; both cock and hen Redstart seen continually. In both cases the greater number of the eggs in the set were quite spotless. The markings are sparsely distributed over the broad end, as in eggs of the Wren. The two localities in which the nests were found are over four miles distant from one another, so I do not think it likely that the eggs were laid by the same bird.—E. W. H. BLAGG (Cheadle, Staffordshire).

[Eggs of the Redstart "with a few faint reddish specks" are noticed in the fourth edition of Yarrell's 'British Birds,' vol. i. p. 331.—ED.]

Hawfinch nesting in Kent.—Several young Hawfinches were seen flying about in the Cemetery here in June. One of the old birds was with them.—HENRY LAMB (Maidstone).

Cirl Bunting breeding near Godalming.—It will perhaps interest your readers to know of the breeding of the Cirl Bunting in this locality. About the middle of May a nest was shown me by the caretaker of the

Godalming Cemetery, which adjoins this house; it was built in a small yew tree close to one of the paths, and was composed of bents, mixed with a little moss, and was lined with finer bents and some hair; it contained four eggs of a dull white, tinged with grey, and streaked and blotched with liver-brown. The nest was interfered with, one of the eggs was taken, and the old birds forsook it. Having become aware of this I removed the nest, but I was able to save only one of the eggs, which had been sat upon for some days, and that one is in but a shattered condition. Since then the same pair of birds have built a second nest, about a hundred yards distant from the first, among some twigs growing out of the trunk of an elm tree, and a foot and a half from the ground. When I first saw it (on June 18th) it had four eggs which were almost ready to hatch; last week there were four young ones in the nest, but yesterday morning (June 27th) I found that two of the four—the cause I know not—were dead. I may add that both my son and I have spent some time in watching the old birds. Each takes a share in feeding the young; when alarmed each utters a single note which is repeated several times; also, when disturbed, the female flutters along the ground as if hurt. The birds are not at all shy, but continue to carry food—which appears to consist of caterpillars—to their young whilst we are standing a few yards off. I observe that in the second edition of Yarrell's 'British Birds,' it is stated that the Gird Bunting has been found in Surrey, near Godalming; and in the last edition of the same work it is said to breed in Surrey; but I have not noticed any specified instance of its doing so, and that is why I send you this account. The second nest is precisely similar to the first. It may be well to add, again, that I have been for many years a diligent observer of birds and of their habits, and that I am quite certain the bird in question is the Gird Bunting, for with careful scrutiny of its plumage it is impossible to mistake it.—HENRY BENSON (Rector of Farncombe).

Curious site for Chiffchaff's Nest.—On the 4th of June last I found a nest of the Chiffchaff, containing three eggs, built in a holly-bush quite five feet from the ground. The nest was very loosely built, and came to grief before the young birds were reared. The old Chiffchaff was seen and clearly identified.—E. W. H. BLAGG (Cheadle, Staffordshire).

Long-eared Owl laying in Rook's Nest.—In March, 1886, a friend of mine, while collecting a few Rook's eggs near Barnborough, Northumberland, found a nest containing three eggs of the Rook and one of the Long-eared Owl. There can be no doubt about the latter, as the old Owl was seen to fly from the nest.—RILEY FORTUNE (Harrogate).

The Missel Thrush occasionally a Bird of Prey.—With reference to the note under this heading (p. 263), I may mention that I obtained a pair of Missel Thrushes from a nest in May last year, and one of the

birds—a handsome cock—is still in my possession. I have been in the habit of giving him all my young dead Canaries, if only two or three days old, and he has eaten them with considerable relish, bolting them whole: the young Thrushes being larger could not be so readily swallowed, and therefore would necessarily have to be pulled to pieces.—A. G. BUTLER (British Museum Nat. Hist.).

Nesting of the Common Sandpiper.—Although the following facts are mostly at second-hand, they may be of interest to some readers of 'The Zoologist.' The Common Sandpiper, *T. hypoleucus*, disappears from the banks of the Severn in this neighbourhood about the middle or end of May, and I hear that it also leaves the lower reaches of the Wye—say from Ross downwards—about the same time. It is not rare during early spring on both rivers. Doubtless these birds move up-stream to breed on the banks of the higher waters and tributaries of both these rivers. It is found breeding annually on the banks of the Lugg; and Dr. Williams, of Kingsland, has this year brought a somewhat remarkable fact to my notice. The nest is usually placed on the shingle and mud thrown up by the river, and which becomes covered with docks and other coarse herbage. During the last two seasons all the eggs have been destroyed by floods, and this year a complete change of habit has taken place. Every nest except one—possibly that of a new arrival in the district—has been placed out of reach of any possible flood, some being sixty yards from the water, others in a wood on a steep hillside, and one even placed in the head of a pollard willow. An Ayrshire correspondent has sent me some fine clutches of only three eggs each, and he suggests the fact of four (the usual number) not being laid may be attributed to stormy weather. Has this been noticed elsewhere?—H. W. MARSDEN (Gloucester).

Note on the Ring Ouzel.—On June 13th, at Castleton (Derbyshire), hearing a great noise from two Ring Ouzels, I watched them going to a nest, from which one of them (the other looking on from close by) twice took eggs to the grass near, where he began to eat them. I afterwards climbed to the patch of grass, and found one of the eggs finished, the other (quite fresh) only half eaten. The eggs in question were either Blackbird's or Ring Ouzel's. I was unable to reach the nest. As this fact of Ring Ouzels robbing a nest for the sake of the eggs is strange to me, I thought it worth communication.—ALFRED F. BUXTON (5, Hyde Park Street, W.).

A new Egg-drill.—Several correspondents having written to me asking about the egg-drill mentioned in 'The Zoologist' for June, I beg to state that the full address of the firm from whom it may be obtained is "The Dental Manufacturing Company," 6 to 10, Lexington Street, Golden Square, London, W. In ordering they should ask for No. 65 in "Ash's Catalogue," and particularly mention that it is to be sharp-pointed. They

charged me 1s. each, and for the instrument with a half-inch diameter, which they had especially to make for me, 4s. 6d.—HERBERT LANGTON.

A singular Bird's Nest.—The 'Continental Times' of July 13th states that a bird's nest, made wholly of long spiral steel shavings, without the least particle of vegetable or animal fibre, has been found at Solothurn, in Switzerland, the centre of a large watch manufacturing district. It has been preserved in the local museum.

Unusual Site for a Flycatcher's Nest.—The Spotted Flycatcher almost invariably makes a nest for itself, but this summer a pair of these little birds have hatched out their young in an old Missel Thrush's nest here. The site seems to be sufficiently curious to be worth notice.—DARELL STEPHENS (Trewornan, Wadebridge).

Nightingale singing in July.—On the 2nd of July, and again on the 8th, I heard the Nightingale singing on the wooded banks of the Medway above Maidstone.—HENRY LAMB (Maidstone).

[This is a late date at which to hear a Nightingale. The song generally ceases by the end of the first week in June. The young birds being then hatched, the old ones busy themselves in getting food for them.—ED.]

REPTILES.

Coloration of the Viper.—The remarks of my friend Mr. Lodge (p. 271) have revived my interest in Vipers, and I should like to express my accordance with his view, that the colour of Vipers bears little or no relation to the colour of the soil on which they live. In the Forest of Fontainebleau, and in Auvergne, a good many Vipers occurred to me some years ago. The usual ground-colour was a bronze or olive-brown, and I never met with the red variety. But in Auvergne a beautiful French-grey variety was found upon the same ground as the bronze examples, and seemed almost as abundant. The fact was impressed upon my mind by three rather severe bites incurred in the capture of a lively grey specimen. This grey variety has never come under my notice in Great Britain.—H. A. MACPHERSON (3, Kensington Gardens Square).

Mode in which Vipers are killed by the Hedgehog.—M. Ferdinand Coste, of Lacanche, in a letter to the French journal 'l'Eleveur,' writes as follows:—"Everyone knows that the Hedgehog is a sworn enemy of reptiles in general and of the Viper in particular; but few perhaps are aware in what way he contrives to overcome so recalcitrant and dangerous an enemy and make a meal of it. My keeper was going his round this summer in a wood which is unfortunately infested with Vipers, when he espied an enormous one asleep in the sun. He was on the point of killing it with a charge of shot, when he perceived a Hedgehog coming cautiously

over the moss and noiselessly approaching the reptile. He then witnessed a curious sight. As soon as the Hedgehog was within reach of his prey he seized it by the tail with his teeth, and as quick as thought rolled himself into a ball. The Viper, awakened by the pain, at once turned, and perceiving his enemy made a terrific dart at him. The Hedgehog did not wince. The Viper, infatuated, extends itself, hisses, and twists with fearful contortions. In five minutes it is covered with blood, its mouth is one large wound, and it lies exhausted on the ground. A few more starts, then a last convulsive agony, and it expires. When the Hedgehog perceived that it was quite dead he let go his hold, and quietly unrolled himself. He was just about to begin his meal and devour the reptile, when the sight of my keeper, who had approached during the struggle, alarmed him, and he rolled himself up again until the man had retreated into the wood. The Hedgehog, then, did not exactly kill the Viper, but compelled it to kill itself by darting against his sharp spines."

Slow-worm attacked by a Missel Thrush.—One day last summer, while driving to Dorchester, I noticed a little cloud of dust rising from the road. On drawing nearer I saw it was caused by a Missel Thrush, *Turdus viscivorus*, which held a struggling Slow-worm, *Anguis fragilis*, and was pecking at it with all its might and main. When I got quite close, the Thrush flew away, and the Slow-worm slowly wriggled off. When searching for beetles I have often found Slow-worms under the loose bark of fallen trees.—C. W. DALE (Glanville's Wootton, Sherborne).

FISHES.

Tunny at Penzance.—On July 11th a small Tunny, *Orcynus thynnus*, Day, was brought to me. It measured two feet six inches over all, and turned the scale at 20 lbs. It was taken by hand embayed in a salt-water pool in the rocks at Newlyn, in this Bay. The stomach was gorged with pilchards. The flesh had all the appearance of dark bull-beef. My friends and myself dressed portions of it by several methods, with the following results:—Stewed, it was delicate and good; broiled, it was coarse, but palatable; baked in oil and vinegar ("marinated"), it was very good. In every case the taste of the fish was pronounced to be between that of mackerel and salmon, but not so good as either of these fish separately.—THOMAS CORNISH (Penzance).

A Man killed by a Swordfish.—The schooner 'Venus' is a small vessel of about twelve tons, owned and commanded by Franklin D. Langsford, of Lanesville, Mass., with a crew of three men, engaged in the general fisheries off the coast of Massachusetts. On August 9th Capt. Langsford sailed from home in pursuit of Swordfish. About 11 a.m., when eight miles north-east from Halibut Point, in Ipswich Bay, a fish was seen. The

captain, with one man, taking a dory, gave chase, and soon harpooned the fish, throwing over a buoy with a line attached to the harpoon, after which the fish was left and they returned to the vessel for dinner. About an hour later the captain, with one man, again took his dory and went out to secure the fish. Picking up the buoy, Captain Langsford took hold of the line, pulling his boat toward the Swordfish, which was quite large, and not badly wounded. The line was taut as the boat slowly neared the fish, which the captain intended to lance, and thus kill it. When near the fish, but too far away to reach it with the lance, it quickly turned and rushed at and under the boat, thrusting its sword up through the bottom of the boat twenty-three inches. As the fish turned and rushed towards the boat the line was suddenly slacked, causing the captain to fall over on his back; and, while he was in the act of rising, the sword came piercing through the boat and into his body. At this time another Swordfish was in sight near by, and the captain, excited and anxious to secure both, raised himself up, not knowing that he was wounded. Seeing the sword, he seized it, exclaiming, "We've got *him*, any way!" He lay in the bottom of the dory, holding fast to the sword, until his vessel came alongside, while the fish, being under the boat, could not be reached. Soon the captain said, "I think I am hurt, and quite badly." When the vessel arrived he went on board, took a few steps and fell, never rising again. The boat and fish were soon hoisted on board, when the sword was chopped off to free the boat, and the fish was killed on the deck of the vessel. The fish weighed 245 pounds after its head and tail were cut off and the viscera removed; when alive it weighed something over 300 pounds. Captain Langsford survived the injury about three days, dying on August 12th, of peritonitis, the sword having penetrated his body to the extent of seven inches, and entered the pelvic cavity. The sword has been deposited in the U.S. National Museum.—W. A. WILCOX (in a letter to Prof. S. F. Baird), *Bull. U.S. Fish Commission*, 1887, p. 417.

Crenilabrus exoletus at Penzance.—Early in May, in a crab-pot in about ten fathoms of water, I took a Rock-cook, *Crenilabrus exoletus*. It is not a rare fish here, but is rarely observed, and I note it on account of its exceedingly brilliant colouring. The ultramarine-blue stripes over and below the eye throughout the whole length of the head, were followed along the back by markings, following the edges of the scales, of a similar blue, intermixed with bright iridescent-green. The base of the pectorals and of the caudal were similarly marked, as were also three or four rows of scales below the lateral line; and it was similarly, but in fainter colour, marked on the belly behind the vent, the blue colour preponderating; the sides were of a golden bronze colour, and so also were the lower sides of the preoperculum. The dorsal and anal fins were also bright blue at the base; the belly was of a bronzed white. The fish was a male, which may perhaps

at this season account for its peculiarly brilliant appearance. It possesses the very unpleasant character of having an extremely disagreeable odour, even whilst alive. I presume that the reason why fish are very rarely described in their true colours by ichthyologists is that they do not see their specimens until they are dead and have lost their colours, but this is the brightest coloured Rock-cook I have ever seen.—THOMAS CORNISH (Penzance).

CEPHALOPODA.

Octopus at Penzance.—During the week ending July 16th I took two specimens of *Octopus vulgaris* in my nets, in about eight fathoms water. They were both small ones, the largest less than three feet in length. Both had ink-sacs full of the ordinary fluid, but they did not attempt to squirt it when taken. In fact, I never saw an Octopus attempt to squirt. One was beautifully coloured at the time of its capture, mottled light and dark sepia-colour. The other was dull self-coloured when captured, but attained this mottled appearance as it died.—THOS. CORNISH (Penzance).

MOLLUSCA.

Secretion of a violet-coloured fluid by certain of the Limnæidæ.—My friend Mr. Wm. Nelson (Leeds) noted in the 'Quarterly Journal of Conchology' for May, 1877, that *Limnæa stagnalis* had the power of emitting, when irritated, a pale violet-coloured liquid, which he had noticed on taking the animal (after killing) from the shell, and also when lifting them alive from out of the water. It may be of interest to know that both *L. peregra* and *L. palustris* also possess this peculiar property, which I have frequently noticed in living specimens. The liquid discharge is of a much darker colour in *palustris* than that in *peregra*.—W. E. COLLINGE (Springfield Place, Leeds).

Rate of Progress by Snails.—The rate of progress in the land Mollusca is so slow, that to travel "at a snail's pace" has become proverbial. It would seem from experiments recently made by an American savant, at the Terre Haute Polytechnic, that the precise rate has been approximately determined. Half-a-dozen snails were allowed to crawl between two lines ten yards apart, when the average speed was ascertained to be at the rate of a mile in fourteen days. The particular species of *Helix* is not named. It would be well to have stated this, for doubtless some species can travel faster than others.

CRUSTACEA.

Livid Swimming Crab at Penzance.—I have to-day taken a crab which I must describe as the "Livid Swimming Crab." It precisely coincides with the descriptions given by Bell of *P. marmoreus* and of

P. holsatus, except in its size, which is greater than that of *P. marmoreus*, being $1\frac{5}{8}$ in. in length, and $1\frac{7}{8}$ in. in breadth across the carapace, and in the colour of the carapace, which is of a dull leaden hue all over, relieved on the hepatic regions by two corresponding crescents of little white spots. The specimen is a male, and is in excellent condition, and my conclusion about it is that it is merely a largely developed specimen of *P. marmoreus*, as Bell suggested *P. holsatus* might turn out to be. Its colour makes no difference in my conclusion. It is well known that in many of our smaller crabs the colour of the young is quite unlike the colour of the adult in the same species. For instance, the little many-coloured *Xanthos* develop into the well-known sluggish self-coloured reddish-brown crab.—THOMAS CORNISH (Penzance).

INSECTS.

Wasp attacking a Tarantula.—My friend Mr. Samuel Bligh, of Catton, Coslanda, Ceylon, writes me as follows, under date of 22nd May, 1887:—"On the 16th a Mason Wasp, of a large species common here, was discovered dragging a large Tarantula across my garden-path; it had evidently stung to numbness its huge and venomous prey, and was taking it to its nest. The Wasp was killed; the Spider is still alive, but completely paralysed; it weighed three drachms, the Wasp only ten grains." I think the above may be interesting to readers of 'The Zoologist.'—J. H. GURNEY (Northrepps Hall, Norwich).

SCIENTIFIC SOCIETIES.

ZOOLOGICAL SOCIETY OF LONDON.

June 23, 1887.—Prof. W. H. FLOWER, LL.D., F.R.S., President, in the chair.

Mr. Sclater exhibited the skin of a White-nosed Monkey of the genus *Cercopithecus*, lately living in the Society's Gardens, which appeared to be the *C. ascanias* of Schlegel. It had been obtained by the Rev. W. C. Willoughby from the west shore of Lake Tanganyika, East Africa.

Mr. Sclater also exhibited and made remarks on a specimen of the Pheasant from Northern Afghanistan lately described by him as *Phasianus principalis*.

An extract was read from a letter addressed to the Secretary by Mr. A. H. Everett, of Labuan, reporting the return of Mr. John Whitehead from his expedition to Kina-Balu Mountain in Northern Borneo, with specimens of some fine new Birds, Mammals, and other objects of Natural History.

Dr. Günther exhibited and made remarks on a hybrid Pheasant, between a male Golden Pheasant, *Thaumalea picta*, and a female Reeve's Pheasant, *Phasianus reevesi*. Dr. Günther also exhibited a living hybrid Pigeon, produced by a male white Fantail Pigeon and a female Collared Dove, *Turtur risorius*.

Dr. Günther read a report on the zoological collections made by Capt. Maclear and the other officers of H.M.S. 'Flying Fish,' during a short voyage to Christmas Island. This island is situated in the middle of the Indian Ocean, south of Java, and had never been before visited by naturalists. The collection, which had been worked out by the staff of the British Museum, consisted of ninety-five specimens, amongst which were examples of two Mammals, two Birds, two Reptiles, two Mollusks, two Coleoptera, two Lepidoptera, and a Sponge new to Science.

Mr. F. Beddard read a paper on *Myrmecobius fuscatus*, in which he described a remarkable glandular structure stretched across the anterior region of the thorax of this Marsupial.

Prof. F. Jeffrey Bell read the sixth of a series of studies on the Holothuridea. The present paper contained descriptions of several new species belonging to the genera *Cucumaria*, *Bohadschia*, and *Holothuria*.

Mr. A. Smith-Woodward read a report on the fossil teleostean genus *Rhacolepis*. The author gave a detailed description of this Brazilian fossil-fish, which had been named and briefly noticed by Agassiz. Three species were defined, and the author showed that the genus had hitherto been erroneously associated with the Percoids and Berycoids. He considered it an Elopine Clupeoid.

A communication was read from Mr. James W. Davis, containing a note on a fossil species of *Chlamydoselachus*. The author pointed out that some teeth from the Pliocene of Orciano, Tuscany, figured and described by R. Lawley in 1876, were referable to this newly-discovered genus of Sharks. He named the fossil species *C. lawleyi*.

Mr. Frank E. Beddard read the fourth of a series of notes on the anatomy of Earthworms. The present communication treated of the structure of *Cryptodrilus fletcheri*, a new species from Queensland.

A communication was read by Mr. Roland Trimen, containing observations on *Bipalium kewense*, of which worm he had obtained many specimens from gardens at the Cape.

Dr. Günther gave the description of two new species of fishes from the Mauritius, proposed to be named *Platycephalus subfasciatus* and *Latilus fronticinctus*.

Mr. Selater read a note on the Wild Goats of the Caucasus, in which he pointed out the distinctions between *Capra caucasica* and *C. pallasi*, which had been until recently confounded together.

Mr. G. Boulenger made remarks on the skull and cervical vertebrae

of *Meiolania*, Owen (*Ceratochelys*, Huxley), and expressed the opinion that these remains indicated a Pleurodiran Chelonian of terrestrial and herbivorous habits. The peculiar structure of the tail pointed to a distinct family (*Meiolaniidæ*).

A second paper by Mr. Boulenger contained remarks on a rare American fresh-water Tortoise, *Emys blandingii*, Holbrook, which was shown to be a close ally of *Emys orbicularis* of European fresh waters, but to present distinct differential characters.

Mr. A. Dendy read a paper on the West-Indian Sponges of the family *Chelininæ*, and gave descriptions of some new species.

Mr. H. Seebohm gave the description of a new species of Thrush, from Southern Brazil, proposed to be called *Merula subalaris*.

A communication was read from Mr. R. Bowdler Sharpe, containing the description of a new species of the genus *Calyptomena*, lately discovered by Mr. John Whitehead on the mountain of Kina-Balu, in Borneo, which he proposed to name *C. whiteheadi*.

This Meeting closes the present Session. The next Session (1887-88) will commence in November.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

July 6, 1887.—Dr. D. SHARP, F.Z.S., President, in the chair.

The Rev. W. T. H. Newman, M.A., 11, Park Terrace, The Crescent, Oxford, was elected a Fellow of the Society.

Mr. McLachlan remarked that at the meeting of the Society in October, 1886, he exhibited a quantity of the so-called "jumping seeds" from Mexico, containing larvæ of *Carpocapsa saltitans*, Westw. The seeds had long ceased to "jump," which proved that the larvæ were either dead, had become quiescent, or had pupated; about a fortnight ago he opened one of the seeds, and found therein a living pupa. On the 4th inst. a moth (exhibited) was produced.

The President, on behalf of the Rev. H. S. Gorham, exhibited the following Coleoptera, lately taken in the New Forest:—*Anoplodera sexguttata*, Fab., wholly black variety; *Grammoptera analis*, Fab.; *Colydium elongatum*, Fab.; and a specimen of *Tachinus elongatus*, Gyll., with brownish-red elytra.

Mr. S. Stevens exhibited a specimen of *Orsodacna humeralis*, Latr. (*lineola*, Panz., var.), taken by him at Norwood: he also exhibited a specimen of the same beetle taken by him fifty years ago in Coombe Wood; during the interval he had never seen it alive.

Mr. G. T. Porritt exhibited, on behalf of Mr. N. F. Dobrée, of Beverley, a series of about thirty specimens of a *Taniocampa* he had received from Hampshire, which had previously been referred to as a red form of

T. gracilis. Mr. Dobrée was inclined to think they were not that species, but *T. stabilis*.

Mr. A. C. Horner exhibited the following species of Coleoptera from the neighbourhood of Tonbridge:—*Compsochilus palpalis*, Esp. (5); *Acrognathus mandibularis*, Gyll. (4); *Homalota atrata*, Mann., *H. vilis*, Er., and *H. difficilis*, Bris.; *Calodera rubens*, Er.; and *Oxytelus fulvipes*, Er. He also exhibited a *Rhizophagus* from Sherwood Forest, which appeared to belong to a new species; and several specimens of *Holopedina polypori*, Först., also from Sherwood Forest, where he had found it in company with, and probably parasitic on, *Cis vestitus*.

Mr. Elisha exhibited two larvæ of *Zelleria hepariella*, Stn.

Mr. Stainton remarked that as the greater part of the larvæ of *Zelleria* were attached to the Oleaceæ, it seemed strange that certain species had recently been found on Saxifrage.

Mr. Slater read a paper "On the presence of Tannin in certain Insects, and its influence on their colours." He mentioned the facts that tannin was certainly present in the tissues of the leaf-, wood- and bark-eating species, but not in the tissues of the carnivorous beetles, and that black colour on the elytra of certain beetles appeared to be produced by the action of iron on tannin. A discussion ensued, in which Prof. Meldola, Mr. Poulton, Dr. Sharp, and others took part.—W. W. FOWLER, *Hon. Sec.*

NOTICES OF NEW BOOKS.

Die Waldschnepfе. Ein Monographischer Beitrag zur Jagdzoologie, von Dr. JULIUS HOFFMANN. Zweite vermehrte Auflage. 8vo. Stuttgart, 1887.

THE first edition of this book appeared in 1867, and in the twenty years which have elapsed since its publication, considerable advance has been made in the study of Ornithology. Not only are there now a great many more skilled observers than formerly, but their observations are much more systematic and thorough of their kind. It may almost be said that more definite knowledge has been gained on this subject during the last five and twenty years than was acquired during the previous century. Especially is this the case with regard to the migration of birds, the determination of their breeding haunts, the discovery of new species, and the exposition of relationships from careful anatomical and physiological research. With the greater facilities which now exist for travel and exploration, naturalists have been enabled to

follow our summer migrants into their winter quarters, and to ascertain whereabouts, and in what manner, those birds nest and rear their young which visit us only during the winter months. With this general advance in the science of Ornithology it is not surprising that we have come to learn more even about so common a bird as the Woodcock, sought after as it is not only by naturalists and by sportsmen of every degree who are fond of shooting, but also by that unthinking class of persons who expect to have *gibier* of some kind in season or out of season, and care not where it comes from, or how it is obtained, so long as it appears in their *ménu*.

A glance at Dr. Hoffman's monograph suffices to show that it has been written for the two first-named classes; for the naturalist who is fond of shooting, and for the ardent sportsman who in the intervals of sport may like to read something of the history and habits of a bird which, from the nature of its haunts and its mode of flight, is at all times worth pursuit in the proper season, and, in favoured localities, affords the most enjoyable kind of shooting.

Commencing with some remarks upon the systematic position of the Woodcock in the class *Aves*, Dr. Hoffmann gives a brief review of the different species of Woodcock and Snipe known to Science, with their geographical distribution, based in a great measure upon Mr. Seebohm's article on this subject which appeared in 'The Ibis' for April, 1886, and adopting the differentiations and trinomial nomenclature there proposed. As Dr. Hoffman is not primarily responsible for the views which he has thus adopted, but merely takes them upon trust, this is perhaps hardly the place in which to criticise them, or we might be disposed to question some of the opinions here reiterated, and show cause for reducing the number of species enumerated. Moreover, such a course is rendered the more unnecessary from our expectation that in Mr. Seebohm's forthcoming work on the *Limicolæ* he will see reason to modify some of the views which he has expressed even as recently as in April, 1886. We shall at least expect to see *Scolopax rosenbergi*, Schlegel, identified with *Scolopax saturata*, Horsfield, and *Scolopax solitaria*, Hodgson, allowed to include the Japanese form which, under the trinomial *Scolopax solitaria japonica*, has been raised to the dignity of a subspecies by Mr. Seebohm in the article quoted. A closer study

of the South American Snipe, also, will probably lead to a further revision of this difficult group of birds.

After describing the European Woodcock at length, and noticing some of its anatomical peculiarities, such as the flexibility of the upper mandible, which enables the bird to seize more readily a worm beneath the surface which may be felt though not seen, Dr. Hoffman discusses the question whether there is not more than one race of Woodcock, on the ground that two very different forms of this bird are well known to sportsmen, namely, a large Woodcock (*der Eulenkopf*) of a yellowish tone of colour, with a large head, and flesh-coloured feet; and a smaller and slimmer bird (*Steinschnepfe, Dornschnepfe, der Spitzkopf, oder der Blaufuss*), more sombre in colour, and with feet of a blue or steel-grey colour. The former, it is said, breeds in Central Europe; the latter does not, although some authorities maintain that the differences above noted are indicative of sex only.

In a tabular form (pp. 25—32) Dr. Hoffman has given the weight, measurements, and coloration of forty-two specimens procured in spring (twenty-six males and sixteen females) with critical remarks on the plumage of each, which has a special bearing on the question whether the sexes of the Woodcock can be recognized by any outward markings. It has often been asserted that the sexes may be distinguished by the appearance of the first primary, in which, it is said, the outer web is of an uniform colour in the female, and has white or buffy-white zigzag markings on a darker ground colour in the male. This, however, has long ago been shown (amongst others by Gould) to be a fallacy, and we have seen the first primary of a Woodcock which had the markings referred to for half its length only, the remaining half being quite uniform in colour. Thus no dependence can be placed upon this character, which varies, not with sex, but with age; nor can any constant character be pointed out as an invariable indication of sex.

One of the most interesting chapters in the book is that (Chap. IV.) which deals with the life-history and habits of this bird, including the habit of carrying its young (p. 85), its peculiar note or call, its food, and propagation, under all of which headings a number of useful statistics are given from personal observation by the author or by some of his friends, as well as by authors of note whom he cites.

In the succeeding chapter we have an account of the geographical distribution of the Woodcock and its migrations, including a table showing the date of its spring arrival at Stuttgart (Württemberg) and at Greifswald (Pomerania) as observed for thirty years (1856—1886) by the author and by Dr. Quistorp, of Greifswald, respectively. The regularity of its appearance as noted by these two observers is remarkable, being almost invariably during the first fortnight of March, very rarely during the last week of February, and in two years only as late as the 1st and 4th April, the autumn migration commencing in Northern Europe and in the mountainous parts of Central Europe about the end of the month of September, although later in Germany, and, according to the weather, sometimes even as late as the middle of November.

In Chapter VI. the winter quarters of the Woodcock are defined with more or less exactness (pp. 108—120), and its occasional appearance in the United States noted.

The concluding portion of the volume deals with Woodcock shooting under various aspects, and includes some interesting statistics in regard to the number of birds killed in different years; while an appendix of eight pages contains an account of the North-American Woodcock, with which species the author became personally acquainted in New Brunswick.

On the whole it may be said that both naturalists and sportsmen will find in Dr. Hoffman's monograph an excellent contribution to the history of a much-prized bird, written by one who is evidently well qualified from his experience to deal with the subject.

A Year with the Birds. By an OXFORD TUTOR. Second Edition, enlarged. Post 8vo, pp. 180. Oxford: Blackwell. London: Simpkin, Marshall & Co.

WE believe it to be now an open secret that Mr. W. W. Fowler is the author of this very pleasant little volume, which has deservedly reached a second edition; any doubt on the subject may be almost certainly removed by a glance at the neat "dedication," which runs thus:—"Patri meo qui cum Aucupis nomine avium amorem filio tradidit."

The object of the writer apparently is to show how much

real enjoyment may be gained from a study of Ornithology, even in a city, and under circumstances which at first sight would hardly seem favourable. The "list of birds observed in Oxford and within a radius of four miles" (pp. 165—170) includes upwards of a hundred different species, and, although a few of them (like the Hoopoe) may be considered as of doubtful occurrence, while others, like the Hen Harrier and Goshawk, must be exceedingly rare within the radius referred to, yet it is evident that even in close proximity to a large city like Oxford there is an abundance of bird-life to be met with, offering an attraction at all seasons to those who would have an object in their walks.

It is surprising how many birds, in spite of the presence of their deadliest enemies, boys and cats, will come into our gardens to build their nests, if only fair opportunities are afforded them. "An Oxford Tutor" tells us that in a garden close to his own, wherein the owner had used every means to attract them, there were, in May, 1886, fifty-three nests, exclusive of those of Swallows and Martins. The garden is not more than two or three acres in extent, including a small orchard which adjoins it; but by planting thick bushes and coniferous trees, and by placing flower-pots and boxes in the branches at some height from the ground, he inspired them with confidence in his good intentions. The fact that a pair of Missel Thrushes reared their young there only a few feet from the ground, and close to a stable and much frequented walk, shows that even birds of wild habits of life may be brought to repose trust in man by attention to their wants.

It is not often that one has an opportunity of seeing the Grasshopper Warbler, though its note is very familiar; for it is of such skulking habits and restless disposition that it seldom affords more than a momentary glimpse of itself as it creeps through the thick covert in which it delights. The author of the present volume furnishes some interesting notes on this species (pp. 101—103) from his own observation of it under favourable circumstances. His attempt to sketch the local migration of birds, as observed in the neighbourhood of a particular mid-land village, is doubtless applicable to many other parts of the country.

Nor is it only as an exponent of English bird-life that "an Oxford Tutor" comes before us. Vacation rambles in Switzerland

have afforded many opportunities, which have been turned to good account, for the quiet observation of some of the so-called rarer British birds in some of their continental haunts. Comparatively little has been published in English on the birds of Switzerland, and the chapter entitled "The Alps in September" will on this account, as well as for the information which it affords, be read with interest by every ornithologist.

In the succeeding chapter on "the Birds of Virgil" (one of the best in the book) we find ample proof that a knowledge of natural history is a material aid to the proper understanding and due appreciation of many passages in the works of this most observant Latin poet. The brief sketch given of his home and surroundings in early life (pp. 135—139) shows what opportunities he must have enjoyed for a study of nature, and how well these opportunities were subsequently turned to account:—

"The first sixteen years of his life were spent in his native country of Cisalpine Gaul, almost under the shadow of the Alps. His parents were "rustic," and he was brought up amongst the woods and rushy meads of Mantua and Cremona. At that time probably the great plain of the Po was still largely occupied by those dense forests the destruction of which is said to be the chief cause of the floods to which the river is liable. Much land also must have been still undrained and marshy; and we can still trace in the neighbourhood of Mantua the remains of those ancient lake dwellings which an ancient people had built there long before the Gauls (from whom the poet was perhaps descended) had taken possession of the plain. These woods and marshes, as well as the land which Roman settlers had tilled for vine or olive, must have been alive with birds in Virgil's day. There would be all the birds of the woods, the Pigeons, Owls, and Hawks; there would be Cranes and Storks at the period of their migrations, and all manner of waterfowl from the two rivers Po and Mincio, and from the Lacus Benacus (Lago di Garda), which is only about twenty miles distant. Later in life he was as much in Southern as in Northern Italy. That the first three Georgics were written, or at least thought out, on the lovely Bay of Naples is tolerably clear from lines at the end of the fourth Georgic. Here were all the sea-birds, and the wild-fowl that haunt the sea; here the summer migratory birds might land on their way from Africa. Here, from the sea and all its

varying life, the poet's mind would enrich itself with sights unknown to him in the flat lands of the Padus, and grow to understand more fully day by day the impressions—often dull ones—which Nature had made on the poets who had sung before him. He loved Campania and he loved Sicily; at Tarentum also he sojourned, probably visiting the friendly and jovial Horace. The hill-country of the peninsula and of the island that belongs to it, became a part of his poetical soul; and as he probably spent much of his time at his own Cisalpine farm, after he was restored to it through his patron's kindly influence, he must have been constantly moving among all the phases of Italian landscape—in the plain, on the hills, by the sea."

"An Oxford Tutor" criticises Virgil's knowledge of birds, of which some twenty different kinds are mentioned, and shows that, although here and there we find some delusions which were the common property of the age, his descriptions of their habits are for the most part accurate, and happily expressed. The classical scholar, as well as the naturalist, will discover in this chapter much sound criticism, and very pleasant reading.

As a tutor, the author considers that one of the most useful aids towards education is to direct attention to the study of natural objects, and his agreeable method of imparting information will bring many, we cannot doubt, to his own way of thinking.

A Bibliography of the Books relating to Fancy Pigeons. By T. B. COOMBE WILLIAMS, with Notes on their Rarity and Value. 8vo, pp. 20. Printed for the Author by West, Newman & Co., Hatton Garden. 1887.

ALTHOUGH nearly all the chief domestic races of Pigeons existed before the year 1600, no English writer on the subject appeared until John Ray, in 1678, in his edition of Willughby's 'Ornithology,' published the first English account of fancy Pigeons, and figured ten varieties of them.

Most English pigeon-books, and very many German and French ones, are of comparatively recent date. Mr. Coombe

Williams's list, although it cannot be said to be exhaustive, conveys a fair idea of the principal literature which exists relating to fancy Pigeons, and will be very useful. Roughly speaking, of the 140 titles, or thereabouts, which he quotes, English writers are credited with 58; German (including translations), 45; French, 21; Dutch, 3; Latin, 3; Italian, 5; Spanish, 1; and Arabic, 1.

Amongst English books on this subject one of the rarest is John Moore's 'Columbarium, or the Pigeon House; being an Introduction to a Natural History of Tame Pigeons.' 8vo, pp. xiv.—60. London, J. Wilford, 1735. It is an original work, and one to which subsequent writers on Fancy Pigeons have been much indebted. It is of such rarity that only half-a-dozen copies are known to exist, four of which are in the British Museum, a fifth in the library of Mr. Esquilant, and the sixth in the possession of Mr. Coombe Williams. In 1852 it was reprinted by Eaton, and in 1874 by Wade, in Philadelphia, the latest edition being that issued by Mr. Tegetmeier in 1879. Of these we are acquainted only with the last named, which seems unfortunately to be not very accurate, for according to Mr. Coombe Williams, although purporting to be a *literatim* reprint it contains more than fifty misprints! Wade's edition also is condemned as having no pretension to be a *literatim* reprint.

John Moore seems to have been somewhat of a celebrity in his day. Pope addressed a poem of ten verses to him, and he is mentioned by Swift in "a letter from a gentleman in the country to his friend in town." His death, which occurred in 1737, is recorded in 'The Gentleman's Magazine' for that year.

Amongst other rare books on this subject in the possession of Mr. Williams, is a curious volume in French by de Sacy, printed in 1805. It is entitled 'La Colombe,' and is translated from the Arabic, the Arabic and French texts being printed on opposite pages. This is stated to be "very scarce."

To judge by these and some other rarities which we notice in the Catalogue, Mr. Williams may be congratulated on his collection of "Pigeon books," and upon his useful list of them.



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ON THE GROWTH OF ANTLERS IN THE RED-DEER AS OBSERVED IN CONFINEMENT.

BY SAMUEL CARTER.

As you have paid me the compliment of asking me to write down my experience of keeping Red-deer in a paddock at Kensington, I now do so, although I feel some diffidence in the matter, having so little to relate.

The early years of my life having been spent amongst some of the best sportsmen in Norfolk, in what was then the business of my life, I had excellent opportunities for making observations on all kinds of game and animals connected with sport, the study of which has since helped me much in my profession of animal painter. Deer always had a great fascination for me, but as they could not be easily approached, either in parks or in the Highlands, I was unable to do much beyond studying their general appearance and beauty of movement. I therefore determined to keep some as models in connection with my studio. Having fortunately a good old-fashioned garden (one of the few left about here, with stabling, &c.), I was able to arrange my deer-houses and walks, which although limited as regards space, I found quite sufficient for my purpose, and met, I consider, with fair success. I bred eleven young deer, or "calves," as they are termed, in six years, one of the hinds being only in her first season when she came. Having arranged their walk, which was about thirty-eight feet long, with nine-foot pallisading and rough concrete floor,

with drains and gratings to enable the man to wash the place down every morning, I left the surface sufficiently rough to wear their hoofs and keep them from growing too long. This is of the first importance in keeping hoofed animals, to prevent their becoming lame. A division was made in the centre, with a gate so arranged that it could be opened and shut from the outside, to separate the stag when necessary from the hinds, and also for the safety of the man when cleaning the place when the stag had his horns burnished. In each division there was a separate retreat, with straw bed, hay-rack, and water-trough, and everything was then ready for the deer, which I purchased from Mr. Herring, the well-known dealer in deer, then living in the New Road. One of the hinds being scarcely at the end of her first year, she did not breed until the second season after I had her,—that is, in her third year,—but the old hind (not her mother, by-the-bye) had a good calf, and after that each season they had a calf for five consecutive years. Whilst I kept them I gave away two yearling hinds to the Zoological Society; but I do not know what became of them, as I never saw them afterwards, and could not learn anything definite from the keeper, though I did not press my enquiry.

One fine male calf, which was born in the last week in May, 1875 (the earliest, by-the-bye, I remember), I thought I would keep, in order to see how he would turn out, and a fine deer he made, being quite the height of the old stag at the end of the first year. He had then begun to throw up his first points, which were, as usual, straight ones, and were shed at the end of the following April, or rather in the last week of that month, so that I reckoned he was then one year and eleven months old. He then commenced his first antlers, which, to my surprise, had *nine* points, when fully up at the end of July! I might, I think, have called him "a stag of ten," but the bay tine on one side was only what is called an "offer," about half an inch long. I parted with him in the following autumn to go to Richmond Park, where I hoped to see him from season to season; but I was much disappointed afterwards to find that they had been obliged to cut him, for being brought up so tame, and having lost the natural fear of man, he became too dangerous for a public park, and would attack people, and even horses in carriages, I was told. It was also unfortunate that when moving him they were obliged to

saw off his horns, which they did by cutting off the brow-tines close to the burr and the beam, just above, in the usual way, and, as I was not at home at the time, the pieces were eventually lost sight of, for at that time I had no idea of writing or taking further notes on the subject, the deer having been seen by all my neighbours and many visitors to my studio. Amongst others, Mr. Tattersall, a near neighbour, saw them, and Mr. Norman and the late Rev. John Russell, both great stag-hunters with the Devon and Somerset Staghounds. I first made their acquaintance and enjoyed a good season's sport with them, when I painted the late Master of that pack, Mr. Bisset, and other members of the hunt, with a stag at bay in the Doone Valley.

Mr. Russell, I remember, was rather puzzled about the antlers, as he always held to the theory that they progressed more gradually, whilst I maintained that many of their deer which they would have were seven years old were only three or four years old, the rapid growth of the horns being due to the fact that in that country they get such good browse in the large covers of scrub-oak and other trees, as well as from the enclosures. In this way getting generally better feeding than the deer in Scotland, and having to put up with less severe winters, they are larger and have better heads at a much earlier age. This accounts for so many "warrantable deer," as they are called, being found every season, notwithstanding so many being killed the previous season.

I feel confident that the development of antler is more the result of feeding than anything else, and I think my young stag might have had "three upon top" if I had not thought it necessary, when the horns had passed the "tray" and were forming the top, to stop the supply of maize, on account of the heat in the beginning of July, and the rather circumscribed space in which they were confined, for they appeared to suffer somewhat in consequence, the walk being open to the south and very warm, although in the sleeping sheds the sun was of course kept off. There is no doubt that in some herds the deer, either from the food in their locality or from some peculiarity in their nature, grow larger horns than those in other herds. I am almost convinced that the six points indicate the proper head for a stag after shedding his first

uprights, if he is a healthy animal, living under favourable circumstances, with plenty of good browse and shelter, and on a good soil—as, for example, in the better parts of Hertfordshire, which centuries ago took its name (so I have been told) from the size of “the great hertes” found there. My impression in this respect was confirmed by a gentleman who visited my studio. Being interested in deer, I told him about the young stag throwing up such a large head immediately after shedding his first uprights, and he replied that it was not at all strange, for it was a matter of keep and comfort. He then related to me an instance in which a congregation in church were surprised and somewhat alarmed (I forget whether he said it was at Balmoral or Braemar, but I think the latter) by two stags—both “royals”—walking in and down the middle aisle. It turned out that they were two that had been given as calves to the children of a farmer. Having been well nourished each threw up twelve points immediately after shedding the first uprights; but becoming then rather dangerous, were kept in a place of safety, but by some accident had been let out. I only tell this as it was told to me, and have been trying in vain to recollect the name of my informant.

As to my own experience, there are a few things I have noticed about deer which may be worth mentioning. It was an invariable rule that when the hinds had shed their winter coat and assumed their clean bright summer dress, you might in a week, or ten days at the outside, expect the fall of the calf, and it was the same with my Fallow-deer. But in noticing recently the Wapiti in the Zoological Gardens, I was surprised to see that (although each had a fine calf about a month old) the hinds were still shedding their old coats, and that only on their legs, face, and ears had the clean summer coat; they had got rid of the long winter coat, but still their bodies were covered with the shorter winter hair still falling off.

Another point I have remarked is the difference in the colour of deer, and especially in the eye. Some are much lighter coloured than others, and have an eye with a straw-coloured iris; others have a dark brown eye and the red of the bodies and the browns and grey about the face, neck, and legs much darker in tone. So far as my experience goes, I am of opinion that the dark deer belong to the Highlands and Islands of Scotland, and

the light-eyed deer of a lighter and more mealy colour belong to the parks and lowlands, being also larger and partaking more of the character of the continental deer. I have noticed that Sir Edwin Landseer painted the dark eye, which he may have selected because it came in better from an artistic point of view, or because he always painted Highland deer.

My stag was aged when I first had him, and was peculiar in having odd eyes, one straw-colour, the other light blue. He was a good stag, however, rather short and thick-set, and what I call "mealy-faced." The two hinds were darker in colour, especially the younger one, with fine rich brown eyes; the calves took after them, and the young stag had the rich brown eye, like his mother, the largest hind. When quite young, with spotted coats, they were so like the young Wapiti now in the Zoological Gardens that I could not help being struck by the similarity, apart from size. The young Wapiti, as a rule, are darker about the face, ears, and eyes, but not more so than the young of my small dark hind; and it is curious that the difference between the Wapiti and Red-deer develops as they advance towards maturity.

I am surprised that deer are not more often kept, for they are very beautiful when viewed behind nice pallsading, and appear perfectly happy. They do better in a limited place such as mine than if they had a small run of grass, which only gets into a bad state, spoils their feet, and affects their general health. I think, moreover, my deer were also more contented at not having too extensive a view, but only a few trees and shrubs in front of their walks. I am certain this would be a good plan in breeding fresh stock for forests. The dry food which I gave them was hay and maize, with an occasional change to oats; and for moist food I found golden-globe mangolds the best, for I have kept these roots stored in the outhouse all through the winter to the end of June, and still good. This could not be done with swedes, and the mangolds contain more moisture. In summer I gave green tares, and grass from lawns where it could be got clean.

Besides the Red-deer I also kept a Fallow buck and four does, which did equally well, but were not so pleasant to keep, for they quarrelled so—not so much between the buck and does as between the does themselves, which were constantly chasing and biting each other.

Both the calves of the Red-deer and the Fallow fawns used to come out through the railings and lie by themselves in the garden, and only went to their mothers for nourishment, except at night for protection. The only accident which happened was one killed by a large cat. It was one of the Fallow fawns, and hearing it crying I went out, and caught the cat on its neck. As he would not retreat more than a yard or two, I brought out my little rook-rifle and shot him dead. It was the more astonishing because this occurred when the fawn was more than two months old, and a fine strong, well-grown one. It was not quite dead when I arrived, but so injured that it could not stand, and being a good deal torn, I thought it better to put it at once out of pain. It was lucky they were not attacked in this way when younger, for they were generally out in the garden, and at times it was a pretty sight to see them playing on the grass-plot—three Fallow fawns and two Red-deer calves. But they soon became bad gardeners, for they used to send the plants flying in their races over the flower-beds as they became stronger, and had to be kept in by wire-netting outside the iron pallsading.

I have omitted to state that my old stag never had more than eleven points, and one of them only an offer on one of the tops; but I believe him to have been a very old stag when he came. For the last year or two the tines were straight and flat, and lacked the vigour of the curve. He might also have become a "royal" if I had not been obliged, or thought it necessary, to stop a good deal of the food in hot weather, just as the tops were growing, because they used to stand and pant from the heat, as the walk was without a roof and full in the sun, and in their houses it was also very warm, so that both deer, I consider, had the growth of horn checked. I have the old stag's head preserved, with his ten points; but he was going off from the time I had him, although always a heavy deer.

REPORT ON THE GROUSE DISEASE.*

BY E. KLEIN, M.D., F.R.S.

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THE disease which during the spring and summer of the present year prevailed amongst the Grouse on the moors of Ayrshire and Cumberland is, according to the account given to me by the keepers on the various moors, the same which visited those parts during 1882 and at previous periods. The disease, during the present year, commenced on all these moors about the end of the first and during the second week of April, and lasted in a severe form until the end of May. During June it greatly diminished, and by the middle of the month, although in every one of the moors visited there were birds still affected, the disease had so much abated that it may be said to have practically come to a close. But I am sorry to say that this standstill seems to be due, in some degree, to the fact that most of last year's birds had been almost cleared out by disease. At any rate, on some of the moors few healthy old birds could be met with.

The symptoms of the disease in Grouse during the present year are the same as those noticed in previous epidemics, and I think there can be little doubt also that during this year it is the typical and well-known "Grouse disease." All the keepers of the moors visited are unanimous on this point. The birds affected with the disease show the loss of feathers on the legs, the darker colour of the plumage on the back, the hoarse voice, and the sluggish abnormal flight. The birds seek the water, and when dead are generally found near or at the burnside or other water, loch or drain, on the moors. The diseased birds which I have examined—and this agrees with the accounts given by the various keepers, as well as by other observers—differ in this, that some die in a plump, others in a wasted condition.

The moors which I visited, and on which I examined diseased birds are:—(1) Waterhead Moors, near Cumnock, rented by Mr. L. Marshall and Mr. S. Grant; keeper, J. Sargent. (2) Craiglure Moors, near Maybole, belonging to the Marquis of Ailsa; head keeper, Mr. Cox; under keeper, Macdonald. (3) Kilkerran Moors,

* From 'The Field' of July 23rd, 1887.

Kilkerran, belonging to Sir James Fergusson; keeper, Shiels. (4) Blairquhan Moors, rented by Mr. G. Bailey Worthington; keeper, Tolmie. (5) Stellshaw Moors, belonging to Sir Frederick Graham; keeper, Alexander Crow. (6) Flat Moors, rented by Mr. Carter Wood; keeper, James Crow. (7) In addition to these I examined a diseased bird sent from Peeblesshire.

1. WATERHEAD MOORS.—Few diseased birds to be met with. The keeper shot a cock bird, which, by its dark plumage on the back, its sluggish flight, and its legs bared of feathers, was diagnosed as distinctly diseased. The bird was in a slightly wasted condition. The *post-mortem* examination was made about three hours later. The middle portion of the small intestine, and both the cæcal appendages, contained numerous tæniæ or tapeworms. The small intestine and cæcal appendages showed three perforations, evidently recent, and produced by shot. Through these perforations some tapeworms were protruding. The liver was much congested, and of a dark greenish colour. The second bird shot on these moors was a hen bird, in fairly plump condition. The *post-mortem* examination was made about three hours afterwards. The peritoneum looked normal, except some patchy redness in the small and large intestines. Several recent perforations were noticed on the small intestine and cæcal appendages; from their nature they were probably caused by shot. Numerous tapeworms were found protruding from the small intestine, and extending freely into the peritoneal cavity. The mesentery, the parietal peritoneum, and the under surface of the liver, were covered with a layer of thick sanguineous exudation. The liver was much congested and of a dark colour. The kidney was also congested.

2. CRAIGLURE MOORS.—After a prolonged search, lasting several hours, we got a diseased cock bird, which was shot by the keeper. The bird was in a plump condition. The peritoneal cavity was normal. The whole of the lower half of the small intestine contained numerous tapeworms. There was patchy congestion in many places in the wall of the small intestine. The liver was congested and of a dark colour; the kidney appeared slightly congested.

3. KILKERRAN MOORS.—After several hours' search, during which time a fair number of healthy birds were met with, we came across a diseased cock bird, which was shot by the keeper. The

bird was in a thin condition; bare on chest, abdomen, and legs. The *post-mortem* examination was made about two hours afterwards. Along the small intestine, which contained numerous tæniæ, there were several recent perforations, some minute, others larger, probably produced by the shots. Blood clots were found in the abdominal cavity; these had probably been caused by injury to a large vessel. There was sanguineous exudation on the mesentery, on the parietal peritoneum, and on the upper surface of the liver. Numerous tæniæ were protruding from the small intestine into the peritoneal cavity, several whole tæniæ and several small pieces of them being free in the peritoneal cavity. The liver was congested and discoloured.

4. BLAIRQUHAN MOORS.—Two diseased birds were examined; they were shot by the keeper. One was wasted, and to all external appearance, was considerably advanced in disease. On opening the abdominal cavity, the parietal peritoneum, the mesentery, and the serous covering of the intestines were found greatly inflamed and covered with sanguineous exudation; so was the external surface of the liver. The middle part of the small intestine showed several perforations, probably all produced by shot, tæniæ protruding from its cavity into the peritoneal cavity; in the latter were numerous tæniæ. The liver was large and much discoloured; the lungs and kidneys congested. The second bird was, to external appearances, less diseased, and in a fairly plump condition. The peritoneum looked healthy, but the small intestine showed patchy hyperæmia in several places. At one of these places the wall of the intestine was particularly congested and considerably thinned out, so that it required little for a perforation. The whole small intestine was much distended by numerous tæniæ, more than a dozen heads being noticed. The liver was congested and discoloured.

5. STELLSHAW MOORS.—Numerous adult healthy birds were seen, and numerous healthy and strong young ones. This was the only moor where one might say there was a fair stock of Grouse. During the whole day we came across only one cock bird that could be considered, from external appearances, to be in a diseased condition. It was shot, and found in a fairly plump state. The peritoneum was healthy; the small intestine contained numerous tæniæ, and showed in different parts congested patches. The liver was congested, and slightly darker in colour than normal.

6. FLAT MOORS.—The first bird that I examined was brought to me by James Crow, the keeper, who found it in a dying condition. The *post-mortem* examination was made one hour later, death having by this time ensued. In the peritoneal cavity there were found free several big clots of blood, and also a little of serous fluid; close to the left kidney were lying several blood-clots and a mass of tapeworms. These were protruding through a hole in the middle part of the small intestine, into the cavity of which the hinder portions of these *tæniæ* could be traced. The small intestine showed at and near this perforation congested patches. The liver and lung were congested, particularly the former, which was of a dark green colour. The kidney was in a state of extreme congestion, particularly the right kidney, on which some big venous branches were found ruptured, and from them blood was exuding. The second bird examined was a cock bird; it was shot because, from external appearances, it was considered by the keeper to be in a distinctly diseased condition. The animal was fairly plump. The peritoneum was much inflamed, particularly the parietal layer on the right side and the serous covering on the intestines; sanguineous, thick exudation on mesentery, and in right hypochondrium. The small intestine, in its middle portion, was much distended by *tæniæ*, and on one place opposite the right kidney there was a place noticed where the wall of the intestine had become much thinned out and ready for perforation. In addition to these birds, the keeper caught two living hen Grouse, which seemed to all appearances to be in a diseased condition. Both had the external signs of disease on them, but were in a fairly plump condition. They were brought to London in a living state. One was killed, the other died after two days. The *post-mortem* examination of the first showed patchy redness of the small intestine, the liver of a darkish colour. Numerous *tæniæ* were present in the small intestine. The second bird showed the congestion of the small and large intestines very pronounced, and the same was observed on the pancreas. The organ was much infiltrated with blood; the liver was enlarged, much congested, and of a dark greenish colour. The small intestine contained only a few *tæniæ*.

7. Through 'The Field' office I received a bird, which was sent from Broughton, in Peeblesshire. The bird, when sent off by the keeper, was still living, but it died *en route*. When

I examined it, the day after, it was in a fairly good condition of preservation. The small and large intestines showed a good deal of congestion, the mesentery was inflamed, and there was a small quantity of fluid sanguineous exudation in the peritoneal cavity. The kidney showed great congestion, so did the lung; the liver was much congested, and of a greenish black colour. In the small intestine were numerous tæniæ. At one of the congested points of the small intestine, the wall of the intestine was very much thinned out and almost perforated.

From these observations it follows that all birds examined showed, as the most constant anatomical symptoms, the congestion of some parts of the intestines, the great congestion and discolouration of the liver and kidney, and in some cases also of the lung. In some cases the peritoneum was inflamed, and there was more or less inflammatory exudation in the peritoneal cavity. Extravasation of blood from the kidney was observed in one bird that had died spontaneously of the disease. In all the birds tæniæ (*Tænia calva*) were present in the small intestine, in some in great numbers; in one bird that died spontaneously only a few examples were noticed.

Unmistakable perforation of the intestine was noticed in one bird that had died spontaneously of the disease (from Flat Moors), and in another bird (from Broughton), also dead spontaneously, the intestine was on the point of perforation. The perforations noticed in some of the birds that were shot must be left out of consideration, since the nature of the perforation was not incompatible with having been caused by shot.*

Comparing these observations with those of previous investigators, we find, then, that they harmonise to a great extent with those recorded by Dr. Andrew Wilson in the 'Edinburgh Medical Journal,' and quoted by Mr. D. G. F. Macdonald in his book on 'Grouse Disease,' p. 145. Mr. Wilson noticed in the birds dissected by him a markedly congested state of the digestive

* The presence of tæniæ, whole and short pieces, found in some of the birds examined by me is easily accounted for by remembering that if a perforation of the small intestine takes place (by disease, as in one of my birds, or by shot, as was most probably the case in several of the birds examined), the tæniæ present in the intestine, by their known power of rapid contraction, would be able to pass out into the peritoneal cavity; this need not take more than some minutes.

and respiratory organs. Prof. Jeffrey Bell, in 'The Zoologist' for July, 1887, p. 265, noticed in some specimens a marked inflammation of the walls of the intestine, in others a congested state of the liver.

In 'The Field' of December 6th, 1873, p. 593, there is a reference to a passage printed in the 'Oriental Sporting Magazine' of January, 1829, and copied from the 'Greenock Advertiser,' so that it was probably first published in 1828—that is to say, sixty years ago—to the following effect:—

“ Having heard a great deal said about a destructive disease spreading devastation among the moor game of this district, we have taken some trouble to inquire into the truth of the report, and, having ascertained it to be correct, we afterwards caused some inquiries to be made into the nature of the malady. From Mr. Wallace, a well-known adept in sporting matters in this immediate neighbourhood, several Grouse, in a state of complete emaciation, were sent to town. These were carefully dissected by one of our medical friends, and the disease found in all of them to be tapeworm. It is quite astonishing to observe the extent to which the disease can exist in the feathered tribe before causing death. . . . Some years ago, when a similar disease was prevalent, Mr. Wallace caused many specimens to be examined, and in some of them life had been protracted in the animals even after the worms had penetrated the intestines, twisted round their outer coats, and produced such extensive suppuration in the cavity of the abdomen, that the intestines literally floated in pus or matter.”

Now, the question presents itself, What is the cause of these anatomical lesions? It is well known that there are a good many theories concerning the cause of the Grouse disease; they have very ably been put together and analysed by Mr. Macdonald in his book on Grouse disease, quoted above. Of these theories three deserve special reference:—The first of these was put forth by Dr. Farquharson, who maintained—without, however, adducing any definite facts to prove it—that Grouse disease belongs to the category of infectious diseases. The second view is that advanced by the late Prof. Cobbold, to the effect that *Strongylus pergracilis* in the intestine is the cause of Grouse disease. And the third view may be considered contained in the passage quoted above from the 'Greenock Advertiser' of 1828. Other theories, such as overstocking, inclement season, insufficient and bad food, &c., are more or less of the nature of secondary influences, such as are known in other infectious diseases to increase or decrease the

susceptibility and spread of the malady, but cannot be regarded as the *causa causans*.

The first theory supposes the existence in the diseased animals of a hypothetical virus, which, by its multiplication within the organism, sets up the symptoms and phenomena of the disease. This virus, when finding access to a healthy bird, would here again multiply and produce the same disorder. In many infectious diseases the virus has been definitely shown to be some low form of life, generally belonging to the group of species of Bacteria. Some of these species have this great character, that they can live, thrive, and multiply within the body (in the blood and tissues) of certain species of animals, and by their chemical action, or otherwise, therein produce a definite group of symptoms characteristic of the particular disease. When they or their offspring find access to a new susceptible body, they again multiply herein, and set up the same diseased state. Thus some of the infectious or communicable diseases have been proved to be caused by a definite species of microbes, differing in the different diseases. They are known as pathogenic microbes, and they are distinguished from other non-pathogenic species of microbes—though both are similar in morphological respects—in this important particular, that the latter have no disease-producing or pathogenic power—*e. g.*, some species of microbes associated with fermentative and putrefactive processes.

The methods generally employed for the study of pathogenic microbes are these:—(1) The blood or tissues, or both, of an animal affected with an infectious disease should, as a first condition, contain some definite form of microbes discoverable by the microscope; (2) these microbes, taken from the blood or tissues of a diseased body, when transplanted on to various artificial nutritive media, multiply thereon, and thus produce new crops; (3) the microbes of these artificial crops, or those taken directly from the diseased tissues, when transplanted (by inoculation or otherwise) into a healthy susceptible animal, set up the same disease as that from which they are derived; and (4) in the animal thus infected the same species of microbes must be found to exist in the diseased tissues.

Accordingly (1) I made a careful microscopic study of the blood and diseased tissues (liver and kidney) of Grouse dead of the disease. Three birds were examined:—(a) the one sent from

Broughton, and mentioned above, No. 7; (b) the bird that was found in a dying condition on Flat Moors, and mentioned No. 6; and (c) the bird that I brought to London with me, and that died here after two days. In no instance have I been able to discover the presence of a definite form of bacteria. Numerous microscopic specimens were examined of the liver and kidney, and the blood; they were prepared by the methods used for the microscopic study of bacteria (staining with certain aniline dyes), but no kind of bacteria was discoverable. (2) I have made a large number of cultivations of blood on artificial nutritive media (nutrient gelatine, Agar Agar mixture, &c.), such as are used for this purpose in bacteriological investigations, but I have not been able to obtain any growths. I was therefore forced to conclude that, with our present means, no bacteria can be discovered as having anything to do with the Grouse disease.

I directed my attention then to the second theory, that advanced by Prof. Cobbold. The three birds which I used for the bacterial investigation, and also the others examined, contained no strongyles in their intestines, and therefore Cobbold's theory was not applicable to our Grouse disease.

The third theory above mentioned, namely tapeworm and perforation of the bowels, did seem to a certain extent to harmonise with the observation made by myself, and recorded in a former paragraph. And I confess it was this theory which I provisionally accepted while in Ayrshire. But after I returned to London, and after I had an opportunity of dissecting the two deceased birds caught in Cumberland—one of which died two days afterwards in London—and found no signs of perforation of the bowels, and, moreover, in one bird only very few tapeworms in the intestine, while the intestines, liver, and kidney showed such marked signs of disease; and further, when I found that Mr. Crisp had stated some years ago, in the 'Pathological Transactions,' that he had dissected several birds not dead of the disease, and that he found in them numerous tapeworms; and finally, taking into consideration that many competent anatomists had dissected birds dead of the disease, but had not noticed any perforation of the bowels, I had to give up this theory of the tapeworm being the cause of the Grouse disease.

I will also state that the tapeworm theory always presented to me this serious difficulty, *viz.*, how to reconcile with it the diseased

state of the liver, which I described in a previous paragraph. As a matter of fact, most of the keepers were firm in the belief that, in all birds dead of the malady this year and in previous years, the liver was found, on opening the animal, in a diseased condition. Others who have had experience in these matters, like Mr. Bailey Worthington and others, were of the same opinion.

The fact that in the two diseased birds which I brought to London, and in which the peritoneum was to all appearances sound, but the liver and kidneys, particularly the former, in a pronounced state of disease, presented an insurmountable difficulty, and I may say, in consequence, I altogether abandoned the theory of tapeworm.

Thus, except having learned from my own observations the nature of the pathology of the diseased birds, I had to confess the *status quo ante*.

This being the state of matters, and seeing that the liver is the organ most constantly and distinctly affected, it was necessary to examine this organ microscopically in order to study more carefully the nature of the affection. Two things seemed to me to deserve special attention. In the first place, there can be no doubt that the theory that Grouse disease belongs to the group of infectious or communicable diseases best harmonises with the general pathology above described, and the manner of the spread of the disease, as observed in this epidemic and in former years—*viz.*, that the disease, having made its appearance in a particular locality, gradually sweeps, as it were, over the whole of this and the adjoining districts; further, that the disease, manifesting itself at first in isolated cases, soon becomes epidemic, and then again gradually declines in frequency.

Secondly, the question of some species of bacteria being the cause of the disease could not be answered in the affirmative. But it was still possible that some other kind of fungus was the cause of the malady, and in this case ought to be discovered in the liver. In connection with this, it is necessary to bear in mind that not all communicable diseases are due to bacteria. Amongst these I may mention various forms of Protozoa, *Amœba coli* and various Psorospermia (*Coccidium oviforme* in rabbit's liver); then there are various higher Fungi, *Favus fungus*, *Aspergillus flavus*, *fumigatus*, and *niger*; then several species of Mucorinæ, all of which are known to be pathogenic to man and animals; then

Actinomyces in cattle and man; and lastly some forms belonging to the group of low Fungi known as Mycetozoa, Mixomycetes, or Plasmodia. In this connection may be mentioned the important discoveries of Marchiafava and Celli on the cause of intermittent fever or ague. These observers have shown the existence, in the blood of persons affected with ague, of certain forms of plasmodium, and these are probably the cause of the disease; and recently also Dr. D. Cunningham, of Calcutta, found in the tissue of the so-called "Delhi sore" (a cutaneous disorder in India), a form of plasmodium.

Now, a careful examination, after my return from Scotland, of microscopic sections of the liver of Grouse dead of the disease, showed the existence, in the capillary blood-vessels and also in large branches of the veins of the liver, of numerous objects which do not belong, and are foreign to the normal liver tissue, as well as to the blood, or any other tissue of the bird. In suitably prepared specimens (hardening in alcohol, staining of fine sections in methylene blue), every capillary blood-vessel, or at any rate the spaces between the streaks of liver-cells usually occupied by capillary blood-vessels, contain certain corpuscles, which are about two to four times the diameter of the liver-cells, and of the white blood-corpuscles. The bodies in question are present in very great numbers, and are of various shapes—some cylindrical, others spindle-shaped, some are irregular and with one or more processes, while others are irregularly elongated; each consists of a hyaline protoplasm, in which one or two oval nuclei are occasionally noticed; but most of the protoplasm of the corpuscles is filled with spherical or irregular coarse particles. The protoplasm does not take the stain, while these particles are deeply tinted. The impression these bodies give one is that they are some form of plasmodium, arrested by the hardening re-agent in one or the other phase of amœboid movement, such as is shown by plasmodium. There can be no question about these bodies, they are present everywhere in the capillaries of the liver. I have seen them also in most of the larger branches of the veins of the liver, and here I have also met with forms which very well harmonise with this view—*viz.*, some forms spherical in shape, smaller than the above, and inclosed in a distinct capsule; they would correspond to the spores of plasmodium. Further, nucleated corpuscles with uniform protoplasm were noticed differing from

white blood-corpucles in size and aspect; they were in groups of three or four, and more or less in the process of coalescence, such as is known to take place with the swarm-cells, derived from the germination of the spores, in order to form a plasmodium.

That the presence of these Fungi in the blood-vessels of the liver would at once readily explain the diseased condition of the liver, is obvious. As to the inflamed condition of the peritoneum noticed in some cases, this would follow the congested state of the liver; and the same applies to the congestion, inflammation, and even perforation of the intestine observed unmistakably in two cases that had died spontaneously of the disease; for the extreme congestion of the veins of the liver might easily produce that state, since the venous system of the intestines discharges into the hepatic portal system. But the same Fungi may be also present in the vessels of the intestine, and thus directly produce the abnormal condition of this organ; but this I have not yet inquired into.

At any rate, it will be necessary to study these bodies in the fresh and living state, which I hope soon to be able to do; and further, their distribution in the diseased animals, the distribution of them and their spores on the moors, and the mode of entrance into the birds, will have to be carefully gone into. It is evident that on such studies will depend all preventive measures. So much I will assert at present, that there exists in the liver of diseased birds large numbers of corpuscles which are foreign to the liver tissue, and which in all respects correspond to some form of low Fungi, most probably to Plasmodia.

In conclusion, I wish to offer my best thanks for the kind help and co-operation which I received from Sir Frederick Graham, Bart., Mr. J. Bailey Worthington, and Mr. Leonard Marshall. I have also to thank the following keepers:—James Sargent, of Waterhead Moors, Cumnock; head-keeper Cox and keeper Macdonald, of Craiglure Moors; head-keeper Shiels, of Kilkerran Moors; head-keeper Tolmie, of Blairquhan Moors; James Crow and Alexander Crow, of the Flat and Stellshaw Moors respectively.

ON THE BREEDING HABITS OF THE SISKIN,
AS OBSERVED IN THE Co. WICKLOW.

BY ALLAN ELLISON.

HAVING observed a pair of Siskins, *Carduelis spinus*, near Shillelagh, in 1885, as late as May 29th, I was led to conclude that this species probably nested in the neighbourhood. Subsequent observation has enabled me to prove beyond question that it does so regularly, and in at least one locality (the Coollatin woods) far from uncommonly. I have also noted the curious fact that while in most parts of the country the Siskin is scarcely known, except as a winter visitor, the reverse is the case about here. In spring and summer it is one of the most attractive small birds in our woods, and passes into the open fields in early autumn, when both old and young form small parties of from six to twenty birds. From November to the beginning of March, however, it is rare, appearing only at uncertain intervals and in small numbers, apparently never remaining near one place for any length of time.

On the few occasions when I have seen Siskins during winter it has been almost always on the wing, flying very high and seldom alighting, as if this locality afforded no attraction at that season of the year. About the beginning or middle of March they reappear in flocks, and immediately resort to their breeding haunts—the pine woods. In early spring Goldfinches and Lesser Redpolls associate with them in considerable numbers, the three species traversing the pines and alders in company, in search of food. As the season advances the Goldfinches and Redpolls leave the pine woods and depart to their own breeding haunts in the fields and hedges.

From what I have observed here it appears that the Siskin, although resembling the species just named in habits, differs from them in rearing two broods instead of one in the season. It also builds its first nest a good deal earlier than other birds of the same group. Of four Siskins' nests which I have discovered this year the first one contained young ones several days old on April 29th—a date on which several of the *Fringillidæ* have not even commenced to build. I have noticed many young broods of Siskins on the wing by the third week of May or even earlier.

The first occasion on which I discovered a Siskin's nest was on May 21st, 1886, as announced in 'The Zoologist' for that year (p. 489). This nest was built near the end of a branch, at the top of a large Scotch fir, but was plundered either by Magpies or Squirrels shortly after the eggs were laid. With great difficulty I succeeded in securing the nest itself by cutting off the branch, and gave it to Mr. A. G. More for the Science and Art Museum, Dublin.

This year I determined to watch the Siskins closely, and to make every effort to discover some more nests, to obtain the eggs, and to find out as much as possible about the habits of the birds and their distribution during the breeding season. The result has been the discovery of four nests, two of which I obtained with the full complement of eggs. The first nest above mentioned contained five young on April 29th, and was situated in a small Scotch fir, very near the top, at the insertion of two of the lateral branches. On May 12th two young Siskins were fully fledged and left the nest.

As I was particularly anxious to obtain the eggs, this nest was rather a disappointment to me, but knowing that there were many pairs of Siskins near the same part of the wood, I continued my search in the neighbourhood of the first nest. I had seen a pair of Siskins about a Douglas fir, and had noticed the hen bird returning several times to a certain spot on a branch, which made me suspect that she had selected it as a building site, though the nest was then not yet commenced. I revisited the tree on May 4th, several days afterwards, when I found the nest completed. It was near the top of the tree on a lateral branch, some distance from the main stem. On the 10th five eggs had been laid, and the nest and eggs were then safely secured.

I subsequently discovered two more nests, both on May 24th. One of these was built at the top of a tall lichen-covered spruce-fir, against the main stem, and contained one young bird about half-grown. The other nest, the fourth which I found, was situated in a tall larch, near the end of a long lateral branch some twenty-five feet from the ground, and when found had only just been commenced, but must have been finished within two or three days, for when I took it with five eggs, on June 3rd, the eggs were already incubated. As may be imagined from its position it was no easy matter to reach this nest; but I succeeded

by fastening up the branch with a rope, so that it could not bend or break as I made my way out along it.

All the Siskins' nests I found this year were in Coollattin woods, the locality where these birds abound in summer; but that discovered on May 21st, 1886 (Zool. p. 489), was at a place called Ballard, beside the Derry, two miles farther down the valley. I know that Siskins have been breeding at this latter place this year also, as I have observed both adult and young birds there.

The dimensions of the nest now before me are:—External diameter, about $3\frac{1}{2}$ in.; internal diameter, $1\frac{3}{4}$ in.; depth, $1\frac{1}{2}$ in. The foundation and outer structure are composed of small dead spruce twigs, while the walls of the nest are chiefly formed of green moss, with fine roots around the margin, the whole being bound together with wool, and smoothly lined with fibrous roots, wool, horsehair, and a few feathers. The eggs are almost equal to those of the Goldfinch in size, or very slightly smaller; of a pale bluish green, nearly identical with the ground colour of a Bullfinch's egg, and with small specks of subdued lilac and a few larger spots and dashes of deep purple and reddish brown. In some the darker spots are nearly or entirely absent.

The young Siskins appear to be fed partly on Aphides, for while watching the parent birds carrying food to them I have observed that they gathered it from the leaves and green shoots of the alder trees, which nearly always swarm with Aphides, as anyone can testify who has made his way through an alder thicket in early summer, the offensive insects falling down from the branches in showers at the slightest touch.

I know no birds so interesting and varied in their habits as Siskins. Their extreme restlessness makes them very difficult to watch, for they seldom remain near the same spot even for a few minutes at a time. They particularly affect the tops of large fir trees, the highest point of the tallest spruce-firs being their favourite resting-place. From such a point of vantage their call-note, which is loud and clear, resembling the word "glee," is constantly repeated. This call sometimes so nearly resembles that of the Coal Titmouse as to be indistinguishable from it, except by a practised ear, especially as the two species frequent the same trees, and are often found in company. The male Siskins are most indefatigable and pleasing songsters, and the

song is uttered from a branch, or tree top, as well as on the wing. Frequently whilst singing the bird may be observed to dart from its perch with an upward and somewhat circular flight, after the manner of a Meadow or Tree Pipit, and after describing a curve to realight at a little distance. But there is this difference, that while a Meadow Pipit sings but once during its flight, the Siskin often repeats its song several times before alighting, but always changes the direction of its flight each time that it recommences its song. This manœuvre is always accompanied by a wavering and desultory motion of the wings, as if the bird was wounded and scarcely able to fly—a peculiar habit which is exhibited by the Greenfinch also in the pairing season. These flights are often many times repeated within a few minutes, especially in the neighbourhood of the nest, and while the female is occupied in building. The song itself seems to include notes of almost every other small bird, but I do not think it likely that the notes are in reality borrowed. Sometimes it assumes a considerable resemblance to that of the Chaffinch, but is rather harsher and more prolonged. Then, again, the bird will sing almost without a pause for some minutes together, introducing sounds which resemble the notes of the Sedge Warbler, Sky Lark, Goldfinch, Redpoll, Sparrow, and many other birds; but the most characteristic part of the whole is a prolonged creaking note, with which the song generally concludes. This is a sound which once heard is not likely to be soon forgotten, or mistaken for the note of any other bird. It is one of those strange bird-sounds which, like the “drumming” of the Snipe, the “churr” of the Nightjar, or the “trill” of the Grasshopper Warbler, are difficult to describe. Another note, which is not so often heard, is a soft chatter, which the bird generally utters as a call to its mate or companions when about to take flight.

The male Siskins differ considerably in colour, some being of so bright a yellow as to resemble Canaries, the throat being jet-black, while others are greener and more dingy, the black on the throat being nearly or entirely absent. These last are evidently younger birds.

ON THE NESTING OF THE TUFTED DUCK
IN KIRKCUDBRIGHTSHIRE.

BY ROBERT SERVICE.

THE Tufted Duck has of late years been gradually extending its breeding range in the British Islands, though I am not aware that its greater abundance or wider distribution in the winter months has been noticed in print.

Whatever may be the case elsewhere, it is certain that in this district Tufted Ducks are far more frequently observed now than they were previous to (say) 1880. Until about that period I very seldom ever saw it, and only in certain favoured localities. Since then it has become comparatively common, and may be observed singly, or in small parties of half a dozen or more, every winter on almost all the lochs of this district.

I cannot say that any corresponding increase in number has been noticed on the Solway Firth. On the Kirkcudbrightshire Solway it is very uncommon. Mr. Armistead states ('Naturalist,' 1886, p. 72) that he has seen two which were killed on the Firth, but that it is decidedly rare. In reference to this remark the Rev. H. A. Macpherson subsequently wrote (p. 150) that "The Tufted Duck is fairly common on the upper parts of the Solway." Owing to the different meanings evidently attached to the word "Solway," we are left in doubt whether the actual waters of the Firth are meant or not. The authors of the 'Birds of Cumberland' characterize it as "a winter visitant, constantly present with us from November to April, and tolerably plentiful near the Solway, being less frequently met with far inland."

There is a prevalent idea amongst sportsmen here that it is one of the hard-weather fowl, and perhaps formerly this notion had some foundation, but for several years past this duck has made its annual appearance in winter in considerable numbers, quite irrespective of weather. Sir Wm. Jardine has remarked:—"On the Solway we have observed it in a much less proportion [than the Scaup], and only in small parties together. Its describers consider it more lacustrine than the Scaup, and we have frequently shot specimens in the Annan, fifteen or twenty miles from the sea; the weather, however, was always severe

when this bird appeared" (Brit. Birds, vol. iv. p. 143). Much the same opinion has been expressed by Gray and Anderson in relation to the Tufted Duck in two of the neighbouring counties:—"Strictly a winter visitant, frequenting the open sea in fine weather, and coming up the larger rivers during storms" ('Birds of Ayrshire and Wigtonshire,' p. 46).

In all the references to this bird in our own and neighbouring districts, no observation is made of its increasing frequency in winter, nor—except where a hope is expressed by Messrs. Macpherson and Duckworth (*op. cit.*) that it may yet be found breeding in Cumberland—is there any allusion made to its nesting.

Last year I observed two pairs of Tufted Ducks frequenting Lochratton, a loch a few miles west of Maxwelltown, during May and June, and there is a strong suspicion that at least one of the pairs nested, but I could not obtain any satisfactory proofs of it. On the 23rd May of last year I saw a pair of Tufted Ducks on Loch Ken. This year there were three of the same species on Preston Merse, below Southernness, on May 15th; and during the past breeding-season I have made frequent visits to Lochratton for the purpose of observing a couple of pairs of Tufted Ducks which again remained about the Loch after the other Tufted Ducks, Goldeneyes, and Pochards had left. On the 24th May their actions plainly showed them to be preparing for nesting. Several days afterwards only one pair remained, and these were seen together frequently till nearly the end of June. On July 2nd I saw the male only, the female evidently having commenced to hatch, but the place being strictly preserved whereon the nest was likely to be, no attempt was made to find it. On the 21st July the female appeared out on the Loch surrounded with a brood of eight young ones, which at a little distance looked quite black. They were a few days old, so they had been hitherto concealed amongst the reeds, or they may have come down one of the burns.

A week later I again saw them, but in the interval they had decreased to five, the three missing ones having probably been taken by Pike, with which the Loch abounds. We approached in a boat to within less than ten yards before the mother duck, thinking her safety compromised, rose and spluttered along the water, feigning inability to fly properly till she was forty or fifty yards off, when she sat down on the water pecking at her

feathers, and trying to look quite unconcerned, but every now and then uttering a guttural sound like "kuruk," casting a glance back to where the young ones were diving incessantly, in a vain and most absurd-looking endeavour to hide themselves. She several times flew back to within eight or nine yards of the boat, and repeated the same manœuvres as before. When we left the place, she gathered her brood round her, and made off quickly to the shelter of the reeds.

It is satisfactory to add that this first recorded instance of the breeding of the Tufted Duck in the Stewartry of Kirkcudbright has been well authenticated without infringing the Wild Birds Protection Act by taking the life of any of the birds in question.

NOTES AND QUERIES.

To purify Water in an Aquarium.—There is an easier method of keeping pure the water in a small aquarium than the chemical plan suggested at p. 292. No doubt the snails do good scavenger work, but the important point is to keep the water charged with ordinary atmospheric air. This can be done by the use of an ordinary pair of bellows for a few minutes twice or thrice a day. There is no mistaking the pleasure with which the fish receive a good blowing up.—T. CORNISH (Penzance).

MAMMALIA.

A Herd of Red-deer from a single Hind.—The following information, derived from letters addressed to Professor Flower by Mr. J. A. Houblon, of Hallingbury Park, Bishop Stortford, has been kindly placed at our disposal for publication in 'The Zoologist':—"A Red-deer hind was hunted by Mr. Petre's hounds into this neighbourhood and lost in 1875. I was walking soon afterwards through the Forest (Hatfield Broad Oak) when I saw the hind with a male calf at her foot. Since 1877 she has had one calf every year, except one, though no stag, except her own offspring, has been seen in the Forest since she was lost and left there. Two young harts got drowned on going to drink at a muddy place from which they were unable to extricate themselves. In 1881 we killed and ate a five-year old stag thus reared, and another last year. The heads of these are good average heads, and are now hung up in our hall. They have each of them ten points, and neither of them showed any signs of degeneracy that we could perceive. There are now (May 28th, 1887) five Red deer in Hatfield

Broad Oak Forest, all of them sprung, as we believe, from this solitary hind."

Cat attacked by a Swallow.—Whilst walking in my garden not long ago my attention was drawn to an unusual screaming of Swallows, and on turning around I perceived my little kitten looking very frightened and uncomfortable in the drive, about thirty yards from the house. To my surprise this was caused by a Swallow which swooped down several times and actually touched the Cat, making her jump round in a most ludicrous fashion. The movement of the bird was so rapid that I could not see if it touched the Cat with its beak or claws, but it certainly did with one or the other. Poor Puss seemed too startled to move at first (except simply to look round at the same spot), but eventually she fairly bolted with tail erect (after the manner of Cats when Tim the Terrier is after them), closely pursued by the Swallow until out of sight. I fetched Kitty again, and placed her on the same spot, but directly she heard the scream of the Swallow away she went as fast as her legs would carry her. I have often seen Swallows hover and heard them scream around a Cat, but never before saw one venture so close.—J. G. HAMLING (The Close, Barnstaple).

White Stoat in August.—I recently examined in the flesh a pure white Stoat (*Mustela erminea*), which was shot by Mr. J. S. Phillips, of Llandovery Court, Usk, on August 3rd, and forwarded by him with another of the normal colour to the Editor of 'The Field.' August 3rd is an unusually early date at which to find a Stoat in complete winter pelage, and in this case there was no trace anywhere of the brown colour which so often appears (even in mid-winter sometimes) in little patches on the head or back, the fur being of a uniform pale yellowish white. It was still further remarkable in having no black tip to the tail, a peculiarity which I have never before observed in any Stoat killed in this country, although such variation from the usual type, I believe, has been noticed occasionally in the northern parts of North America and Canada. In the specimen now referred to, which was one of average size, the eyes were not pink, but of the usual dark brown colour. It has been preserved for exhibition in the Natural History Museum, South Kensington.—J. E. HARTING.

Hedgehog eating Swedes.—My brother, the Rev. W. Bond, of Edgton Vicarage, Aston-on-Clun, Shropshire, writing to me on July 2nd, says:—"Another thing I have lately heard is news to me, but which I have no doubt is perfectly true, as I have heard it from two respectable persons. Directly opposite my house was a field of swede-turnips last winter. The farmer noticed that some animal was taking great liberties with them; thinking rabbits were the delinquents, he set some snares, but had no success. A small spiny runs along one side of the field, which the landlord reserves, and it is under the charge of a woodman. The

farmer desired this man to set some steel traps (which are commonly used in these parts, notwithstanding the illegality), and in a very short space of time he caught over twenty Hedgehogs. After this no more turnips were eaten." I see that Bell says Hedgehogs will readily eat vegetable substances, and I know that tame ones will eat boiled potatoes and cabbage. Gilbert White, in his 27th letter to Pennant, observed that they eat the roots of the plantain in his grass-walks. If so, I do not wonder at their eating swede-turnips, which I fancy would be much more palatable.—F. BOND (5, Fairfield Avenue, Staines).

[With regard to plantain roots, the author of the 'Letters of Rusticus' discovered that the destroyer was not the Hedgehog, but a night-eating caterpillar. See Harting's edition of White's 'Selborne,' p. 91, footnote.—ED.]

A Badger in Birmingham.—It may interest some of your readers to know that a specimen of this comparatively rare animal was dug out of a hole recently in some sandhills in the neighbourhood of Chad Valley, Edgbaston, which is in the borough of Birmingham. It had been committing great depredations among the poultry for some time past, until its presence was at last suspected. A Fox was shot in the same locality last spring.—W. HARCOURT BATH (Ladywood, Birmingham).

The Bats of Merionethshire.—Natterer's Bat, *Vespertilio Nattereri*, may be added to the species mentioned by Mr. Caton Haigh in the August 'Zoologist' (p. 293) as inhabiting this county, on the authority of the late Mr. Wm. Thompson, of Belfast, who took a specimen in the ruins of Harlech Castle in July, 1835, as recorded in his 'Natural History of Ireland' (vol. iv. p. 2), and in the Zoological Society's 'Proceedings' for 1837, p. 52.—J. E. KELSALL.

BIRDS.

Unusual Site for a Flycatcher's Nest.—A very similar occurrence to that mentioned by Mr. Darell Stephens (p. 306) came under my notice last year. In this case a pair of Spotted Flycatchers made a neat little nest inside an old Thrush's nest, which was placed on a horizontal bough of a beech about ten feet from the ground. I thought this so unusual and interesting that I made a sketch of it. When I left there were three fledged young ones in the nest.—G. E. LODGE (5, Verulam Buildings, Grays Inn).

Curious Capture of a Snipe.—On coming home from a drive one day in July last I was told a boy with some birds wanted to see me. On being sent up he said, "I have brought two young Snipe and an old one" (which he had in his hand). I said, "Is she hurt?" "No, not a bit, sir." "How did you get her?" "Well, I saw her with her two young ones in

our garden. I caught the young ones and put them in a canary cage, and tied a piece of string to the door and hid myself: in about ten minutes she came, and after a bit went into the cage, and I pulled the door to." I gave him a shilling, saying, "Are you satisfied?" "Yes, sir." I replied, tossing the Snipe up, "So am I; and I am sure the Snipe is." The two young ones are now in Mr. O. V. Aplin's collection of birds in down.—J. W. WHITAKER (Rainworth Lodge, Notts).

Pied Puffin and Razorbill at St. Kilda.—Those of your readers who are interested in abnormal plumage may be glad to know that among the seafowl snared by the men of St. Kilda last June occurred a Razorbill and a Puffin, in each of which the upper parts were pied with white. This I learn from the late schoolmaster there, Mr. Murray, whom I first met on the island last year. Mr. Murray tells me that the Razorbill is the only pied specimen that has ever been taken at St. Kilda. "The pied Puffin," he continues, "is not such a rarity in St. Kilda. They see one or two pied Puffins every year. This one was killed on Boreray during the first week of June."—H. A. MACPHERSON.

[In 'The Zoologist' for 1872 (p. 3279) Lieut.-Col. Feilden, in an article on the Birds of the Færoes, remarks that white varieties of the Puffin are not unfrequently seen there. Two were in the collection of Herr Müller, and he saw a beauty in the flesh brought from the island of Naalsoe on the 17th June: it was pure white with black eyes, and one single black feather on the breast; the legs and bill were of the ordinary colour.—ED.]

Open Nests of the Starling, Stock Dove, and Tawny Owl.—A Starling's nest was found on May 5th at Gatton, in Surrey, in an ivied spruce-fir, some thirty feet up, the peculiarity of which was that it was a cup-shaped nest open to the sky. I never remember to have come across one like this before, though they are not unknown to the much greater birds'-nesting experience of Professor Newton, *cf.* Yarrell B. B. (4th ed. ii. p. 232, note). On an adjoining tree we found an open Stock Dove's nest, built like a Wood Pigeon's. All the Stock Dove's nests I have seen before were in holes. I have also seen three Tawny Owls' nests this summer which were quite open, one in the crotch of an oak, and two in the tops of the stumps of decayed broken alders; two of them were in Norfolk and one at Whitley, in Surrey.—J. H. GURNEY, jun. (Keswick Hall, Norwich).

[Two or three instances of Tawny Owl's eggs being found exposed to open view have come under our notice. Mr. C. B. Wharton some years ago found eggs of this bird laid on the top of a heap of fir-needles, only a foot or two from the ground.—ED.]

Attempt to keep the Sand Martin in confinement.—Whilst in Kent last July, a man brought me five young Sand Martins which he had just

taken from their nest. The burrow from which they had been taken having been destroyed, and the birds themselves being too young to fly, I determined to do my best to keep them alive. The idea of giving them their natural food being out of the question, I mixed up for them a paste consisting of four parts fig-dust and pounded dog-biscuit, two parts pea-meal and yolk of egg, and one part ants' eggs; but it was quite a week before they would take this food from a feeding-stick, and the task of opening their mouths for every morsel was one which I should not care to repeat. After about ten days, all five fed themselves greedily from a small glass pot of food, and I then turned them into a large flight-cage, hoping that they would take sufficient exercise to keep them in health. In this, however, I was disappointed, for, although at first they took short flights and roosted high up on the perches, or rock-work, in the cage, they gradually spent more and more time in cramming their crops, and one by one they dropped off, until, at the end of the twenty-second day, the last of the five died. I may add that, although when first taken these young Sand Martins were beautifully clean, they so messed their faces with the soft food it was necessary to give them, that before they died all their beauty had departed.—A. G. BUTLER (Natural History Museum).

The Song of the Chaffinch.—At p. 299 *ante*, the Rev. H. A. Macpherson asks whether “our home Chaffinches are autumn songsters.” Amongst a number of other British birds, I keep two Chaffinches, one of which was caught five years ago, and the other two years ago. They both recommence singing every year in August, and continue singing during the autumn, but they do not sing so freely as in the spring.—H. GOSS (Surbiton Hill, Kingston-on-Thames).

The Song of the Chaffinch.—I have frequently heard the Chaffinch singing in the neighbourhood of Birmingham in the autumn. Throughout the mild winter of 1881 I heard it almost once a week on the average. It does not usually commence to sing with us until the end of February or the beginning of March. The Kestrel, Green Woodpecker, and Crow have recently been observed breeding in the borough of Birmingham.—W. HARCOURT BATH (Ladywood, Birmingham).

Swifts nesting in Martins' Nests.—The following is an extract from a letter dated July 2nd, 1887, received from my brother, the Rev. W. Bond:—“Did you ever hear of Swifts nesting in Martins' nests? This year they have taken possession of some under the eaves of the vicarage (Edgton Vicarage, Aston-on-Clun, Shropshire), which appears to me a very unusual proceeding.” I wrote for further particulars, suggesting that there might be a hole under the eaves of the roof, and on July 29th got the following reply:—“You will think me very lazy not answering your queries before about the Swifts. There is no mistake about it; there were

two broods in Martins' nests, one of which has flown; the others are now being fed by the old ones, as any one may see who will watch for a few minutes. I mentioned the occurrence as I never heard of such a thing before."—F. BOND (5, Fairfield Avenue, Staines).

Plover's Nest with Five Eggs.—On reading Mr. Whitaker's note (p. 267), it reminded me of a Plover's egg which I took near here some sixteen or eighteen years ago. It was in a nest containing four other eggs of the ordinary Plover type, except perhaps that the ground colour of these eggs was somewhat lighter than usual, which made the smaller and darker egg look more conspicuous, for neither in form, markings, size, nor colour did it resemble any of them, being more ovate, having a brown ground colour with most of the darker markings collected about the smaller end, and the egg itself certainly not larger than that of a Song Thrush. An old collector, to whom I once showed it, said if he had not known its origin he would possibly have referred it to a variety of the Black Tern. I cannot, of course, affirm that all five eggs were laid by one and the same bird, but, as the Black Tern is sparsely distributed here as an autumnal visitor, I may positively say it is not referable to that species; and I see no reason why it should not be a small, abnormally-marked egg of the Plover, *Vanellus cristatus*, for we are well aware that sometimes where an unusual number of eggs are laid there is a marked difference in the size of what we suppose to be the *last* of the clutch, although in such cases the smaller egg has generally a family resemblance—at least, in colour—to its fellows.—G. B. CORBIN (Ringwood, Hants)

[Would it not rather be the *first* of the clutch? The first eggs of pullets are usually smaller than those laid subsequently.—ED.]

Fork-tailed Petrel breeding on Islands off Co. Kerry.—I announced last year in 'The Zoologist' (p. 367) that an egg of this species had been sent to me from the Blasquet Islands. I am happy to say that a bird with its egg has, at my request, been forwarded this summer from the same spot to the Science and Art Museum, Dublin, and I am informed by my friend Mr. Barrington that the specimen is *Procellaria Leachii*. He has moreover received this summer another egg of this species from the same island. It measures 1·31 by ·97 in. I have also recently received an egg, among others of the Storm Petrel, from the Great Skellig, which measures 1·21 by ·93 in. Though these dimensions are unusually small for eggs of the Fork-tailed Petrel, I have never known so large a size to be attained by eggs of the Storm Petrel, of which I have examined hundreds, and I should like to know if any reader of 'The Zoologist' can give an instance of a Storm Petrel's egg of this size. I have three eggs of the Storm Petrel which measure respectively 1·2 by ·84 in., 1·19 by ·88 in., 1·13 by ·9 in. Mr. Seebohm gives as the greatest length 1·2 in., and the

greatest breadth .86 in. I believe this egg from the Skelligs to be of the Fork-tailed Petrel, though the bird was not found with it, as in the former case. These are the first authentic records of this bird breeding on the Irish coast. It appears to do so in very small numbers, and only on the most outlying islands, for the three or four instances I have given are the results of careful and repeated searches which were entirely unproductive in a locality nearer the coast where the Storm Petrel breeds in large numbers.—R. J. USSHER (Cappagh, Co. Waterford).

Honey Buzzard in Dorset.—About June 2nd or 3rd a fine bird of this species was killed not very far from Wimborne, and I had the pleasure of examining it shortly afterwards. It is a very dark, rich-coloured specimen, weighed 1 lb. 10 ozs., and measured $25\frac{1}{2}$ in. from beak to tip of tail. Its muscular feet and claws were very dirty, and it must have been scratching in the vicinity of cow-dung, as portions were attached to its otherwise dirty legs; in fact, the natural colour of both feet and legs was entirely hidden by the dirt. On dissection it proved to be female, as I had anticipated, and in the ovary I counted seventeen eggs, ranging from the size of a pin's-head to a hazel-nut. The two largest were about equal in size, and would have been, I supposed, the produce of the present season had the bird escaped destruction. Its crop contained very little, except two small grubs of some dipterous insects,—probably from the cow-dung, which it had been undoubtedly investigating,—but in its gizzard I found the remains of individuals of several orders of insects, amongst which the horny tail of the cockchafer and the pincer-like tail of the earwig were very conspicuous; beside this was a small quantity of vegetable matter, arising no doubt from the empty skins of three full-grown larvæ of *Plusia gamma* (silver-Y moth), the specific distinctness of which could be easily made out, although the caterpillar-skins were as empty and flaccid as if they had suffered great pressure. The action of the gizzard seemed to have had no more power over the skin of these caterpillars and the markings thereon than it had upon the horny appendages of the other insects, but probably time would have effected a change in both. It thus seems that the Honey Buzzard is an indiscriminate insect-feeder, taking the insect in every stage of its existence; and, since wasps and their grubs, together with dragonflies, is a well-known food of this bird, it seems a great pity that amongst many of the game-preserving community it should be classed as "vermin," and killed as soon as discovered. I have been particular in describing what I found in the stomach, for the man who killed it wished me to understand that it was very destructive to his Partridges. It is interesting to note also that this bird did not reject caterpillars bearing short hair-like spines upon their bodies, as *gamma* does, for it is well known that some birds refuse larvæ unless smooth-skinned, whilst others, as the Cuckoo, are said to prefer those that are comparatively spinous.—G. B. CORBIN (Ringwood).

Addition to the Avifauna of the Færoe Islands.—I am indebted to Mr. Edward Hargitt for handing over to me a portion of his specimens of birds collected in the Færoe Islands, and lately, when arranging them, I was pleased to discover in the collection two examples of the Bar-tailed Godwit, *Limosa lapponica* (Linn.), a species not hitherto recorded from the Færoe Islands; one, a male in breeding plumage, procured by Herr H. C. Müller near Thorshavn on the 14th of June, 1878; the other, in autumn plumage, but without note of sex, nor date of capture, obtained by the same gentleman on the Island of Stromoe. Whilst on the subject of birds from the Færoes, I may refer to the catalogue of a sale at Stevens's in Covent Garden on the 25th April, 1887, wherein lot 179 is described as a fine clutch (2) of Great Northern Diver, Faroes, 1880. Mr. Howard Saunders, who attended the sale, informs me that the eggs were unquestionably those of *Colymbus glacialis*; but I may point out that the locality given is doubtless an error, for the Great Northern Diver has never been known to breed in the Færoe Islands.—H. W. FEILDEN.

The Green Woodpecker an Egg-sucker.—We are well aware how readily a "bad name" attaches itself to any unfortunate object obtaining it, and thus it is with some degree of diffidence I make an accusation against the bird named, for it is a species giving such a marked characteristic to many of our woodlands in the South of England, that I should be sorry if any words of mine helped on the destruction of a single individual. Some two or three seasons ago a gamekeeper asked me if I knew that the Green Woodpecker was often as destructive to eggs as the Jay or Magpie, and that more than once he had seen a bird attacking his pheasants' eggs. I felt very sceptical on the point, and explained to him as well as I could that this species of Woodpecker often feeds upon ants and their pupæ, for which it naturally descended to the ground, and that often the beak of the bird was covered with dirt from the mere fact of its searching about and probing in the earth for such prey. No doubt many readers of this journal have seen this crimson-crowned forester scrutinising an ant-hill, thrusting in its bill to the utter confusion of the active inhabitants, and then securing, with its barbed and glutinous tongue, a plentiful meal of the ants as they ran hither and thither in their anxiety to protect the pupæ. Upon making enquiries of those who, by their occupation as woodmen, &c., would be likely to know anything of this subject of egg-stealing, I found that the majority seemed to be ignorant of the matter with regard to the bird in question, whilst a few spoke of it as well known. This season, however, I have had a more conclusive proof, *viz.*, about the beginning of May a woodman told me he had seen a Woodpecker rifling a nest, and I asked him if he could secure me a bird taken in the act of egg-sucking. During the month I received three specimens—all males—with the following results on dissection:—1. Beak and plumage of head very dirty; throat and crop

containing what might have been the white of an egg. 2. Beak very dirty, plumage comparatively clean, but in the throat and stomach undeniable evidence of both white and yolk of egg. 3. Very clean, full-plumaged bird; stomach containing only a few ants and other insect-remains. Had I found no more conclusive evidence than in No. 1, I should have treated the whole story as a myth, attributing the fluid contained in the throat, &c., to an unusual quantity, and an abnormal condition, of the glutinous substance found naturally in the head and throat of this and allied species; but I know not how to argue in favour of No. 2, for in that case it seems to be "proven"; whilst in No. 3 the accusation is utterly disproved. Is it a recognised fact,—it was new to me,—or is it an acquired habit, something akin to the Kea's love for (living) mutton-fat (*Zool.* 1881, pp. 290—301)? for I should have mentioned that game-preserving is not carried on less keenly than it was some years ago in the locality where these birds were taken. I should be glad to know that egg-sucking is but a case of depraved appetite in a few individuals of the "Yaffingale," whose merry "laugh" forms so pleasant an accompaniment to a woodland ramble.—G. B. CORBIN (Ringwood, Hants).

Dark Variety of Montagu's Harrier in Hants.—At the end of May I heard of "a black hawk" having been killed near here, and on enquiry I have not much hesitation in saying it was the dark variety of the above species, which has been obtained once or twice before in this locality. I did not see the specimen in question, but its occurrence is, I think, worth recording.—G. B. CORBIN (Ringwood).

Egg-drills.—We have received from Mr. Marsden, of 37, Midland Road, Gloucester, two specimens of egg-drills—a small one sold at 6d., and a larger one at 10d.—which may be recommended. They are not so well finished as the one previously noticed (p. 236), but they are less expensive, and, being much shorter in length, are more conveniently carried by the egg-collector.

Notes from Western Australia.—As I believe this district has never been explored from an ornithological point of view, having been settled only ten years, perhaps some notes may be of interest to readers of 'The Zoologist,' though, when I have been here longer, I shall have more to say I trust. At present my camp is about twenty miles from the sea, and about twenty miles north of the River Gascoyne, which, owing to a long drought, has not run for three years. This spell of dry weather interferes with bird-life; many must have died of thirst, and stronger species moved to where there is water. The country may be described as a mass of scrub from two to ten feet high, with here and there sand-flats and clay-pans, where water holds when rain falls. Numerous shallow gullies intersect the country, and are fringed by the white or swamp gum tree (the only tree

that grows here, and not to any great size). Near the sea are sand-hills and salt-marshes, which I have not yet explored at all. Coming down the coast last January I shot many interesting birds at Derby (King's Sound), but they were all swamped in the boat returning to the ship. Mutton-birds were very numerous all along, and at Cossack I saw and shot Ospreys. At Ashburton a fine Sea Eagle settled on the mast-head, but was not secured. The noble Wedge-tailed Eagle (*A. audax*) is numerous here, and very destructive to lambs: a good many have fallen victims to poison. It is a pity to destroy such fine birds, but I have seen a pair kill five lambs in one morning. Birds of prey are very plentiful, but as yet I have not commenced to shoot for skins, the birds being in bad feather this time of year, and I want to secure them with their eggs. Emus are seen almost daily, in spite of the drought, and, from a specimen I examined on March 23rd, I think Gould is correct in surmising that the Spotted Emu is the bird of Western Australia (*Dromæus irroratus*). This was a female, and contained a large cluster of eggs, some as large as a duck's. March 25th no less than twenty-eight were seen in one flock near a pool, many last year's birds not full-grown. The Western Long-billed Cockatoo (*Licmetis pastinator*) is seen in large flocks. I have only Gould's 'Hand-book' to work from, but have seen and shot several of the following species, which he describes as only being found in the interior:—Rose-breasted Cockatoo (*C. roseicapilla*), the Varied Parrakeet (*Psephotus multicolor*), and the Crested Bronze-wing Pigeon (*Ocyphaps lophotes*). The Yellow-collared Parrakeet (*P. semitorquatus*) is common, as are others of this genus I have not yet identified. A flock of Black Swans were on a pool here April 2nd, which I take to be a long way north for this species; they were in company with Avocets, Pelicans, Pink-eyed Duck, Australian Teal, and other wildfowl. The Australian Curlew is very common, and a noisy bird at night. When winter sets in, and we get rain, I hope to be able to send some fuller and more interesting notes.—T. CARTER, of Masham, Yorkshire (Boolathana Station, Gascoyne, Western Australia).

REPTILES.

Coloration of the Viper.—With reference to the remarks of Mr. Macpherson under this heading (p. 306), it may be well to point out that the Viper which occurs in the Forest of Fontainebleau is *Vipera aspis*, and not the British Viper, *Vipera berus*. The characters by which these two species may be distinguished will be found indicated by Mr. Boulenger in 'The Zoologist' for 1885, p. 375.—J. E. HARTING.

FISHES.

"Becker" or "Braise" in Cornwall.—On August 3rd I took, in my trammels, a "Becker" or "Braise." There exists considerable doubt

whether this fish is distinct from the Spanish Bream, but, having now taken several specimens, I am convinced, from its shape, its peculiar dentition, its lustrous colours when alive, and, above all, from the quality of its flesh, that it is distinct. I do not regard the "Becker" as a rare fish. Every summer I see some hawked round our streets and sold as common Sea Bream, but any one who is offered a short Sea Bream, with a red-bronze back and a yellow-bronze belly, and with no spot over the pectorals, will do well to buy it at the fishwoman's price. He will have secured the "Becker"; and, when he has stewed it in milk with shreds of parsley, he will eat a fish superior to Turbot.—T. CORNISH (Penzance).

MOLLUSCA.

Middlesex Mollusca.—The following Mollusca were taken by me in the neighbourhood of West Drayton, Middlesex, on the 30th May last:—*Sphærium corneum*, *S. rivicola*, *Pisidium fontinale*, *P. pusillum*, *Unio pictorum*, *Anodonta anatina* (and var. *radiata*), *Neritina fluviatilis*, *Paludina vivipara*, *Bythinia tentaculata*, *B. Leachii*, *Valvata cristata*, *Planorbis vortex*, *P. complanatus*, *P. corneus*, *P. contortus*, *Physa fontinalis*, *Limnæa peregra* (and var. *ovata*), *L. stagnalis*, *L. palustris* (and var. *tincta*), *L. truncatula*, *Ancylus fluviatilis*, *Arion ater*, *A. hortensis*, *Limax agrestis*, *L. lavis*, *Succinea Pfeifferi*, *S. putris*, *Zonites nitidus*, *Z. crystallinus*, *Z. fulvus*, *Helix aspersa*, *H. nemoralis*, *H. hortensis*, *H. arbustorum*, *H. cantiana*, *H. rufescens*, *H. concinna*, *H. sericea*, *H. rotundata*, *Cochlicopa lubrica* (and var. *alba*), *Carychium minimum*, and *Vertigo pygmæa*.—S. C. COCKERELL (Bedford Park, Chiswick).

CEPHALOPODA.

Hawaiian mode of fishing for Octopus.—The United States Fish Commission in one of their Bulletins furnish an excellent report by Mrs. Emma M. Beckley, Curator of the Hawaiian National Museum, on "Hawaiian Fishing Implements and Methods of Fishing." The writer gives some curious details about Octopus-fishing. The smaller kinds of Octopus, which live in shallow water, are caught by women, who do their work with remarkable skill. They can tell whether an Octopus is in a hole whose entrance is no larger than a silver dollar, and, plunging their spears in, they invariably draw one out. The larger kinds of Octopus, which are always found in deep water, are caught by men with cowries, generally of the Mauritian, but sometimes of the tiger species. An Octopus will not rise to a large-spotted or ugly cowry, so the fishermen have to take care that the spots on the back of the shell are very small and red, breaking through a reddish-brown ground. Cowries with suitable spots, but objectionable otherwise, are slightly steamed over a fire of sugar-cane husks, a process which gives them the desired hue. The fisherman, having

arrived at his fishing-grounds, first chews and spits on the water a mouthful of candle-nut meat, which renders the water glassy and clear; he then drops the shell with hook and line into the water, and swings it over a place likely to be inhabited by an Octopus. The moment an Octopus perceives a cowry, it shoots an arm out and clasps the shell. If the shell is of the attractive kind, one arm after another comes out, and finally the whole body of the Octopus is withdrawn from the hole and attaches itself to the cowry, which it closely hugs, curling itself all around it. The creature remains very quiet while being rapidly drawn up through the water. Just as it reaches the surface, the fisherman pulls the string so as to bring its head against the edge of the canoe, and it is killed by a blow from a club which is struck between the eyes. This must be done rapidly, before the animal has time to become alarmed; for if it lets go the cowry it becomes a dangerous antagonist, and there is risk of the fisherman being squeezed to death. The cutting off of one or more of its eight arms does not affect the rest in the least.

I N S E C T S .

Craneflies preyed upon by Gulls and Terns.—When dissecting a mature Lesser Black-backed Gull, *Larus fuscus*, on the 15th August, I found the stomach and throat crammed full of the common Cranefly, *Tipula longicornis*. When taken out of the bird's crop they weighed one ounce and a half, so I thought the fact worth mention.—C. BRAZENOR (Brighton).

[We have often observed the Black-headed Gull, *Larus ridibundus*, and the Common and Black Terns, *Sterna fluviatilis* and *nigra*, catching Craneflies on the wing, on a still summer evening, when these insects were flying in clouds near the water.—ED.]

Retirement of Mr. A. G. More.—Mr. A. G. More, F.L.S., M.R.I.A., a long and valued contributor to 'The Zoologist,' has unfortunately been obliged, owing to ill health, to resign his appointment as Curator to the Natural History Department of the Science and Art Museum, Dublin. Before he went to Ireland Mr. More had written an account of the Fauna and Flora of the Isle of Wight in Canon Venables' Guide to that Island, and had also published an important series of papers "On the Distribution of Birds in Great Britain during the Nesting-season" in 'The Ibis' for 1865. The central idea of cataloguing the nesting-places of birds was his own, and the working of it out involved an immense amount of labour. On first going to Ireland Mr. More originated the idea of producing a Flora of Ireland. This he accomplished by putting in writing and critically examining the great store of facts which the late Dr. D. Moore had

accumulated in his memory. The 'Cybele Hibernica' was then published, and well supplied a long-felt want. Mr. More is at present engaged on a new edition of that valuable work. In 1867 Mr. More was appointed as Assistant in the Museum of the Royal Dublin Society, and the pages of 'The Zoologist' and 'Ibis,' and other journals testify to his activity in investigating the Flora and Fauna of Ireland. A few of his more important additions to the Fauna may be here noted:—In company with Mr. Wm. Andrews he found the first Irish specimens of Montagu's Blenny, *Blennius gallerita*, at Dingle and Connemara ('Zoologist,' 1878, p. 297). In 1875 he summarised what was known concerning the occurrence of gigantic Squids in Ireland ('Zoologist,' 1875, pp. 4526 and 4569). The form from Boffin Island which he identified as *Architeuthis dux* and the one he described as *Dinoteuthis proboscideus*, n. g. and sp., have since been recognised by Verrill as being specimens of *A. monachus*. In 1881 (Zool. p. 334) the Dusky Shearwater, *Puffinus griseus*, from Co. Kerry and *Falco islandus* from Belmullet (p. 488) were added to the Irish list. He recorded the Cape Pigeon, *Daption capensis*, as a straggler in Co. Dublin in 1882 ('Ibis'), but has now some doubt as to the honesty of his informant. The Spinous Shark, *Echinorhynchus spinosus*, was first recognised by Mr. More as Irish, from the Dublin coast (Zool. 1882, p. 434), and again from Galway Bay (Zool. 1885, p. 311). In 1885 he certified to the occurrence of the Wood Sandpiper in Wicklow (Zool. p. 438). In 1885 Mr. More completed 'A List of Irish Birds, showing the Species contained in the Science and Art Museum, Dublin,' this being the first of a series of official Guides published by the Museum. This year he produced 'A Guide to the Mammals and Birds of the Museum. On several occasions Mr. More has made dredging excursions to various parts of the coast of Ireland, the results of which may be seen in the above Museum. A list of his published notes and papers, or an examination of the Museum under his charge, would not give a complete view of the activity of his mind. His numerous friends and correspondents can tell of his readiness to impart information and to suggest lines of enquiry. His critical knowledge of British plants and birds was continually being tested by local naturalists, and not a few of the papers recently published on the Flora and Ornithology of Ireland owe their origin or their value to his ability. Mr. More's large circle of friends will be pleased to learn that, although no longer connected with the Museum, he will still continue to reside in Dublin; and his house, like his room in the Museum in the past, will we hope continue for many years to be the rendezvous of all those interested in Irish Natural History.

SCIENTIFIC SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

August 3, 1887.—Dr. D. SHARP, President, in the chair.

Mr. John Witherington Peers, M.A., of Wendover, near Tring; and Mr. R. G. Lynam, of the North Staffordshire Infirmary, Stoke-on-Trent, were elected Fellows of the Society.

Jonkeer May, the Dutch Consul-General, exhibited a pupa and two imagos of *Cecidomyia destructor* (Hessian Fly), which had been submitted to him for exhibition by the Agricultural Department.

Mr. W. White exhibited, and made remarks on, a specimen of *Philampelus satellitia*, Linn., from Florida, with supposed fungoid excrescences from the eyes. Mr. Stainton said he was of opinion that the supposed fungoid growth might be the pollinia of an Orchis. Mr. Poulton expressed a similar opinion, and the discussion was continued by Mr. Pascoe, Dr. Sharp, and others.

Mr. White also exhibited a specimen of *Catephia alchymista*, bred from a pupa collected by Mr. Ralfe last autumn on the South Coast.

Mr. M'Lachlan sent for exhibition a number of oak-leaves infested by *Phylloxera punctata*, Lichtenstein, which he had received from Dr. Maxwell Masters, F.R.S.

Mr. Champion exhibited two rare species of *Curculionidæ* from the Isle of Wight—*viz.*, one specimen of *Baridius analis*, and a series of *Cathormiocerus socius*. He remarked that *C. maritimus*, Rye, had been placed in recent European Catalogues as a synonym of the last-named species, but that this was an error. He also exhibited a series of *Cicindela germanica*, from Blackgang, Isle of Wight.

Mons. Alfred Wailly exhibited, and made remarks on, a number of living larvæ of *Antheræa pernyi*, *A. mylitta*, *Telea polyphemus*, *Platysamia cecropia*, *Actias luna*, *Attacus cynthia*, *Callosamia promethea*, and other silk-producing species. He also exhibited imagos of the above species, imagos of *Antheræa Yama-mai*, and a number of species of *Diurni* from Sarawak.

Mr. Poulton exhibited crystals of formate of lead obtained by collecting the secretion of the larva of *Dicranura vinula* on 283 occasions. The secretion had been mixed with distilled water in which oxide of lead was suspended. The latter dissolved, and the acid of the secretion being in excess the normal formate was produced. Prof. Meldola promised to subject the crystals to combustion, so that their constitution would be proved by the final test.

Mr. Oliver Janson called attention to Mr. Pryer's new work, 'Rhopalocera Niponica,' and to the fact that the illustrations had been executed by Japanese artists.—H. Goss, *Hon. Secretary*.

NOTICES OF NEW BOOKS.

Rough Notes on the Birds observed during Twenty Years' Shooting and Collecting in the British Islands. By E. T. BOOTH. With Plates from Drawings by E. NEALE, taken from Specimens in the Author's possession. Part XV. and last; folio. London: R. H. Porter. 1887.

COMMENCED in 1881, and issued at intervals in parts, the recent appearance of Part XV. has brought this fine work to a conclusion. As the author tells us in his Introduction, more years than he anticipated have been spent in describing the habits of the birds observed by him, and it would now be more correct to name twenty-five years instead of twenty as the period over which his observations have extended. The public have been the gainers, for the result is a collection of the most interesting and valuable notes relating to many of the rarer British birds which are not to be found elsewhere.

The concluding part, which is now before us, deals with the Snow Bunting, Bittern, Common Sheld Duck, Wigeon, Mallard, Dunlin, Ruff, and Common Tern, containing in addition the title-pages, contents, and list of plates for the three volumes in which the work may now be bound.

The illustrations by Mr. Neale from specimens in the author's collection, although perhaps somewhat unequal in merit as regards drawing, are accurately coloured, and have this great recommendation, namely, that in many cases several plates are given of the same species in different phases of plumage, many of which have not been previously represented in any other work. As examples, we may note the plates which represent the immature plumage of the Osprey, Kite, Hen Harrier, Montagu's Harrier, Bearded Tit, Yellow Wagtail, Ruff, Whooper, Shoveller, Eider, Velvet Scoter, Gannet (six plates), and Sandwich Tern, besides several Gulls, and eight plates of Skuas in various plumages. Another noticeable feature in the plates is the care that has been taken to reproduce accurately the colours of the soft parts in the species figured. These colours, as everyone knows, fade very quickly after death, and by the time a preserved specimen is thoroughly dried, the colours of the bill, legs and

feet have completely changed in the process. It is therefore of importance that they should be accurately noted before the bird has been skinned. This Mr. Booth has been careful to do.

As regards the value of the letterpress we cannot speak too highly. Especially interesting are his notes on the nesting habits of our rarer birds, particularly those which, like the Osprey, Kite, and Hen Harrier, have almost ceased to breed in the British Islands, or those which, like the Brambling, have been found to do so on very rare occasions. It must be admitted that Mr. Booth has enjoyed remarkable facilities for exploring out-of-the-way places in search of the nests of what may be termed out-of-the-way birds. He has, in fact, gone straight to the haunts wherein they were most likely to be discovered, and in nine cases out of ten he has succeeded in finding them.

Now and again he has been doomed to disappointment, as, for instance, in the case of the Snow Bunting. In July, 1876, he tells us, he made an attempt to reach the ground on the summit of the high hills in the east of Inverness where the Snow Bunting is supposed to breed; a dreadful storm of wind and rain, however, put a stop to his advance, and rendered it an impossibility to reach the haunts of these birds. He thus graphically describes the situation:—

“Having settled to search Ben Muich Dhu for Snow Buntings, we decided on making an early start, and leaving the lodge at midnight, we drove to a bothy on the east side of the forest. Here four keepers and foresters were awaiting our arrival, and an immediate start was made for the high ground. The morning proved dull and gloomy, and we were well up the Braemar Pass before it became fairly light. The weather then got worse, and the wind increased, the mist and clouds rolled lower down the hills, while the rain drifted in blinding showers, rendering it impossible for us to advance. For two hours we sheltered among some large slabs of rock near the highest part of the Pass in hopes that the storm might moderate. At length, however, we came to the conclusion that it was useless to attempt to reach the high ground; added to which the position we now found ourselves in could scarcely be termed pleasant. The terrific gusts as they roared round the crags above us now and then dislodged stones and pieces of rock that came rolling down the side of the hill. Some of these dashed past us at no great distance just after we had quitted our shelter, and I must confess I felt greatly relieved when we emerged from the Pass; the unearthly howling and screeching of the wind among the jagged and

pointed rocks was perfectly deafening, and the force of the blasts was such that it would have been the height of folly to have proceeded further."

The account given of the habits of the Ruff and Reeve, as observed in one of its last breeding-haunts in Norfolk, is very entertaining. So also are the remarks which follow about Terns. Writing of the last-named birds, Mr. Booth says:—

"Many of the breeding stations to which the Common Tern resorted in former days have been deserted. These birds are stated to have reared their young in considerable numbers on several of the wide-stretching shingle banks along the coasts of Kent and Sussex; I doubt, however, if a single egg has been laid on several of their former haunts in this locality for some years. Common and Arctic Terns not unfrequently breed in company. * * * The only species I was unable to identify on the Farne Islands were the Sandwich and Arctic, with the exception of a single Roseate Tern [which was procured]. I was not then aware that the Common Tern had been stated by several authors to nest on these islands; not a single specimen, however, was observed. * * * From repeated observations concerning the nesting habits of Terns, I am of opinion that the Common Tern usually lays three, and the Arctic Tern invariably four eggs."

The remarks on the migration of Terns in spring and autumn as observed by the author (too long to be quoted here) will, we are inclined to think, be new to many. Indeed, did space permit, there are many pages in the last part of the work now before us from which we should like to make extracts.

But, as we have intimated on former occasions when noticing the progress of this work, Mr. Booth's 'Rough Notes' should be in the hands of every ornithologist to be perused at leisure. Especially should it be studied by those who are pleased to assert that British Ornithology is "played out," and that there is nothing more to be learnt on the subject. We venture to think they will find in these pages a very great deal that they did not know before, and of which most probably they never dreamed. Mr. Booth is candid enough to tell us of his failures as well as his successes, and young and ardent ornithologists would do well to profit by his varied and pleasantly told experience.





West, Newman & Co. trop.

The Bank Vole. *Arvicola glareolus*.



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ON THE BANK VOLE, *ARVICOLA GLAREOLUS* (SCHREBER).

BY THE EDITOR.

PLATE V.

THE variation both in regard to size and colour which is observable in the Voles formerly led to the inference that there were many more species in this country than are now known to exist here. Thus the Irish naturalist, Thompson, described a Vole of which specimens were obtained in Perthshire, at Megarnie Castle, and subsequently at Aberarder, in Invernessshire (Ann. Mag. Nat. Hist. 1841, p. 270), and which he named *Arvicola neglecta*, under the impression that it was a distinct species. Baron de Selys Longchamps also, in an article entitled "Distribution Geographique des Campagnols en Europe," described another, under the name of *Arvicola britannicus* ('Revue Zoologique,' 1847, p. 307), which was thought at the time to differ from the now well-known *Arvicola agrestis* (Linn.), to which species, however, both of these have since been referred by Professor Blasius and other writers. Bellamy also, in his 'Natural History of South Devon' (1839), described and figured a Vole under the name of *Arvicola hirta* (p. 369), which, both from the description given as well as from the figure (wherein the tail appears to be much too short for *A. glareolus*), would seem to be merely a variety of *A. agrestis*.

It is now pretty well ascertained that only three species of Vole are indigenous to the British Islands, namely, the Water

Vole, or Water Rat, as it is commonly termed, *Arvicola amphibius*; the Short-tailed Field Vole, *A. agrestis*; and the Bank Vole, *A. glareolus*. The characters which distinguish all these from the true mice and rats belonging to the genus *Mus* are to be found in the form of the skull, and especially the teeth, the molars, for example, having no roots. Their external appearance also is different. Instead of a long narrow head, large prominent ears, and long tail, either naked or sparsely clothed with hairs, they have a large rounded head, ears so short that they are almost hidden in the fur of the head, and a comparatively short tail well covered with hair.

It is remarkable that neither the so-called Water Rat nor either of the two smaller Voles are found in Ireland, in which country, in fact, there is no representative of the genus *Arvicola*.

In Scotland all three species occur, and are widely distributed. *A. amphibius* is common throughout the mainland and in Orkney, but the late Edward Alston could obtain no satisfactory evidence of its existence in the Inner Islands, though said to be found in Islay and Mull; and it is certainly absent from the Outer Hebrides. *A. agrestis*, though common on the mainland, in the Inner Islands, and in Orkney (according to Messrs. Baikie and Heddle, *Hist. Nat. Orcadensis*, p. 16), has not been found in Shetland. In the Outer Hebrides it has been reported from Rodil and Loch Boisdale, and in 1879 Mr. Harvie Brown captured a specimen, now in the British Museum, at Newton, North Uist. *A. glareolus*, the least well-known of all, was first noticed in Scotland by Macgillivray, who examined specimens procured at Kelso and Bathgate, in Linlithgowshire (*Naturalists' Library*, *Brit. Quad.* vol. vii. p. 272), and is locally distributed. It has not been recorded, however, from any of the Islands, nor from further north than Morayshire, where, according to the Rev. G. Gordon, it is extremely common, and particularly destructive to young larch trees, climbing the branches to feed on the young buds, and barking the stems in winter.

In 'The Zoologist' for 1866 (pp. 9, 10) Mr. Alston noticed the occurrence of the Bank Vole in Lanarkshire, under the impression, at that date, that it was a new addition to the fauna of Scotland; but he had overlooked the previous notice of it by Macgillivray above referred to, an inadvertence subsequently admitted (*Zool.* 1866, p. 240).

In the Appendix on the Fauna of Banffshire, which is given at the end of Smiles's 'Life of a Scotch Naturalist' (Thomas Edward), the Bank Vole is apparently included under the name *Arvicola pratensis*, for it is described as resembling *Arvicola agrestis*, the Short-tailed Field Mouse, in appearance and habits, but "recognisable by its much longer tail" (p. 393). This Appendix, as we learn from the Preface (p. vii) was prepared by Edward himself, and it is to be regretted that he has given no further details concerning this little animal, so as to place the fact of its occurrence in Banffshire beyond all doubt.

In Messrs. Alston and Harvie Brown's Account of the Mammals of Sutherlandshire (Proc. Nat. Hist. Soc. Glasgow, 1875) we find the statement (p. 145), that this Bank Vole has "not hitherto been recorded from Sutherland, but from what we have observed of its distribution in other parts of Scotland we think that it will probably be found in some districts. It seems to be a widely-spread but rather local species."

In Mr. Lumsden's Catalogue of the Mammals of the neighbourhood of Loch Lomond (Proc. Nat. Hist. Soc. Glasgow, 1877) the Bank Vole is included provisionally on the ground that a specimen was procured by Dr. Dewar on the shores of Loch Katrine.

Crossing the Scottish border we find the occurrence of the Bank Vole in NORTHUMBERLAND vouched for by Messrs. Mennell and Perkins in their Catalogue of the Mammalia of that county (Trans. Tyneside Nat. Field Club, vol. vi. 1864) on the strength of specimens obtained by Selby at Twizel (Mag. Zool. and Bot. ii. 92, 1838), and by Dr. Johnston, of Berwick (Proc. Berwick Nat. Field Club, i. p. 24).

In CUMBERLAND, according to the Rev. H. A. Macpherson, it is probably thinly distributed, but has hitherto been detected in only two localities in that county, namely, at King Moor, Carlisle, and on the arable area bordering the English Solway at Allonby, near Maryport. It was from the latter place in the spring of the present year, that, thanks to Mr. Macpherson, the specimen was forwarded which now forms the subject of the accompanying plate.

In DURHAM it does not appear to have been noticed by any author treating of the fauna of that county, but, inasmuch as it is known to occur in counties to the north and south of this,

there can be little doubt that its detection there will be merely a matter of time.

In YORKSHIRE, according to Messrs. Clarke and Roebuck (Handbook Yorks. Vert. p. 14), it has been reported from a few localities scattered irregularly over the whole county. In Upper Nidderdale it is considered common ('Naturalist,' 1886, p. 197).

In LANCASHIRE, Mr. George Roberts, of Lofthouse, Wakefield, whilst visiting at Lytham, in April, 1866, found a dead Bank Vole in its nest, which was formed in a heap of potatoes and composed of soft short straws (Zool. 1866, p. 206).

In DERBYSHIRE the Bank Vole was noticed by the late Mr. Harpur Crewe at Calke Abbey, where, in February, 1863, he obtained half a dozen specimens (Zool. 1863, p. 8554). The following spring he announced the capture of more than thirty others at the same place during the preceding twelve months (Zool. 1864, p. 9016). So that in South Derbyshire, at all events, it would seem to be tolerably common.

In regard to NOTTINGHAMSHIRE and LINCOLNSHIRE information is wanting.

As regards STAFFORDSHIRE, no mention of the Bank Vole is made by Garner in his 'Natural History of Staffordshire' (1844), although he includes the Short-tailed Vole (*Arvicola agrestis*) as "very common." Mr. John R. B. Masefield, however, in a more recent account of the existing indigenous Mammalia of North Staffordshire (1886), states (p. 13) that it is far from uncommon in the district of Cheadle; it is an animal as well as a vegetable feeder; and that one was taken in a trap baited with flesh-meat.

For SHROPSHIRE, so far as has been ascertained, a report on the existing small Mammalia is still wanting.

In LEICESTERSHIRE, Mr. Montagu Browne has not met with the Bank Vole (Zool. 1885, p. 219), although he has some reason to believe that it occurs there.

From NORTHAMPTONSHIRE and BEDFORDSHIRE information is desirable.

In CAMBRIDGESHIRE we have the authority of the Rev. L. Jenyns (now Blomefield) for stating that it is a native (Man. Brit. Vert. An. p. 34).

BERKSHIRE also, on the same authority, may be added to the list of counties in which it has been found.

With regard to NORFOLK, when Mr. Southwell, in 1871, prepared a List of the Mammalia of that county (Trans. Norf. Nat. Soc. i. p. 78, and Zool. 1871, p. 2756) he was unable to include the Bank Vole amongst the species found there; but some years later, when a revised edition of his Catalogue appeared (Trans. Norf. Nat. Soc. iii. 1884), he supplied the omission, for in the meantime (1878) Mr. F. Norgate had obtained several specimens of this Vole at Sparham, and one in the adjoining parish of Bawdeswell (Zool. 1874, p. 4236, and Trans. Norf. Nat. Soc. ii. p. 469), and in a footnote to the second edition of Lubbock's 'Fauna of Norfolk' (1879, p. 10) Mr. Southwell mentions Keswick, Aylsham, and Northrepps as localities in which it had been met with or procured.*

In SUFFOLK, Mr. G. R. Rope has found the Bank Vole to be "far from uncommon" in the neighbourhood of Blaxhall, where he resides; and in 'Science Gossip' for July, 1886, he has given an interesting account of it from his own observation, both in a state of nature as well as in captivity. From this account we shall have occasion to quote presently when dealing with the observed habits of this little rodent.

It was in ESSEX that the Bank Vole was first detected as a British species, and was described by Yarrell under the name *riparia* from specimens procured at Birchanger, in that county, in the 'Proceedings' of the Zoological Society for 1832, p. 109, as well as in the 'Magazine of Natural History' (vol. v. p. 599). Much more recently (1882) Dr. Laver, of Colchester, has seen specimens from West Bergholt and Layer de la Haye in the same county (Trans. Essex Field Club, vol. ii. p. 175); and in August, 1885, as recorded by Mr. E. Rosling (Zool. 1885, p. 433) an albino Bank Vole was taken by him uninjured from a cat at Chelmsford, and forwarded alive to the Zoological Gardens, where it was identified by Mr. Bartlett.

In HERTFORDSHIRE as well as in BERKSHIRE we have the authority of Yarrell for stating that it occurs.

In MIDDLESEX, also, Yarrell procured specimens which, if we mistake not, were taken by Mr. F. Bond in the neighbourhood of

* The so-called "curious variety of the Bank Vole," killed near Norwich in the autumn of 1865 (Zool. 1866, p. 152) proved to be an albino Water Vole.

Kingsbury. Many years ago, when residing in that parish, we found the Bank Vole not at all uncommon in certain sheltered spots, in dry ditches and hedge-banks, and about the hollows of old tree-roots. We used to catch them alive in ordinary mouse-traps and keep them in a Dormouse-cage, and very interesting pets they were. Now and then the cats used to bring one in freshly caught, but they much more frequently brought in the Short-tailed Field Vole (*Arvicola agrestis*), of which one cat, a famous mouser, sometimes brought in three or four a day, with an occasional *Mus sylvaticus* from the kitchen-garden. On examining the contents of the stomachs, of such as were brought in dead in this way, we found that those of *A. agrestis* contained a soft mass of green herbage smelling quite fresh, while those of *A. glareolus* and *Mus sylvaticus* contained a hard mass of what appeared to be ground acorns, nuts, or farinaceous food, having a faint sickly smell.

In the Home counties, generally, the Bank Vole is probably locally distributed, although evidence of its occurrence in KENT and SURREY is not forthcoming.

In WEST SUSSEX and on the borders of HAMPSHIRE, near Petersfield, we have reason to believe that it frequents the "hangers" or wooded slopes of the South Downs, for on one occasion, when covert-shooting in that neighbourhood, we picked up a dead specimen, which was too far decomposed to be preserved.

In the western counties of England it appears to be hardly known at all,* and no information respecting it has reached us from any part of WALES. No Voles of any species are mentioned in the list of Mammalia given in Dillwyn's 'Materials for a Fauna and Flora of Swansea' (1848).

In CORNWALL, according to Dr. Bullmore, it is not uncommon in the neighbourhood of Falmouth ('Cornish Fauna,' 1886, p. 5); and Mr. W. P. Cocks, in his "Contributions to the Fauna of Falmouth" ('Naturalist,' vol. i., 1851), gives two localities near Falmouth where it is found. It was to have been expected that some additional information in regard to this species would appear in the revised edition of Couch's 'Cornish Fauna,' published in 1878, with the co-operation of Messrs. Brooking

* It is not mentioned in Hastings' 'Natural History of Worcestershire.'

Rowe, Thomas Cornish, E. H. Rodd, and C. Spence Bate; but nothing further is stated beyond the facts above mentioned.

In DEVONSHIRE the Bank Vole appears to be either very rare or extremely local. For a long time it was only accorded a place in the fauna of Devon on account of its having been included, by the Rev. W. S. Hore, in a list contributed by him to Rowe's 'Perambulation of Dartmoor'; and for this reason it was included by Mr. Brooking Rowe in his 'Catalogue of the Mammals, Birds, &c., indigenous to or observed in the County of Devon,' published in 1863. The species of Vole described and figured by Bellamy, in his 'Nat. Hist. S. Devon' (1839), under the name of *Arvicola hirta*, as already remarked, was most likely a variety of *Arvicola agrestis*. It was not until 1879 that Mr. D'Urban, the energetic Curator of the Albert Memorial Museum, at Exeter, was enabled to state with certainty that *A. glareolus* really does occur in Devonshire. In 'The Zoologist' for that year (p. 487), after stating that there were no well-authenticated instances of its occurrence in that county, he announced his reception at last of a living specimen, which had been captured by Mr. A. Dudley at Ide, near Exeter. Other examples may, therefore, be expected to occur.

We can hardly doubt, also, that it will be met with in WILTS and DORSETSHIRE, if looked for in suitable spots.

The Bank Vole is included by Mr. A. G. More in his "Catalogue of the Mammalia of the ISLE OF WIGHT," printed in Venables' 'Guide to the Isle of Wight'; but, beyond the mere insertion of the name, no information is given respecting it. As this 'Guide,' however, was published so long ago as 1860, when less attention was paid to the geographical distribution of species than at the present time, due allowance must be made.

It is most probable that in the attempt which has been made to trace the distribution of *Arvicola glareolus* in the British Islands, many records may have been overlooked which ought to have been noticed. In this case it is to be hoped that readers will forward a note of such omissions as may appear to them important, and particularly a note of any localities with which they may be acquainted in counties where, so far as the writer is aware, the occurrence of this species has not yet been made known.

In order to aid those who may have leisure to search for it, we may point out the chief characters which serve to distinguish

the Bank Vole from the Short-tailed Vole, and will conclude by giving some account of the habits of the rarer species as noticed by several good observers. This by way of supplement to the remarks under this head, which are given in the second edition of Bell's 'British Quadrupeds.'

Yarrell, when first describing the Bank Vole as British, under the name of *Arvicola riparia*, pointed out the striking difference between that species and *A. agrestis* in the length of the tail in proportion to length of body, the tail of the Bank Vole being much longer, equalling about one-half the length of the body; while that of the Short-tailed Vole reaches only to one-third of the length of body. The number of caudal vertebræ he ascertained to be in *A. agrestis*, 19; in *A. glareolus*, 23. In *agrestis*, also, which is the larger of the two species, he found the cavity of the thorax much larger, the ribs of greater expanse, the sternum longer, and the feet slightly shorter. The proportions of the Bank Vole, as Bell has pointed out, are more elegant, its colours brighter, and its fur more smooth and glossy. The head is narrower and less flattened; the eyes larger and more conspicuous; and the ears longer, showing distinctly above the fur. The head and back are rich chestnut, which passes on the flanks into a more or less clear grey; while the breast, belly, and feet are almost pure white.* The young are much darker in colour than the adults.

Of nine adults obtained by Mr. Rope in Suffolk, near Blaxhall, the average dimensions were:—Head and body, 3 inches 8 lines; tail, 1 inch 9 lines. One example, a female, measured as much as 4 inches in head and body, the tail being 1 inch 9 lines. An old female (with five young), brought in by a cat belonging to Mr. Norgate, of Spurham, near Norwich, was larger and redder than an old male; ear, 6 lines long and 6 broad; base of tail covered with long hair, like that of the body (Zool., 1874, p. 4236).

Arvicola agrestis is a dweller in the open fields; *A. glareolus* affects more sheltered situations. The haunts of the latter

* Mr. Rope says, "the bright fawn or orange tint observable on the under parts of some specimens varies a good deal in intensity, being sometimes altogether absent." An albino specimen, procured at Chelmsford in August, 1885, by Mr. E. Rosling, was reported in 'The Zoologist' for that year, p. 433.

species have been well described by Mr. Rope, who writes as follows:—

“Their favourite haunts here are old rough ivy-covered hedge-banks, especially those from which the soil has been washed away in places, leaving the roots bare, and thus forming hollows behind them; banks adjoining woods and plantations seem particularly attractive to them. In spots like this, pleasingly varied by a sprinkling of old mossy stubs, brambles and bushes, with the roots of overhanging trees backed by deep cavernous recesses, the Bank Vole makes its burrow, and forms runs in all directions, partly above and partly below the surface; probably also making use of those of the mole. I have caught them, too, among artificial rockwork, and in a plantation in which are banks thickly covered with the lesser periwinkle, among the roots and stems of which they had formed numerous runs.”

The late Mr. Edward Alston also noticed that the Bank Vole is partial to gardens (‘Zoologist,’ 1867, p. 669). He kept one for some time in confinement, and gave an account of it in this Journal (1866, pp. 9, 10). It would eat almost any vegetable substance, but preferred roots and fruit to herbage, a raw potato being a special delicacy. Gooseberries were neatly emptied by a small hole on one side, the skins of all fruit being rejected. Mr. Rope, who has kept several of these little animals in confinement at various times, remarks:—

“Not only do these little animals make pleasing and interesting pets, but they also thrive remarkably well in confinement. On more than one occasion, indeed, on placing a freshly-caught specimen with the former occupants of a cage, I have been struck with the superior plumpness and sleekness of the latter; I may also add that I have never had one die in captivity. A female caught here in January, 1883, was exceedingly fond of bread, and would often carry a large piece up a ladder to her sleeping-place; in fact, I have always found them prefer bread and grass to any other food, and this has generally been the staple diet of those I have kept. In captivity they will also eat haws, peas, nuts, apples, and hemp-seed; of maize, like the Tits (*Paridæ*), they only devour the middle, rejecting the greater part of the grain; their fondness for the seeds of the sunflower is another taste they share with those birds. In addition to grasses, they probably feed in the wild state upon

the leaves of various other plants, but the following are all that I can vouch for with absolute certainty: sheep's-parsley, common plaintain, Brussels sprouts, and hogweed. They are able to bite through the shell of most filberts, but I doubt whether that of the hazel-nut would not prove too much for their gnawing powers. Several times during March, 1884, I pegged down apples in the runs of these animals, but in no instance were they bitten, though, as stated above, they eagerly devour them in captivity. The stomach of a specimen, caught during the month of July, 1884, by a cat, contained a mass of partially-digested matter, consisting apparently of small seeds (resembling those of grasses), rather than of leaves and blades of grass. Victor Fatio, in his 'Faune des Vertébrés de la Suisse,' states that during the winter the Bank Vole subsists on bark and roots; he also affirms that, in addition to its usual vegetable diet, it also devours worms, and is in the habit of robbing the nests of small birds building on or near the ground. This taste for animal food and insects has been observed on various occasions in its congener the Short-tailed Field Mouse, and the Water Rat has also been accused of occasionally exhibiting similar tastes. There can, however, be little doubt but that by far the greater proportion of the food of all three species is of a vegetable nature. When angry these little creatures make a great fuss, grinding their teeth and using their voice very freely, which may be described as a short grunting squeak, neither so sharp nor so prolonged as that of *Mus sylvaticus* or *musculus*. In quarrelling their actions are ludicrous in the extreme: they dodge round each other in a perfectly upright attitude, hopping on their hind legs, and now and then nearly throwing themselves over backwards in endeavouring to avoid each other's attacks, the fore paws being held stretched out before the face for protection. There is a great deal of fuss, and much squeaking and grinding of teeth, but very little comes of it all, and in general they are peaceable and gentle in their ways. They are remarkably quick and active in their movements, the usual manner of progression being a succession of short jerky runs, very bird-like in character, and not unlike the action of the Hedgesparrow when on the ground. They are most expert climbers, and quite at home among the branches and twigs of hedges and bushes. Many years before I had become personally acquainted with the appearance and habits of

this pretty little animal, I saw what I have now little doubt was a Bank Vole, climbing about in a whitethorn fence in this parish (Blaxhall), probably in search of haws. (Dormice do not occur here.) Last summer I kept three Bank Voles with a pair of Dormice in a very large bell-glass, having a superstructure of wire-gauze, in which a rough bush was fixed for them to climb about on: this they often made use of, and ran up and down with almost as much agility as their companions; but they evidently lack the power of jumping long distances from branch to branch, possessed in such perfection by the Squirrels and Dormice. A female killed by a cat, July 4th, 1884, contained five young, which to all appearance would have been born almost immediately; probably, however, the species breeds much earlier in the year than this, and, like *A. agrestis*, has several litters during the spring and summer months. According to the writer last quoted, they breed from twice to four times, producing from four to eight in a litter.

“A word as to traps may be acceptable to some of your readers. I have caught Bank Voles in various kinds of traps, but have found nothing answer better than a larger make of the common (live) mouse-trap with a slanting door. If the usual small-sized penny trap be used, the bait-hook must be shifted one wire farther from the mouth, so as to give greater length to the trap, otherwise the hind-quarters of the captive will be crushed by the falling door; but even with this alteration the trap is not large enough, and it is far better to use a bigger one. There is a useful trap for this purpose in form somewhat like a toast-rack, with a small wire falling door at each end, the floor being of wood; one advantage of which is that it may be easily covered up and kept dry and warm, should the night prove wet or frosty; in which case the little prisoner would (without such protection) almost certainly be found in a few hours dead and stiff. For bait nothing is better than a crust of bread; a soaked pea or even a bit of cheese will also be found attractive. A very few hemp-seeds scattered about the entrance of the trap serve as a useful ground-bait.”

The figures in the accompanying plate have been drawn—one (1) by Mr. G. E. Lodge, from a specimen received by Mr. H. A. Macpherson, from Allonby, Cumberland; the other (2) by Mr. G. Rope, from a living specimen in his collection, captured by him near Blaxhall, in Suffolk.

SWALLOWS AND SWIFTS IN CAPTIVITY.

[THE account given by Mr. A. G. Butler (p. 347) of his attempt to keep Sand Martins in confinement has recalled to mind the experience in this direction of Mr. W. E. Teschemaker, as related by him in 'The Bazaar, Exchange, and Mart' of the 13th April last. Experiments of the kind have been so seldom made, or, if made, the results have been so seldom reported, that we believe many of our readers will be glad to see Mr. Teschemaker's remarks reproduced here.]

KNOWING from practical experience how hard it is to preserve in health for any length of time the majority of our British Warblers, it was only recently that it occurred to me that it might be possible to domesticate our *Hirundines* also, and it was not until the end of last summer (1886) that I put the matter to a practical test.

The Swallow and its congeners always seem so fragile, so ethereal—such devotees of the sunny south—that the last thing in the world that one thinks of in connection with them is a cage, or any other such conventional domicile. Nevertheless I am pretty well convinced now that not only are they readily domesticated, but also that they make most charming and interesting pets.

The first thing I did, when my attention was directed to this subject, was to glance at such books of reference as I had by me. No volume, however, to which I had access mentioned any case of the *Hirundines* being domesticated; nor am I aware of any work on aviary birds that does so, though of course it is quite possible that some that I have not been able to consult may contain the required information. The best of all such works, Bechstein's 'Cage Birds,' does not include the *Hirundines*, nor does the last edition of his work, which contains also the addenda of Sweet's "Warblers," and is most complete.

Last of all, I hunted out an old edition of Bewick (the pioneer of many a modern book), and there I found what I wanted—a detailed account of a successful attempt to reclaim the Swallow. First and foremost, then, I will give the substance of Bewick's narrative. This experiment was made by Mr. James Pearson, of 21, Great Newport Street, Long Acre, London, and was communicated to Bewick by Sir John Trevelyan, Bart.

It appears that about the latter end of August, 1784, Mr. Pearson obtained five or six Swallows in a fowling-net at night. He put them at first separately into small cages, and fed them on "Nightingale's food." After about ten days of hand-feeding, they consented to take food for themselves, and were then put all together into a deep cage, four feet long, with gravel at the bottom; a broad shallow pan with water was placed in it, in which they sometimes washed. All went well for some little time; but one day, as the cold weather approached, they were observed to plunge repeatedly and excitedly into their bath, and, very shortly after, all five became torpid, and three died; the remaining two revived, and lived until Christmas, when they also unfortunately became afflicted with inflamed feet and succumbed.

In the following year, however (1785), Mr. Pearson repeated the experiment with four birds, this time covering the perches with flannel, and met with complete success! The Swallows thrived, sang their pleasant chattering song all through the winter months, moulted soon after Christmas, lived for three or four years, and only perished from neglect during the illness of their owner.

I only came across the above passage late in the year 1886—so late that I doubted whether I could obtain any Swallows to make the attempt with. I was at that time in the Isle of Man, and the Swallows had almost all left for warmer climes; moreover, I wanted *young* Swallows.

However, chance favoured the idea. At six o'clock one evening (it was the 6th of September)—a dark, cloudy, stormy evening, which foretold a storm to come—my cousin and myself anchored our boat off the Banner Rock, a little south of St. Anne's Head, on the Manx coast, and sprang on to a reef, exposed by a dead low spring-tide, and thence scrambled up to the base of the cliff, in order to explore a cave which was said to exist about there, and from which a subterranean passage was said to lead to Castle Rushen. The back of the cave was blocked with masonry; so ran the legend. Well, we found a cave that answered to the description, crawled some way in on hands and knees in pitchy darkness (for we had lost candle and matches), and, far in, we found the masonry; but, what is more, out flew a Swallow from above our heads. We soon spotted the nest, which contained four young birds, fully fledged, and quite able to fly.

I give this somewhat detailed preamble, not because I see anything phenomenal in having been on the Manx coast on September 6th, but, firstly, because some of your readers may not have heard of a Swallow's nest—which one always associates with chimneys—in the abysmal depths of a wild part of a wild coast; secondly, because September 6th is the latest date but one that I have found a Swallow's nest with young; and, thirdly, because if anyone who reads this is up in the North, he may find in the Banner Cave that unusual coincidence—a legend fulfilled!

Well, we took two of the young Swallows home, and fed them by hand on flies and lean meat (chiefly flies) for three days, at the end of which time they would take flies from the hand freely. They seemed chilly little mortals, and required to be kept warm at night in a small cage padded thickly with cotton-wool. Very soon they began to fly about the room, and would perch on the hand at a given whistle. They picked flies very neatly off the window-panes, but were never very successful in catching them in the air. The fact was, the family became such willing and assiduous caterers that the birds were far too lazy to exert themselves on their own behalf. They seemed even to prefer lean meat to flies. So tame were they that, if tossed up in the garden, they always returned to the hand without fail, chattering away familiarly all the time. Altogether, they proved among the most fascinating of the many feathered pets I have kept. Next to seeing a Peregrine come swooping down to a swing of the lure, I think there is no sight so enjoyable as watching these elegant little birds, with their marvellous power of wing, circle round and over one in graceful curves, free as the air, then shoot down in one moment and alight simultaneously on one's shoulder, twittering gaily the while, and peer comically into one's hand to see if any dainty has been reserved for them! I know of no bird so thoroughly or so easily tameable as the Swallow.

Unhappily, I have to chronicle their early death. One strangled itself by getting its head between the wires about a fortnight after it came into my possession; and, curiously enough, about a fortnight later, had its wing broken by a tame Hedgehog, who snapped at it while resting for a moment on the floor. Both birds were perfectly healthy.

The third piece of evidence I have to offer is the case of a

lady living at Rugby, who, in 1885, kept three Swifts for a little more than three months. These were kept in a middling-sized cage with no perches, and were fed almost entirely on lean beef given in small fragments. They were at length killed because they absolutely refused to fly away, and their mistress was obliged to go away from home. They were strong and well, and afforded the greatest amusement.

Here, then, are three instances of the successful domestication of our British *Hirundines*. Probably it has been often done; and I am only surprised that they are not more frequently kept. I hope any bird-lover who has made the experiment will give us the result of his experience; and if these few jottings only induce those who have not, to do so—they will not, I am sure, have been penned in vain.

I have purposely refrained from prolix directions. A few hints, however:—(1) A bath frequently; covered perches; as much exercise as possible; a moderate temperature—no sudden changes. (2) Feed on flies at first; when you cannot get live ones supply a few dead and dry ones with the lean meat (these cleanse the maw, and are almost indispensable); as little food should be given as possible.

ORNITHOLOGICAL NOTES FROM DEVON AND CORNWALL.

BY THE LATE JOHN GATCOMBE.

[THE following notes, made during the year 1886, by the late Mr. Gatcombe, whose death we were sorry to announce in a previous number (p. 233), reached us only a short time before his decease, and have stood over until now for want of space. They conclude a series of observations communicated by him annually to this Journal since the year 1872.—ED.]

IN the month of January several Long-eared Owls were obtained and sent up from Cornwall (three of them by one person), one of which was an unusually light-coloured variety. On the 21st Mr. Clogg, of Looe, kindly forwarded for my inspection a beautiful variety of the Redwing. The general colour of this bird was a delicate light buff, with the usual markings thereon of a darker tint. I have seen somewhat similar varieties of the common Song Thrush, but none so striking in colour as this, and consider such variation in the Redwing to be

of much rarer occurrence. During this month a number of Kingfishers and Green Woodpeckers were received by the bird-stuffers, the cold weather, as usual, having a great effect on these birds.

On Feb. 6th the weather was exceedingly severe; notwithstanding which a Common Guillemot was captured, which was in full breeding plumage. By the 21st I remarked *Larus ridibundus* with nearly a full black head, and also examined another Guillemot undergoing a change of plumage—this consisted of a change in the colour of the feathers without any sign of moult.

On March 1st several examples of *Larus ridibundus* were observed with perfectly dark heads; and on the 8th a Peregrine Falcon was shot on Dartmoor whilst in pursuit of a Black Grouse. Many Barn and Tawny Owls were forwarded to the birdstuffers. Up to March 26th Lesser Black-backed Gulls were numerous in our harbours previous to their departure for their breeding-stations. A few Wheatears appeared.

On April 18th, wind east, light but cold, there was an arrival of Willow Wrens and Chiffchaffs on the coast.

On May 11th two Curlew's eggs were taken on Sherbaton Farm, Dartmoor, two miles from Prince Town; and several more Tawny and Barn Owls were sent to the bird-preserver. On the 13th a Lesser Spotted Woodpecker was received. I also understood from Mr. Nicholls that a Hoopoe was obtained about this date in the neighbourhood of Kingsbridge, South Devon; and Mr. Clogg, of Looe, Cornwall, informs me of a Common Redstart having been procured—the first of the kind he had ever met with in that locality. Strange to say, although the Black Redstart is seen on the coast there almost every autumn and winter, the common species is considered rare throughout the county. He also mentioned a Great Northern Diver having been recently taken in a trammel-net. On the 21st I was shown a Nightjar, which had been killed by flying against a telegraph-wire.

On June 10th a Common Buzzard was trapped, and also a Kestrel. The stomach of the latter bird contained a Slow-worm, *Anguis fragilis*.

On July 28th an immature Peregrine Falcon was sent to the birdstuffer, and on August 5th another fully adult male killed in Cornwall, which makes the fourth example I have examined within the last six months. What a pity it seems that so many

of these noble birds should be thus destroyed. On August 9th I observed the last Swifts for the season.

On September 5th the birdstuffer at Stonehouse received an Oystercatcher and Wryneck (a very uncommon bird in Devon and Cornwall). I also saw a Quail at a poulterer's in Devonport; this was a male bird with the dark patch beneath the chin. On the 12th I examined an adult Arctic Tern which had been killed in the neighbourhood. A curious young Sparrow, in brownish white plumage was sent to me by Mr. Clogg, of Looe, and about the same time I observed in our garden a Sparrow showing a white patch on each wing, reminding one of a hen Chaffinch. On the 29th a Great Black-backed Gull, in moult, was killed in the harbour.

On October 3rd Richardson's Skua was shot near Saltash, on the River Tamar; also a Storm Petrel and three Oystercatchers near Plymouth. After a tremendous gale four or five Grey Phalaropes and several more Storm Petrels were obtained. Most of the latter were found dead inland; one, however, which was alive, but in an exhausted state, lived in a cage for nearly a fortnight, being fed on minute scraps of fat, but I think would have survived much longer on oil; it also drank freely when water was offered. The food in one of the Phalaropes examined consisted of the bodies and wings of some small brown beetles, one valve of a very thin and minute marine shell, and many fragments of decayed seaweed. A young Gannet, in the spotted plumage of its first autumn, was also procured—the first I had seen for many years in that state of plumage. About this date I examined an adult Kittiwake, which possessed a very small but perfect hind toe and claw—the first I had ever met with which showed this peculiarity among the large number of specimens I have hitherto closely examined. Although perfectly formed this small toe and its claw measured only one-eighth of an inch in length, being the same on both feet. A nice specimen of the Great Snipe, *Gallinago major*, weighing seven and a half ounces, was killed on Dartmoor by Mr. Charles Clark. On the 24th, wind east, strong and cold, lots of both Arctic and Common Terns were seen in the harbour and along the coast—no doubt driven in with the Phalaropes and Storm Petrels by the late severe gales. On the 27th a variety of the Common Partridge was brought to the birdstuffer. Its flight-feathers were pure

white, but the rest of the upper plumage of the usual colour, with the exception of the head, cheeks and throat being of a lighter tint. On the 29th the first Black Redstart made its appearance on the coast—a rather early date, as this bird is seldom seen here before the first week of November. Two Snow Buntings were sent to the birdstuffer, one from Cornwall and the other from the neighbourhood of Plymouth. This species is by no means common with us.

On Nov. 2nd another Black Redstart was observed near the Devil's Point, Stonehouse; and on the 4th a Great Northern Diver, in nearly full summer plumage, which appeared to be in exhausted state, was knocked down with a paddle by a boatman in Weston Mill Creek. On the 6th an immature Peregrine Falcon was killed by a gamekeeper at Sheviock, on the Cornish side of the River Tamar; the crop contained the remains of a Partridge. I was informed by my friend H. M. Harrison that on the 9th inst., when out rabbit shooting at Craffhole, on the Cornish side, he remarked large flights of Missel Thrushes, in some instances as many as 150 in a flock; this species had previously been very scarce with us. On the 11th a Common Buzzard and Long-eared Owl were obtained; the crop of the latter was completely filled with the remains of mice. An immature Crested Grebe was also received by the birdstuffer, the gizzard of which was stuffed, as usual, with feathers and some bones of small fish. The colour of its iris was of a light orange, with a narrow yellowish white ring surrounding the pupil, similar to that of the Slavonian Grebe. Another, but immature, Northern Diver was also killed about this date.

On Dec. 9th a young Black Guillemot, in the plumage of the first year, was obtained in Plymouth Sound—the only specimen I remember to have seen in this locality. At the same time a fully adult Razorbill was brought in, which had the tongue protruding through an aperture in the throat just under the chin, in which state it had apparently been for a long time, the border or rim of the hole having perfectly healed and become hardened, and the hole itself sufficiently large to give the tongue perfect play, so as to allow the bird to swallow its food. The protrusion of the tongue was three-quarters of an inch, the tip of which had turned or twisted into a perfect scroll. The head of this bird was preserved. Several Purple Sandpipers, *Tringa*

maritima, and Guillemots were obtained during the prevailing north-east winds; and on the 12th I purchased in the Plymouth Market an immature specimen of the Common Dotterel, *Endromias morinellus*, killed on Dartmoor, and the first local specimen I remember to have met with.

THE BRITISH MARSH TIT.

BY LEONHARD STEJNEGER.*

PARUS PALUSTRIS DRESSERI, subs. nov.

DIAGNOSIS.—Similar to typical *Parus palustris*, but much darker; the brown of the back more olive, and the rump clearer and lighter buffish brown; flanks much browner; tail shorter, the longest rectrices averaging 49 mm; outer pair of rectrices shorter than the rest, which are nearly of equal length.

HABITAT.—Great Britain.

TYPE.—U. S. National Museum, No. 96,550.

It is curious that none of the British ornithologists have had the courage to describe this bird under a distinctive name, not even those who recognise *Parus britannicus* as a distinct species, since there is no lack of evidence in the literature that they have been aware of the difference of the British Marsh Tit from the Scandinavian and Central European bird, for which Linnæus's name, *P. palustris*, is properly retained, and most of the modern authors, when speaking of *P. palustris* generally, or when describing it, have been obliged to qualify their reference to its occurrence in Great Britain by remarking that examples from this island are very much darker than *P. palustris vera*.

Thus, for instance, Messrs. Dresser and Sharpe ('Birds of Europe,' iii. p. 100 *seqv.*) make several remarks to the same effect:—"Male from England. Very much darker than continental specimens, the back especially; the rump very much paler than the rest of the back, and inclining to rosy white; cheeks and centre of the body underneath dingy white; the flanks dark buff, this colour almost extending to the abdomen" (p. 100).

* From the 'Proceedings of the United States National Museum,' vol. ix. (pp. 201, 202). Advance sheet kindly forwarded by the author.

“But in a comparison of specimens care must be taken to have the true Scandinavian species, and not the sombre English subspecies” (p. 105). “Compared with the true *P. palustris* of Sweden, our English Marsh Titmouse is a very much darker bird, and has the head slightly browner and less glossy. As, however, there are many continental specimens which, *in their winter dress, approach* British examples, we feel that it would not be advisable to bestow a *specific* name on our *insular form*, as the distinctions are not *so clearly* characterised as in the Coal Titmouse. That our island bird, however, is *constantly* darker is apparent on comparison of a series of specimens from Great Britain and the Continent. Capt. R. G. Wardlaw Ramsay has kindly sent us some Scotch specimens which exactly agree with English birds” (p. 109) (*italics mine*). Professor Newton’s remark (Yarrell, Brit. Birds, 4 ed., i., p. 497) is much to the same effect, and so are those of Mr. Seebohm (‘British Birds’ Eggs,’ i., pp. 476, 477). The latter gentleman thinks that the amount of brown is not sufficiently great to warrant the separation of the British bird from the continental one, notwithstanding the fact that he himself has described as a “variety” *P. japonicus*, and recognised as deserving of a separate (though varietal) name “forms” like *P. brevirostris* and *P. baicalensis*.

From the series which I have now before me, I see no difference between the present case and that of *P. britannicus*, neither in the quality nor in the quantity of the additional colouring matter of the British forms. The Coal Tit is considerably more bluish in the grey, and consequently the suffusion of buff in *P. britannicus* causes the back to look more olive. Intermediate forms occur in both. Very well! Therefore we give them trinomials, calling one *P. ater britannicus*, the other *P. palustris dresseri*. I am quite unable to appreciate the consistency or logic of recognising the former and rejecting the latter.

In addition to the difference in colour, it appears to me that *P. dresseri* has a shorter tail than true *P. palustris*, as I have found the longest tail-feathers in the former averaging 49 mm., against 53 mm. in the latter, while the other dimensions seem to be nearly the same.

In default of a better place, I wish to correct here a quotation in the synonymy of *P. borealis* as given by Sharpe and Dresser

('Birds of Europe,' iii. p. 107), and by Gadow (Cat. B. Brit. Mus., viii., p. 51). These gentlemen regard "*Parus fruticeti*, Wallengr., Naumannia, 1854, p. 141," as a synonym of *P. borealis*, while in reality Wallengreen proposed the new name for "*P. palustris*, Auctorum," regarding, as he did, *P. borealis*, Selys, as a synonym of *P. palustris*, Linn. We hold that Linnæus's diagnosis is equally applicable to both forms, and that the name, therefore, is to be applied to that one, to which it was first restricted by Selys-Longchamps. *P. fruticeti*, Wallengr., therefore, is a synonym of what we consider *P. palustris vera*.

NOTES AND QUERIES.

MAMMALIA.

Hornless Stags.—Hornless stags have long been known to the shooter of large game in Germany by the name of "Flatheads," or "Monks" (*Plattkopfe oder Mönche*). In these animals the so-called "rosette" on the skull, which forms the proper base of the horns, appears remarkably deformed, and is entirely clothed by a prolongation of the hairy skin of the forehead. The cause of this phenomenon in many districts has been often attributed to interbreeding for many years, as well as to neglect in regenerating the blood through natural selection with deer from other districts. But since Deer and Roe which are kept in confinement and fed liberally with oats, grain, dry pease, maize, acorns, beechmast, and chestnuts, set up horns and antlers of extraordinary dimensions, one naturally comes to the conclusion that it must be the absence of this and similar food which prevents or retards the formation of horns. Indeed it is in the extensive forests (*e. g.* the Forest of Goerde) consisting exclusively of pine and fir, that the so-called "Flatheads" are principally found, and, as regards food, are chiefly restricted to heather during the winter, other food being exceptional. Besides the more or less exceptional "Flatheads," there are other deer found there with only one "rosette" deformed, the other very likely supporting a well-developed antler, carrying from ten to twelve points. [No such antlers are ever seen now on British Reddeer.—ED.] Others again may have insignificant smooth horns of a dull colour, which in some specimens take peculiar curves or are distorted in the shape of a spiral. Those deer which, instead of horns, are provided merely with a strong and straight antler on one side only, were formerly known as "murderers," being dangerous adversaries to other deer during

the rutting-season, and consequently they were always sought to be removed—the sooner the better. As a rule, neither of the above-mentioned distortions, nor the entire absence of horns in the so-called “Flatheads,” should be regarded as indicating a lack of generative power, and at any rate ought not to be confounded with that abnormal formation of horn which inevitably results from injury or total loss of the horn in deer and roe. In regard to strength and weight, the “Flatheads,” in the districts referred to, are seldom inferior to antlered deer of the same age, and sometimes even exceed them in that respect. They also enter upon the rutting-season in due course, and are then extremely pugnacious. Their mode of fighting is peculiar; they stand up on their hind legs, as do also the hinds, and strike savagely at their adversary with their fore legs. It is remarkable that if any horned deer is attacked by a “Flathead” in this way, it will instantly fight in the same manner, rearing up vertically, without making use of its horns, which otherwise would be such terrible weapons. It thus happens on such occasions that considerably stronger animals, possessing ten or twelve points, are forced to retreat after a few charges by the “Flathead,” owing to the superior pluck of the latter. Such a scene, drawn from nature, is depicted in an engraving in the ‘*Illustrierte Zeitung*’ of October 2nd, 1886 (p. 345). Combats of this kind, where “Flatheads” exist, may be occasionally observed when a herd is temporarily enclosed and surrounded in a small space—as, for example, during a chase. These encounters are of a less serious character and of a shorter duration, for they are only casual encounters provoked through excitement.—L. BECKMANN. (Translated from the ‘*Illustrierte Zeitung*,’ October 2nd, 1886.)

The Roe-deer in Cumberland.—The presence of Roe-deer in Cumberland having been doubted in some quarters, for lack of published information, it becomes desirable to state that a limited number are established near Wigton (not Netherby), in the north of this county. The graceful little deer wander through the largest of our border plantations, occasionally making their appearance in new and unexpected localities. Thus in 1880 a buck, which had no doubt forded the Eden, took up its abode in the Cotehill Wood, where it was frequently seen for two years, as reported by Mr. T. H. Horrocks and other gentlemen. Ultimately it disappeared; no one knew exactly where, but suspicion fell upon a local poacher who brought a Roe into Carlisle about the time of its supposed decease. The resident Roes (which are believed to be aboriginal, with fresh importations a few years since) maintain their numbers steadily, but there is no marked increase. The leaves of brambles form an important part of their diet during the winter months. When visiting the haunts of the Roe in Cumberland on April 23rd, 1886, Mr. Duckworth witnessed a curious incident. On that day a Roe which had been reared as a pet by the keeper’s

children, but had disappeared for a period of eight or nine months, returned to her early home. The children gathered eagerly round their lost favourite, caressing her and hastening to decorate her slender neck with the insignia of a blue ribbon. The wilder mate, which had accompanied the truant part of the way, kept watch in a covert about two hundred yards distant, awaiting the return of his partner with evident concern.—H. A. MACPHERSON (Trans. Cumberl. and Westmorl. Assoc. Lit. and Sci., 1887, p. 44),

[The Roe was abundant in Cumberland during the reign of Charles I., when a number (31) were transported from the woods around Naworth Castle to the royal park at Wimbledon. An account of the transportation will be found in Harting's 'Essays on Sport and Natural History,' pp. 47, 48.—ED.]

The Grampus or Killer on the Coast of Norway.—I am indebted to Professor Flower for the inspection of a photograph of a Grampus, or Killer, *Orca gladiator* (Lacépède), which was captured on February 26th, 1885, at Bildöen, a small island about 15 English miles west of Bergen. Extraordinary to relate, no less than sixty-two of these animals were captured at the same time in this Fjord, and the photograph before me, representing one of the largest males, was taken on the spot immediately after capture by a photographer of Bergen. The precise dimensions have not been forwarded, but as the length of the animal in the photograph is about nine inches, one is easily enabled to judge of its proportions. On comparing it with the figure given at p. 445 of the second edition of Bell's 'British Quadrupeds, including the Cetacea' (which is probably the figure most accessible to the majority of our readers) it is seen to differ from it in many respects. In the first place, the white spot above the eye is very much larger in the Bergen specimen, extending from the eye backwards to an imaginary line drawn perpendicularly from the anterior insertion of the flipper, the breadth of this spot being about one-third of its length. In the second place, the specimen photographed has not the belly white throughout its entire length, as represented by Bell. It is only white "fore and aft," as a sailor would say, the intermediate portion being of the same colour as the back and sides—namely, slaty black, so far as can be judged. In the third place, the dorsal fin is not only more triangular and upright, but is much more solid than is depicted in Bell's figure, and without any indication, as there suggested, of what in a fish would be termed fin-rays; the same remark applying to the tail; and, fourthly, as regards the position of the flippers, which are oval anteriorly and pointed posteriorly, they appear from the photograph to be directed backwards rather than downwards, as represented by Bell, although doubtless they are capable of a certain freedom of movement. The "saddle-mark" of a grey colour, to which Bell makes allusion as being "sometimes" present, is seen in the photograph to be situated immediately behind the dorsal fin. So far as

I am aware, there is no previous record of anything like so many as sixty-two examples of this cetacean being captured at one time.—J. E. HARTING.

BIRDS.

Ornithological Notes from Hunstanton, Norfolk.—Adult Sanderlings appeared in considerable flocks on the shore at Hunstanton during the first week of August. On the 4th I saw four Cormorants, and the same day had a good view of a Seal, which had been basking on a sand-bank off Holme Point. On August 25th I met with a flock of Curlew Sandpipers, and obtained two specimens, one a fine mature bird in almost full summer plumage, and also saw four or five Little Stints, one of which I shot. I have never met with either species here before. On the 27th I got another Curlew Sandpiper, an immature bird, from a flock of Ring Plovers feeding on the shore near the old Hunstanton life-boat house. Curlews, Whimbrels, and Oystercatchers have been passing along shore daily to and from their feeding grounds with the rise and fall of the tide. Arctic, Common, and Lesser Terns have been very abundant, the two latter species especially so, congregating in large flocks on the beach and on the sand-banks. I am glad to say that I think very few have been shot. Many of the readers of 'The Zoologist' have no doubt read with much regret of the wholesale slaughter of Kittiwakes and other sea-birds during the last few weeks at their breeding stations, especially at Flamborough Head, and it might be worth the consideration of ornithologists whether some united effort could not be made for the extension of the close-time for sea-birds till August 20th or Sept. 1st.—JULIAN G. TUCK (St. Mary's, Bucknall, Stoke-on-Trent).

[From the accounts which have lately reached us of the wanton destruction of sea-birds before they are strong on the wing at Bridlington and Flamborough, we should rejoice to see the close-time extended as proposed to Sept. 1st.—ED.]

The Nightingale in Scotland.—A writer in 'The Scotsman' of Sept. 19th last, after citing the correspondence between David Earl of Buchan and the Hon. Daines Barrington, a century ago, relative to a proposed attempt to introduce the Nightingale into Scotland, recapitulates the methods suggested by Lord Buchan for the benefit of any enterprising naturalist who may feel inclined to repeat the experiment, namely, "(1) to procure from England several pairs of Nightingales trapped in the beginning of April, before they build; (2) to procure eggs and place them in the nests of the genus *Motacilla*; and (3) to bring down a number of nestlings, with hen Sky Larks for nurse, and cage Nightingales in full song for instructors." On May 16th, 1795, Mr. Thomas Milne, Curator of the Botanical Gardens at Oxford, succeeded in obtaining five Nightingale's eggs, which he instantly dispatched to Lord Buchan by the 'Royal Charlotte.' They reached him on the 19th. By the 21st he had discovered, after much search, a Hedge-sparrow's nest, where her first egg had been laid about two hours before;

he placed a Nightingale's egg there "tinted with chalk-powder," and withdrew the Sparrow's. This process he repeated till three of the eggs were disposed of. This nest unfortunately was soon afterwards robbed. "The same evening," writes the Earl, "I gave the remaining pair of eggs to John Burton, gardener to Mrs. Scott, of Harden, at Mertoun, to place in a nest suitable to the purpose, which he had discovered in a place where he could watch, and protect it from plunder, being on the roof of the hot-house there, adjoining his own house. This disposition of the remaining eggs was intended not only to give a better chance of success in the experiment, but to pay a compliment to my friend Lady Diana Scott, who had gone to the bird men in London, in the year 1787, to bespeak nestlings for me, when I thought of rearing them with hen Lark nurses, from which plan I desisted." On the 16th June the Earl's agent wrote to him from Kelso, in great excitement, that Burton had been successful; that two Nightingales had actually been hatched there on the 10th inst.; that the practicability of the thing had been ascertained. Burton was "fixed in his opinion as to the birds being Nightingales, and that they left the nest at the proper time," and were different from the Chaffinch. Fame and immortality were now spoken of, and compliments heaped upon Lord Buchan, to whom was accorded the merit of having been the first who "either thought of, or had the spirit to try the experiment;" and it was prophesied—"Your fame in Scotland will oft be celebrated in the Nightingale's song." A notice was prepared for the local paper that "A pair of Nightingale's eggs were deposit in a Straw-finch's nest on the 24th May, and actually hatched on the 10th inst." But when the first burst of excitement had subsided doubts arose. It was seen that from the date when the eggs were "deposit" to the 10th June was a very short time for incubation. Therefore a messenger was sent to Mertoun to question John Burton more particularly. It was found that he was "not clear in the matter." This was the report. "Originally there had been five eggs in the nest, and he only withdrew two, substituting the two Nightingale ones, and of these five only two were hatched, the other three were broken by the bird. So that Burton could not say whether the two were the produce of the Nightingale eggs or not. Further questioned, Burton could not say the birds flew or had been taken by any beast. The nest was undisturbed. Nor could he say much as to the colour of the birds." Therefore it was thought only prudent to defer for the present the newspaper notice lest they should be laughed at for announcing, as it is somewhat quaintly phrased, "the accouchment of two Chaffinches in place of Nightingales." Thus ends the record of an experiment which did no justice to the careful preparation that preceded it.

The Tufted Duck on the Solway.—My friend Mr. R. Service is a little at a loss to reconcile the statements of Mr. Armistead and myself as to the abundance or scarcity of the Tufted Duck on the Solway. Allow

me to point out that we are really entirely of one mind on the subject. In the district westward of Silloth, with which Mr. Armistead dealt, the Tufted Duck is a scarce bird; but in the neighbourhood of the upper Solway—that is, from Silloth to Gretna—the Tufted Duck is fairly plentiful, and can be found at all times (save in the breeding season) on one particular loch. When our volume on the ‘Birds of Cumberland’ was being written I enquired of the Heysham family for any existing MSS. of the late Mr. T. C. Heysham, of Carlisle. No such papers could be found, and I was obliged to fall back on the information which Mr. Heysham included in a few articles published in ‘*Loudon’s Magazine*,’ and—a little earlier—in the pages of the ‘*Philosophical Magazine*.’ A few weeks since I made fresh application to the representatives of Mr. Heysham, and this time with success. Mr. Heysham Mounsey, of Castletown, is still unable to find any of his late relative’s memoranda; but Mr. Mounsey, of Carlisle, has most kindly made a diligent search in the family archives, and though the greater part of Mr. Heysham’s writings were committed to the flames by his executors, yet we have left much of his correspondence with Mr. Yarrell, Mr. Gurney, Mr. Hancock, Mr. Gould, Mr. Proctor, and Mr. Doubleday. We have also letters from many local correspondents, and fuller data as to the rarer birds obtained in Mr. Heysham’s time than I ever hoped for. The notes which refer to the nesting of the Dotterel would furnish materials for an excellent article. I have alluded to these circumstances because I think they will interest many, but I only wish to notice one point. In the ‘*Birds of Cumberland*’ (p. 106) we chronicled the fact that a Tufted drake was shot on the Solway a few summers ago in the middle of July. Mr. Heysham proves to have anticipated us, with a note of a Tufted drake shot on the Solway on July 15th, 1838, or some thirty years earlier. I will only add that when male ducks are killed in England in the middle of July the natural inference would be that they have bred in the vicinity.—

H. A. MACPHERSON.

Roller and other Birds in the Isle of Wight.—While walking along the old channel of the Yare, which runs through what was once the upper part of Brading Harbour, Isle of Wight, on July 25th last, I came upon an old black-breasted Dunlin, accompanied by four young birds in first plumage; they were extremely tame, and by crawling through the rough grass and thistles I was able to get within ten paces of them. It seems improbable that these were bred on the moors of Cornwall, as the tendency of such would, I suppose, be to move westward and then south in autumn rather than to the east, as they must have done had they been of Cornish origin, and although it is stated in “*Yarrell*” that the Dunlin is not known to breed in Dorsetshire nor along the south coast, I cannot help thinking that this brood may have been reared in the marshes of Dorset, or more probably Sussex. It would be an unusually early date for migrants from

the northern counties. On the mud-banks were also several Common Sandpipers and one Ringed Plover, but the former birds also migrate south very early, and often appear in Oxfordshire about that time; the latter, I was informed, bred in the vicinity. A Roller, which was shot in the island in the summer of 1886, was shown to me as an unknown bird; and I also examined a Rose-coloured Pastor killed some twenty-five years ago. I was glad to hear that the Peregrine still bred regularly on one of the cliffs on the east side of the island; the nest had, I believe, been robbed this year, and I saw nothing of the birds, the only species noticed about the cliffs being some breeding Herring Gulls and Shags, and a Kestrel. The Herring Gulls on the wing (above eighty) were all adult, with one exception—*viz.* a very brown young one following the old birds, which could not fly well. A little way further along the coast I saw two immature Great Black-backed Gulls on the wing, but these of course were not bred there.—OLIVER V. APLIN (Bloxham, near Banbury).

Disparity in Size and Colour of Eggs of the same Species.—In support of the Editor's suggestion (p. 349), I can cite an instance in which an abnormally small egg was certainly not the last laid. Some years ago I found a Hedgesparrow's nest which as yet contained only two eggs, one of them not larger than a Wren's, the other—as well as the rest laid afterwards—being of the normal size. There is little doubt that in this instance the small egg was the first of the clutch. On May 10th last I took four Chaffinch's eggs exactly like Bullfinch's eggs of the ordinary type—light blue with a circle of purplish spots on the large end. But that I saw the nest and the parent birds, I would not have had the slightest suspicion that the eggs were not those of a Bullfinch.—ALLAN ELLISON (Shillelagh, Co. Wicklow).

Lesser and Black Terns near Gloucester.—On September 12th a specimen of the Lesser Tern, *Sterna minuta*, was shot on the Gloucester and Berkeley Canal, about four miles from Gloucester, the first recorded in this county, although I believe the species has been seen or shot before. Another Black Tern was also shot on the Severn, near Gloucester during the last week in August.—H. W. MARSDEN (37, Midland Road, Gloucester).

White-winged Tern in Cornwall and Scilly.—Allusion has been made to the difficulty of distinguishing between the young of the Black Tern, *Sterna fassipes*, and the White-winged Tern, *S. leucoptera*. Among several of the former, at Mr. W. H. Vingoe's at Penzance, I saw one which presented characters which led me to think it could not be of that species, and I am glad to say that on being submitted to Mr. Howard Saunders he decided it to be a White-winged Tern. It was shot at Sennen, in Cornwall. When Mr. Harting edited the late Mr. Rodd's work on the 'Birds of Cornwall,' the White-winged Tern had not been identified as a

Cornish bird; but it has since occurred both in Cornwall and Scilly. On May 14th, 1882, an adult bird of this species was shot on the Long Pool at Tresco, and is now in Mr. Dorrien Smith's collection at the Abbey, where it is shown with the rest of his collection to visitors on application.—J. H. GURNEY, JUN. (Keswick Hall, Norwich).

Esquimaux Curlew at Scilly.—By the kindness of Mr. Dorrien Smith I have inspected a specimen of the Esquimaux Curlew, *Numenius borealis*, obtained by him at Tresco, Scilly, on September 10th. It was an adult in full plumage, and there is no doubt about the identity of the species; but on comparing the description given of it by Wilson and Yarrell with that of other authors within reach, and with the bird itself, we find a discrepancy in the length of the tarsus. We cannot make it more than one inch six lines. Wilson and Yarrell (apparently following Wilson) make it one inch ten lines. The specimen much resembles in shape a small Whimbrel, with one of which birds it was in company when taken; but its plumage, especially that of the under side of the body and wings, differs much from that of the Whimbrel, as does also the bill, both in shape and comparative length.—THOMAS CORNISH (Penzance).

Manx Shearwater in Gloucester.—On Sept. 8th a Manx Shearwater, *Puffinus anglorum*, was picked up in a field at Hempstead, about a mile below Gloucester on the Gloucester and Berkeley Canal. The thigh-bone was broken, and the man who found it brought it to Gloucester and turned it into the docks "for a swim." It was afterwards killed, and came into my possession, in the flesh, two days later, through the hands of Mr. Coles, birdstuffer, of this town. On dissection it proved to be a female, and is, I believe, the first recorded to have been procured in this county.—H. W. MARSDEN (37, Midland Road, Gloucester).

Cormorants roosting on a Church.—A few weeks ago four or five Cormorants (*Phalacrocorax carbo*) came nightly to roost on the tower of Holy Trinity Church in this town, and probably would have continued to do so for some time had not some over-curious people ascended the tower one evening after they had alighted, thinking to get a nearer view of them. At the first sound of approaching footsteps the birds of course immediately decamped, and have not since returned. After this they took up their quarters for some time in an overhanging tree about a mile further up the river (Taw). The tower referred to is situated near the river, entirely surrounded by houses, but is unusually high. Is it not an unusual occurrence for these birds to select such a roosting-place? This town is situated about five or six miles from the sea.—J. G. HAMLING (The Close, Barnstaple).

[We have occasionally heard of Cormorants roosting upon the towers of churches, which they apparently consider the best substitute for sea-cliffs to be found inland.—ED.]

The Folk-Lore of Ceylon Birds.—A correspondent of the 'Ceylon Observer' of Colombo, referring to the interest excited by Mr. Swainson's book on "The Folk-Lore and Provincial Names of British Birds," notes some points in the folk-lore of the birds of Ceylon, obtained largely in conversation with natives. The Devil-bird (*Syrnium indrani*) stands *facile princeps* for his evil reputation; his cry heard in the neighbourhood of villages is a sure harbinger of death, and the superstitious natives are thrown into great consternation by its demoniac screech. The legend about the bird is as follows:—A jealous and morose husband, doubting the fidelity of his wife, killed her infant son during her absence and had it cooked, and on her return set it before her. She unwittingly partook of it, but soon discovered that it was the body of her child by a finger which she found in the dish. In a frenzy she fled to the forest, and was transformed into a *ulania*, or Devil-bird, whose appalling screams represent the agonised cries of the bereaved mother when she left her husband's house. The hooting of Owls in the neighbourhood of houses is believed to bring misfortune on the inmates. The Magpie-robin, though one of the finest of the song-birds of Ceylon, is similarly tabooed; it has a harsh grating screech towards evening, which is considered ominous. The quack of the Pond-heron flying over a house is a sign of the death of one of the inmates, or of a death in the neighbourhood. If the Green Pigeon (*Nila kobocya*) should happen to fly through a house, as it frequently does on account of its rapid and headlong flight, a calamity is impending over that house. Similarly with the Crow. But Sparrows are believed to bring luck, and are encouraged to build in the neighbourhood of houses, and are daily fed. The fly-catcher Bird of Paradise is called "cotton thief," because in ancient times it was a freebooter, and plundered the cloth merchants. As a penalty for its sins it was transformed into a bird and doomed to carry a white cotton attached to its tail. The Red-wattle Lapwing, the alarm bird of sportsmen, has the following legend connected with it:—It is said to represent a woman who committed suicide on finding herself robbed of all her money, amounting to thirty silver pieces, by her son-in-law. The cry of the bird is likened to her lament: "Give the silver, give the silver, my thirty pieces of silver." Its call is heard at all hours, and the stillness of night is broken with startling abruptness by its shrill cry. Another story about it is that when lying in its nest in a paddy-field, or a dry spot in a marsh, it lies on its back with its legs in the air, being in continual fear that the heavens will fall and crush its offspring. The story current about the Blue-black Swallow-tailed Flycatcher (*Kawudu panikkia*) and its mortal enemy, the Crow, is that the former, like Prometheus of old, brought down fire from heaven for the benefit of man. The Crow, jealous of the honour, dipped its wings in the water and shook the drippings over the flame, quenching it. Since that time there has been deadly enmity between the

birds. The Indian Ground Thrush (*Pitta coronata*) is said to have once possessed the Peacock's plumes, but one day, when bathing, the Peacock stole its dress; ever since the *Pitta* has gone about the jungle crying out for its lost garments. According to another legend, the bird was formerly a prince who was deeply in love with a beautiful princess. His father sent him to travel for some years, and on his return the princess was dead. He still wanders disconsolately about calling her name. It is also said that the Peacock, being a bird of sober plumage, borrowed the brilliant coat of *Pitta* to attend a wedding, and did not return it. The disconsolate *Pitta* wanders through the jungle calling on the Peacock to restore its dress—hence the cry, *ayittam, ayittam* (my dress, my dress). The cry of the Hornbill (*Kandetta*) is inauspicious and a sure sign of drought. The bird is doomed to suffer intolerable thirst; not being able to drink from any stream or rill, it has the power only to catch the rain-drops in its bill to quench its thirst, and keeps continually crying for rain.

The Misdeeds of the House Sparrow.—Mr. J. H. Gurney, jun., has recently issued a pamphlet with this title (to be obtained from Messrs. Gurney and Jackson, 1, Paternoster Row), which is intended as a reply to one with a somewhat similar title by the Rev. F. O. Morris, and combats the opinion that Sparrows do more good than harm by reason of the great number of injurious insects which they destroy in summer. According to Mr. Gurney "recent investigations have conclusively shown that the Sparrow does not destroy nearly so much insect-life as was supposed." He adds that "Old Sparrows as a rule do not eat insects. The larvæ which form the customary food of young Sparrows are for the most part species which prey on shrubs and plants, but not on corn, such as *Teras contaminana*, *Triphæna pronuba*, and *Pontia brassicæ*." He asks for evidence of their eating the wireworm, or the larvæ of the gamma moth, or crane-fly (daddy-longlegs). "They eat the rose-aphis, but no one has detected them eating the wheat-aphis (*A. granaria*), which is much more to the point, though at least one competent observer has made diligent search for it."

Osprey in Hertfordshire.—On Sept. 17th, as a party of gentlemen were shooting in the parish of Great Gaddesden, near Hemel Hempstead, a large bird which rose from near the River Gade and flew within gunshot, was winged by Mr. George Meacher, of St. Margaret's. It was only slightly injured, and, as the party formed a circle round it, it exhibited its hooked beak and talons with such effect that no one felt inclined to touch it. At last a farm-labourer seized it, and it was brought for identification to Hunton Bridge, where it has remained until to-day (Sept. 23rd), and proves to be a male Osprey. It has been confined in a covered fowl-run and fed upon fish. It refused to eat anything dead, but directly a live Dace was placed in a trough within reach it quickly devoured it. Minnows proved

too insignificant to attract it, and were allowed to swim about in the trough unmolested, but for Chub, Perch, and Dace it evinces a decided predilection. Its method of feeding is peculiar: tearing the fish open, it devours the entrails, before proceeding to feast upon what one might reasonably suppose to be more attractive diet. It measures five feet two inches from tip to tip of wing, and is in capital plumage. It is recovering from the injury to its wing very rapidly, and I have but little doubt that, in the course of another week, it will again be able to fly. It appears that the Osprey occurs in England during September more frequently than in any other month. It visits us on its southward migration, and in a few exceptional instances has been known to remain during the winter. Since the above was written another Osprey is reported to have been shot, about Sept. 20th, near Wheathampstead by Mr. W. Thrale, and has been forwarded for preservation to Mr. Norman Thrale, of Port Vale, Hertford. The two birds were probably travelling companions on their way south for the winter.—JOHN E. LITTLEBOY (Hunton Bridge, near Watford).

Snow Bunting breeding in Confinement.—During a recent visit to the Elgin Museum, the Curator, Mr. John Gatherer, showed me a couple of eggs of the Snow Bunting, *Emberiza nivalis*, which had been laid in his own aviary. This aviary, an open-air one, contained several other small birds besides a pair of Snow Buntings, and on building materials being supplied during the past summer, the Snow Buntings very soon showed signs of nesting. They chiefly collected dry grass, of which the nest was almost entirely composed, and two eggs were laid. But the hen Snow Bunting was disturbed by a hen Greenfinch, which took possession of the nest, and at intervals occupied it; the result being that the eggs were never hatched, and were subsequently found to be addled. These eggs, although typical of the species in size and markings, are more richly coloured than the average specimens usually seen in collections. They have been presented by Mr. Gatherer to the Elgin Museum.—J. E. HARTING.

Swifts appropriating Martin's Nests.—I can record a case similar to that mentioned by Mr. Bond (p. 348). Two pairs of Swifts laid their eggs this year in Martins' nests under the eaves of the roof of the church of this parish. The eggs were brought to me by my keeper, who afterwards pointed out the nests to me. I made an examination of them, and found that a lining of hay had been introduced; otherwise the nests were unaltered. A new roof had been built during the winter, and the entrance to their usual nesting-place had probably been closed; hence possibly their selection of this curious site.—HUGH G. BARCLAY (Colney Hall, Norwich).

Wryneck nesting in holes in the Ground.—Mr. A. G. Butler's note (p. 299) on the Wryneck breeding in a hole in a brick-earth cutting confirms my record of the supposed nesting of this species in a Sand Martin's burrow

(Zool. 1885, p. 27), in which case, although the eggs were taken, the old bird was not identified.—OLIVER V. APLIN (Bloxham, near Banbury).

REPTILES.

Mode in which Vipers are killed by the Hedgehog.—As some of our readers have expressed themselves a little incredulous with regard to the statements made under this heading (p. 306), it may not be amiss to quote the following corroborative story, which is narrated by Broderip in the second volume of 'The Zoological Journal' (p. 19), his informant being no less an authority than the late Dean Buckland:—"It is not so well known, he says, that like the Peccaries these 'hedge-pigs' will devour Serpents. That they will do so appears from the following interesting communication, for which I am obliged to my friend the Rev. William Buckland, Professor of Zoology in the University of Oxford, and President of the Geological Society. Having occasion to suspect that Hedgehogs, occasionally at least, preyed on Snakes, the Professor obtained a Common Snake, *Coluber natrix*, and also a Hedgehog which had lived in an undomesticated state some time in the Botanic Garden at Oxford, where it was not likely to have seen Snakes, and put the animals into a box together. The Hedgehog was rolled up at their first meeting; but the Snake was in continual motion, creeping round the box as if in order to make its escape. Whether or not it recognised its enemy was not apparent; it did not dart from the Hedgehog, but kept creeping gently round the box; the Hedgehog remained rolled up, and did not appear to see the Snake. The Professor then laid the Hedgehog on the body of the Snake, with that part of the ball where the head and tail meet downwards, and touching it. The Snake proceeded to crawl,—the Hedgehog started, opened slightly, and, seeing what was under it, gave the Snake a sharp bite, and instantly rolled itself up again. It soon opened a second time, repeated the bite, then closed as if for defence; opened carefully a third time, and then inflicted a third bite, by which the back of the Snake was broken. This done, the Hedgehog stood by the Snake's side, and passed the whole body of the Snake successively through its jaws, cracking it, and breaking the bones at intervals of half an inch or more, by which operation the Snake was rendered entirely motionless. The Hedgehog then placed itself at the tip of the Snake's tail, and began to eat upwards, as one would eat a radish, without intermission, but slowly, till half the Snake was devoured, when the Hedgehog ceased from mere repletion. During the following night the anterior half of the Snake was also completely eaten up."—ED.

BATRACHIA.

Enemies of the Toad.—It is currently believed that the Common Toad, *Bufo calamita*, is so repulsive in appearance as to escape becoming

the prey of other animals. A short time since I was told by a friend that a wounded Corn Crane, *Crex pratensis*, recently caught by his dog, disgorged a very small Toad (apparently of this year's hatch); and that, on examining the bird's crop, he also found a Frog of much larger size. About a fortnight ago I noticed in a poultry yard a cock calling his hens to partake of some choice morsel held in his beak. This on examination also proved to be a small Toad with its head much crushed and battered by the cock's beak.—G. T. ROPE (Blaxhall, Suffolk).

FISHES.

Thresher Shark at Portland.—While staying at Weymouth, during the last week in August, a specimen of this fish, measuring about ten feet in length, was captured off the Chesil Bank, Isle of Portland.—W. HARCOURT BATH (Ladywood, Birmingham).

Ray's Bream at Scilly.—Ray's Bream has recently been obtained off the Scilly Islands, and I believe this to be its first recorded appearance there. It was taken in a Mullet- (Grey Mullet) seine, shot off Tresco, in the Islands of Scilly, and therefore in free water, swimming at large. I think this is the first recorded specimen captured in the open sea. Through the kindness of Mr. J. C. Tonkin, of St. Mary's, I received the specimen in a perfectly fresh condition.—THOMAS CORNISH (Penzance).

[Ray gave the first account of this fish, having obtained a description and figure of one left dead by the receding tide in Middlesburgh Marsh, at the mouth of the Tees, in September, 1681. The largest number of British examples, according to Dr. Day (Fishes of Gt. Brit. i. p. 116), have been taken in the north of England, Scotland, and Ireland. Cornish examples, however, have been recorded by Couch (Zool. 1846, p. 1406), Clogg (Zool. 1866, p. 349), and by Mr. Cornish himself (Zool. 1875, 4542).—ED.]

 SCIENTIFIC SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

September 7, 1887.—Dr. SHARP, President, in the chair.

Mr. Arthur Sidgwick, M.A., Fellow of Corpus Christi College, Oxford, of Woodstock Road, Oxford, was elected a Fellow of the Society.

Mr. Jenner Weir exhibited a living larva of *Myrmeleon europæus*, which he had taken at Fontainebleau on the 6th August last.

Mr. Elisha exhibited a series of bred specimens of both sexes of *Zelleria hepariella*, Stn.; and also, on behalf of Mr. C. S. Gregson, a series of eighty varieties of *Abraaxas grossulariata*, selected from the specimens bred during the year 1886 from 4000 larvæ obtained from eggs laid by selected varieties, the result of crossing and interbreeding for more than twenty years.

Mr. Stainton remarked that the female of *Zelleria hepariella* had until lately been considered a distinct species, and was known as *Zelleria insignipennella*, but directly Mr. Elisha began breeding the insect its identity with *Z. hepariella* was established.

Mr. Tutt exhibited specimens of *Crambus alpinellus*, *C. contaminellus*, *Lita semidecandriella*, *L. marmorea* (dark forms), and *L. blandulella* (a new species), *Doryphora palustrella*, and *Depressaria Yeatiana*, all collected at Deal during last July and August.

Mr. Stainton observed that *Crambus alpinellus* was so named from the earliest captures of the species having been made on the lower parts of the Alps, but that it had since been found on the low sandy ground of North Germany, and its capture at Deal quite agreed with what was now known of the distribution of the species in Germany. It was first recorded as a British species by Dr. Knaggs in 1871, from two specimens taken at Southsea by Mr. Moncreaff. Mr. Stainton further observed that he had named Mr. Tutt's new species "*blandulella*" from its similarity to a small *maculea*, of which one of the best known synonyms was *blandella*. He also remarked that Deal was a new locality for *Doryphora palustrella*, which had hitherto only been recorded from Wicken Fen and the Norfolk Fens in England, and from the neighbourhood of Stettin on the Continent.

Mr. Waterhouse exhibited, on behalf of Mr. Coote, a variety of *Lycæna phlæas*; also a number of *Stenobothrus rufipes*, and three specimens of *Coccinella labilis*, recently taken by himself at Herne Bay.

Mr. Martin Jacoby exhibited specimens of *Spilopyra sumptuosa*, Baly, and *Sybriacus magnificus*, Baly. He also exhibited several species of *Galerucidæ*, belonging to a genus which he proposed to call *Neobrotica*, closely resembling in shape and coloration certain species of *Diabrotica*, but differing therefrom in structural characters. He remarked that the late Baron Von Harold had described a *Galeruca* from Africa, which, except in generic characters, exactly resembled the South American genus *Dircema*.

Dr. Sharp communicated a paper, by Mr. Thomas L. Casey, "On a new genus of African *Pselaphidæ*."

Mr. Bridgman communicated a paper entitled "Further Additions to the Rev. T. A. Marshall's Catalogue of British *Ichneumonidæ*."

Mr. Distant read a paper entitled "Contributions to a Knowledge of Oriental *Rhynchota*."

Mr. Enock read notes "On the Parasites of the Hessian Fly," and exhibited specimens of injured barley. A discussion ensued, in which Dr. Sharp, Mr. Jacoby, Mr. Billups, Mr. Waterhouse, and others took part.—H. Goss, *Hon. Secretary*.

NOTICES OF NEW BOOKS.

Ocean Birds. By J. F. GREEN. With a Preface by A. G. GUILLEMARD, and a Treatise on skinning Birds by F. H. GUILLEMARD, M.D. 4to, 120 pp.; 6 Coloured Plates. London: R. H. Porter. 1887.

A good work on 'Ocean Birds' is a *desideratum*. A charming volume might be written on the species to be observed in a voyage round the world. Starting from New York a traveller could scarcely fail to see a few coast birds before the ship was out of sight of land—Gulls, Terns, or Skuas, and, if the breeding season was over, probably a few Gannets, Razorbills, Guillemots, or Cormorants. A brief account of the species which occur on these coasts, and a few hints respecting the peculiarities of each species, especially those that would enable the *voyageur* to recognise them on the wing, would be profoundly interesting. Once out at sea the species to be observed in the wide Atlantic would be perhaps not more than three or four in number. The most conspicuous of these would be the Fulmar, *Fulmarus glacialis*; the least conspicuous, Wilson's Petrel, *Oceanites wilsoni*; and the rarest—though, in reality, by no means rare—the Great Shearwater, *Puffinus major*. All these birds belong to the *Procellariidæ*, which are the only true Ocean Birds. On again sighting land it would be most interesting to learn how to recognise the channel coast-birds. Then, again, some information is still desirable concerning the peculiarities of the coast-birds of the Bay of Biscay. A chapter on the Petrels, Shearwaters, and Gulls of Madeira, the Canaries, and Cape Verd, might clear up many a difficulty. By some extraordinary oversight, the most conspicuous bird of this part of the ocean, the Yellow-legged or Mediterranean Herring Gull, *Larus cachinnans*, is not mentioned by Mr. Green. When the last individual of this species has been left behind, and the line has been crossed, flocks of Sooty Terns, *Sterna fuliginosa*, are almost sure to be observed for a couple of days. Then perhaps for a week very few birds are seen, except a solitary Storm Petrel, or a pair of Shearwaters now and then, until the Cape is neared, when sea-birds again become numerous. What are the little white birds that fly about in large flocks in these latitudes? The sailors call them "Whale-birds." Are they the

Blue Petrel (*Halobæna cærulea*) or the Broad-billed Prion (*Prion vittatus*)? These are questions the traveller is sure to ask, and to which Mr. Green's book supplies no answer. What is the species so common on the Southern Ocean from Cape Town to East London? Its plumage both above and below is sooty-brown, without a speck of white. The sailors call it the "Cape Hen."

A book on Ocean Birds ought to be written geographically. It is a mistake to arrange the species systematically. Mr. Green's volume would have been much more interesting and useful if he had simply told us what he has himself observed. He might have added as much as he thought necessary from published works, but the backbone of the book ought to have been extracted from his own diary.

The plates are artistic, and good examples of chromolithography, but would be of greater use to travellers had they been more strictly accurate.

Mr. Green has compiled some interesting notes on the Albatrosses, but the information given is at times somewhat confused. On page 4 he tells us that *The Albatross* is *Diomedea exulans*; and on page 7 he adds, "the great breeding-place of *the Albatross* is Tristan da Cunha." Then follows an account by Professor Moseley of the breeding of the Albatrosses on this island, which the reader naturally supposes to relate to *the Albatross*, until the final sentence of the quotation informs him that "the Great Albatross, *D. exulans*, also nests on Tristan da Cunha." Which species of Albatross then is *the Albatross* of Moseley? Mr. Green does not tell us; nor does he inform the reader where Moseley's notes are to be found. The fact is that Moseley, in his "Notes by a Naturalist on the 'Challenger,'" p. 129, describes the breeding of the Yellow-billed Albatross, *Diomedea chlororhynchus* (which he calls *D. culminata*), not on Tristan da Cunha, as stated by Mr. Green, but on Nightingale Island, twenty miles to the south-west. On page 6 some explanation ought to be given of which species is meant by "the Yellow-billed species (*D. melanophrys*)."

On page 23, Mr. Dresser is made to say that the Fork-tailed Petrel is only an Atlantic species. It is equally common in the Pacific, as the next sentence—which, however, is omitted by Mr. Green—states.

The plates, as we have said, are not satisfactory; the index to them is even less so. Plate III., fig. 6, appears to represent a Shearwater which is very common in the Southern Ocean. In the list of plates it is called the Black-eyebrowed Albatross. On page 4 we are told that this is the English name of *Diomedea melanophrys*, which is stated to be figured on Plate II., fig. 6. As there is no fig. 6 on Plate II., we may take it for granted that the II. is a misprint for III. This misprint is repeated on page 95, while the bird figured is certainly not the Black-browed Albatross.

The Petrels, like most birds which are able to swim, have remarkably "fluffy" plumage. All the feathers appear to be covered with fine down, so that they lie one over the other without absolutely touching. This arrangement gives to their plumage a softness—a tone (to use a familiar artistic term) which is exquisitely beautiful, and which is perhaps best expressed by the word velvety. A Storm Petrel is one of the most beautiful objects in nature. Every feather lies in its place; the gradation of light and shade is a study for an artist. The subtlety of these gradations is marvellous, the depth of tone unrivalled, the general effect almost sublime in its beauty, its delicacy, its perfect loveliness; and when the bird is alive, in the wonderful curve of its outline. But instead of a good figure we find on Plate IV. a wretched caricature: in his search for the picturesque, or rather the grotesque, the artist has libelled the poor Storm Petrel.

Report on the Migration of Birds in the Spring and Autumn of 1886. By a Committee of the British Association, consisting of Mr. JOHN CORDEAUX (Secretary), Professor NEWTON, Messrs. HARVIE BROWN, EAGLE CLARKE, R. M. BARRINGTON, and A. G. MORE. 8vo, pp. 174. Macfarlane & Erskine, 19, St. James Square, Edinburgh. 1887.

THIS is the Eighth Annual Report of the Committee appointed by the British Association for the purpose of obtaining observations on the migration of birds at lighthouses and light-vessels, and reporting the same. It includes observations from 126 stations out of a total of 198 supplied with schedules, letters of instruction, and cloth-lined envelopes for wings. In the previous Report

attention was particularly directed to the main lines of migration by which birds approach the east coast of Scotland both in spring and autumn. The two chief lines indicated are by the Pentland Firth and Pentland Skerries, also by the entrance of the Firth of Forth as far north as the Bell Rock Lighthouse. On the east coast of England the stream of migration is not continuous over the whole coast line, but the same direction is persistently followed year by year. There is a well-marked line, both of entry and return, to the Farne Islands, on the coast of Northumberland. Second to this in importance is the mouth of the Tees, both in the spring and autumn.

The North Yorkshire coast and the elevated moorland district from the south of Redcar to Flamborough, including the north side of the headland, is comparatively barren, few birds appearing there. Bridlington Bay and Holderness to Spurn and Lincolnshire, as far as Gibraltar Point, on the coast of Lincolnshire, give, perhaps, the best returns on the east coast.

In Norfolk there are indications, in the returns sent from the Llynwells, Dudgeon, Leman Ower, and Happisburgh light-vessels, that a dense stream of birds pours along the coast from east to west, probably to pass inland by the estuary of the Wash and the river systems of the Nene and Welland into the centre of England, thence following the line of the Avon Valley and the north bank of the Severn and Bristol Channel, and crossing the Irish Sea to enter Ireland at the Tuskar Rock, off the Wexford coast. This is apparently the main thoroughfare for birds in transit across England to Ireland in the autumn. Large numbers of migrants also which pass inland from the coasts of Holderness and Lincolnshire eventually join in with this great western highway by the line of the Trent, avoiding altogether the mountainous districts of Wales. The coast of Essex, with the northern side of the Thames is fairly good; but the coast of Kent, between the North and South Forelands, including the four Goodwin and the Varne lightships, is an uninteresting district for arrivals, the chief migrants seen being such as are apparently following the coast to the south.

Autumn migrants approaching the Humber from the sea cross the river diagonally from E.S.E. to W.N.W. This course is so persistently followed that year by year, on such days when migra-

tion is visible, birds are observed to cross the same fields and at the same angle. Supposing this course to be continued, they would strike the Trent at or near Gainsborough.

Much information has been obtained from the legs and wings sent in the envelopes provided for that purpose; and by this means already several rare and unusual wanderers have been recorded, not the least interesting being the occurrence of a small Asiatic species, the Yellow-browed Warbler, at Sumburgh Head, Shetland, on September 25th, and an immature example of the American Red-winged Starling, at 3 a.m. on October 27th, at the Nash Lighthouse, Bristol Channel. This station lies directly in the track followed by migrants from England to Ireland. The Black Redstart was killed at the Nash Lighthouse on the night of October 29th; and another interesting occurrence was that of the Green Woodpecker, seen on October 26th, with many other birds, at sunrise, passing to the S.E. The Black Redstart was also received from the Fastnet, Co. Cork, found dead on October 30th. It is also recorded at four other stations on the south coast of Ireland, where its regular occurrence in the winter on the south and east coasts has now been fully established by this inquiry.

From the Irish coasts the rarities received were numerous, including the second Irish specimen of the Wryneck from Arran Island, Co. Galway, killed striking 2 a.m. on October 6th. From Tearaght, Co. Kerry, a Pied Flycatcher was caught at the lantern, September 21st, the species only having once before occurred in Ireland—in April, 1875. The repeated occurrence of the Corn Crake, several miles from shore—killed striking against lanterns between 100 and 200 feet above sea-level—must satisfy the sceptical that this well-known species can fly at a high level with great power and velocity. The Water Rail, which seems so unwilling to fly, was received from the Fastnet and Tuskar on October 26th and 28th; also from Spurn light-vessel, Nov. 1st, one; Llyn Wells light-vessel, Nov. 4th, two; and Coquet Island lighthouse, same date, one; showing a widely-extended migratory movement of this species during the last week in October and early in November.

The Great Spotted Woodpecker occurred in considerable numbers in the eastern counties of Scotland about the middle of October. Almost all the specimens examined were either old

birds or with very slight traces of immaturity. This immigration extended southward to the coast districts of Lincolnshire, where considerable numbers were obtained in the autumn and winter.

At Rathlin O'Birne (West Donegal) immense flocks of birds—Starlings, Thrushes, and Fieldfares—passed *west* from Dec. 18th to 23rd. The nearest land to the west of this rocky island is America. This is not an isolated occurrence. The westerly flight of land-birds at stations off the west coast of Ireland has been noticed on other occasions; the movement is apparently as reckless as that of the Lemmings.

The autumnal passage of Quails from England is shown by their occurrence at the Smalls Lighthouse, Sept. 3rd, and the Eddystone on October 5th; also a wing from the Shipwash light-vessel, off the Essex coast, obtained on October 26th.

An enormous rush of immigrants is recorded from the east coast of England on October 4th, 5th and 6th, with easterly and south-easterly winds. On the west coast of Scotland, during the same period, at the majority of stations the rush of birds was enormous; but the movement was much less accentuated on the west coast of England, and to a less degree still on the Irish coasts.

As usual, on the east coast of England, Rooks, Daws, Hooded Crows, Starlings, and Larks occupy a considerable portion of the schedules. Chaffinches cross the North Sea in extraordinary numbers; they are always numerous, but last autumn the immigration was in considerable excess of previous years. With these exceptions, however, there was a marked falling off in the migration of some species whose breeding range lies chiefly in the north of Europe—Fieldfares, Redwings, Ring Ouzels, Bramblings, Snow Buntings, Short-eared Owls, and Woodcocks.

Eight Reports having now been issued, it seems highly desirable that an attempt should be made to analyse, classify, and digest the large mass of facts brought together in these Reports, so as to show the actual results which have been arrived at by the inquiry.



THE ZOOLOGIST.

THIRD SERIES.

VOL. XI.] . NOVEMBER, 1887. [No. 131.

ON THE PRESENT CONDITION OF THE EXISTING HERDS OF BRITISH WILD WHITE CATTLE.*

THIS Report does not include extinct herds, but as one herd—that in Lyme Park—has only very recently ceased to exist, and as this is the first account of the Wild Cattle published since that catastrophe, it has been thought well to include a short notice of that ancient stock.

The following list includes all the herds now remaining in the British Isles, arranged according to the probable order in time of their arrival at their present abode. In the detailed account of the different herds further on, they are arranged to some extent geographically, from north to south.

Chartley Park, near Uttoxeter, Staffordshire (Earl Ferrers), appears to have been enclosed by the middle of the thirteenth century.

Chillingham Park, near Belford, Northumberland (Earl of Tankerville), seems to have been enclosed before the latter part of the same century, and possibly before 1220.†

* Report of the Committee, consisting of Mr. E. Bidwell, Prof. Boyd Dawkins, Prof. Bridge, Mr. A. H. Cocks, Mr. E. de Hamel, Mr. J. E. Harting, Prof. Milnes Marshall, Dr. Muirhead, Dr. Selater, Canon Tristram, and Mr. W. R. Hughes (Secretary), appointed by the British Association for the purpose of preparing a Report on the Herds of Wild White Cattle at present existing in Great Britain. Read at Manchester, Sept. 1887.

† For these dates see the authorities quoted by Harting, 'Extinct British Animals,' pp. 230—232.

Lyme Park, near Disley, Cheshire (Mr. W. J. Legh), at the latter part of the fourteenth century.

Cadzow Park, Hamilton, Lanarkshire (Duke of Hamilton). Date of enclosure unknown, but the present park occupies a portion of the old Caledonian Forest, in which Robert Bruce is traditionally stated to have hunted the Wild Bull in 1320, and where in 1500 James IV. of Scotland took part in the same wild sport.

The above are probably the only herds remaining on the ground on which they were originally enclosed.

Somerford Park, near Congleton, Cheshire (Sir Charles W. Shakerley, Bart.). The cattle cannot be traced here more than about 200 years, though it is possible they have been here since the original enclosure of the park; it is perhaps more likely that they were brought in the seventeenth century from Middleton Park, Lancashire, from a herd which in turn is supposed to have come from Whalley Abbey.

The Middleton herd is now represented by offshoots (to some extent cross-bred, however, and now, like the Somerford herd, domesticated) at Blickling, near Aylsham, Norfolk (Marchioness of Lothian), and at Woodbastwick Hall, near Norwich (Mr. A. Cator). The cattle were removed from Middleton about 1765 to Gunton Park, Norwich (Lord Suffield), where they became extinct in 1853; but some had meanwhile—*viz.* between 1793 and 1810*—been introduced to Blickling, and others in 1840 were sold to Mr. Cator, of Woodbastwick.

The herd at Vaynol, near Carnarvon (Mr. G. W. Duff-Assheton-Smith), was started in 1872 from stock purchased from Sir John Powlett Orde, of Kilmory House, Argyllshire. This stock (see pp. 411, 412) was originally at Blair Athol, Perthshire. In 1834 the herd was sold to the Marquis of Breadalbane, Taymouth, and to the Duke of Buccleuch, Dalkeith. When the latter herd was broken up, the late Sir John Orde purchased the only survivor and transported it to Argyllshire. In 1886 the entire remainder of the Kilmory herd was transferred to Vaynol, and incorporated with those already there.

At Hamilton, Chartley, and Somerford, persons who have known the herds for a number of years have expressed the opinion

* Storer, 'Wild White Cattle,' p. 307.

that the cattle have somewhat deteriorated in size within their recollection; but there is nothing to prove this, and it must be remembered that by degrees things appear smaller than the recollection of the first impression received as children.

At Chillingham, Chartley, and Hamilton, the heads seem slightly larger in proportion to their bodies than in ordinary cattle, the feet larger and broader, and the legs stouter. May not these be taken as indications of a certain amount of deterioration in their size? At Chillingham the cattle have a "fine-drawn" almost "washed-out" appearance, which may be considered as the result of close breeding, and the fact of more male than female calves being born is probably the effect of the same cause. It is interesting to note that in the semi- or wholly-domesticated herds at Vaynol, Somerford, and Woodbastwick, the calves are extremely shy when first born, and only become accustomed to human beings by degrees.

If it is not beyond our province to make a suggestion, it would be extremely interesting if the noble owners of the three ancient herds would co-operate with some other owner of a large park—if haply such could be found—willing to undertake the following experiment:—Namely, that all calves which would ordinarily be converted into veal or steers should instead be sent to build up a new herd, which, combining the blood of the only remaining ancient herds, and with no artificial selection exercised, might be expected to revert more nearly to the aboriginal wild type than could be achieved in any other manner.

HAMILTON (CADZOW).—On August 22nd last this herd was made up as follows:—Bulls: 2, six years old; 1, five years old; 2, three years old; 6, two years old; five calves; total, 16 bulls. Females: 25 cows, four years old and upwards; 10 heifers, two years old; 9 yearlings and calves; total, 44 females. Total, 60 head (against 54 at the beginning of the year). The coloration and markings are tolerably uniform, though ten years ago, at any rate, there was a variety in the amount of black on the outside of the ears, and in a slight degree in the amount on the muzzle. Any that are defective in their points are slaughtered or made into steers; there are none of the latter at the present moment in the park, but two were shot last October, and some of the young bulls will be operated on in the fall. There is a good deal of black on the fore legs in this herd, the hoofs are black, also tips

of horns, roof of mouth, and circle round eyes; black calves are frequently born—ten years ago the average was about three annually. Three years ago a bull, which was considered as a Highland bull, arrived from Kilmory; it was marked precisely like the Hamilton cattle, but one of its progeny was white all over, and another was black, so the bull and all its stock were killed. The new blood was introduced in consequence of an idea prevailing that the breed was deteriorating from too close breeding. Last year (1886) a bull was procured from Chillingham, and perhaps greater interest attaches to the result of this admixture of blood than any other event in connection with the white herds of recent years. The first two calves were born in March last, and three others somewhat later. Four of these were males, and only one a female. Three of the bull calves took after their sire in having brown ears, and have been destroyed. The remaining bull calf is described as beautifully marked, with black points after the Hamilton pattern. The heifer calf has her ears slightly tipped with a few brown hairs, but the keeper thinks she may throw well-marked calves by a Cadzow bull. There is no certain evidence of new blood having previously been introduced into this herd, however unlikely it is (as shown by Storer) that a small number of cattle could have been continually bred only *inter se* for centuries, and the herd still exist. But Sir John Orde was told that one, if not two, Highland bulls bred in the herd some years ago. With regard to what has been recorded as to this herd being formerly polled, the following appears to be fresh evidence:—Joseph Dunbar, a labourer who has been in the ducal service for about fifty years, says that forty-five years ago (say, 1842) the cattle were all hornless, and the present Duke's grandfather caused all showing the least appearance of being horned to be killed. The calves are all born here in spring and early summer; to insure this the bulls are kept in a run apart from the cows during the greater part of the year. At the present time the Chillingham bull is in a third enclosure with seven cows (in March the Chillingham bull was by himself, and the ten calves then in existence, in a fourth enclosure). When the grass is scanty, hay and turnips are given, and the cows in addition get a little cotton-seed cake. The keeper (Scott), who has known them for upwards of twenty years, says they are much less wild and dangerous now than formerly, in consequence of being visited by so many people of late years.

CHILLINGHAM. — In October last this herd numbered sixty animals, which has been the average number for the last twenty-three years, though Lord Tankerville wishes to raise the number to 70, which would suffice for the extent of the park. During the period named, 113 male calves and 105 females have been dropped, averaging over nine a year. The deaths have averaged about ten annually. The causes of death, besides the shooting of oxen and an occasional aged or sickly bull or cow, include old age, drowning, injuries received in fighting, rupture, cancer, fall, and other injuries; poverty and want of food; and, in calves, the failure of the dams' milk. The cattle live on good terms with the Red-deer, but will not tolerate the Fallow-deer or sheep in the park, possibly because they eat the pasture too close. They never will touch turnips. During the last few winters ensilage has been given them along with the hay, but for a long time none of them would eat it. They sniffed at it and turned away, and it remained untouched, even when all the hay had been eaten. At length a young bull was seen to try the ensilage; he went back to the herd, and they returned to the ensilage with him. Since then it has always been finished before the hay is attacked. It is not thought prudent to give too much ensilage, as it appears to stimulate the milk in the cows too much for a time, and it afterwards fails. One difficulty in increasing the herd is that the cows continue to suckle their calf even after a second calf is born, and the latter is consequently left to starve. The calves dropped in winter suffer from want of milk. The herd is subject to sudden panics, owing to strangers frightening them purposely to see them run, and several calves have been trodden to death in these stampedes. Drowning in the marshes has been a frequent cause of death in wet winters and during thaws. It is denied that any calves are now coloured otherwise than the correct white, with black extending very slightly beyond the naked part of the nose, and red ears; though in Bewick's time (towards the end of the last century) there were some with black ears, and from the steward's book in 1692 it appears there were not only several animals with black ears, but some entirely black and one brown.*

* Storer, 'Wild White Cattle,' p. 154; and Harting, 'Extinct British Animals,' p. 234. Bewick, 'Quadrupeds,' 1824, p. 39, in a foot-note, says:— "About twenty years since there were a few at Chillingham with BLACK

It is believed that Culley's celebrated shorthorns at the beginning of this century were bred by a cross secretly obtained with a Chillingham wild bull.* During the last ten years Lord Tankerville has been trying the experiment of strengthening the domestic breed by crossing wild cattle and shorthorns. He commenced with a wild bull and two shorthorn cows. They produced a heifer and bull calf respectively on June 10th and 17th, 1877. Both the calves had red noses, though the male's was smutted with black; while the heifer (her dam's first calf) was the more correctly marked about the ears. The bull calf, being the first male of this new race, was named "Adam." In April, 1878, Adam's dam, a shorthorn cow, produced a bull calf by Adam. This bull when $3\frac{1}{2}$ years old measured 56 inches at the shoulder. In the following year Adam became the father of two more bull calves out of shorthorn cows. In 1877 a wild yearling heifer was shut off from the herd, and the following year a second one, in continuation of this experiment. The elder one dropped a calf by a shorthorn bull in 1880, but it died; its fertility was afterwards at least temporarily impaired by a remarkable contingency. but in October, 1881, both were supposed to be in calf to a shorthorn bull. None of these were to be added to the wild herd, nor were the wild cows to be ever readmitted.

LYME.—Mr. W. J. Legh, writing on June 3rd last, states that this "herd ceased to exist about four years ago." It will be of interest, therefore, to mention what state it was in ten years ago, since which time we have no particulars of it. The herd being on the decline so long ago as the year 1859, Mr. Legh purchased in October of that year the last surviving cow and calf from the Gisburne herd, and added them to his own at Lyme. The latest account of this herd appeared in 'The Zoologist' for 1878, and refers to a visit made by Mr. A. H. Cocks in June, 1877. Correcting one or two obvious errors by comparing this account with Mr. Storer's, taken in August, 1875, the following list includes the animals that were nearly, or quite, the last representatives of this ancient and interesting herd:—One old bull, said in 1877 to be dying of old age, and to be eleven or twelve years old, though

EARS, but the present park-keeper destroyed them, since which period there has not been one with black ears."

* Bewick, *op. cit.* p. 41 (foot-note), says:—"Tame cows, in season, are frequently turned out amongst the wild cattle at Chillingham."

referred to by Mr. Storer in 1875 as three years old; one bull, brought from Chartley as a yearling, in 1877 was probably rising or upwards of seven years; one cow, aged about ten; one cow, from the last named, by the old bull, died previous to August, 1875; one bull, out of the last-named cow probably, by the Chartley bull, sent to Chartley; one cow, *black*, out of the old cow first mentioned, by the Chartley bull was in 1877 rising or turned five probably; one heifer, about two years old, by the old bull, out of the old cow, both first mentioned; one heifer, about eighteen months old, out of the black cow, by the old bull; one heifer calf, by the Chartley bull, out of a domestic cow; one heifer calf, from Vaynol.

SOMERFORD.—In July last the herd consisted of thirty animals, made up as follows:—3 bulls, *viz.*, one born about April, 1885, one born about March, 1886, one born about June 21st last; 18 cows of all ages, the youngest being about two years old; 5 heifers, *viz.*, one about two years old, one born about February, 1886, one born about May, 1886, one born about June, 1886, one born about September, 1886; 4 heifer calves, *viz.*, one born January, two born about end of April or beginning of May, one born July 21st; total, 30. No steers are reared, all surplus bull calves are fed for veal. Three calves born this year have died, *viz.*, one male from quinsey, two females born prematurely. Two heifers were due to calve in September and four cows in October. This will make a total of fourteen births during the year, from which we may infer that this herd is in no danger of extinction from shy breeding. These cattle weigh up to fifteen score to the quarter when fed for beef. They are thoroughly domesticated, and allow one to move freely among them, and the second bull permitted two visitors and Mr. Hill (the agent) to handle him simultaneously. The cows are all regularly milked. The butter made from them is pronounced the best in the county, and they are as a rule excellent milkers. The highest record (*vide* Mr. J. Hill) is thirty-three quarts per diem, but the drain on this cow's constitution proved fatal in four months, notwithstanding that everything possible was done in the way of feeding.

These cattle are polled, and no exception is known to have occurred. They are black-pointed, but there is considerable range in the markings—far more than in any other herd. When Mr. Hill became agent, some nine years ago, he found the herd

somewhat uncared for, and many of the cows so aged as to be past breeding, and he has, therefore, during that interval of time, been keeping every good heifer calf, without weeding out too stringently on account of irregular markings. About 1876 or 1877 a young bull was exchanged with the Marchioness of Lothian for one from Blickling. This cross succeeded fairly well, a peculiarity in this strain being that many are born with the ears square-tipped, as if the animals had been marked by cropping. About the year 1879 a young bull was exchanged with Mr. A. Cator, of Woodbastwick. This bull was *brown-pointed*, but threw calves with red ears and muzzles, which were the first so marked known to have occurred at Somerford. Of the twenty-three cows and heifers, eleven have either very little black fleckings about the body or even none at all; while half a dozen have a good deal of black in thickly-grouped fleckings, spots, and small patches; two or three have probably fully one-third of the entire hide black. One cow, about ten years old, may be described as a blue-roan, black and white hairs being placed almost alternately over the greater portion of her body, which give her a *blue-grey* coloration. The fronts of her fore legs below the knees are black, and all the outside of her ears, instead of as usual from one-third to a half at the distal end. This cow was (according to Mr. Hill) giving twenty-four quarts of milk per day. One cow is red-pointed, and slightly flecked on the neck with the same colour. The black on the nose in the majority extends evenly round the whole muzzle, including the under jaw, but some have merely the naked part of the nose black, and in one or two even this is rusty coloured and not perfectly black. All, with the exception of the red-pointed cow, have a narrow rim of black round the eyes. The animals with the least black about them appear to have the finest bone and smallest heads. This may be following the old strain, while the others perhaps more nearly follow the cross-strains. The red-pointed cow and one of the pure white ones have small knobs or excrescences on either side of the frontal bone, like budding horns, but they do not protrude through the skin. The bulls (though both immature) are very strongly made, very broad across the thighs, short on the legs, and with remarkably broad, thick-set heads. Both are plentifully flecked with black, and in the younger of the two the fleckings extend to the lower part of his face, while the black on his muzzle is broader than in probably any other

example of park cattle. The cows produce their first calf when from two to two and a half years old. The bulls run with the herd throughout the year, but, in order in some degree to regulate the birth of calves, individual cows are temporarily shut up. One of the handsomest of the cows is almost entirely white, and is the daughter of a cow that died this year at the extraordinary age of twenty-three (at Chillingham they rarely reach ten) years. She was very dark, although of the old strain, and had withstood infection during the cattle plague epidemic. The old bull, aged eleven, was consigned to the butcher this spring, as he had become dangerous, having nearly killed the cattle-keeper.* In winter all the cattle, especially the bulls, develop long hair on the poll and neck, which divides along the central line and covers them like a mane. The hairs decrease in length backwards to the withers, where they cease somewhat abruptly. The bull calf and three of the heifer calves have very little black about them beyond their ears and muzzles, while the fourth is the blackest individual in this herd, having probably more black than white about it, in spots and patches with ill-defined boundaries. One of the cows and the younger bull have some black in their tail tassels, in all the rest it is quite white. The udders of the cows here are as large as those of ordinary domestic cows, which is not the case in the herds which are not milked. About 180 acres of the park are allotted to the cattle, consisting of excellent upland turf sloping down to the river Dane. It is said that the whole herd will sometimes gallop to a pond in their enclosure, and go in so deep that little but their heads remains visible. In dry seasons, when the river Dane has become unusually low, instances have occurred of cattle of both sexes crossing the river both ways; but calves produced by the park cows are kept if correctly marked, even when the sire was probably a common bull. The cattle are housed at night during winter, and supplied with hay.

CHARTLEY.—This herd in July last was made up as follows:—Bulls: 1, nine years old; 1, six; 1, four; 1, three; 1, one; 4 calves; in all, 9. Females: 6 cows, aged; 2 cows, four years old; 2, three; 2, two; 6 yearlings; 2 calves; in all, 20. Bullocks: 1, four years old; 1, three; 3, two; in all, 5. Total, 34. This

* This was no doubt the "big calf, eight or nine months old," seen by Mr. Storer on August 6th, 1875 ('Wild White Cattle,' pp. 258 and 259).

is the largest number recorded during recent years. An idea or tradition prevailed that the number could not be raised beyond 21, so the late Earl tried the experiment, and succeeded in April, 1851, in getting the number up to 48. The late Mr. E. P. Shirley, in November, 1873, recorded 27; the late Rev. John Storer, in July, 1874, found 25, and apparently an increase of two or three in the December following. In June, 1877, Mr. A. H. Cocks* found the number reduced to 20. Mr. J. R. B. Masefield,† whose visit was apparently about 1884, remarks that “a few years ago the number was reduced to 17”; but at the time of his visit the number was 28, and three had been recently killed. Mr. E. de Hamel,‡ in May, 1886, found 30. The existence of this herd, according to Sir Oswald Mosley (Hist. Tutbury, Co. Stafford, 1832), seems to be traceable further back even than that of Chillingham—namely, to 1248–49. The animals in this herd are heavier in front and lighter behind than any of the other herds; in general shape and character, both of bodies and horns, they closely resemble the old domestic breed of Staffordshire long-horns. The colour is uniform—white, with black noses, ears, and feet, sometimes ticked. Occasionally black calves are born, but are not kept. An old tradition says that the birth of a black calf means a death in the family of Ferrers. The number of calves reared annually would average about half the number of breeding cows. The udders of the cows are remarkably small, and incline forwards at an angle—very unlike the huge gland of a domestic cow. There is no evidence or knowledge of fresh blood having at any time been introduced. Lay cows were formerly admitted to the park, and crosses with the wild bulls obtained, but this was stopped twenty years ago. The result of these crosses was very good meat, but the cross-breeds were very awkward to milk or handle.§ The park is nearly 1000 acres, and is in its natural, original condition. It has never been manured, or

* ‘Zoologist,’ 1878, p. 276.

† Proc. North Staffordshire Nat. Field Club, 1885, p. 33.

‡ Handbook for the use of the British Association when visiting Birmingham, 1886.

§ A heifer calf born in 1875 from a domestic cow by a wild bull was said to resemble the wild animals very closely. Seen in the distance, the clear white, characteristic of the young of the park herds, was conspicuous.

broken up, or seeds sown, and contains a very great variety of wild plants. The cattle are fed on hay during winter in sheds.

VAYNOL.—In August last the herd here consisted of fifty-three animals—namely, 1 old bull, 2 young ditto, about 20 cows, and about 30 heifers and calves of both sexes. They are short-legged, straight-backed animals, all white with black muzzles, black tips to the ears, and more or less black about the hoofs, varying, however, in individuals, some being only faintly marked in this way. They all have horns, not very long, sharp, and turned up at the ends, but not quite uniform. In winter they are fed with hay, but are never housed, and none of the cows are ever milked. The beef is of excellent quality. The original importation of this herd from Kilmory took place in 1872, consisting of 22 head—namely, 1 bull, 9 cows, 6 heifers rising two years, 6 yearling steers. In May, 1882, the herd numbered 37 or 38, including eight young calves, and one bull, which would be killed when three years old. In August, 1886, the remainder of the Kilmory herd were brought here—namely, 2 yearling bulls, 14 cows and heifers, 8 two-year old heifers, 8 yearling heifers; 32 in all. The average number of calves born yearly (previous to the addition of the remainder of the Kilmory herd) was about 14, of which perhaps half a dozen were reared, the remainder being killed for veal. Some time within six or eight years of the first instalment of cattle coming to Vaynol a black bull calf was born. Very few deaths occur, and only among the calves, of which now and then one dies of “scouring.” The cattle, although never handled nor housed in winter, are not fierce, and will allow a near approach (except when they have calves) without showing any signs of impatience or alarm. Since the arrival of this herd at Vaynol in two instalments no fresh blood has been introduced, nor have any exchanges been effectual; nevertheless, Mr. Assheton-Smith is of opinion that the cattle have improved both in size and weight. Sir John Orde, in a letter dated June 1st, 1887, says that, shortly before he parted with the herd, he obtained two young bulls from Hamilton, with a view to changing the blood, but they proved useless, and both met with accidents, and had to be destroyed. His desire to introduce fresh blood was owing to an opinion that the cattle were deteriorating in bone and horn from close-breeding, and also slightly in fertility. The origin of the Kilmory herd, as gathered by Storer, is that the late Sir John

Orde in 1838 purchased a bull, the only survivor of the Duke of Buccleuch's (Dalkeith) section of the old Athol herd. This was used with Kyloe (West Highland) cows, carefully selected. After some few years this bull and Lord Breadalbane's (Taymouth) were exchanged, and the latter was used with good results until 1852, when a West Highland bull calf was bought, and this sire was supposed to have much improved the stock. No further crosses were made up to the time Mr. Storer's book was published (1879); but since then the present Sir John Orde, in the letter above quoted, says that they had had at various times crosses with ordinary Highland, Ayrshire, and Indian cattle. The first named was the only one found desirable, the produce of some cows recently that proved infertile with the wild bull being very satisfactory in everything except colour. The cattle show traces of their Kyloe extraction. About 200 acres of the park at Vaynol are allotted to the cattle, consisting of old (artificial) pasture, bordering a lake. In the same park are Red- and Fallow-deer, and in the plantations round the park there are a few Roe-deer descended from Scotch and German stock. A Roe doe was seen in August last with two fawns.

BLICKLING.—In July last this herd comprised :—Bulls : 1, five years old ; 2, two years old ; 1 calf. Cows : 9 ; 2 yearling heifers ; 6 calves. Total, 21. Only the two young bulls and the two heifers were in the park ; the others were kept up. Storer says that these cattle were introduced from Gunton about the beginning of the present century, and that they were nearly destroyed a few years since by the rinderpest, which killed off all but three or four ; since then the herd has been somewhat made up, and consequently somewhat altered its characteristics. The cattle here are black-pointed, but the six heifer calves born this year are irregular in their markings. Two have black ears, but no spots ; while one has red ears, and the other has white ears. These cattle, it is said, sometimes have red points ; sometimes there is no colour about them at all. They are frequently spotted like flea-bitten Arab horses. All calves with black points are preserved, amounting to about five or six in a year. The herd is low at present—only numbering about twenty altogether, ranging from five years old to calves of this year. There have been a large proportion of bull calves during the last year or two. The individual animals are finer at the present

time than when Mr. Storer made his report, but they are not so large as they were previous to the rinderpest, which destroyed the whole herd except a few calves. By the advice of Mr. Storer a cross was obtained from Somerford, two young bulls being sent thence, one of which had an incipient horn. There was another cross about five years ago with a cow from Yorkshire, which in appearance was like the cows in the Blickling herd—it was out of a white shorthorn by a black Galloway. No horns have appeared among its descendants, though one cow always throws black calves (which are never reared), and in some of the others the black points have been more than usually pronounced. As soon as the animals are adult, and are taken into the dairy herd, they no longer range in the park, but are fed in meadows. The land is light, and they are given cotton cake all through the summer; in winter this is supplemented by hay, but no roots are given. They are housed at night in cold weather.

WOODBASTWICK.—The herd here in August last contained:—1 bull; 12 cows, aged from nine to two years; and about the same number of young animals. Ten calves have been born this year, of which three have died. There is also a white shorthorn bull, which was used for breeding purposes last year. Originally all these cattle had red ears and red muzzles. Latterly, however, for want of fresh blood, it has been impossible to maintain the red points. A red-pointed bull, received in exchange from Somerford (about 1879), proved useless. Mr. Cator was therefore obliged to use a black and white bull sent from Somerford, which had (as was supposed) some black Angus blood in him. The stock by this strain have nearly all had black points, though some few have them of a dark chocolate colour, and a few others are red-pointed. This bull had a good deal of black on his back, and the calves at first took after him, being in most cases more or less spotted with black. As he got older, however, the calves took after the cows, and in 1883, which was the last year he was used, all the calves came pure white, with black ears and noses. The next bull used was a son of the last, and the result was satisfactory as regards markings, although more calves were black- than red-pointed. The present bull is a son of this one, and is a splendid animal and beautifully marked. Though a little light behind, as all this breed seem to be, they are very heavy in the withers. At different times some three or four

different shorthorn bulls have been used, the last occasion being last year (1886). This was done with a view to improving the hindquarters, which are rather light. They are inclined to be weak in the loins, and their coats had been getting very fine. This last cross has not proved very successful as regards marking, all the calves turning out pure white, ears and all, and a few will have horns, while the character of the head differs from the old type, which was short, and broad between the eyes. The cattle, from interbreeding, had become delicate, and thin in the coat, but the shorthorn cross has much improved the coat. The white of the shorthorn looks yellow by the side of the pure white of the park breed. Though the cattle are not considered hardy they are good milkers when well-fed. This herd originated from Gunton stock. According to Storer the late Mr. A. Cator bought one cow at a sale about 1840; his son, the present proprietor, says in a letter, "about the year 1832." This cow produced a bull-calf, and at various times subsequently the herd was recruited by red-pointed calves from Blickling. The cattle here are kept in fields, and do not enjoy the wider range of a park. The soil is poor and gravelly. They are stalled all the winter and fed on turnips. In the exceptionally protracted bad weather of last winter they were given oil-cake in addition.

In conclusion, the Committee request that the thanks of the British Association be conveyed to the following noblemen and gentlemen for the assistance they have kindly rendered in the preparation of this Report, and that a copy of this Report may be forwarded to each of them:—The Dowager Marchioness of Lothian, Blickling Hall, Norwich. The Earl Ferrers, Chartley Castle, near Stafford. The Earl of Tankerville, Chillingham Castle, Belford, Northumberland. Sir John W. P. Campbell-Orde, Bart., Kilmory, Loch-Gilp-Head, N.B. Sir Charles W. Shakerley, Bart., C.B., Somerford Park, Congleton, Cheshire; and his Agent, J. Hill, Esq., Smethwick Hall, Congleton. G. W. Duff-Assheton-Smith, Esq., Vaynol Park, Bangor, North Wales. A. Cator, Esq., Woodbastwick Hall, near Norwich; and his son John Cator, Esq., Woodbastwick Hall, near Norwich. D. C. Barr, Esq., Chamberlain to his Grace the Duke of Hamilton, Hamilton, Lanarkshire.

ORNITHOLOGICAL NOTES FROM NORFOLK
AND SUFFOLK.

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

THE following notes comprise the more remarkable ornithological events which came under my observation in these two counties during the year 1886.

An adult female Montagu's Harrier was killed in the neighbourhood of Gaywood, near King's Lynn, and forwarded to me on August 16th. On Dec. 17th a young Peregrine Falcon was shot on the Woodhall estate, near Downham Market. The stomach contained remains of a Partridge. I failed to detect any traces of entozoa, which have occasionally been met with in this species. (See 'Zoologist,' 1880, p. 515; and 1881, p. 306.)

On June 29th I received an adult female Long-eared Owl, and on July 3rd and 5th two fully fledged young ones that, having moulted their wing-feathers, were able to fly. The stomachs contained remains of field mice. The colour of the irides in both old and young birds, noted whilst the birds were alive, was bright orange.

An adult female Barn Owl with the breast of a deep buff colour was shot Oct. 29th near Harford Bridges, Old Lakenham, and sent to me. I have on several previous occasions received examples of this variety, and generally at the period of the autumn migration. The chief marks of distinction in the sexes are the spotted flank feathers of the female, those of the male being quite plain. The plumage of the under parts, which in the ordinary Barn Owl is white, is in this variety a deep buff, while the back and upper parts are several shades darker than usual. The stomach of the specimen noted contained the remains of a common brown rat.

In my former notes (Zool. 1886, p. 472) I reported my success in breeding and rearing the Little Owl. Last year I was not quite so fortunate. The old and young birds passed successfully through the autumn moult, when it became almost impossible to distinguish them, so nearly alike were they in plumage. They agreed pretty well until January, when their usual pugnacious disposition again manifested itself to such an extent, that I was compelled to remove the young ones to another cage. The old birds, however, appeared to get on no better by themselves, but

fought so furiously at times that I was afraid they would tear each other to pieces, and I had on several occasions to separate them. Eventually they settled down more quietly, and the female, taking to the nest, laid four eggs, which she sat upon for the usual time, but failed to hatch. Meanwhile, in another cage, two of the three young birds had mated, and, after attempting to get rid of the third by driving and hunting it about the cage, they eventually killed and devoured it. Although the usual complement of eggs was laid, they were not hatched; but, as the two pairs of birds seem now to be more comfortably settled, I anticipate better results next breeding season.

An adult male Little Owl was shot Nov. 6th, and sent to me from the neighbourhood of Harleston. Its stomach contained the remains of a tumbler dung-beetle, a centipede, five or six lepidopterous larvæ (including that of the common sword-grass moth), and a small black beetle, unidentified. This specimen exhibited no traces of confinement; its internal organs were healthy, and its plumage quite perfect. On comparison with my tame specimens it proved to be much less in weight, being $6\frac{1}{2}$ ozs. instead of $7\frac{3}{4}$ to 10 ozs. The plumage of the wild bird also was somewhat darker, the beak of a deeper yellow, the claws finer, sharper, and more deeply curved; the following being its dimensions:—Total length (beak and tail included), $9\frac{1}{4}$ in.; expanse of wings, $22\frac{1}{4}$ in.; wing, from carpal joint, $6\frac{1}{4}$ in.; cere and bill (ridge of upper mandible), 1 in.; tail, $3\frac{1}{4}$ in.; tibia, $2\frac{1}{2}$ in.; tarsus, $1\frac{5}{8}$ in.; middle toe and claw, $1\frac{1}{2}$ in.; outer toe and claw, 1 in.; inner toe and claw, $1\frac{1}{4}$ in.; hinder toe and claw, $\frac{7}{8}$ in.; weight, $6\frac{1}{2}$ ozs. avoirdupois.

On Sept. 13th an immature male Nightjar was shot at Beeston, near Norwich. The spots on the outer primaries, which are generally white in the adult bird, were in this specimen of a pale brown, as in the female, excepting that on the first primary, which had just commenced to show a white centre. The stomach contained remains of insects, principally small beetles.

As usual at this period of the year, a small flock of Gray Wagtails made their appearance on Oct. 2nd at the dam at the back of the New Mills, Norwich. I noticed one, a particularly rich-coloured male bird. A few days after their appearance they were scattered along the banks of that part of the river (Wensum) between the New and Hellesdon Mills.

The Lesser Spotted Woodpecker, at one time regarded as rare in Norfolk, is now added to my list yearly. A female specimen was shot Jan. 26th at Runton, near Cromer, its stomach being filled with insect remains. A second, also a female, had been previously killed on the 22nd near this city. A third was caught by a cat, Oct. 7th, in the parish of Cossey, and brought into the house alive, but died the following day.

On June 25th I found a nest of Greater Spotted Woodpeckers in the decaying trunk of an old birch tree, the hole being situated about twelve feet from the ground. The old birds had made several previous borings above the spot finally selected, the wood apparently being too much decayed to answer their purpose. My attention was first directed to the nest by the clamorous cries of the young birds, five in number. Of these the two smallest and latest hatched proved to be males; the three others larger and older, as indicated by the fuller development of their feathers, were females. I have before remarked this disproportion in the size of the sexes, in the young of the Sparrowhawk (Zool. 1885, p. 51). The stomachs of the young Woodpeckers were filled with larva-skins, spiders, and small beetles. The decayed tree was felled, and I cut out that section of the trunk which contained the nest. A number of broad spreading fungi were attached to the trunk, which the old birds apparently used as shelters in their borings, a particularly fine one being situated just above their abode, and on which I occasionally saw the old birds sitting. The stomach of an adult male of *Picus major*, received on Nov. 30th, contained three full-grown larva-skins of the wood-leopard moth, together with other insect remains.

An immature male Missel Thrush, procured on July 5th, had in the stomach remains of small beetles and larva-skins, and three *Filaria*, each about an inch long.

The first specimen of the Ring Ouzel seen during the autumn migration was a male, shot Sept. 30th at Rockland, near Norwich.

On dissecting an adult female Kingfisher I found the stomach contained a roach which measured $2\frac{3}{4}$ in. in length, and which, being longer than the bird's body, was nipped across the middle, and lay doubled in the stomach.

Mr. Gurney (Zool. 1886, p. 391) mentions the fact of Bramblings, *Fringilla montifringilla*, being more numerous during the winter of 1885—86 than had been the case for some years:

I can fully confirm this statement. One field of sainfoin near Norwich, in February, 1886, was occupied by immense flocks of Bramblings. A gamekeeper, taking advantage of their numbers, cleared the snow from a patch into which they crowded to feed, and, firing both barrels of his gun into the flock, picked up about six score. I regret to add that I did not hear of this until several days afterwards, when it was too late to examine them, as they had been eaten by his ferrets.

On Oct. 21st a fine young Goshawk, *Astur palumbarius*, was shot near Yarmouth.

In the Editor's footnote to a communication headed "Swallow perching on an angler's rod" (Zool. 1886, p. 417) an instance is mentioned of a White Owl perching on a gun while held in a sportsman's hand. A somewhat similar instance occurred to myself when collecting small birds a few years since; I was lying in ambush with my walking-stick gun protruding, when a Wren suddenly perched on the barrel, and remained there some few seconds before taking flight.

In reference to Mr. Kelly's communication (Zool. 1886, p. 368) on the subject of three Cuckoo's eggs in one nest, I may refer to a similar circumstance that occurred to my knowledge in this neighbourhood, and which I recorded at the time in 'The Zoologist' (1865, p. 9618). In my case, however, there were two young Cuckoos and one addled egg, in addition to two young Meadow Pipits. The young Cuckoos being hatched, it was impossible to say if all belonged to one parent, as might possibly be determined in the case of the eggs, if it be true that the same hen Cuckoo always lays similarly-coloured eggs.*

Two immature male Blackbirds were shot on Sept. 16th, the first having the two outer feathers of one side of the tail white; the second having the breast, back, tail, and upper tail-coverts of a slate-colour; wings pale greyish brown; head, neck, and throat pale ash-brown, spotted with darker brown, as is usual in immature birds; feet and legs pale brown. On Dec. 4th an adult female Blackbird, killed at Tivetshall, had its stomach filled with

* Let me here express my regret that the proposed "General Index" to 'The Zoologist' still remains unpublished; it would prove an invaluable boon to working naturalists, and especially to the contributors to this Journal.

remains of the guelder-rose berries, several stones of whitethorn berries, the empty skin of a lepidopterous larva two inches in length, a millepede, and two blackberries. The plumage of this bird was beautifully variegated with white feathers all over its surface. An adult male in similar variegated plumage was killed on the 3rd of the same month near Ipswich, and sent to me for preservation. The food of this was guelder-rose berries, small snails, and beetles.

A curious chocolate-coloured variety of the Rook (a female bird) was shot at Old Buckenham on Sept. 17th; the head, back, rump, upper wing-coverts, and under parts of its plumage of a deep chocolate-colour; the wings and tail brown, the feathers being edged with brownish grey on the outer margins; its bill, irides, legs, toes, and claws partake of the general coloration by being of a dark chocolate.

An adult male Green Woodpecker, shot near Norwich in January, had the secondary feathers and coverts of the left wing of a pale brown colour. Variation in the plumage of this species, I believe, seldom occurs. Another specimen, also an adult male, was sent me by Mr. G. Whincop from Horsford, Sept. 6th. It had only eight tail-feathers, the centre ones being curiously aborted, the shafts curled up, and with only a few fibres in lieu of well-developed webs.

As the Quail is apparently not of so frequent occurrence as formerly, I may mention the only example I saw last year, namely, a hen-bird, which was shot at Old Buckenham on Oct. 17th. The ovary contained small eggs, and the stomach seeds and grit.

A dark variety of the Wigeon, an immature male, was shot on Strumpshaw Broad on Oct. 21st. It had apparently but just arrived, and was very tame. It would not be flushed by a dog, but merely swam out of his reach. The stomach was filled with grass and grit.

An adult female Smew was shot in February on Rockland Broad. The stomach contained remains of fish only. This marine species seldom wanders so far inland except during severe weather. I have one that was killed on the River Wensum above Norwich in cold weather a few years since.

An adult male Pochard, shot at Colney, near Norwich, early in February, had the irides of a brilliant carmine.

Mr. W. D. Ward, of King's Lynn, informs me he killed, with his punt-gun, on Sept. 18th, two out of three Avocets in that locality, and gave them to his friend Mr. Thompson, who has had them preserved.

Mr. Ward also shot a male Spotted Redshank on Sept. 13th, an adult bird, retaining traces of its summer plumage. The base of lower mandible was deep red, as also were the legs and feet, the same parts in spring and summer being of a deep claret-colour.

Mr. J. H. Gurney, jun., sent me for preservation a white variety of the Ringed Plover that he had shot at Cley on Sept. 1st, an immature specimen, and a female by dissection. Irides pale brown; legs pale straw-colour; the entire surface of the dorsal plumage creamy white, with a crescent on each side of the neck of a pale ashy brown; as also are the outer edges of the primaries and the centres of the middle tail-feathers. I remounted a similar variety, obtained in Norfolk four years ago, for Mr. H. M. Upcher, of Feltwell.

Early in February an adult male Bittern was shot by Mr. R. Johnson in the neighbourhood of Tunstead; it weighed 2 lbs. $2\frac{1}{4}$ ozs. On Dec. 1st a female specimen was killed at Benacre, near Wangford, by a gamekeeper. The ovary contained minute eggs, and in the stomach were remains of a sharp-nosed eel, fragments of the elytra of a beetle, and bits of weed, as well as stems of reeds and several shrimps.

Two examples of the Egyptian Goose were killed on the marshes of Barford on Dec. 17th, one being a fine old male.

An adult male Goosander was shot by the Rev. J. R. Lane on the River Wensum, at Tatterford, on Feb. 10th. It was in splendid plumage, with a rich salmon-coloured breast; iris deep red. Both the gullet and stomach contained the remains of roach, and a quantity of minute pebbles. On Feb. 25th, on the Bure, at Wroxham, I caught sight of a male Goosander about 100 yards off in one of the smaller broads, and two days later I received two adult males that were killed on the upper lake at Gunton. Lord Kimberley informed me that he had noticed several Goosanders on his lake at Kimberley in Dec., 1886, and Jan., 1887. The majority appeared to be old birds, several of them males, which are easily distinguished, even at a considerable distance, by their conspicuous plumage. The Rev. H. H.

Lubbock wrote word that he saw seven of these birds flying over the Gunton lakes on Feb. 7th.

An adult female Red-throated Diver was killed on Oct. 20th at Westleton, near Saxmundham, in the gullet of which I found three small flounders fresh and entire. The stomach contained fish-bones and small pebbles.

An immature Common Tern was found (Oct. 17th) entangled in some reeds on Surlingham Broad by two men who were pike-fishing. The bird was still alive when found, but so much exhausted with struggling to release itself that it died soon afterwards. A few years since, I remember, a Kingfisher was entangled in a similar manner in Kendal Dyke, Hickling Broad, but in that instance the prisoner was more fortunate, and flew away on being released.

On Oct. 1st I saw a large flock of Common Gulls hovering over the new railway station at Thorpe. The weather was cold and stormy, and an easterly wind had probably driven them thus far inland. Two birds of this species were brought to me alive a day or two afterwards in an exhausted condition. One of these is still alive in a friend's aviary, subsisting on fish, flesh, and grain, and on seemingly good terms with a couple of Moorhens. The stomach of a Common Gull which I dissected on Nov. 30th contained fish-bones and scales, the seeds of two species of rush, and the legs of a beetle.

An adult female Cormorant was shot on April 12th on Hickling Broad while perched on one of the stakes that mark the course of the river channel. This species is now only an occasional visitor to this part of the east coast, although in former times, according to Sir Thomas Browne, it used to breed upon trees at Reedham; and the Rev. R. Lubbock, in his 'Fauna of Norfolk' (p. 173), notes that "Cormorants have in some seasons nested in the trees around Fritton decoy in some number; in other years there has not been one nest."

ON THE GOLDENEYES AND PTARMIGAN OF ICELAND.

BY THE REV. H. H. SLATER, B.A., F.Z.S.

AFTER having hazarded an opinion which is contrary to general experience, it is always satisfactory when subsequent evidence arises to support it. I recently recorded in 'The Ibis' (1886, p. 49) my belief that the Common Goldeneye, *Clangula glaucion*, Linn., occurs in Iceland. I had only the evidence of my field-glass to go upon, and however well satisfied with such an observer may be in his own mind, he prefers to have conclusive evidence to lay before others.

I am glad, therefore, to be able to mention that in a box of skins lately received from a trustworthy correspondent in the north of Iceland, there were two examples of *C. glaucion*. One of these is fully adult, with green-glossed head; the other a young bird in its first distinctively male dress, with sooty unglossed head. They were killed in the winter of 1885 in the Eyja- or Oefjörd.

Clangula islandica was first distinguished from *C. glaucion* by Latham, and definitely named by Gmelin in 1788. Faber, the Linnæus of Iceland, as Prof. Newton points out (Baring-Gould, 'Iceland, its Scenes and Sagas,' Appendix, p. 416), seems not to have been aware that the two species had been determined to be distinct, and his remarks on *Clangula* refer presumably to *C. islandica*.

There has been no record of the occurrence of *C. glaucion* in Iceland since Faber's time. Herr Preyer, indeed ('Reise nach Island,' &c., p. 411), goes so far as to remark that "*Anas clangula*, L., kommt in Island durchans nicht, vor und wird durch *Fuligula barrovi* ersetzt." Nor does Prof. Newton (*l. c.*) hint at its occurrence. Henceforward it will have a title to be represented in the catalogue of the birds of Iceland. I think it must be a scarce visitor, seldom seen far from the sea. It was near the Skaga fjörd that I saw it; when at Myvator, where ducks most do congregate, I made a careful sketch of the heads of the two Goldeneyes, and submitted it to the various egg-farmers there, who have indubitably a fair knowledge of the birds they cultivate (there is no exaggeration in this word, though the birds in question are strictly wild), and their testimony was

unhesitating and unanimous, that they were quite familiar with the one (*islandica*), but the other they had never seen there.

It is sometimes asked, "What is a Grouse, and what is a Ptarmigan?" I should be inclined to divide the genus *Lagopus* roughly into two groups, in order to answer that question:—first, the Grouse, which "beck," as our Red Grouse and the Willow Grouse do; secondly, the Ptarmigan, which grunt or croak. This difference, which is striking enough to one acquainted with the various species out of doors, is not the only one; the Grouse, as before mentioned, have the fifth primary longer than the second; the Ptarmigan, as above, have the fifth shorter—at least this is the case in *L. mutus*, the Common Ptarmigan, and *L. rupestris*, the Rock Ptarmigan; whether it holds good in *L. hemileucurus* of Spitzbergen, and *L. leucurus*, Sw., of N.W. America, I am unable to say, but should be glad to learn as to the *Lagopus* collected in the Kurile Islands; examination of my only specimen (in winter dress) shows that the second and fifth primaries are equal in length, but this may only mean that its wing-quills were in this case not fully developed.

Although it is possible to separate *L. albus*, the Willow Grouse, in winter dress from *L. mutus* or *L. rupestris*, by examination of the primaries, I cannot find any constant character by which to separate the two latter, though they are distinct enough in summer or autumn plumage. But whilst examining my series of *L. rupestris* in winter dress, I hit upon a somewhat interesting peculiarity, which I do not remember seeing mentioned anywhere. Of my twenty-two winter examples, twenty are males, and I was struck with the manner in which the black lore varies in different birds. Some have merely a small black spot immediately in front of the eye, and another at the base of the upper mandible, with one-fifth of an inch of plain white intervening between them; these I take to be young birds. Others have a broad loreal band reaching from in front of the nostrils, over the eye, into the auriculars, and also a small stripe of black feathers on the lower mandible. I am inclined to believe that the extent of the black loreal patch depends upon, and increases with, the age. I found a few odd feathers of the autumn plumage still remaining on the neck and back; about half of these, in the supposed younger birds, are ordinary male feathers, and the rest are feathers like those of the female—in other words, the remains

of the first plumage, which in both sexes resembles that of the old female. Any coloured feathers remaining upon those which I take to be the old birds are ordinary male feathers. Moreover, the development of the comb, or wattle over the eye, corresponds with that of the black lore. In the old males there is a full red wattle, with fringed and projecting upper edge; in what I consider the adolescent males, who have only the promise of a black lore, the comb is insignificant, and yellowish in colour, like that of the hen bird.

Will any reader of 'The Zoologist,' who may happen to have a series of skins of any other Ptarmigan, be good enough to look over those in winter plumage, and state whether he finds a similar state of things to exist?

NOTES AND QUERIES.

MAMMALIA.

Parasitic Disease in the Hare.—At a recent meeting of the Paris Biological Society, M. Mégnin gave an account of a peculiar disease which is very prevalent at present among Hares in Alsace. It is a parasitic disease, a sort of pulmonary tuberculosis, caused by the presence, in the lungs, of *Strongylus commutatus* (*Filaria pulmonalis* of Frölich). The same disease was noticed in Thuringia in 1864.

Squirrels at a distance from Trees.—In the month of September last, when Grouse-shooting in Elginshire, I was surprised one day to come suddenly upon a Squirrel in the heather, right out on the open moor, far away from any trees. The little animal was proceeding by short bounds through the heather, every now and then stopping to rest, as if much fatigued, and was apparently on migration. A similar case has been noticed by the late A. E. Knox in one of his delightful books, 'Autumn on the Spey' (p. 52); and other instances are mentioned by Mr. Harvie Brown, in his excellent essay on the Squirrel, Proc. Roy. Phys. Soc. Edinb., vol. vi. (1881), p. 166.—J. E. HARTING.

Young of the Hedgehog.—On the 17th October last I was shown a Hedgehog which had been found in an outhouse, with a litter of seven young ones, as near as I could guess about a month old. Bell, in the second edition of his 'British Quadrupeds' (p. 110), says, "The female produces from two to four young ones early in summer"; and Macgillivray (Jardine's Nat. Lib.) states that "Early in the summer the young are

produced; they are generally three to four, and are born blind." It would be interesting to know whether this was the second litter this year. I suppose Hedgehogs are capable of producing two litters in a year, as I have not heard or read to the contrary.—F. HAYWARD PARROTT (Walton House, Aylesbury).

Distribution of the Bank Vole.—I see by your paper in 'The Zoologist' for October, that you wish for localities for the Bank Vole. I accordingly send you a list of the counties in which I have taken this little animal. At Kingsbury, Middlesex, it was quite common twenty years ago; I sent some from there to the late Mr. Yarrell. The first specimen I ever saw was brought to me by a favourite cat; I have it still, and it is the best specimen I think I ever saw. I have taken the Bank Vole in Buckinghamshire, Berkshire, Hants (Isle of Wight), Hertfordshire, Cambridgeshire, Herefordshire; and I once found a dead one within a quarter of a mile of Monmouth. About twenty years ago I saw a very pretty variety, of a light cream-colour with red eyes, that was taken in Huntingdonshire. I believe it will be found to be regularly distributed in England, if looked for.—FREDERICK BOND (Staines).

Black Rat in Wexford.—The Black Rat is not infrequent in the neighbourhood of New Ross. I have myself met with it at Kilmanock, where it can hardly be called very rare. I have also heard of it at Duncannon, a village near Arthurstown, not far from Hook.—GERALD E. H. BARRETT-HAMILTON (Harrow School, Middlesex).

The Musk Rat and the Unio.—There has been much discussion in regard to the method by which the Musk Rat, *Fiber zibethicus*, Cuv., opens the *Unios* which it uses for food, and many methods have been suggested as to the manner in which the body is taken from the shell. Nearly every method proposed has been based upon the strength of the adductor muscles and the supposed impossibility of overcoming their power without killing, or at least poisoning the animal. In experimenting with some *Unios* last summer, I found that it was an easy matter to get the shell open as far as the ligament would open it, and that in this condition it required much less than a Musk Rat's strength to force it entirely open. When the *Unio* is travelling along, its foot projects a half inch or more from the lower side of the shell. If, while the foot is in this, its usual condition, the two valves be pinched, the foot will be caught between the closing shells; if the pinching be continued for half or three-quarters of a minute, the animal, probably from the pain produced, becomes paralyzed and unable to make use of the adductor muscles. Now, if the shell be released, it will fly open about one-half inch, and can easily be torn entirely open. The strength needed to keep the foot from being drawn into the shell is not great, being far less than that of the jaws of the Musk Rat. So all that it is necessary for

Fiber to do when he wants his dinner is to swim along until he sees a *Unio* at the bottom, dive, and quickly seize the animal, then swim leisurely to his hole or the bank. By the time he has reached a good place for eating his meal the *Unio* will be ready to open far enough for the insertion of paw or nose, and the luscious bivalve can be devoured from the whole shell. In my own experiments I was usually, though not always, successful. The failures I think were always due to the fact that not quite enough of the foot was caught by the closing shell; this was caused by my disturbing the animal before taking hold of it. If the Musk Rat be not more supple than I, he must occasionally miss his meal.—*Prof. Austin C. Appgar, Journ. Trenton Nat. Hist. Soc. 1887, p. 58.*

Bats preyed upon by Owls.—There is nothing new in the fact that Bats are sometimes preyed upon by Owls, as also by the Hobby, *Falco subbuteo* (Zool. 1877, p. 472), for this has been ascertained by examination of the pellets ejected by these birds, or by discovery of the remains of Bats in their stomachs. But it does not often happen that one is enabled to see *how* the Bat is captured by the Owl, and we may reasonably suppose that, as a rule, he is snatched from the wall, or roof, of the church, barn, or old building in which both species have been in the habit of roosting. The rapid eccentric flight of a Bat would in nine cases out of ten probably prove too much for the steady-going “mousing Owl.” But that an Owl will occasionally venture a flight at a Bat is vouched for by an observer at Greenlaw, where, in the High Street, one evening in August last, an aerial contest of this kind was witnessed. We are indebted to Mr. L. Richardson for the following account of what took place:—“A number of persons standing in the High Street about half-past eight o’clock on Thursday evening (Aug. 18th) saw a Bat, followed by an Owl in hot pursuit, fly over the houses on the south side of the street. The pursuit was continued down the street for a short distance, the Bat being only about a foot in advance of its pursuer, which, strangely, kept at this distance, without apparently making any effort at a nearer approach, and at the same time keeping a like average distance below the flying line of the Bat, which in its wavering was continually changing its altitude. By this strategy the Owl was ready to strike on the first favourable opportunity presented by the Bat coming downwards. This opportunity was not long in coming. The Bat crossed the street into the Green, where it made a sudden dart downwards. The Owl at once got under, forcing the Bat up again, and causing it to continue its forward course a little further. The Bat soon made another descent, and when on a level with the Owl the latter instantly struck it with one of its wings, either stunning or killing it, and when it was falling it was secured by the Owl, and borne away in triumph to the neighbouring church-tower.” From the infrequency with which the skulls or other remains of Bats have been found in Owls’ “pellets,” we may infer

that they are probably only captured when the Owl is "hard up" for more palatable and more easily captured prey.

BIRDS.

Breeding of the Tufted Duck in Aberdeenshire.—On the 11th of August last I was in a boat on Loch Skene, near Aberdeen, for the purpose of looking for the Tufted Duck, *Fuligula cristata*, which I had been told had bred there for the last three years. I heard also that, shortly before I was there, a female Tufted Duck, with a brood of young in down, was seen to cross a road not very far from the lake, and that one of the young ones was caught, the mother having flown off into some standing corn close by. I have little doubt that when disturbed she was leading her young from the breeding-place to the lake for the first time. She called her young to her into the corn. When we were on the lake we saw, first, several parties of Teal and Mallard, both of which breed there. We afterwards saw a Tufted Duck rise from the water, and from her manner as she went off, flying as if wounded for about a hundred yards, and then returning to the same spot and again acting in the same manner, I have little doubt but that her young were on the water, but owing to its being very rough we could not detect them. On another part of the lake we afterwards saw another Tufted Duck acting in a similar manner, and I came to the same conclusion, but we failed to get sight of the young. I learned from the keeper that there were this year five or six broods of young Tufted Ducks on the lake, and I have since heard that he saw the first brood on the lake two years ago, and that, now his attention was called to it, he had known the call-note for several years. Besides the two which I suppose had young I counted a flock of about twenty-five Tufted Ducks flying high in the air, and several smaller parties which did not leave the lake.—WILLIAM BORRER (Cowfold, Sussex).

[In connection with this subject, on which we have lately received two or three communications, attention may be directed to a short paper by Mr. R. Jex Long, printed in the 'Proceedings of the Natural History Society of Glasgow' for 1880 (vol. iv., p. 53), entitled "Notes on the occurrence of the Tufted Duck, *Fuligula cristata*, as a breeding species in Scotland."—ED.]

Food of the Mistletoe Thrush.—I shall be obliged to any of your readers who will tell me if they have ever observed the Mistletoe Thrush, *Turdus viscivorus*, or any other bird, to feed upon the berries of the mistletoe. Although called *ἰξοβάρος* by Aristotle, and *viscivorus* by later authorities, it seems doubtful whether either name is especially appropriate. In this part of Shropshire the mistletoe is not common, but I have frequently noticed that the berries on the few plants we have are left to decay even after severe winters, when those of hawthorn and holly have all been eaten. Perhaps

some of your correspondents who live where mistletoe abounds will give me their opinion.—WILLIAM E. BECKWITH (Eaton Constantine, Salop).

Swifts laying in Martins' Nests.—In 'The Zoologist' for September (p. 348) I see Mr. F. Bond writes about Swifts nesting in Martins' nests. About ten years ago I found two or three pairs of Swifts building, or rather laying, in Martins' nests outside a barn in Lincolnshire. I saw the Swifts going in and out of the Martins' nests, and, getting up to the latter with a ladder, I found Swifts' eggs in the nests, some of which I have still in my collection.—G. E. LODGE (5. Verulam Buildings, Gray's Inn).

Late stay of the Swift in Ireland.—On October 4th, near Cappagh, Co. Waterford, while watching the movements of a large flight of Swallows, in company with my friend Mr. R. J. Ussher, we were astonished to see among them a Swift, which came flying close over our heads in full view, and was clearly identified by both of us. Is not this an exceptionally late stay for this bird, at least in Ireland? At Shillelagh the Swifts have never remained later than August 16th, and they generally depart at least a week earlier, though this year I saw a solitary one flying about Shillelagh church on August 27th. The flock of Swallows among which we saw the Swift was a very large one, numbering some hundreds, most of them *Hirundo rustica*, but with a few House Martins amongst them, many settling from time to time on the tree tops, and then flying off again. They had evidently halted for a short time to rest and feed before finally leaving the country. Later in the afternoon we noticed large numbers of Swallows flying towards the south-east, in the direction of the sea. I observed several House Martins near Shillelagh on October 11th. Mr. Ussher wrote to me that there was again a large number of Swallows at Cappagh on the same day. The Chiffchaff was still at Shillelagh on October 6th.—ALLAN ELLISON (Shillelagh, Co. Wicklow).

Knot on the West Coast of Scotland.—The Knot, *Tringa canutus*, is generally considered a scarce bird on the west coast of Scotland, and the late Mr. Robert Gray was of this opinion; yet ever since the middle of September there have been several hundreds of birds of this species on the shores of Loch Gilp. To what extent does the species really occur on this coast?—ARTHUR H. MACPHERSON (Bishopton, Lochgilphead, N. B.).

Lesser Redpoll nesting in Middlesex.—On Sept. 14th I found two young Lesser Redpolls, *Linota rufescens*, at Highgate, dead, but quite fresh. This is interesting, not only as affording evidence of the Lesser Redpoll nesting in Middlesex, but on account of the late date for the nestlings, which is unusual. In the 'Birds of Cumberland,' where a full account is given of the nesting habits of this bird (p. 47), the authors say, "The first eggs are usually laid early in May, but we have found fresh eggs in July. In a letter to me upon the subject, one of the authors, the Rev. H. A. Macpherson, writes, "The date is very unusual. I have known Goldfinches to have

young in the nest at the end of this month (September), but I never heard of Redpolls nesting after July. In Switzerland all birds breed late on the high stations, but your date for the *Linota* is very remarkable." I may add that I have seen Lesser Redpolls at Highgate every year throughout the summer, and they probably breed here regularly. In 1884 a pair built a nest among the upper twigs of an arbutus tree, from which I obtained four eggs.—JOSEPH VINE (11, Chester Road, South Highgate).

Late nesting of the Greenfinch.—On the 16th September I took a nest of three young Greenfinches, apparently about five days old, out of a plum tree in an orchard near Sittingbourne, Kent. One of the birds was delicate, and died on the 29th; the other two (a pair) are vigorous at the present time (October 1st). As the parents must have been in moult when the nest was discovered, it is highly improbable that they would have continued to feed the young until able to shift for themselves.—A. G. BUTLER (Natural History Museum).

Missel Thrush feeding on *Pieris rapæ*.—While staying at Windermere, during the first week in August, I was astonished to see a Missel Thrush capture three specimens of *Pieris rapæ* on the wing in succession and devour them.—W. HARCOURT BATH (Ladywood, Birmingham).

Nidification of the Noddy and Sooty Terns in the West Indies.—From a long letter lately received from a friend at Kingstown, Jamaica, I gather the following facts, which I think may be of interest to ornithologists, especially as so much doubt remains as to the number of eggs these birds lay. The egg of the Noddy (*Anous stolidus*) is more chalky than that of the Sooty Tern (*Sterna fuliginosa*) and is also distinguished, after boiling, by the peculiar consistency of the albuminous portion, which, instead of turning white, has an opalescent appearance that my friend "can only compare in colour to that of soapy water." The Noddy rarely, if ever, nests on the sand, but heaps up a mass of sea-weed on the low bushes or clumps of prickly-pear growing on the "Cays." On the other hand, the Sooty Tern (more generally known in the West Indies as the "Egg-bird") invariably nests on the ground on a few weeds only. My correspondent's further notes I copy verbatim;—"I am not able to state positively as yet whether the Noddy lays one or more eggs. [Auduban, who visited a famous breeding-place of the Noddy on one of the Tortugas, called Noddy Key, off the coast of Florida, states that this bird, like the Sooty Tern, lays three eggs.—ED.] The eggs are gathered by the crews of two or three small schooners that leave here for the Cays in March or April, timing their departure so as to arrive just as the birds begin to lay. It often happens, however, that they find the birds in possession and sitting. The only way therefore to ensure getting fresh eggs is to break all they can see or even reach. After this they are taken as soon as laid. The

men say that on landing the birds fly up in immense numbers, and the nests are in such close proximity one with the other as to make it difficult to decide upon the number in each nest. The men, however, believe that they lay but one egg if not disturbed. This applies to the 'Egg-bird.' The Noddies refuse to leave their nests, and resist with open beak all attempts to dislodge them, and have to be forcibly removed to get at their eggs."—H. W. MARSDEN (Gloucester).

Manx Shearwater in Staffordshire.—A specimen of this bird, picked up alive in a village near here, was given to me on the 9th of September last.—E. W. H. BLAGG (Cheadle, Staffordshire).

Manx Shearwater in Herefordshire.—A Manx Shearwater was picked up on the 7th September last in the parish of Upton Bishop, near Ross. When found it seemed remarkably tame, and during the four or five days it was kept alive it made no effort to fly. It weighed 14 ounces, and measured $12\frac{1}{2}$ inches from tip of bill to end of tail. Though it would not feed itself it retained all that was put down its throat; chopped meat, sopped bread, and minnows were given to it. It refused fresh water, but when put into a bath of water in which Tidman's sea-salt had been dissolved, it drank readily. It appears to me that hurricanes are not the only cause of the appearance of sea-birds at a distance from the sea. Possibly they may change the east for the west coast by the most direct route, or if migratory species the land may lie between them and their destination. Gulls seem to do fairly well on the passage, but Petrels not so well, judging from several I have heard of being found dead and dying.—W. BLAKE (3, Myrtle Villas, Ross).

Sooty Shearwater at Flamborough.—Allow me to record the capture of a specimen of the Sooty Shearwater, *Puffinus griseus*, which was obtained near Flamborough, August 27th, and is now in the possession of Mr. J. Morley, birdstuffer, of this town, where I saw it the day after he had mounted it. A very dark specimen, in good plumage, was shot in the autumn of 1879, by Sir William Feilden, Bart., near Filey, and is now in his collection.—R. P. HARPER (2, Royal Crescent, Scarborough).

Note on the Tree Pipit.—In the last edition of Yarrell's 'British Birds' the Tree Pipit is described as having the legs, toes, and claws pale yellow-brown (vol. i. p. 574). A male and female which I procured this year, on the 14th May and the 11th June, had three parts pale brownish flesh and pale flesh with no brown shade respectively, the feet very slightly darker in each case. These colours were noted down at once, and I observed that they had changed slightly in a few hours. The legs finally dry to pale—almost transparent—yellowish brown, the feet being a shade darker, and the description in Yarrell was probably drawn up from a specimen in this condition.—OLIVER V. APLIN (Bloxham, near Banbury).

Male Tufted Duck retaining the Breeding-plumage.—A few years ago I winged a male Tufted Duck, which fell on the Black Lake at Sir A. Reed's, and was left to see if one of the other sex would join it; but it remained in single blessedness all the spring and summer, and surprised me by retaining its full breeding-plumage, only getting a little duller in August. This year I had three pinioned Tufted Ducks on water in front of the house here, two males and one female; two of them paired, and the other male was left by himself. About May the paired male began to show signs of summer plumage, and by June had completely changed into the dull chocolate dress; but the other male was just as bright and smart as ever, and even now (September 2nd) is in fair breeding-plumage, though during the last month he has got less white on the flanks.—J. WHITAKER (Rainworth Lodge, Notts).

Song of Chaffinch in Autumn.—I heard this bird singing for the first time this autumn, on August 1st, near Birmingham.—W. HARCOURT BATH (Ladywood, Birmingham).

Troglodytes parvulus a Migrant.—When we observe the habitually short flights taken by the Common Wren when disturbed, and examine its small and apparently feeble wings, it is difficult to understand how so diminutive and weak a bird can traverse wide open tracts where no trees exist, and even venture to cross the sea. Yet that it does so, both in spring and autumn, is evident from the returns received from the keepers of the lightships and lighthouses. In the last Report (the eighth) on the Migration of Birds issued by the British Association Committee (*vide antea*, p. 397) its appearance on the west coast of Scotland is noted (p. 69) at Turnbury on two different days in April, and at Skerryvore on May 6th. In September it was seen at Corsewell and Little Ross; in October at Rona, Skye, Skerryvore, Rhinns of Islay and Lochindaul; and in November at Little Ross. On the east coast of Scotland one was captured in August at the lantern at Inch Keith, in the Firth of Forth, and "great numbers" were seen at the Isle of May on the 21st and 24th October (p. 14). On the east coast of England in spring (March 24th) one came on board the lightship at the Outer Dousing, and was caught on deck, while seven of these little birds were killed against the Flamborough lighthouse on May 17th. In the autumn several were observed at the following lighthouses and lightships:—Cromer, Cockle, Leman and Ower, Spurn, and Farne (p. 32). This points to a regular migration of the Wren in spring and autumn—a fact which a few years ago would have been discredited as improbable. During the last week of September in the present year, when returning one evening from Grouse-hawking on Riddlehamhope Moor, Northumberland, I came unexpectedly upon a Wren making its way across the open moor, far away from all trees, and with no shelter of any kind except the heather in which

it was from time to time resting. This seemed strange enough, but how this tiny bird can manage to cross the sea *without a rest* is to me a greater wonder.—J. E. HARTING.

Report on the Migration of Birds.—As some of your readers may fail to find the “Llyn Wells” or “Llynwells” light-vessel, so often mentioned in the Reports of the Migration Committee on any map of the Welsh coast, where they would be most likely to search for it, it may be well to explain that the Lynn Wells light-vessel referred to is moored in the Wash between the counties of Norfolk and Lincoln.—T. SOUTHWELL (Norwich).

Tawny Pipit near Brighton.—A specimen of this rare visitor, the Tawny Pipit, *Anthus campestris*, was taken in a net close to the Ditchling Road, about a mile from Brighton, on August 25th, and upon dissection proved to be a male.—R. W. CHASE (Edgbaston, Birmingham).

[The number of rare Passerine birds (rare, that is, in England) which are captured by the birdcatchers near Brighton is very remarkable. In this locality *Anthus campestris* has occurred more frequently than in other parts of England, while its visits, always in autumn, have hitherto been confined to the southern counties.—ED.]

Long-tailed Duck in Cumberland.—The Long-tailed Duck, *Harelda glacialis*, was first obtained in Cumberland in November, 1834, since which date a very few immature birds have been killed upon the Solway and its tributaries. In 1884 a male bird was killed on March 19th, and I saw a small party on the Solway in the succeeding November. No others were heard of until the 10th October last, when an adult female bird was shot near Silloth, and forwarded to me through Mr. Duckworth. The date is earlier than any previously obtained in autumn.—H. A. MACPHERSON.

Purple Heron in Lancashire.—An example of the Purple Heron, *Ardea purpurea*, was killed, on the 7th April last, in the neighbourhood of Alderley Edge, about thirteen miles from Manchester. It was an adult male bird, and weighed 2 lbs. 4 oz.; width between the extended wings, 4 ft. 8½ in.; length from tip of bill to sole of foot, 3 ft. 10 inches.—J. PICKIN (83, Bridge Street, Manchester).

Crossbills in Kent.—In a note communicated to the ‘Rochester Naturalist’ for October, 1887 (p. 311), Mr. Henry Lamb reports that a pair of Crossbills, *Loxia curvirostra*, were shot near Maidstone in July last.

Open Nests of the Tawny Owl and Stock Dove.—*Apropos* of the remarks on this subject (p. 347) I may state that I found a Tawny Owl last year almost at the top of a spruce fir. This was in July. There were four eggs in the nest, which had evidently been deserted, as they were all addled, and much discoloured by exposure to the weather. This

nest was swarming with fleas. I once found a Stock Dove's nest with three eggs. Is this likely to be a case of two hens laying in the same nest, or had the same bird laid the three eggs?—G. E. LODGE.

Osprey captured in the Bristol Channel.—A female Osprey, in immature plumage, was taken alive on a boat in the Bristol Channel on Sept. 22nd. The owner kept it alive for ten days, but, as it was offered raw meat and refused to take it, it starved. Had fish been given probably it would have lived. It is now being preserved.—WM. SHAKESPEARE (Cardiff).

[It seems extraordinary that there should have been any difficulty in procuring fish so close to the Bristol Channel, unless the owner of the bird was ignorant of its species, and of the fact that its natural food is fish. It is a pity it should have been allowed to die of starvation. It might have been sent to the Clifton Zoological Gardens, where it would have been properly taken care of.—ED.]

Pectoral Sandpiper in Norfolk.—On Sept. 8th a specimen of the Pectoral Sandpiper, *Tringa maculata*, was shot on the banks of the River Bure, near Yarmouth. The man who shot it, not knowing what it was, took it to Mr. G. Smith, of that town, who identified the species, and sent the bird on to me. Sex, male; length from end of tail to tip of bill, 10 in.; extent of wings, 18½ in.; weight, 2½ oz., but fat. Contents of stomach undistinguishable, owing to its being badly shot. I may add that the bird was examined by Canon Tristram in the flesh. It has been beautifully set up by Cullingford, of Durham, and is a welcome addition to my collection.—R. W. CHASE (Edgbaston, Birmingham).

Gull-billed Tern in Belfast Lough.—It may possibly interest some of your ornithological readers to know that towards the end of September a specimen of the Gull-billed Tern, *Sterna anglica*, was shot in Belfast Lough. The bird was placed in the hands of Mr. Darragh, of the Museum of that town, and brought by him to me for determination. On consulting the last edition of Yarrell, I find that it does not appear to have been previously recorded from Ireland.—ROBERT O. CUNNINGHAM (Queen's College, Belfast).

CRUSTACEA.

Crustacea from the Channel Islands.—Mr. R. L. Spencer having lately presented to the Natural History Museum a small but well-preserved series of Crustacea from the Channel Islands, it may be of interest to note a list of the species, with remarks upon some of the more interesting types. The collection includes:—(1) *Stenorhynchus rostratus* (Linn.). (2) *Portunus corrugatus*, Penn.: interesting on account of its very extended geographical range; it occurs not only in the British Isles, but in the Mediterranean, the Azores, St. Vincent, and Cape Verde Islands, and has been repeatedly

recorded from Japan by De Haan, Dr. Stimpson, and myself; it is also one of the British species known to occur in the Australian Seas, specimens having been taken in Bass's Straits, E. Moncœur Island, 38 fathoms, by H.M.S. 'Challenger.' (3) *Portunus pusillus*, Leach. (4) *Pilumnus hirtellus*; Herm, near Guernsey. (5) *Ebalia tuberosa*, Pennant: a male and female of full size were obtained, in which the coloration is excellently preserved; the ambulatory limbs are very prettily spotted with red, and the abdomen of the female has six spots symmetrically disposed in two longitudinal series of the same colour. (6) *Corystes cassivelaunus*; Guernsey. (7) *Eupagurus berryardus* (L.). (8) *E. prideauxii* (Leach). (9) *Spiropagurus Anapagurus*) *hyndmanni* (Thompson): Mr. J. R. Henderson, in working out the Anomorous Crustacea of the 'Challenger' collections, first observed that *Pagurus* (*Eupagurus*) *hyndmanni*, Thompson, *P. lævis*, Thompson, and *P. ferrugineus*, Norman (= *P. chrysacanthus*, Lilljeb.), presented a character akin to *spiropagurus* in the curved genital appendage attached to the coxal joint of the fifth (left) leg, which appendage, however, is not spirally coiled as in *spinopagurus*, and he established therefore for these species a new subgenus, *Anapagurus*. (Of the genus *Spiropagurus* the described species are *S. spiriger* (De Haan) from Japan; *S. dispar*, Stimpson, from the Barbadoes; *S. iris*, M.-Edwards, from the Barbadoes; and *S. elegans*, Miers, from Goree Island, Senegambia). (10) *Galathea strigosa*, L. (11) *G. intermedia*, Lilljeborg (= *G. andrewsii*, Kinahan): of this distinctly characterized little species there are specimens in the collection of the Natural History Museum from Dalkey Sound (Dr. Kinahan); Cumbrae; Benhaven; Balnesia (the Museum of Stockholm); Kenmare River, Ireland (Sir P. Egerton); and Vigo Bay, Portugal (W. S. Kent). (12) *Callianassa subterranea* (Montagu). (13) *Athanas nitescens* (Montagu). (14) *Alpheus megacheles*, Hailstone (a specimen in spirit, and a fine dried specimen from Herm). (15) *Idotea lupharis* (Pennant).—EDWARD J. MIERS.

HOLOTHURIOIDEA.

The Trepang Fishery.—An important fishery for a food product, although one scarcely known in Europe or the United States, is that carried on for Trepangs in the South Pacific and Indian Oceans, where it is found chiefly on coral reefs, from which it is gathered and imported in large quantities into China, where it is considered a great culinary delicacy. The Trepang is found in all latitudes, but hitherto the supply has come mainly from the islands of Oceanica, particularly New Caledonia. In Malaysia, the Ladrones, and the China Sea, thousands of junks are equipped annually for these fisheries. The island of Erromanga, in the New Hebrides, has long been an important shipping point for this product. The Trepang, or Beche-de-Mer, as it is often called,—another of its names being the Sea-cucumber,—is a rather repulsive looking animal, being a kind

of Sea-slug belonging to the genus *Holothuria*. There are several species. The ordinary kind which is used for food (*Holothuria edulis*) resembles somewhat a prickly cucumber in size and appearance, except that the colour is a light brown with a yellow belly. Another kind is black. Sometimes they are found nearly two feet in length; but they are generally much smaller, and about eight or ten inches may be taken as the average length. The Trepang, when prepared for market, is an ugly-looking brown-coloured substance, very hard and rigid, and can be eaten only after being softened by water and a lengthened process of cooking, when it is reduced to a sort of thick soup by the Chinese, who are very fond of it; and when cooked by a Chinaman who understands the art it makes an excellent dish, which the Europeans at Manila regard very highly. The preparation of the Trepang for market is simple. They are boiled in water, either salt or fresh, for about twenty minutes, and then slit open, cleaned, and dried. Those dried in the open air or sunshine bring a higher price than those dried over a wood fire, which latter is the usual process adopted by the Malays. Some varieties require boiling for only a few minutes, or till they become firm to the touch. They must be dried thoroughly, as they absorb moisture readily, and are then liable to become mouldy and spoil. No one has yet attempted this fishing in the North Pacific, although Trepangs abound in the waters along the north-western coast of America, particularly in the region of the Queen Charlotte Islands and the Alexander Islands of Alaska, as well as on the west coast of Vancouver Island. Some time ago an Indian brought me two good specimens, which he had caught at low tide near the end of the Mill Wharf at Point Hudson. I showed them to several Chinamen, who at once pronounced them to be the best quality of "Whetong," one of the Chinese names for the Trepang. When properly cured they are a valuable food product, and will sell in Canton for about forty-five dollars per ton. This indicates that there may be a deal of money in the business, if rightly conducted, as a cargo of a hundred tons could easily be cured at some places in a few months with a sufficient force of Indians to collect them. The cost is simply to gather the Trepangs at low tide, or have the Indians to do so, and then have them properly dried, which is an easy process, though one requiring some care and skill. A few inexpensive experiments will enable one to ascertain the correct way of preparing these slugs, which will be likely to find a ready and lucrative sale to the Chinese merchants.—J. G. SWAN (Port Townsend, Washington).—*From the 'Bulletin of the United States Fish Commission' for 1886, p. 333 (1887).*

ERRATUM.—At page 392 of 'The Zoologist' for September, the specific name for the Common Toad is inadvertently given as *calamita*. It should of course be *vulgaris*, *Bufo calamita* being the Natterjack.

SCIENTIFIC SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.

October 5, 1887.—Dr. SHARP, President, in the chair.

Mr. Jacoby exhibited a specimen of *Aphthonoides Beccarii*, Jac., a species of *Haltica* having a long spine on the posterior femora. He also exhibited a specimen of *Rhagiosoma madagascariensis*, and remarked that it had the appearance of a Longicorn.

Mr. Stevens exhibited a very dark specimen of *Crambus perlellus* from the Hebrides, which its captor supposed to be a new species.

Mr. Porritt remarked that this brown form of *Crambus perlellus* occurred at Hartlepool with the ordinary typical form of the species, and was there regarded as only a variety of it.

Mr. Slater exhibited a specimen of *Gonepteryx Cleopatra*, which was stated to have been taken in the North of Scotland.

Mr. Jenner Weir remarked that although the genus *Rhamnus*—to which the food-plant of the species belonged—was not a native of Scotland, some species had been introduced, and were cultivated in gardens.

Mr. South exhibited an interesting series of about 150 specimens of *Boarmia repandata*, bred in 1876, and during the present year, from larvæ collected on bilberry in the neighbourhood of Lynmouth, North Devon, including strongly marked examples of the typical form, extreme forms of the var. *conversaria*, Hüb., a form intermediate between the type and the variety last named, and examples of the var. *destrigaria*, Steph. Mr. South said that an examination of the entire series would show that the extreme forms were connected with the type by intermediate forms and their aberrations.

Mr. Poulton exhibited young larvæ of *Apatura Iris*, from the New Forest; also eight young larvæ of *Sphinx convolvuli* reared from ova laid on the 29th August last by a specimen captured by Mr. Poda in South Devon. Mr. Poulton said the life-history of the species was of extreme interest, throwing much light upon that of *Sphinx ligustri*, as well as upon difficult points in the ontogeny of the species of the allied genera *Acherontia* and *Smerinthus*.

Mr. Stainton commented on the interesting nature of the exhibition, and said he was not aware that the larvæ of *Sphinx convolvuli* had ever before been seen in this country in their early stages.

Mr. M'Lachlan remarked that females of this species captured on former occasions, when the insect had been unusually abundant, had been found upon dissection to have the ovaries aborted.

Mr. R. W. Lloyd exhibited two specimens of *Elater pomonæ*, and one of *Mesosa nubila*, recently taken in the New Forest.

Mr. Porritt exhibited a series of melanic varieties of *Diurnea fagella*, from Huddersfield, and stated that the typical pale form of the species had almost disappeared from that neighbourhood.

Mr. Goss exhibited, for Mr. J. Brown, of Cambridge, a number of puparia of *Cecidomyia destructor* (Hessian Fly), received by the latter from various places in Cambridgeshire, Norfolk, Suffolk, and Wiltshire. He also exhibited a living larva of *Cephus pygmaeus*, Lat. (the Corn Sawfly), which had been sent to Mr. Brown from Swaffham Prior, Cambridgeshire, where, as well as in Burwell Fen, it was stated to have been doing considerable damage to wheat crops.

Mr. Verrall, in reply to a question by Mr. Enock, said he believed that the Hessian Fly was not a recent introduction in Great Britain, but had been here probably for a great number of years. In reply to a further question, he admitted that he was unable to refer to any but recent records of its capture.

Prof. Riley said he was unable to agree with Mr. Verrall, and was of opinion that the Hessian Fly had been recently introduced into this country. Its presence here had not been recorded by Sir Joseph Banks, by Curtis (who paid great attention to farm insects), by Prof. Westwood, by the late Mr. Kirby, or by any other entomologist in this country who had given especial attention to Economic Entomology. It seemed highly improbable, if this insect had been here so many years, that its presence should have so long remained undetected both by entomologists and agriculturists. It had been stated that the insect was introduced into America by the Hessian troops in 1777, but this was impossible, as its existence at that date was unknown in Hesse.

Mr. M'Lachlan, Mr. Elwes, Mr. Verrall, Mr. Jacoby, and Dr. Sharp continued the discussion.

Mr. James Edwards communicated the second and concluding part of his "Synopsis of British *Homoptera-Cicadina*."

Prof. Westwood contributed "Notes on the life-history of various species of the Neuropterous genus *Ascalaphus*."

Mr. Elwes read a paper "On the Butterflies of the Pyrenees," and exhibited a large number of species which he had recently collected there.

Mr. M'Lachlan said he spent some weeks in the Pyrenees in 1886, and was able to confirm Mr. Elwes' statements as to the abundance of butterflies. He remarked on the occurrence of Spanish forms in the district, and on the absence, as a rule, of the peat-bogs so common in the Swiss Alps. The discussion was continued by Mr. Distant, Mr. White, Dr. Sharp, and others.—H. Goss, *Hon. Secretary*.

NOTICES OF NEW BOOKS.

The Mammoth and the Flood: an attempt to confront the theory of Uniformity with the facts of recent Geology. By HENRY H. HOWORTH, M.P., F.S.A., &c. 8vo, pp. 464. London: Sampson Low & Co. 1887.

MR. HOWORTH'S lately-published volume, while dealing with exceptionally curious facts, and dealing with them, moreover, fairly on their merits, will be regarded by many as an unorthodox book. In it we find the so-called Mosaic cosmogony referred to as "a collection of Babylonian legends," and Lyell's theory of Uniformity is regarded as an unverified hypothesis which fails to account for the extinction of the Mammoth and the animals which perished with it. But perhaps the most remarkable feature of the work is the evident desire on the part of the writer to "throw cold water" on the Glacial Epoch, and to substitute for the "action of ice" the almost equally powerful "action of gigantic floods," not caused by deluges of rain, but (if we may generalise from the author's conclusions at p. 354 with respect to the Pampas of South America) by the sudden elevation of vast mountain ranges.

A large portion of the book is occupied with an overwhelming array of facts relating to the condition in which the remains of the Mammoth and other monster mammals have been found. Some of these facts are very remarkable. The Mammoth appears to have been a resident in the forests of Siberia and Europe north of the Pyrenees, in an age when pine trees grew on the shores of the Arctic Ocean, and the climate was much milder than it is now. It lived contemporaneously with the mammals now inhabiting those regions, and with others which like it have become extinct, such as the Rhinoceros and Hippopotamus. It was not destroyed by man, nor by beasts of prey, but by a deluge which overwhelmed it and its contemporaries with mud, and which was accompanied by sudden cold, which in some cases froze the carcasses before they had time to decompose. During the thousands of years which have elapsed since this catastrophe, the frost has never been relaxed in the high north. Surface-thaws take place every

summer, but beneath this the frost has been uninterrupted. This catastrophe not only destroyed the Mammoth, but it also overwhelmed Palæolithic Man. Between the remains of the Mammoth, the Rhinoceros, and the rough flint implements of contemporary man, and the finely-cut flints of Neolithic Man which are found with remains of rude pottery and the bones of *Bos primigenius*, there is a great hiatus. The Old Stone Age did not gradually pass into the New Stone Age by insensible degrees, but there is abundant evidence that in these latitudes the earlier races of man were exterminated by a catastrophe, and thousands of years afterwards Northern Europe and Siberia were peopled by a new race of men who had attained a considerably higher degree of civilisation when they emigrated thither than were possessed by the race of men which lived there ages before.

In North America the Mammoth ranged across Alaska to the Mackenzie River, and its remains are found under precisely the same conditions as those of the Old World, except that there is a considerable difference in the animals with which it is associated.

But the evidence of a great deluge is by no means confined to the northern hemisphere. The Mastodon and the Giant Sloth of South America tell precisely the same story as the Mammoth and Rhinoceros of Siberia. "The whole area of the Pampas is one wide sepulchre for these extinct animals" (Darwin, 'Voyage of the Beagle,' iii. p. 155). According to d'Orbigny (quoted on p. 352), "It would seem that the cause which destroyed the terrestrial animals of South America is to be found in great dislocations of the ground, occasioned by the upheaval of the Cordilleras; otherwise it is difficult to understand on the one hand the sudden and fortuitous destruction of the great animals which inhabited the American continent, and on the other the vast deposit of Pampas mud."

Unfortunately Mr. Howorth stops short at the most interesting point—the bearing of all this evidence on the theory of one or more glacial epochs, exactly as the first volume of a novel leaves the hero at the most critical period of his history. We must not, however, complain, inasmuch as we are promised a second volume, in which will be discussed the purely geological side of the argument. All we can do at present therefore is to

anticipate his conclusions, and accept or refute them as the case may be.

The Andes and the Himalayas are the highest mountains in the world, and therefore are presumably the most recent. Their sudden upheaval may almost have shaken the world, if not to its centre, at least to its circumference, and may have caused the catastrophe handed down to us in the legends of every nation as the "Great Flood." This deluge may have destroyed the monster mammals which became extinct at the end of the Pleistocene Age, and may have nearly exterminated Palæolithic Man; but there may, and there must have been, a Post-Pliocene, and probably a Præ-Pliocene, Glacial Epoch before the Flood. To say nothing of the impossibility of accounting for the present geographical distribution of mammals and birds, ~~or~~ any other theory, the distribution of human remains demands a Glacial Epoch as well as a Great Deluge. If the latter destroyed Palæolithic Man, what becomes of the overwhelming evidence in support of the theory that at least nine-tenths of the Palæolithic flint implements are Post-Glacial? The evidence clearly points to the fact that Palæolithic Man lived for the most part after the Post-Pliocene Glacial Epoch, and before the Pleistocene Deluge, a period which may have lasted forty thousand years. on/

Mr. Howorth's most interesting and instructive book shows pretty conclusively that the uniformity of geological events has been now and again broken by catastrophes of enormous magnitude, and to this extent the evidence which he has collected is valuable. But philosophers are prone to jump from one extreme to the other, and Mr. Howorth is apparently no exception to the rule. If the disciples of Lyell have erred in carrying too far the theory of Uniformity, and have tried to twist every fact in conformity with it, Mr. Howorth errs in not carrying it far enough, and would have us account for everything by his theory of a catastrophe. We willingly accept his theory of a Great Deluge, but we cannot forego our belief in Glacial Epochs. The evidence of the one is as indelibly imprinted on the universe as that of the other, and, unless he can bring forward in his promised second volume some facts which are inconsistent with this belief, we must continue to place credence in both.





West, Newman & Co. imp.

The Common Mole. *Talpa Europaea*.

J. Hutchinson, lith.



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THE MOLE, *TALPA EUROPÆA* (LINN).

BY THE EDITOR.

PLATE VI.

At the present day, when such close attention is paid to details of structure as a guide to the classification of animals, and when in the case of the Mammalia the form of the skull and the dentition are so strongly relied upon to distinguish the several orders in that class of Vertebrates, it is amusing to find that nearly 300 years ago the peculiar dentition of the insectivorous Mole had already attracted the attention of English naturalists.

The Rev. Edward Topsel, Chaplain of St. Botolph's, Aldersgate, in his curious 'Historie of Four-footed Beastes,' published in 1607, quaintly remarks:—

“I do utterly dissent from all them that holde opinion that the Mole, or Want, is of the kinde of Myse, for that all of them in generall, both one and other, have two large crooked fore-teeth, which is not in Moles, and therefore wanting those as the inseparable propriety of kind, we will take it for graunted that it pertaineth not to that ranke or order of four-footed beastes.” (p. 499).

He clearly perceived a difference between the long-curved incisors of the Rodentia, or gnawing animals, and the short, sharp front teeth of the Insectivora, although he failed to express it scientifically.

The distinction, however, to which he alluded is one which at
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the present day is still obviously characteristic, and indicative of the creature's mode of life. Indeed, we have only to examine a Mole attentively to see how admirably its structure is adapted to its habits.

Spending most of its time underground as it does, in tunnels of its own construction, we note first that the cylindrical form of its body must facilitate progress in its burrows; secondly, that the ears having no external conch, are not liable to be filled with the crumbling soil which is displaced as it works its way underground; thirdly, that the fur, being inserted perpendicularly to the surface of the skin, will lie in any direction, and does not prevent a retrograde movement in the tunnel, should a retreat in that direction become necessary; fourthly, that the forelimbs, short, broad, and spade-shaped, are admirably suited for digging; and fifthly, that the prehensile snout and long jaws, set with sharp teeth, are adapted for seizing, holding, and masticating the earthworms and insect larvæ upon which it chiefly preys.

Keeness of sight not being required in the darkness of its underground chambers, that sense is reduced to a minimum of development; but contrary to popular belief the animal is not blind, although the eyes are very minute, and completely buried in the fur which surrounds them. The sense of smell, on the other hand, is believed to be well developed, to enable the detection of its food, its enemies, and its own kind. The sense of hearing, too, is very keen; it takes alarm at the slightest sound, and will not come forth until all is still again. The Mole is not mute as many people imagine, but, especially when alarmed, can utter a loud and shrill squeak.*

Everyone knows, generally, that the Mole spends most of its time underground; that it forms "runs" or "galleries" on a more or less definite plan; with a chamber or cavity to live in, and another for the reception of its young.

These facts which have been described in detail by the French naturalists, Le Court and Geoffroy St. Hilaire, will be familiar to readers of Bell's 'British Quadrupeds,' in which work will be found (p. 122, 2nd ed.) a plan of the Mole's encampment.

It is not my intention to go over the same ground again in

* Zool. 1865, p. 9708, and 'The Field,' 6th May, 1876.

different words, but rather to touch briefly upon such traits in the life-history of the Mole as have been either overlooked by Bell, or have at least received but inadequate treatment.

To deal first with its distribution in the British Islands, it may be observed that in England it is too well known to render necessary any enumeration of counties in which it may be found; it becomes scarcer, however, as we proceed northward, being considered rare in the north of Scotland; while it is absent from the Western Islands, and unknown also in Ireland.

Writing in 1874, Bell observes (pp. 137, 138), "The Mole is not found in the northern extremity of Scotland, nor in the islands of Orkney and Zetland" (*sic*). The late Edward Alston, however, in his notes on the 'Fauna of Scotland,' published in 1880, remarks (p. 9), that the Mole has greatly extended its range of late years, and is now well known throughout the mainland to Sutherlandshire and Caithness.

In Sutherland, in 1843, it was very rare in the parish of Durness, and only to be met with on the western side of Loch Hope ('Old Statistical Account,' p. 88.) In Assynt it is now quite plentiful in low-lying ground and valleys where the surface is cultivated. In some of the pastures great numbers of old mole-hills may be seen overgrown with grass, making the whole surface of the fields rough and uneven. In Sutherlandshire this animal is never found at any considerable elevation, a fact which must be attributed to the nature of the soil, or rather to the want of soil on the hill sides, for in other localities the Mole ascends mountains to a great height.*

The Irish naturalist, Thompson, observed burrows of the Mole at Aberarder, about sixteen miles from Inverness; and the late Thomas Edward, of Banff, asserted that, although it used to be very rare in Banffshire, it has of late years become more numerous there. During the past autumn, while staying in Elginshire (near Carron), I came upon a Mole one day, travelling above ground on the edge of a turnip field, close to a plantation,

* Alston & Harvie Brown, "On the Mammals of Sutherlandshire," Proc. Nat. Hist. Soc. Glasgow, 1875. In the winter of 1863 newly made casts of the Mole were observed on the top of Ingleborough, which is the highest hill but one in Yorkshire. Zool. 1872, p. 3183. Mr. Cordeaux also has noticed the presence of Moles on the highest point of the Lincolnshire North Wolds, Zool. 1868, p. 1186.

and was rather surprised to remark the rapid progress which it was able to make by means of its hind feet. I should have liked to observe it longer, but our setters were "standing" a little way on in the roots, and my observations were cut short by having to walk up to the "point." So the Mole was hastily transferred to my pocket, and was subsequently skinned and preserved for the sake of the northern locality in which it was found. It is now in the Natural History Museum, South Kensington.

In Lanarkshire, in 1867, the Mole was reported to be common in spite of constant persecution (Alston, Zool. 1867, p. 668). Thirty-six years ago it was said to be spreading rapidly in West Argyllshire (New Stat. Acc. Argyll, pp. 380, 439); and in Mull it is reported to have been accidentally introduced in a boat-load of earth from Morven, early in the last century; but it appears to be unknown in the rest of the Scottish islands.

With regard to the distribution of the Mole in Wales I have little or no information. I have noted its occurrence in Monmouthshire, and Carnarvonshire; and Thompson, commenting upon its absence from Ireland, has noticed its existence in Anglesea. He says:—

"It is singular, when entering Scotland and Wales at the nearest ports to Ireland, to see Mole-hills in both those countries almost as soon as we land. They are very numerous along the coast of Ayrshire, just opposite Antrim; and I have remarked them close to the roadside in Anglesea, near to Holyhead, which I mention on account of the western position."

As a rule, perhaps, it may be asserted that the Mole is partial to light soils, which are easily worked, such as old pasture, park lands, warrens, and downs. Mr. Roberts, of Lofthouse, Wakefield, has remarked (Zool. 1872, p. 3183), "they are generally most numerous in light soils which have been manured, but I have seen them in barren lands, on clay soils, and on hills."

Whether the Mole is injurious or not, from an agriculturist's point of view, is a question upon which, probably, there will always be a difference of opinion. Many farmers will tell you that Mole-hills are not only very unsightly, but that they prevent the mowing grass from being properly cut. They apparently

* Nat. Hist. Ireland, vol. iv. p. 4.

overlook the fact, that if the hillocks were knocked about in the spring, and the fine soil of which they are composed were spread over the surface, they would have an excellent and inexpensive top-dressing for their fields. Another recommendation lies in the system of surface drainage, which is effected by the Mole's "runs;" while a third, and perhaps the most important consideration, is the fact that the Mole preys not only upon earth-worms, but also upon the larvæ of many coleopterous and dipterous insects, which are very destructive to the roots of grasses and other field crops. On this account, if on no other, it surely deserves protection. The late Mr. Henry Reeks, of Thruxton, near Andover, who was a practical farmer as well as a good naturalist, was strongly in favour of sparing the Moles upon agricultural land.*

In connection with this part of the subject, it may be of interest to mention here the earliest notice of the Mole which I remember to have met with. It is to be found in the Roll of John Kelyng, Clerk of the works to Dudley, Bishop of Auckland (A.D. 1476—83), wherein the following entry occurs:— "1480—1.—Paid to Henry Newton for spreading Molehills, 8d." So it would seem that the practice is of some antiquity. The fact of its preying on worms, too, has long been known. Sylvester, in his translation of Du Bartas, 'Divine Weekes and Workes,' printed in 1605, makes the following allusion to it:—

" Even as the soft blind mine-inventing Moule
In velvet robes under the earth doth roule,
Refusing light and little ayre receives,
And *hunting wormes* her moving hillock heaves."

The quantity of worms which a Mole will consume in a day must be very considerable. Under date December 12th, W. Thompson writes: "I examined the stomach of a Mole, and found it entirely filled with earthworms. One or two, which were quite perfect, were of the short, thick species, with the yellow band round the body.† These must have been swallowed whole, as an Italian would eat maccaroni.

The late Edward Alston, who kept a Mole for some time in confinement, was quite surprised at its voracity. "The

* 'Zoologist,' 1872, pp. 3181—2.

† Nat. Hist. Ireland, vol. iv. p. 4.

quantity of food, he says, which it would eat in one day was astonishing; more than its own weight I am sure. During the first three days it disposed of three or four dozen earthworms, a large frog, a quantity of raw beef, the body of one turkey-pout, and part of a second, and one or two black slugs.*

In its eager pursuit of earthworms, the Mole has been observed to follow them above ground (Zool. 1883, p. 76), and on wet and dewy evenings, to hunt above ground, like a dog, for worms or slugs (Zool. 1872, p. 3182).

A mole-catcher informed Mr. Jesse, that previous to the setting in of winter, the Mole prepares a sort of basin in a bed of clay, which will hold about a quart, and in this it deposits a quantity of worms, partly mutilated to prevent their escape. On these worms the moles feed during the winter months. The mole-catcher added, that when he found few of these basins in autumn, he knew the winter would be a mild one.†

Another view, however, has been expressed with regard to those "stores," namely, that they are made as provision for the young which are born in March or April.‡ The observer examined "a round cavity, the sides of which were beaten hard by the Mole, so as to prevent the worms from attempting to pierce their way. Inside this there was nearly a quart of fine worms, quite free from any admixture of soil, each worm apparently tied up in a coil or knot, yet all alive."

There is no direct evidence to show that these were intended as provision for the young, which would probably be suckled by the parent until able to shift for themselves. It is more likely that they were intended for a winter store, to which the Mole can resort when the ground is too hard for tunnelling. It seems doubtful, however, whether the worms could live long in such a condition, for if unable to make their escape they would themselves die for want of nourishment.

According to Bell (p. 183) the period of gestation "is supposed to be about two months or upwards;" but Jesse states that the female goes a month with young, and has never more than six or less than two at a birth. The nest, which is formed by

* 'Zoologist,' 1865, p. 9707.

† Jesse's 'Gleanings in Nat. Hist.,' 2nd ser., p. 26.

‡ 'Zoologist,' 1875, p. 4493.

excavating and enlarging the point of intersection of three or four passages, is generally lined with dry grass or dead leaves, sometimes with moss, and even fur.

The young ones begin to run in about five weeks, when they are about three parts grown. They follow their mother for some time.

Contrary to what might be expected from the nature of their haunts, Moles are fond of water. The one which Mr. Alston kept in confinement (*ut supra*) was supplied with a vessel of water sunk in the gravel, and drank frequently. Sometimes it was seen to run through the water and splash about in it.

More than this, Moles have been observed to swim well and voluntarily. They will not only cross ditches of running water and still pools ('The Field,' 24th June, 1876), but have been found boldly swimming across rivers, such as the Taw in Devonshire (Zool. 1860, p. 7169), and the Greta in Yorkshire ('The Field,' 4th Sept., 1880).

The Mole has other enemies besides man, amongst which may be reckoned Weasels, Owls, and Buzzards.

It was long ago remarked by Gilbert White (in his 40th letter to Pennant), that "Weasels prey on Moles, as appears by their being sometimes caught in Mole-traps." This of itself would not be conclusive, as the Weasels thus caught might have been in pursuit of Field Mice, which often make use of the Moles' runs; but two or three instances have been recorded in which Weasels have been seen carrying dead Moles in their mouths.* That Owls occasionally prey upon Moles (that is, probably, when they can catch them above ground), is proved by an examination of their "pellets" or "castings." Upon scrutinising 210 pellets rejected by the Tawny Owl, Dr. Altum discovered (besides Rats, Mice, Voles, Shrews and small birds) the remains of forty-eight Moles.

The Common Buzzard is a capital Mole-catcher, and in the vicinity of Mole-hills will take up a position on some tree, and watch until it sees a Mole working near the surface, when it will instantly drop down and seize it. In this way (*i.e.* by watching and jumping down) Buzzards destroy numbers

* 'The Field,' 9th July, 1881, and 1st May, 1886. Reprinted in 'The Zoologist,' for February last, p. 68.

of rats and other vermin, for which good service they deserve to be protected, instead of being shot and trapped at every opportunity.

The colour of the Mole's fur is subject to some variety, and more frequently than many people seem to suppose.

Looking through the pages of 'The Zoologist' for the last twenty years, we find the following varieties reported from time to time:—Light umber-brown (1865, p. 9645); orange (1877, p. 225; 1878, pp. 22, 128); apricot (1822, p. 351); amber-colour (1884, p. 271); buff (1885, p. 214); cream-colour, 1862, p. 7879; 1865, p. 9645; 1868, p. 1186; 1869, p. 1926; 1871, p. 2782; 1873, p. 8448; 1882, pp. 187, 263); and albino (1867, p. 702; 1868, p. 1096). Three albino Moles were captured last year in Nidderdale ('Naturalist,' 1886, p. 36). Pied varieties are the most uncommon of all. A piebald specimen caught near Falmouth, is mentioned by Mr. Cocks, in his account of the Fauna of that district. White, with red throat, and black and white varieties, are noticed by Turton, in the Appendix to his 'British Fauna,' and by Dillwyn, in his 'Fauna of Swansea.' Perhaps the most curious variety yet reported, was one with a white head, the rest of the body being of the ordinary colour. This singular specimen was caught in October, 1880, upon the Dysart estate, belonging to the Earl of Rosslyn, in Fifeshire.

In the accompanying illustration, Mr. G. E. Lodge, drawing from Nature, has happily caught the attitude of a Mole when brought to bay, with head thrown back and open jaws, "snarling."

WILD WHITE CATTLE IN SOUTH-WESTERN SCOTLAND.

BY ROBERT SERVICE.

The Report on the existing herds of Wild Cattle in the November 'Zoologist,' prompts me to offer the following disjointed remarks on three of the herds of the same breed, formerly existing in South-western Scotland. The latest surviving herd was the one kept in Cally Deer Park, in Kirkcudbrightshire. I have no precise information as to its number,

some of the old people to whom I applied giving it as about a score, while others have put it at nearly twice that figure. John McDiarmid, describing Cally Park ('Sketches from Nature,' 1830, p. 353), speaks of "inclosures peopled with numerous flocks of red and fallow deer, and a race of cattle that is nearly extinct—the wild or ancient kine of Scotland—cream all over, save the nose and ears, which, in each specimen, are as black as jet." McDiarmid, in the 'Dumfries Courier,' for September 25th, 1883, when describing another visit to Cally, again alludes to these cattle, stating that they were then in a separate walled enclosure. And in reviewing 'Low's Illustrations of the Breeds of the Domestic Animals of the British Islands,' in the same newspaper, on March 4th, 1840, a writer, who, there is not the least doubt, was McDiarmid himself, says:—"Mr. Murray, of Broughton, has also a few in the magnificent grounds around Cally House, which, judging from recollection, correspond exactly with the plate given. Some years ago, when there was a shortness of grass for the other cattle, a few Ayrshires were placed amongst the wild or white breed; and when spring came round it was found that the calves of the latter were variously streaked, and as regards colour had lost most of their distinctive qualities. This phenomenon we chanced to witness, and were powerfully reminded by so unlooked for a circumstance, of the uses to which Jacob, in patriarchal times, turned his peeled wands. Mr. Low himself mentions the dispersal of white cattle at Drumlanrig Castle, and we have often heard that when they became located in the neighbouring country, precisely the same effects were produced." As regards the origin of the Cally herd, Dr. Murray says ('New Statistical Account,' Girthon Parish, 1844, p. 298):—"There is a deer park, nearly a mile square, within less than a mile of Cally, on the south. In addition to herds of deer, it contains a few of the ancient Caledonian breed of cattle, procured from the stock of the Duke of Hamilton." Alexander Murray, of Broughton, the proprietor of Cally, died in 1845, and in the following year most of the deer were sold, the wild cattle being disposed of at same time. What became of them I am unaware in the meantime.

The following interesting letter, transcribed from an old file of the 'Dumfries Courier,' refers to the Ardrossan herd. So little can now be gleaned respecting these extinct herds that any

information, however fragmentary it may be, is of interest and value :—

“ *To the Editor of the ‘ Dumfries and Galloway Courier.’*—Sir,—It will perhaps amuse some of your readers to see a short account of the present state of the wild cattle that used to range the Caledonian forests, and the mode of hunting, or rather of shooting them. Those I allude to are in the parks of Ardrossan, Ayrshire, under the protection of the Earl of Eglinton. The original, I am told, were two quey, and one bull, calves, of two months old, brought from Auchencruive, about twenty years ago, and said to be so vicious that, when tied on the cart, they bit whatever came near them. They seem different from those that were at Drumlanrig, and extirpated for more profitable stock, by William, Duke of Queensberry, about forty years ago, for the Duke’s were all horned, with black tips ; whilst those at Ardrossan are all without horns, and seem much larger. A cow shot here, some weeks ago, weighed of beef 20 stone 3 lbs. (30 stone 4½ lbs. Dumfries weight), and some bulls weighed 32 stones ; they are well shaped, broad before, and full in the ham, and would in Galloway be called handsome ; they are all white, with brown ears : they herd by themselves, though other black cattle be in the field. When undisturbed I got within a good pistol-shot of them ; then they scampered off at a gallop, but not very far, and stood in seemingly a composed state. They drop their calves at various times of the year, which does not betoken them in the wildest state ; but here they have abundance of good food at all seasons, which may produce this variation from other wild animals. Some weeks ago there were three bulls, eight cows, and three calves. When the calves drop in winter, or early in spring, they sometimes die from the severity of the weather ; and it is observed that during winter they lose flesh more than other cattle in the same fields, with the same advantage of hay. It is thought that the cows have little milk, for they show no udder, and the calves will offer to eat hay at ten days old. Last year three of them died suddenly of an infectious disease thought to be black-leg, though I could not learn that this disorder was at all observed among other cattle in the neighbourhood. Yesterday was fixed for taking two bulls ; seven greyhounds were on the ground, but the mode adopted was the old herd, mounted on a hunter, almost his contemporary, pushed into the flock, and separated the intended victim, who galloped off, the herd pursuing, till he got among the gamekeepers, who stood separately at convenient distances ; they fired at him as he came nigh ; he received three shots in the head without bringing him down ; the fourth bullet hit in the centre of his forehead so effectually that I saw him drop before I heard the report, though I was little more than a gunshot from the place. The second bull was still more difficult to overcome, though only two years old ; he received six shots at distant intervals, leapt through a hole in a wall, which to appearance was

impracticable, and after all was mastered with considerable difficulty and some danger. The first bull, 4 years old, weighed after being bled, 11 cwt. 24 lbs.; the second, 2 years old, 8 cwt. 8 lbs. The first, beef, 28 stone; tallow, 1 stone 7 lb.; hide. Second, beef, 24 stone; tallow, 1 stone 4 lb.; hide; 24 ounces to the pound. The first, length from nose to tail, 13 feet; girth behind fore legs, 7 ft. 2 inches. Second, length from nose to tail, 11 ft. 8 in.; girth behind forelegs, 6 ft. 6 in.—I am, Sir, yours, &c. (Signed) J. G. CAIRNINSES." (Dated 11th Oct. 1817).

The signature has every appearance of being a pseudonym, and it is almost hopeless to find out the real name of the writer at this distance of time; but at all events we have these minute details, from an eye-witness, of the Ardrossan herd.

It might be inferred from his remark about the Drumlanrig herd, that "Cairninses" had seen it also. Pennant has left us an account ('Tour in Scotland,' ii. p. 124) of the appearance of the Drumlanrig cattle when he saw them about 1770. Gilpin has also put on record some of their peculiarities from personal observation. These two authors differ in the colours they assign to the orbits, ears, and muzzles, Pennant making these parts black, while Gilpin says they were a dark brown, approaching to black. It is believed that this herd was disposed of some time between 1770 and 1780, but where it was sent to remains a mystery. The late Dr. C. Ramage states ('Drumlanrig and the Douglasses,' 1876, p. 26):—"There is a tradition that about a hundred years ago the whole stock was sold, and driven off *en masse* to Chillingham, the seat of the Earl of Tankerville, in Northumberland, *via* Durisdeer, and the Wald-path, and as they were rather an unruly drove, they were accompanied to the confines of the county by almost all the men and dogs in the surrounding district." Dr. Ramage made enquiries at Chillingham, but was informed by Mr. Jacob Wilson that no record or tradition existed of any such addition to the Chillingham herd. Several versions of this tradition, all substantially the same, exist in Nithsdale to the effect narrated by Dr. Ramage. From the route said to have been taken, the herd was much more likely to have been going to Cadzow rather than Chillingham. There has been a suggestion (Zool. 1878, p. 275) of a "reintroduction" at Hamilton Palace, and if such a surmise is well founded the Drumlanrig cattle may have been taken there after all.

NOTES ON THE ORNITHOLOGY OF NORTHAMPTONSHIRE
AND NEIGHBOURHOOD.

BY THE RIGHT. HON. LORD LILFORD.

I RESUME my notes from my last date, April 15th (Zool. 1887, p. 254). The dates concerning migratory species refer, with a few specified exceptions, to the neighbourhood of Lilford, Oundle.

- April 16. Common Sandpiper.
 „ 17. Wryneck and Spotted Flycatcher.
 „ 18. Cuckoo.
 „ 19. Swallow.
 „ 20. House Martin, Nightingale, and Tree Pipit.
 „ 21. Swift.
 „ 23. Curlew.
 „ 25. Sedge Warbler and Redstart.
 „ 26. Whitethroat and Lesser Whitethroat.
 „ 27. Reed Warbler and two Wigeon.
 „ 28. Ring Ouzel, Landrail, and five large Gulls (sp. ?).
 „ 30. Hobby.
 May 1. Turtle Dove (Thrapston).
 „ 3. Wood Warbler, and Pied Flycatcher (Yardley Chase).
 „ 10. Whimbrel.
 „ 24. Red-backed Shrike.

In a letter dated May 5th, Captain J. A. M. Vipan informed me that a Woodcock flew against the telegraph-wires between Stanground and Peterborough, on the 3rd inst., and was picked up alive by a workman. Mr. W. Tomalin, of Northampton, informed me that he had received an authentic report of the nesting of the Pied Flycatcher at Harlestone last year (1886). This is the first notice that I have received of the nesting of this species in our county. Mr. G. Hunt, writing on May 22nd, told me that his gamekeeper's son, in April, came face to face with a small Owl sitting on a low branch of an oak in Bearshank Wood near Wadenhoe, and that this Owl sat bobbing, bowing, and winking at him within a few feet for some minutes. The youth stated that this bird was of "about the size of a Thrush," and made him laugh, but he carefully kept the occurrence to himself for about a month. This bird was without doubt a specimen of

the Little Owl, *Athena noctua*, in all probability one of many that have at various times been turned out in several English counties.

Although it perhaps can hardly be considered as coming legitimately under the head of County Ornithology, I think that it is worthy of record that three Nutcrackers, *Nucifraga caryocatactes*, in the aviary at Lilford, catch and devour many mice that find their way into the compartment allotted to these most amusing birds.

June 25th. Mr. Hunt told me that this morning he saw four Terns (sp. ?) hotly pursuing a Heron.

June 27th. A nest of House Sparrows, containing six purely white eggs, was taken from the wall of the kitchen-garden at Lilford, and brought to me.

A nest of the Redstart, from which five young birds took their departure some time ago, was shown to me in the flower-garden at Lilford in a somewhat unusual situation, about three feet from the ground, in a very dense, clipped, Irish yew.

June 30th. A sudden appearance of very large numbers of House Martins—which species had up to this date been remarkably scarce—about the house at Lilford.

One of the gamekeepers reported having seen two Snipes at a pond near Thorpe on the 29th. In this connection I may mention that being anxious to ascertain the fact, of which I have for many years had my suspicions, of the Snipe's nesting near Lilford, I this year offered a high reward to any of our people who could show the eggs *in situ*; but although I received notice of Snipes being seen at intervals throughout April, and Mr. Hunt reported one as "doing the skimming and soaring business peculiar to the breeding season" on the 29th of that month, and one was seen at our decoy on June 3rd, no nest, nor any sign of one, was discovered, and I am inclined to think that a few Snipes remained through the summer in our neighbourhood without nesting.

July 6th. First report of Green Sandpiper since March last.

July 11th. The falconer reported an "old blue Falcon" as passing within a few yards of him near the house at Lilford. Mr. Hunt, a few days subsequently, told me that he had seen a Falcon, in the plumage above mentioned, on two consecutive days near Aldwinkle, and felt nearly sure that she carried jesses.

July 19th. All beasts and birds are feeling the long drought very severely; one of the gamekeepers assured me that he has this summer lost many Partridge's eggs from the Moles burrowing under the nests and the eggs rolling into the runs of these little beasts, who are hard set for food, and found dead or dying in all directions.

July 27th. A fine old male Hawfinch was caught in a fruit-net in our kitchen-garden; he was so perfect in plumage that I could not make up my mind to cage him, and, careless of green peas and raspberries, set him at liberty. These birds, though now fully established as breeders with us, do not appear to have increased much in number during the last ten or twelve years.

July 28th. The falconer, whom I despatched on an exploring expedition this morning, brought down three young Hobbies from an old Carrion Crow's nest in a tall oak, at a very short distance from that in which he found the nest on the same day of last year (*cf.* Zool. 1886, pp. 468-9).

July 30th. As I sat fishing this morning in a boat on the Nene, at a short distance below Lilford, I noticed a bird coming rapidly up the course of the river towards me at no great height; it approached "straight on end" till within ten yards of us, when it turned off, and showed me that it was a Grebe—neither Dabchick nor Great Crested Grebe. This bird flew round us twice, once within easy gunshot, and was without doubt either an Eared, *Podiceps nigricollis*, or a Slavonian Grebe, *P. auritus* (Linn.). I am inclined to consider that it belonged to the latter species, from its size and the pure white of the whole of the under plumage. The Slavonian Grebe is not very rare in our district in winter, but I have only one, somewhat doubtful, record of the Eared Grebe in Northamptonshire.

August 2nd. Miss M. Stopford brought to me four eggs taken from a Robin's nest at Tichmarsh this year, one of which eggs was of the usual type of coloration; another unusually scanty of markings, which were exceptionally pale in colour; another pure white; and the fourth white with scanty spots of dark brown.

August 5th. We noticed a large raptorial bird soaring at a great height over the meadows near Lilford. I had no glasses, and cannot be quite positive as to species, but have very little hesitation in pronouncing this to have been an Osprey.

August 20th. First report of Grey Wagtail—very exceptionally early for our neighbourhood.

August 26th. About forty large Gulls passing high to S.W.

August 28th. Mr. Hunt reports a string of eighty to one hundred Curlews—or more probably Whimbrels—passing over to S.W. high in air.

September 8th. Professor A. Newton reported having seen a Swift near Thorpe to-day.

Sept. 9th. Mr. Hunt, whilst Partridge shooting on Pilton to-day, fired a long shot at a passing flock of some twelve or fifteen small birds, and brought down one of them, which proved to be a young male of the Pigmy Curlew, *Tringa subarquata*. This is the first appearance of this species in our neighbourhood that has come to my knowledge. Four Teal at Aviary Pond.

Sept. 15th. A Quail was flushed in the same field on Wadenhoe as that recorded in 'The Zoologist' for 1886 (p. 470). These are the only two occurrences of this species (formerly not uncommon) in our neighbourhood that have come to my knowledge for several years past.

Sept. 20th. The first Wigeon of the season seen on our decoy; two on 26th instant.

October 1st. The first Grey Crow of the season reported.

Oct. 2nd. Mr. Hunt reported the first Merlin of the season, but on enquiry from the falconer he declared that he had seen two or three of these little hawks, whilst exercising the young Hobbies during the last ten days, without taking note of first appearance.

Oct. 7th. First report of Golden Plovers near Aldwinkle.

Oct. 10th. First Woodcock of season, seen by Mr. Hunt in his garden at Wadenhoe. With the exception of last year, when I received authentic reports of Woodcocks seen in September, and in all probability bred in the neighbourhood, the present is the earliest record that I can find in journals and Lilford game-books.

Oct. 11th. Two large Gulls seen going southwards. Very cold northerly wind, with heavy driving rain-squalls.

Oct. 12th. A Gull, supposed to be *Larus canus*, found by our shooting party on Tichmarsh, apparently very much exhausted, and only capable of flying short distances.

Oct. 14th. A Water Rail was shot by one of the gamekeepers near Thrapston; two others picked up dead on the railway, and evidently killed by telegraph-wires, were brought to me on Sept. 21st and 28th respectively. This species is by no means rare with us in the autumn and winter, and I only place these occurrences on record, because it appears to me that two at least of these three individuals were evidently on migration. As in the case of the Snipes above mentioned, I this year offered a reward to any one who could find a nest of the Water Rail with eggs in the neighbourhood of Lilford; but in spite of very diligent and intelligent research, in many localities admirably suited to the breeding habits of this species, no nest was found, although an old bird was observed in June.

Oct. 16th. First Fieldfare of season, reported by Mr. Hunt. First report this season of Bramblings; two seen near Achurch.

I may conclude with a few general remarks upon birds about Lilford since our return thither from Bournemouth on 14th June last. I had heard many reports before that date of the scarcity of the *Hirundines* in many parts of England, but there were certainly quite an average number of Swallows about the house from June to October; House Martins, however, were very scarce till the end of June, as above mentioned—since that time rather more abundant than usual. Sand Martins, never very abundant in the immediate neighbourhood of Lilford, appeared sparingly along the river in July.

The Pied Woodpecker was seen and heard during this summer very much more frequently than in any previous year within my recollection. A nest full of nearly fledged young was found, within less than a quarter of a mile from the house, in the third week of June, and another brood was hatched out in our pleasure-grounds about a fortnight afterwards.

Most of our common summer visitors were in about their usual numbers; Spotted Flycatchers and Redstarts perhaps more abundant than usual. We had a wonderful number of Partridges, and our returns of killed during September and October are higher by nearly four hundred brace than in any season as yet recorded. Kestrels and Sparrowhawks were remarkably scarce with us till late in August, when both species appeared in force. I saw a Hobby on two or three occasions near the house in July and August, and heard of several more

in the first fortnight of September. The Green Sandpiper was very unusually scarce with us. The long-continued drought drove all our Blackbirds and Song Thrushes to the spring-heads and river-side, and our snails and slugs had a very bad time. My personal observations are, unhappily, very limited, but our shooting parties reported vast numbers of Sky Larks on the stubbles,—or fields in which stubble ought to be,—and crowds of Finches about our fences.

ON THE OCCURRENCE IN ENGLAND OF THE
CASPIAN TERN.

BY J. H. GURNEY, JUN.

As some uncertainty enshrouds the few recorded examples of *Sterna caspia*, Pallas, which have been killed in England, I send the following corrected version of the list of Norfolk specimens which appeared in the 'Transactions of the Norfolk and Norwich Naturalists' Society.' Some of the information has been gleaned from the correspondence of the late T. C. Heysham, brought to light by the Rev. H. A. Macpherson (*vide antea*, p. 386), a correspondence full of interesting matter, which has now most fortunately fallen into good hands:—

One, Yarmouth, or Breydon Broad, October 4th, 1825. Mag. Nat. Hist. iv. p. 117; Babington's 'Birds of Suffolk,' p. 247.

One, Yarmouth, 1830. 'The Zoologist,' 1856, p. 5035. In the Norwich Museum.

One, Cromer, 1836. A letter to T. C. Heysham, dated Nov. 21st, 1836, lent by the Rev. H. A. Macpherson.

One, Yarmouth, April 16th, 1839. Received in the flesh by my father.

One, Yarmouth, female, June 2nd, 1849. Is, or was, in the possession of Capt. Barber.

One, Yarmouth, male, June, 1850. In the Bury Museum.

One, Yarmouth, July 16th, 1850. My father was informed that others were seen at the same time.

One, Yarmouth, male, August 11th, 1851. Preserved at Northrepps.

One, Yarmouth, male, May 2nd, 1862. Stevenson, Zool. 1862, p. 8093.

This list somewhat augments those previously published (*l. c.* iii. 565; iv. 409), and the particulars are now as correct as it is possible to obtain after the lapse of time which has occurred.

In addition to the occurrences above noted for Norfolk, there are nine more in other parts of England, and one doubtful one. In Scotland and Ireland *Sterna caspia* has not yet been recognised. Its appearance sooner or later in Cornwall, or the Scilly Isles, may be safely predicted, Terns from the Mediterranean being as likely to visit the south coast of England as those from Sylt do the east coast.

One, Aldeburgh, Suffolk, prior to 1835. Jenyns, *Brit. Vert. Animals*, p. 265.

One, Lydd, Kent, prior to 1845. E. P. Thompson, 'Note-book of a Naturalist,' p. 265.

Two, Weymouth, autumn of 1848, *vide* W. Thompson. Mansell-Pleydell's 'Ornithology of Dorset' (1879), p. 52. Mr. Mansell-Pleydell writes that these birds are no longer in existence, having perished with the rest of Mr. Thompson's collection, though in good condition at the time of his death.

One, Caythorpe, Lincolnshire, May 17th, 1853. 'Zoologist,' 1853, p. 3946. This locality is twenty miles from the sea.

One, Christchurch harbour, about 1853. Wise, 'New Forest,' p. 317.

One, Wareham, Dorsetshire, July, 1872. Mansell-Pleydell, 'Ornithology of Dorset' (1879), p. 52.

[One, Birmingham, April 28th, 1874. 'Zoologist,' p. 4036. Doubtful, as it was not shot, and the observer never got within 250 yards.]

One, Filey, Yorks., September, 1874. R. A. Willis, 'The Field,' Nov. 15th, 1879. Preserved by Baker, of Cambridge, and identified by Prof. Newton.

One, Farne Islands, June 6th, 1880. Seen by Mr. E. Bidwell, but not obtained. The red beak of this Tern is conspicuous a long way off, and in Egypt our party easily identified it by this character alone.

We have thus altogether eighteen reported occurrences of this fine Tern in the British Isles, but thirteen years have elapsed since the last specimen was obtained.

NESTING HABITS OF THE HUMMING-BIRD
(*TROCHILUS COLUBRIS*).

BY PROF. WILLIAM MACFARLAND.*

IN his enchanting little volume entitled 'Wake Robin,' John Burroughs says:—"The woods hold not such another gem as the nest of the Humming-bird (*Trochilus colubris*). The finding of one is an event to date from. It is the next best thing to finding an Eagle's nest. I have met with but two, both by chance." Having found three nests, one more than Mr. Burroughs, it is hoped I may be pardoned for feeling somewhat elated over my good luck.

By the side of my house stand two large maples, through the branches of which I noticed a Humming-bird come and go several times. Following her closely, I discovered the nest while she was in the act of feeding the young. This was August 22nd, 1883. The position of the nest was on a pendent limb about fifteen feet above the ground. From an upper window it could be looked into with an opera-glass, and all the details made out. The young were well pin-feathered, but the beaks were quite short. It being my vacation, I spent much time near the nest, where I could frequently see the female, but the male as yet eluded me entirely. The weather was fair until August 26th, when just before noon a cold easterly storm set in, accompanied by high wind. During this storm, which lasted until midnight, the young were entirely unprotected. They lay close in the nest, and seemed lifeless, while the long slender limb, on the lower end of which the nest was placed, swayed several feet in various directions, seemingly making it impossible for anything to remain in the nest.

The next morning the sun shone brightly, and I was gratified to find that the birds had not only not perished, as seemed to be their destiny, but were animated and vigorous. By the last day of August they were fledged, and the beaks were quite mature. They seemed very active, and were now too large for the nest, constantly crowding each other over the edge, on which they would sit or stand a part of the time and exercise themselves by

* From 'The Journal of the Trenton [N. J.] Nat. Hist. Society,' 1887, pp. 55—58.

rapidly vibrating their wings, and by probing the nest with their long beaks, protruding the tongue beyond the mandibles. (This observation was made with a small telescope, through which they appeared larger than English sparrows at arm's length).

On Sept. 3rd one ventured to a limb a few feet away, where it remained until next day, when the other joined it. They made short flights from limb to limb for a few days, when I lost their whereabouts, and did not see them again.

About July 20th, 1884, another female was frequently seen, and was soon detected at nest-building. The site was near the former one, but several feet higher, and less favourably situated for observation.

The outside of this nest was complete when first seen, but the bird worked two days longer, carrying tufts of a white material, and each time alighted with them in the nest. My only position for observation being beneath the tree, I could not see her operations. I soon missed her, and the nest seemed deserted. About a month later, being fully convinced that it was empty, I decided to take it down. Mounting an improvised support, the limb was drawn down, and, by standing on tip-toe, I cut it off just above the nest. To my great surprise it held two young birds but a few days old. They resembled in appearance short downy caterpillars, and were about the size of a honey-bee. The nest was placed near its original position, and the old bird continued her attention. It was not well secured, and soon turned, dropping its occupants to the ground. I readily found one by following the bird to where she fed it, but the other was lost. With some difficulty the claws of the former were loosened from the grass, to which it clung with surprising tenacity, and it was again placed in the nest. This time, however, the nest was not elevated to its former position, but placed on a fir near by, and so low that it could be handled. The mother found it at once, and made no objection to the new situation.

The young bird was soon covered with green glossy feathers; even the ruby throat was well defined and faintly showed its metallic lustre, thus giving positive evidence of the sex. It was very tame, and was well contented to have its back stroked. On approaching the nest it would greet me with a musical, plaintive, piping note, and beg for food in the most appealing manner.

Many visitors saw this unique nest with its superbly-embellished occupant, but not one would leave it until his vocabulary of best adjectives was exhausted. Like those of the previous year, this little fellow, too, suddenly outgrew his home, and sat on its edge, preening his feathers, vibrating his wings, and looking excitedly at the moving leaves and passing birds. He left the nest Sept. 7th.

Early in July, 1885, a third nest was found in process of building in the same tree, but too high for observation except through a glass.

I will trouble you with but one item concerning this nest. A male bird came once and sat near, when the female immediately joined him, remained a minute, and returned to the nest, when the male flew away. During my presence this is the only time that a male bird approached either of the three nests, or was seen at all in the vicinity.

The nests were procured in fair condition, and are alike in construction. The outer covering is of lichens, used only for concealment, since they are but attached to the nest proper by a material resembling cobweb, but less elastic. The real texture of these nests, as identified by undoubted authority, consists of the cottony tufts of willow and dandelion seeds mainly, the willow coma predominating.

Many persons could not see the nests when a few feet away, even though the exact locations were pointed out; hence its perfect concealment may be readily imagined. The diameter of the nest is one inch, and its weight fifteen grains.

NOTES AND QUERIES.

The use of the word "feral."—I desire to protest against the use of a word which, as a scientific adjective, is becoming settled with a sense it has no right whatever to bear, if classical correctness be worth taking into account. This is the word "feral," as signifying that the creature to which it is applied has either escaped from domestic conditions, or represents the wild stock of a domesticated animal. I am the more moved to call attention to it at the present time, because it has just been given a place in the "Ornithologist's Compendium," or Glossary, in Mr. Ridgway's 'Nomenclature of Colours,' &c. A reference to any Latin dictionary will

assure the referrer that "feral" has nothing to do with *ferus*, as Mr. Ridgway supposes. The adjective derived from *ferus* is *ferinus* (Virg. *Æn.* i. 215; xi. 571), and the English form, naturally, "ferine." — H. H. SLATER (Irchester Vicarage, Wellingborough).

MAMMALIA.

The Bank Vole in Sussex.—Observing the scant notice of the occurrence of the Bank Vole in this county (p. 366), I venture to offer the following observations. I am not sure in what year it was, but shortly after this little animal had been described by Yarrell as a new British species under the name of *Arvicola riparia*, I obtained several specimens at Highlands, in the parish of Framfield, where, in an orchard, it was rather plentiful. This was in East Sussex. In West Sussex it is by no means uncommon in my own garden, at Cowfold, near Horsham, where I have often watched it playing around me, sometimes two or three being together; and on one occasion, whilst sitting with a book by the side of a pond near my house, a remarkably red one was for some time sitting on my foot, eating a frond of wood-anemone, part of which it carried into its hole, which I then saw was close at hand. The Bank Vole is very partial to maize, to obtain which from a small trough for feeding wildfowl it does not hesitate to take the water and to dive for the grains; in fact, it seems as much at home in that element as its congener the Water Vole, or the Brown Rat. I have frequently seen it swimming about near the banks of the pond, without any apparent object beyond its own amusement. — WM. BORRER (Cowfold, Sussex).

The Bank Vole in Durham.—I can in some degree supplement the Editor's interesting paper on *Arvicola glareolus*, so far as one county is concerned. When at school at Durham we used to capture most of the wild beasts and birds of the neighbourhood, subject, to a certain extent, to the prejudices of the local gamekeepers. We used to keep domesticated colonies of the smaller rodents in large wooden boxes, with a four-inch sod on the bottoms, in which they burrowed, bred, and were as happy as circumstances permitted. We caught several Bank Voles at different times ("red mice," as we used to call them till we found out the proper name), but they were decidedly rare as compared with the Short-tailed Vole, and I do not remember that we caught more than half-a-dozen altogether. They were caught with cheese, our general bait, and always in hedge-banks. In captivity we could always recognise their voices, which were much more deep-toned than those of their relatives. As to food, we used to give them anything in the vegetable way that came handy, besides bread and milk. We noticed that they had a great fondness for acorns and beech-nuts; they would leave anything for the latter; hazel-nuts they could certainly master without assistance. They were much more amiable than the other species;

if a finger was introduced into a burrow occupied by a Field Vole or Long-tailed Field Mouse it got bitten without hesitation. Shrew Mice never, and Bank Voles seldom, bit, but would scratch when pressed. When outside their burrows none of the species ever tried to bite, and all seemed perfectly friendly with one another. I have caught more than one example of this species in South Northumberland also; but I always found it comparatively rare there.—H. H. SLATER (Irchester Vicarage, Wellingborough).

The Bank Vole in Northamptonshire.—The editorial hint as to the desirability of information regarding the Bank Vole, *Arvicola glareolus* (Schreber) set us at work trapping about Lilford; and I am glad to inform you that the result of our exertions goes to prove, *quantum valeat*, that in our district of Northamptonshire the above-named species is about as common as the Short-tailed, *A. agrestis* (Linn.); in fact both species are very abundant, the former principally frequenting old stone-work, and the cover of shrubs and trees, whilst the latter swarms in our open meadows and pastures.—LILFORD (Bournemouth, Nov. 12th).

Range of the Dormouse in England.—In 'The Zoologist' for 1885 (p. 204), Mr. G. T. Rope referred to a note in which I mentioned the occurrence of the Dormouse in the beech woods on the Chiltern Hills, in Bucks. Since then I have ascertained that these little animals are far more numerous in the nut hedges. Towards the end of October last, a man in this town had a consignment of five dozen, which were caught in the nut rows on Buckland Common, on the borders of this county adjoining Hertfordshire. I purchased a couple from him, the smallest of which had a white tip to its tail.—F. HAYWARD PARROTT (Walton House, Aylesbury).

BIRDS.

Swans with white Cygnets.—In the summer of 1885 a pair of tame Swans, belonging to St. John's College in this University, brought off a brood of cygnets, whereof one, when I saw it, a few days after it was hatched, had the down with which it was covered white, slightly tinged with buff. Its feet were pale, and its bill flesh-coloured. The rest of the brood (four in number, if I remember right) presented the ordinary appearance. I took some interest in this white bird, and, at my request, its life was spared when its brethren met their fate. Its first feathers were white with a decidedly buff tinge, but this gradually disappeared, and in the following spring they were of a pure white all over, while the bill was of a fine orange-pink, and the legs were of a dusky flesh-colour. Hitherto this cygnet had remained with its parents, but as they began to ill treat it, it was removed, and, I believe, given away. Just the same thing happened in the summer of 1886; one bird of the brood was white, while the others

were sooty. This last summer of 1887 two white cygnets were hatched by the same pair of Swans, the other three in the brood being of the usual colour, and I had the pleasure a few days since of showing all five, together with their parents, to Mr. A. D. Bartlett, who told me that he had never known or heard of a similar instance. All these four white birds, I may add, have been perceptibly smaller than their dusky brethren. The feet of the old male Swan are not so fully black as usual, but otherwise there is no variation to be noticed in his appearance or in that of his mate. It will be observed that these white cygnets correspond very closely with those of the so-called "Polish Swan" (see the excellent papers of Mr. Stevenson and Mr. Southwell—the latter in *Trans. Norf. and Norw. Nat. Soc.* ii. pp. 258—260), but I do not now write to express any opinion on that as a supposed species; I may, however, remark that Dr. Plot, in his 'Natural History of Staffordshire' (pp. 228, 229), just about 200 years ago, wrote of certain Swans on the Trent near Rugeley, whose legs were of a bluish red, like those of tame Geese, and also of cygnets white as snow.—ALFRED NEWTON (Magdalene College, Cambridge, November 1, 1887).

Knot on the West Coast of Scotland.—Replying to the enquiry of Mr. A. H. Macpherson (p. 428), I may state that the Knot occurs far from uncommonly in the West of Scotland, though not nearly so abundantly as on the East Coast.—J. A. HARVIE BROWN (Dunipace House, Larbert, N. B.).

Supposed breeding of the Great Northern Diver in the Færoe Islands.—In 'The Zoologist' for September (p. 351) Colonel Feilden alludes to two eggs of the Great Northern Diver from the Færoes (1880) which were sold by auction at Stevens's on April 25th, 1887, and which were purchased by me. I thought some of your readers might have been able to give some information on the subject; but as no mention has been made in either October or November numbers, I should be extremely obliged if I could obtain some particulars respecting these two eggs through your valuable Journal, and hope these lines may catch the eye of the collector who took them.—G. T. PHILLIPS (Wokingham, Berks).

Nesting of Montagu's Harrier in Dorsetshire.—At Winterbourne Kingston, on the 24th June last, whilst a carter in the employ of Mr. E. Besent, was cutting a field of clover with a mowing-machine, he disturbed a large hawk from her nest, which was immediately joined by another equal in size, but of lighter plumage. The sudden apparition of so large a bird frightened the horse, but before the machine reached the nest, the carter descried it. It was on the bare ground, about the size of a man's hat, composed of pieces of straw (grass?) and feathers, and contained four eggs, which were bluish white, with a few indistinct red spots and streaks, and slightly incubated. The pair frequented the field and neighbourhood for some days afterwards. Three were seen in a field of sanfoin a quarter of

a mile from the clover-field before and after the 24th, and during the course of cutting it, in the month of July, the mowing-machine disturbed "a large brown hawk." No nest was found, and Mr. Besent thinks there was one, but destroyed by the machine. Some time afterwards I saw two Harriers on the wing leisurely beating a stubble-field within half a mile of Kingston; they were either birds of the year or females. The neighbouring keepers tell me they have seen the birds during the past summer, which up to the present moment have eluded both gun and trap. The grass in the neighbourhood of the nest was much damaged and trodden down.—J. C. MANSELL-PLYDELL (Whatcombe, Blandford).

[On comparing one of the eggs above mentioned with a series in the Natural History Museum it was evident that it belonged to Montagu's Harrier, *Circus cineraceus*.—ED.]

Breeding of the Tufted Duck in Aberdeenshire.—With reference to Mr. Borrer's communication on this subject (p. 427), I may mention that on the 25th June last I found a Tufted Duck's nest, containing seven fresh eggs, on the margin of the Loch of Park, near Aberdeen. It was placed among *Carices* in a rather marshy spot, and most likely would not have been detected had not the duck flown off as I passed. I took one egg for the sake of the locality, but otherwise left the nest undisturbed, and was glad to see the bird on it again an hour afterwards. The duck, on leaving the nest joined the drake, who was swimming in a piece of open water close by. Several other Tufted Ducks were in view at the same time. Mr. G. Sim, of Aberdeen, to whom I communicated the above facts, informed me that, so far as he was aware, the nest of this species had not previously been discovered in the county. In certain other parts of Scotland with which I am better acquainted it has bred freely for a number of years past, and I have found many nests.—WM. EVANS (18, Morningside Park, Edinburgh).

[On this subject Mr. Harvie Brown writes:—"Of the breeding of the Tufted Duck in Aberdeenshire, since Mr. Jex Long's record (Proc. N. H. Soc. Glasgow, 1880, iv. p. 103), it has become abundant as a breeding species, and also much more widely distributed. I could name many localities in Scotland where it is now quite common."—ED.]

Breeding of the Tufted Duck.—Mr. Borrer's note upon the breeding of the Tufted Duck in Aberdeenshire (p. 427) is incomplete, as he was unluckily rather late in his visit to our mutual friend Mr. Hamilton, of Skene. Had he looked for the ducks early in July, as I did, he would have enjoyed the sight of several fine broods of Tufted ducklings diving actively through the duckweed. At Skene the majority of broods hatch out at the end of June and early in July; and, from what Mr. Whitaker told me, when introducing me to the Rainworth colony last spring, I should imagine that in Nottinghamshire the birds hatch out about the same time

as those in Aberdeenshire. In West Norfolk the Tufted Duck must be an earlier breeder, as the kindness of Lord Walsingham enabled me in May last to examine many nests containing the full complement of eggs, which the keepers stated to be incubated on May 29th. On that date the young of the Gadwall, Shoveller, Mallard, Teal, Pochard, and Wigeon were all hatched out, but the Tufted Ducks were uniformly sitting hard. On the waters of the Lewes Corporation, where the Tufted Duck (pinioned) has bred for many years, occasionally interbreeding also with the Pochard, the season of 1887 brought out forty young Tufted Ducks; but, owing to defective management, only three of the number grew to maturity.—H. A. MACPHERSON (3, Kensington Gardens Square).

Puffin and Whimbrel in Somersetshire.—I was staying with a friend at South Petherton in the middle of October, and the week before he had a Puffin, *Fratereula arctica*, brought to him, which had been picked up in a field close to the village, in an exhausted state; he tried to keep it alive, so as to send it to Weymouth the following day, but it died during the night. I presume it was driven inland by the late storm. Is it not an uncommon occurrence, as South Petherton lies between Ilminster and Crewkerne, and some twenty-five to thirty miles from the sea, in the direction from which the storm came. We have during the breeding season large flocks of Whimbrel, *Numenius phaeopus*, on the moors near here. My supposition is that these birds do not breed until the second year, and that they are last year's birds. Am I right in this?—H. ST. B. GOLDSMITH (Bridgewater).

[We are surprisid to hear of the occurrence of the Whimbrel in Somersetshire *during the breeding season*, having hitherto regarded it as a passing visitor in spring and autumn. Is our correspondent sure that this bird is found on the moors referred to in June? It breeds late, and is commonly to be found on the south and east coasts of England during the first and second weeks of May.—ED.]

Lesser Redpoll and Hawfinch nesting in Berkshire.—On June 10th last I took a nest containing three eggs of the Lesser Redpoll, *Linota rufescens*, near Wokingham; and on May 20th a nest with five eggs of the Hawfinch, *Coccothraustes vulgaris*. As both these species are somewhat local in regard to their breeding haunts, this note may be worth publishing.—G. T. PHILLIPS (Wokingham, Berks).

Glaucous and Iceland Gulls on the Essex Coast.—Through the kindness of my friend Mr. Kerry, of Harwich, I have been able to add to my collection specimens of these two Gulls, both immature; as near as I can judge, the Glaucous is in the second year, and the Iceland in the third year's plumage. The first named was shot by Mr. Kerry in Harwich Harbour on Dec. 25th, 1885, and the Iceland Gull was shot by a smacksman in the Colne, near Brightlingsea, on Jan. 1st, 1887.—C. A. MARRIOTT.

Uncommon Birds near Scarborough.—Early in September several Manx Shearwaters, *Puffinus anglorum*, were obtained near Filey; a Glaucous Gull, *Larus glaucus*, in nearly mature winter plumage, having acquired the light grey mantle, but retaining some of the light ash-brown feathers on the breast, was shot on Scalby Ness; other specimens in immature plumage have occurred along the coast, and are not uncommon in some winters, though I have not known a mature example being obtained for some years. The person who shot the Glaucous Gull also obtained a Little Stint, *Tringa minuta*, about the end of August or beginning of September, near Scalby Ness. This species is rare in this neighbourhood, and the specimen referred to is the fourth that has come to my notice within the last twenty-five years, and Mr. A. Roberts, who was in business as a bird-preserver here for over thirty years, told me he never had one during that time through his hands. On October 3rd I shot an immature Velvet Scoter, *Ædemia fusca*, in Bridlington Bay; all the upper parts of the plumage, with the exception of the bar on the wing and a white patch before and behind the eye, were quite black; under parts dark grey; feet, legs, and bill brownish black. A few days ago I was much amused by observing the extreme fearlessness of a Purple Sandpiper, *Tringa maritima*. I have frequently walked to within half-a-dozen yards of two or three, but on the day in question I tried to take one with my hat by creeping on the sea-weed, and so nearly succeeded that the bird did not take wing until my hand was within half-a-yard of it, when it flew out to sea, but returned again and settled on a rock at a few yards distance.—R. P. HARPER (2, Royal Crescent, Scarborough).

Unusual site for Swallows' Nest.—I have just seen a Swallow's nest in a very unusual position. It is placed on the upper side of a transverse beam running across the porch of a village post-office, and is cup-shaped, like that in the woodcut of the Swallow's nest in a sycamore tree in Yarrell's 'British Birds.' The nest is very conspicuous, standing about seven feet from the ground, and about midway along the beam. The visits of the public to the post-office must greatly have interfered with the domestic arrangements of the old birds. The postmaster tells me, however, that the young were brought up and sent safely into the world. But the nest is a last year's nest, and, as the old birds do not seem to have attempted to return this year, it may be assumed that the discomforts of their first experience were enough for them. The nest may be seen *in situ* at the post-office of Dovers Green, near Reigate.—E. P. LARKEN (Gatton Tower, Reigate).

Late Stay of Martins.—On the 15th of November, whilst driving past Kearnsey Abbey, I and my companion counted five Martins flying about the first reservoir between that place and Dover. The striking feature was

that the banks of the dam were powdered white with snow, and thin pancake ice had formed close to the edges. Waterhens were swimming, and dabchicks diving amongst the thin ice, and above, but skimming close to the water, was this party of Martins. It was an exceptionally cold and wintry day for the time of year, and I quote an extract from 'The Standard' of Nov. 16th:—"A Dover correspondent telegraphed last night: Wintry weather has set in on the coast unusually early, a somewhat heavy snow-storm having been experienced in this district to-day. Snow commenced falling last night, and fell for several hours, continuing at intervals throughout the day. It is several inches deep on the hills, and in some places there is reported to be as much as a foot. The wind is bitterly cold, and the sky is overcast and threatening. The wind blew very heavily last night from the north."—H. W. FEILDEN (Dover).

Iceland Gull in the Moy Estuary.—On November 9th, while passing through one of my fields, I observed an Iceland Gull, in company with a Herring Gull and some Common and Black-headed Gulls, feeding on the worms turned up by the plough. It was very tame and unsuspecting, as I have generally remarked Iceland Gulls to be, very unlike the Glaucous, which is almost as wary as the Great Black-backed species. It frequented the field for some days, and, as I wanted it for comparison, I shot it. It was in very poor condition, and apparently in the first year's plumage, for it is very dark-coloured underneath, similar to a specimen I shot on Dec. 29th, 1877, near the village of Enniscrone.—ROBERT WARREN (Moy View, Ballina, Co. Mayo).

Spotted Redshank in the Moy Estuary.—Early in October I heard the call of a Spotted Redshank, *Totanus fuscus*, and yesterday (Nov. 15th), when out in my punt, I passed quite close to one feeding on the sands, but lost my chance of obtaining the bird through mistaking it for the Common Redshank, not recognising it until it got off, its dark wings and peculiar call then telling what it was. It is very difficult to distinguish this bird from the Common Redshank when feeding or resting on the shore, unless one chances to observe the dark line from the bill to the eye, or is struck by the greater length of the legs. When disturbed it seldom gives the shooter a second chance by realighting, like the Common Redshank, some distance off, but flies right away out of the locality.—ROBERT WARREN (Moy View, Ballina).

ERRATA.—Page 422, line 11, *for* conclusive *read* more conclusive; line 29, *for* durchans *read* durchaus; line 34, *for* Myvator *read* Myvatn; page 423, lines 16, 17, *for* I am unable to say, but should be glad to learn as to the Lagopus collected in the Kurile Islands; examination, &c., *read* I am unable to say, but should be glad to learn; as to the Lagopus collected in the Kurile Islands, examination, &c.

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

November 3, 1887.—WM. CARRUTHERS, F.R.S., President, in the chair. Mr. J. H. Hart, of Trinidad, was elected a Fellow of the Society.

The President called attention to the death-roll since the June meeting, specially deploring the loss of Prof. Julius von Haast, N.Z., Dr. Spencer Baird, U.S., and Prof. Caspary, of Königsberg.

Mr. H. N. Ridley gave an account of his Natural History collections in Fernando Noronha. The group of islands in question is in the S. Atlantic, 194 miles east of Cape San Roque. The largest is about five miles long, and two miles across at broadest part. Although chiefly basaltic, phonolite rocks crop up here and there. The cliffs are steep, but otherwise the soil is fertile; there is an absence of sandy bays on the south side. Generally speaking the specific animal forms differ on the opposite sides of the main island. The indigenous fauna and flora seem to have been much modified, and in some cases extirpated by human agency. Of mammals the Cat is reported to have become feral, and Rats and Mice swarm; Cetacea occasionally frequent the coast. The land birds comprise a species of Dove, a Tyrant, and a Greenlet (*Virio*). Sea-birds are numerous, but by no means so abundant as they were formerly, when the island was first discovered. Among the reptiles were found a species of *Amphisbœna*, a Skink (*Euprepes punctatus*) and a Gecko; Turtles are also frequently seen in the bays. Batrachians and fresh-water fish are entirely absent. One butterfly, a well known Brazilian species, was plentiful; but insects, though abundant, were poor in number of species. Two species of *Trochus* called for remark, as having a southern distribution; the remainder of the marine shells, and indeed most of the marine fauna and flora, show affinities to that of the West Indies.

Afterwards there was shown a Wasp's nest, which had been constructed on a roof-board at Dovercourt.

A report was read on the Pennatulida of the Mergui Archipelago, by Prof. A. Milnes Marshall and Dr. J. Herbert Fowler. The collections made by Dr. John Anderson were from shallow water and mud-flats exposed to spring tides. Of ten species two are new, and there are several varieties not hitherto recorded.—J. MURIE.

 ZOOLOGICAL SOCIETY OF LONDON.

November 14, 1887.—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 from June to October, and called attention to certain

interesting accessions which had been received during that period. Amongst these were specially noted a red and white flying Squirrel (*Pteromys alborufus*), from the province of Szechuen, in the interior of China, presented by Mr. Percy Montgomery, of Ichang, China; and an Urva ichneumon (*Herpestes urva*) and a young male gorilla (*Anthropopithecus gorilla*), being the first gorilla acquired by the Society, obtained by purchase.

A communication was read from Herr W. v. Nathusius, of Königsborn, on a microscopic Acarus (*Symbiotes equi*), a parasite of the horse, causing what is called "greasy-foot," of which he sent specimens for exhibition. The same Acarus was regarded by the author as being the cause of skin diseases in other domestic animals.

The Secretary read a letter addressed to him by Dr. Emin Pacha, dated Wadelai, April 15th, 1887, referring to some communications on Natural History which he was preparing for the Society.

A letter, enclosing photographs, was read from Surgeon-General George Bidie, referring to a case of the breeding of the Elephant in captivity. The usually received date of twenty-one months as the period of gestation was confirmed.

Prof. F. J. Bell made some observations on the "British Marine Area," as proposed to be defined by the Committee of the British Association, and opposed the idea of omitting the Channel Islands therefrom.

Prof. A. Newton exhibited (on behalf of Mr. W. Eagle Clarke) a specimen of Bulwer's Petrel (*Bulweria columbina*), believed to have been picked up dead in Yorkshire.

Mr. H. E. Dresser exhibited (on behalf of Lord Lilford) specimens of a new species of Titmouse, allied to the Marsh Tit (*Parus ater*), obtained by Dr. Guillemard in Cyprus, which he proposed to designate *Parus guillemardi*.

Mr. Boulenger exhibited a living specimen of a rare African batrachian (*Xenopus lavis*), which had been sent to him by Mr. Leslie, of Port Elizabeth, and also gave a description of a new species of *Hyla* from Port Hamilton, Corea, living in the Society's gardens, which he proposed to name *Hyla stepheni*, after its discoverer.

The reptiles, shells, Lepidoptera, and mammals collected by Mr. H. H. Johnston at the Cameroons and the Rio del Rey, were described by Messrs. Boulenger, E. A. Smith, A. G. Butler, and G. E. Dobson respectively.

Prof. Flower exhibited a photograph of Rudolphi's Whale (*Balænoptera borealis*), taken in October in the Thames near Tilbury. This species was formerly regarded as one of the rarest of the Cetacea. A few years since 750 were captured in one season off the coast of Scandinavia; but, after two seasons, the shoals disappeared. Of the geographical distribution of this and other species of Whales much remains to be discovered.

The next meeting of the Society will be held on Tuesday, Dec. 6th.—
P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

November 2, 1887.—Dr. DAVID SHARP, F.Z.S., President, in the chair.

Mr. Stevens exhibited a specimen of *Acidalia immorata*, L., purchased by him some years ago at the sale of the collection of the late Mr. Desvignes. Mr. Stevens remarked that specimens of the insect lately captured near Lewes had been described last month by Mr. J. H. A. Jenner as a species new to Britain.

Mr. Adkin exhibited, and made remarks on, a series of male and female specimens of *Arctia mendica* from Co. Cork; he also exhibited for comparison two specimens of *A. mendica* from Antrim, and a series of bred specimens from the London district. Some of the males from Cork were as white as the typical English females, but the majority of them were intermediate between the form last mentioned and the typical English form of the male.

Mr. Enoch exhibited a specimen of *Calocoris bipunctatus* containing an internal parasitic larva.

Dr. Sharp exhibited three species of Coleoptera new to the British list, viz.:—(1) *Octhebius auriculatus*, Rey, found by Messrs. Champion and Walker some years ago in the Isle of Sheppey, but described only quite recently by M. Rey from specimens found at Calais and Dieppe. (2) *Limnius rivularis*, Rosenh., found by the late Dr. J. A. Power at Woking; the species, though not uncommon in Southern Europe, had not, he believed, been previously found farther north than Central France. (3) *Tropiphorus obtusus*, Bousd., taken by himself on the banks of the Water of Cairn, Dumfriesshire; he had considered previously that this might be the male of *T. mercurialis*, but M. Fauvel, who was studying the European species of the genus, informed him that this was not the case. Dr. Sharp also exhibited a *Goliathus* recently described by Dr. O. Nickerl as a new species under the name of *Goliathus atlas*, and remarked that the species existed in several collections, and had been supposed to be possibly a hybrid between *G. regius* and *G. cacticus*, as its characters appeared to be exactly intermediate. He also exhibited a living example of the Mole Cricket, *Gryllo-talpa vulgaris*, from Southampton; between the spines of its hind legs were a number of living Acarids placed in a symmetrical manner so as to appear as if they formed a portion of the structure of the limb.

Mr. Eland Shaw exhibited two species of Orthoptera, which had been unusually abundant this year, viz. *Nemobius sylvestris*, from the New Forest, and *Tettix subulatus*, from Charmouth, Dorset.

Mr. E. B. Poulton exhibited the cocoons of three species of Lepidoptera, in which the colour of the silk had been controlled by the use of appropriate colours in the larval environment at the time of spinning up. Mr. Poulton said this colour susceptibility had been previously proved by him in 1886 in the case of *Saturnia carpini*, and the experiments on the subject had

been described in the Proc. Royal Society, 1887. It appeared from these experiments that the cocoons were dark brown when the larvæ had been placed in a black bag; white when they had been freely exposed to light with white surfaces in the immediate neighbourhood. Mr. Poulton stated that two other species subjected to experiment during the past season afforded confirmatory results. Thus the mature larvæ of *Eriogaster lanestris* had been exposed to white surroundings by the Rev. W. J. H. Newman, and cream-coloured cocoons were produced in all cases; whilst two or three hundred larvæ from the same company spun the ordinary dark brown cocoons among the leaves of the food-plant. In the latter case the green surroundings appeared to act as a stimulus to the production of a colour which corresponded with that which the leaves would subsequently assume. Mr. Poulton further stated that he had more recently exposed the larvæ of *Halias prasinana* to white surroundings, and had obtained a white and a very light yellow cocoon—far lighter than the lightest of those met with upon leaves. The larva which spun the white cocoon had previously begun to spin a brown one upon a leaf, but upon being removed to white surroundings it produced white silk.

Mr. Stainton suggested that larvæ should be placed in green boxes, with the view of ascertaining whether the cocoons would be green. He understood that it had been suggested that the cocoons formed amongst leaves became brown because the larvæ knew what colour the leaves would ultimately become.

Mr. Poulton said he felt convinced that the whole process was entirely involuntary, and that the susceptibility had arisen through the action of natural selection. The discussion was continued by Mr. Waterhouse, Dr. Sharp, Mr. M'Lachlan, and others.

Mr. Klein read "Notes on *Ephestia Kuhniella*," and exhibited a number of living larvæ of the species, which he said had been recently doing great damage to flour in a warehouse in the East of London.

Mr. A. G. Butler contributed a paper "On the species of the Lepidopterous genus *Euchromia*; with descriptions of new species in the collection of the British Museum."

Lord Walsingham communicated a note substituting the generic name *Homonymus* for the generic name *Ankistrophorus*,—which was preoccupied,—used in his "Revision of the genera *Acrolophus* and *Anaphora*," recently published by the Society.

Mr. Waterhouse announced that at the December meeting he would exhibit a series of diagrams of wings of insects, and make some observations on the homologies of the veins.—H. Goss, *Hon. Secretary*.

SUBSCRIPTIONS for 1887 ARE NOW DUE.
THIS NUMBER CONTAINS A PLATE.

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9 JAN 1887

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