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THE

ZOOLOGIST:

A

POPULAR MISCELLANY

OF

NATURAL HISTORY.

CONDUCTED BY

EDWARD NEWMAN, F.L.S., Memb. Imp. L.-C. Acad.

VOLUME THE TWENTY-SECOND.

LONDON:

JOHN VAN VOORST, PATERNOSTER ROW.

M.DCCC.LXIV.

The little birds which sing so sweet
  Are like the angel's voice,
Which renders God His praises meet,
  And teach us to rejoice.

GASCOIGNE. 1556.

Come then, Dione, let us range the grove,
  The science of the feathered choirs explore,
Hear linnets argue, larks descant on love,
  And blame the gloom of solitude no more.

SHENSTONE.

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THE ZOOLOGIST

FOR 1864.

Natural-History Notes from Norway. By GEORGE NORMAN, Esq.

IN the month of June last, in company with my friend Mr. N. F. Dobrée, I visited the Hardanger district of Norway, and during this and two previous visits to Norway I made a few notes on various subjects connected with Natural History. These notes I venture to send, thinking some of them may interest the readers of the 'Zoologist.'

Fieldfare (*Turdus pilaris*). It was on our road to the Vöring Foss, on the 20th of June, that the first fieldfares' nests were seen. My friend was very anxious to obtain eggs of this bird, and, although not now an egg-collector myself, I must confess my early bird-nesting propensities were strongly excited. With a walking-stick gun we had with us, I shot a young, fully-fledged bird, quite strong on the wing, but did not find eggs in any of the nests. Afterwards, in the extensive pine forests near Vossevangen, carpeted with Linnæa borealis, Trientalis europæa, Maianthemum bifolium and Pyrola uniflora, we found one nest with five eggs strongly incubated: this was perhaps ten feet from the ground, on the branch of a Scotch pine. The nest resembled that of the missel thrush, and the eggs those of the blackbird, only being uniformly larger. Some days afterwards, in driving towards Gudvangen, and further northward towards the Sogn Fjord, we met with whole colonies of these birds. The nests were situated at various distances from the ground, say from two to fifteen or twenty feet, and were found in pine, spruce and junipers. The greatest number of nests, however, were in the alder trees growing along the roadside, and in the dried-up branches of streams. Frequently we took twenty eggs or more in a day, selecting those which had the greatest variety in colour and marking. Some curious varieties

were blotched with red, in the way of the eggs of the missel thrush. Near Sande we counted forty-three nests, along the roadside, in about the space of two English miles.

Brambling (*Fringilla montifringilla*). In driving through the woods near Vossevangen, the peculiar note of a bird caught my ear: the carriole was instantly stopped, and with a Voigtländer binocular I soon discovered whence it proceeded. A magnificent male brambling, with his glossy black head and orange breast, was sitting on the uppermost twig of a tall spruce fir. I watched the bird attentively for some minutes, and noticed when he uttered his harsh, grating note, closely resembling that of the greenfinch, that his back was suddenly elevated and the head jerked forward. We shot several specimens in full summer plumage, and managed to preserve them tolerably well, by pouring a few drops of creosote down the throat, and a like quantity into the vent. No one, having seen this bird in the winter garb only, can conceive the beauty of the shining blue-black head and neck during the summer months. Being anxious to obtain the nest and eggs of this bird, we searched diligently, but unfortunately were too late in the season. Several nests were found, seven in one day's stroll, near Sande. All contained either young ones, or these had already flown. The nests were beautiful structures, closely resembling those of the chaffinch, and were mostly built in alders and pines.

Sandpipers. It was near Sande that, while looking for a sandpiper's nest, I saw the old bird alight on the branch of an alder tree, and coolly watch my fruitless search. Sandpipers and water ouzels are very plentiful on all the brawling streams, but I suspect the nests are difficult to find.

In the woods near Vossevangen we saw many siskins, crossbills, pied flycatchers, nuthatches and a green woodpecker, which we secured with a rifle loaded with shot. This we had borrowed of the landlord at Vossevangen.

Ants. Throughout the wooded districts of Norway the gigantic nests of a formidable species of ant are met with. I have seen them, in many instances, as much as from four to five feet high, and composed externally of pine needles. The interior was not disturbed further than by thrusting a stick into the centre. The strong pungent smell of formic acid became then very perceptible: frequently I have been compelled to beat a hasty retreat from these pugnacious fellows.

Magpies. Throughout Norway the magpie is certainly the bird most frequently noticed: on the roadside their enormous nests, consisting of whole barrowsfull of sticks, were frequently noticed, pro-

jecting from beneath the meadow-covered roofs of the houses or from the wooden church steeples. No one in Norway thinks of shooting a magpie, consequently they are bold and familiar to a remarkable extent. As a rule, I believe the Norwegians treat all animals kindly, and I have often noticed the tameness of many birds which in this country are rarely approachable: this trait speaks much in favour of the people.

Throughout the country, swallows, martins, swifts, wheatears, cuckoos, sparrows and chaffinches abounded, and once or twice the wryneck was seen and heard.

Northern Jay (*Garrulus infaustus*). In July, 1858, while fishing in the river Orkla, between Bjerkager and Drontheim, I saw a bird fly across the stream, which I recognized as the northern jay. In flying, its elongated body reminded me of the bolt-like flight of the longtailed tit.

Eider Ducks. Flocks of these birds were frequently seen in the Hardanger and Sogn Fjords, accompanied with puffins, auks, gannets and skuas. In the numerous Vands, or inland lochs, were almost invariably plenty of redthroated divers, and on the little islands colonies of common gulls (*Larus canus*) were nesting.

Herons were frequently seen. In sailing along the Hardanger Fjord I noticed with my glass the luxuriant vegetation on the stupendous cliffs, which rise 3000 to 4000 feet from the water. The trees were mostly pine, aspen, poplar, elm, ash, oak, birch and lime, all clothed in a luxuriant foliage of most exquisite green, indeed more so than we commonly see them at home. While examining these trees, I perceived a numerous colony of herons were nesting in the branches, safe enough from all interruption. Kestrels also seemed to have their nests in considerable numbers in the ledges of the rocks. Thinking this a good opportunity to examine the lime trees from an undoubted native habitat, on landing I procured a branch, and noticed that the leaves were unequal-sided to a very perceptible degree. I think it is Loudon who gives this as a good character to distinguish the American forms of lime from Tilia europæa. If I mistake not he gives the oblique cordate leaves as the peculiar mark of the American limes, and unjustly so, if my observations are verified. Here I may state that many trees, especially limes, are pollarded, and the branches and foliage stowed away for winter forage for cattle and horses.

Redshanks, &c. Stopped a day and night near Saude, northward of the Sogn Fjord, owing to the beautifully wooded nature of the country. Visited an extensive morass, thickly bespangled with the

beautiful crimson flowers of Vaccinium oxycoccus. Here we disturbed whole flocks of redshanks, lapwings and other waders. Shot a fine male redshank, but failed in finding any nests, owing to the sponginess of the ground.

Museum at Bergen. We visited the Museum at Bergen, and were much interested with the very extensive collection of fishes preserved there. Specimens of the opah (*Lampris guttatus*) of large size were noticed, and one curious ribband-shaped fish of great length was shown us as a great rarity: this is called by the Norwegians the "herring king" (*Gymnetrus glesne*). This collection of fishes contains, I believe, many of extreme rarity, and all seem admirably preserved. The collection of antiquities belonging to the stone, bronze and iron ages, and of rune stones, is also very extensive, and would amply repay the visits of our archæologists. One or two cylindrical stones of remarkable, though unmistakeable form, had been dug up in the neighbourhood of the Sogn Fjord: probably these, like the Egyptian obelisks, were regarded as symbols of fecundity, and connected in some way with religious rites at a very remote period.

Willow Grouse. The Bergen Museum also afforded me an opportunity of examining a very good series of specimens of the willow grouse in all stages of plumage. In many specimens the only difference between this bird and the British red grouse was in the white wings of the former. I am now fully satisfied the two birds are identical. In continuation of this subject, I may mention that we met with a very intelligent Norwegian sportsman, who knew the willow grouse well, and who, moreover, had shot the red grouse in Scotland; he unhesitatingly stated his opinion that the two birds were the same. My friend Mr. Dobrée had the good fortune to have an egg of the willow grouse presented to him by this gentleman: this is in no way to be distinguished from the egg of the red grouse. This gentleman also informed me that Lord Garvegh, who was then in Norway, had a good series of eggs of the willow grouse. Perhaps his lordship would allow these to be examined, and by this means tend to clear up this disputed question. I know of no question of greater interest to the naturalists of this country, and I trust some competent ornithologist will take the subject in hand, and come to some decision as to whether the slight difference in plumage is of any specific value or not.

Ring Ouzel. Saw several specimens of the ring ouzel in the valley leading to the Bondhuus Glacier of the Folgefond, and indeed all over the country. Here I caught with my net specimens of an Hipparchia similar to, though I believe distinct from, the Arran Argus.

At the foot of the Morraine, in the water running from the Glacier, I obtained a good gathering of Diatomaceæ: the ice-worn stones were completely covered with a brown velvety layer.

After leaving the Glacier, we took a boat for Enæs, where we found very comfortable quarters for the night. After dinner, took a stroll in the pine forest with my net, but only took a few small moths, such as the following:—Ellopia fasciaria, Metrocampa margaritata, Boarmia repandata, Selenia illunaria, Cymatophora duplaria, Cabera pusaria, Bupalus piniarius, Lomaspilis marginata, Larentia multistrigaria and L. flavicinctata, Melanthia albicillata and M. ocellata, Camptogramma bilineata, Cidaria russata and C. montanata. Several large moths were seen flying about the pine tops: these I took to be pine lappets, but, as none were captured, I am not sure. Saw in the forest a brood of fully-fledged green woodpeckers.

Labrus cæruleus. While waiting for the steamer in the morning, on the little wooden pier, a large shoal of fishes, such as wrasse and codlings, were seen. Among these were several splendid fishes, which I had often before admired in the Bergen and Christiansand markets. They were almost a foot in length, the belly of a tawny orange colour, and the mouth somewhat constricted and snout-like in form; the back and sides brilliant in the extreme, being of an intense cobalt-blue and verditer-green colour, banded with black streaks. The Norwegians called it the bergylt (*Labrus cæruleus*), certainly a very different fish from the bergylt figured and described as a British fish in Couch's work. I had no other than trout tackle with me, still, as the fish seemed in a feeding humour, I took a gut-line from my fishing-book, and baited the hook with a piece of salted herring: instantly the bait was seized by the ravenous shoal of wrasse and codlings, and soon a goodly number were sprawling on the pier. The beautiful blue wrasse had no chance, on account of the smaller fry; so to baffle them, a piece of bait was attached to the hook longer than their mouths, when I had the satisfaction of securing a splendid bergylt. Is this fine fish a native of Britain?

Swallows and martins were frequently seen flying about the perpendicular cliffs in the fjords, and although we did not succeed in finding their nests, from their actions we were sure they were breeding there.

Gray, yellow and white wagtails abounded throughout the country. We were unfortunate in not succeeding in shooting one of the latter, for the sake of comparing afterwards with our British bird.

Redwings (*Turdus iliacus*). Frequently we heard the song of

the redwing, but it was evidently too late to secure eggs of this species. Several times nests were found closely resembling those of the song thrush, with particles of blue eggs, undistinguishable from those of the thrush: these were, in all probability, nests of the redwing, and were placed in similar situations to those chosen by the common thrush. What makes this the more probable is that the song thrush is a very rare bird so far north.

Ferns in great variety were noticed all over the country. In no part of Great Britain or in Germany have I seen the beautiful Polypodium Dryopteris so plentiful and fine; fronds of twelve and fifteen inches were frequently noticed. Lastrea Filix-mas, L. Oreopteris, Pteris aquilina, Athyrium Filix-fœmina, Asplenium septentrionale, Cystopteris fragilis, Polypodium vulgare and P. Phegopteris, were also seen in profusion. Near the Odde Glacier I noticed, where the snow had only disappeared a few days before, a luxuriant growth of Polystichum Lonchitis. In the low grounds by the road-sides we frequently passed whole acres of Struthiopteris germanica, with fronds three and four feet high. Osmunda regalis and Cryptogramma crispa were seen; and in the crevices of the rocks luxuriant masses of Woodsia hyperborea, Asplenium Trichomanes and A. viride. On one occasion, in driving along the road I fancied I saw Asplenium fontanum. In the neighbourhood of Drontheim, and throughout the Guldbrandsdal, is a large aconite in great profusion: the plant seemed to me to be much larger, with more deeply cut leaves, and a more lurid blue flower than A. Napellus. The beautiful Arnica montana abounds in all the meadows; Anchusa tinctoria, Impatiens Noli-me-tangere, and other plants, unknown to me, were frequently seen on the road-side. Norway is indeed a paradise for the botanist.

Doritis Apollo. During two previous trips to Norway a few weeks later in the year I frequently saw in one day's drive twenty or more splendid specimens of Doritis Apollo in the meadows by the road side. I had no net with me, but often jumped from the carriole and secured specimens by knocking them down with my hat. In flight they resembled nothing so much as animated pieces of tissue paper. Argynnis Lathonia is not uncommonly seen alighting on the sandy ground. I noticed also Limenitis Sybilla, Vanessa Atalanta, Satyrus Semele, Gonepteryx Rhamni and other butterflies, as well as Macroglossa Stellatarum.

Golden Plover and Godwits are found in great numbers on the Dovrefjelds. I first noticed the former birds with black breasts near Hjerkin. Engaged in procuring specimens of some beautiful alpines,

such as Salix lanata, S. reticulata, Saxifraga aizoides, S. oppositifolia, Oxyria reniformis, Lychnis acaulis, &c., I frequently flushed these birds from the rocks on the Fjeld, where no doubt they were breeding. No nests, however, were found.

Lemmings. Near the Vöring Foss I caught a lemming which had run for shelter beneath a rock on the Fjeld. Frequently I have seen eight or ten drowned near the sides of the Vands or upland lakes, as though they had attempted swimming over and been met with a storm. In appearance they reminded me of small guinea pigs, being white, tawny and black in colour. Some seasons they abound in immense quantities all over the country, while for seasons together none will be seen. This curious circumstance requires explaining.

Fucus vesciculosus. A circumstance frequently surprised me when searching for Diatoms among the Algæ, to see the common "bladder wrack" (*Fucus vesciculosus*) growing in profusion on the rocks near the head of the various Fjords, where the water was so fresh that in using it for drinking a very slight saline taste only was perceptible. A complete black coating of common mussels was attached to the rocks, where the water was similarly free from salt.

Near the Folgefond Glacier we noticed several beautiful Alpines, Veronica alpina, V. officinalis, *var.* rubra, Saxifraga nivalis, Menziesia cærulea, Bartsia alpina; and afterwards, in going over the Folgefond snow-field, from Odde to Overhuus, for some fifteen or twenty miles nothing but unsullied snow was met with. On reaching the crest of the Fond, for miles nothing but a dreary snow waste was visible. This utter desolation was the more remarkable from the fact that an hour before I had been plodding up the steep side of the Fjell with a nearly tropical temperature, and through a region of luxuriant vegetation.

Peregrine Falcons. These birds were frequently seen. Once, indeed, on sailing up one of the Fjords a young heron was chased by a peregrine. The poor heron tried hard to dodge the falcon, and several times attempted to conceal himself in the crevices of the cliff. Just where the boat was passing beneath, he lost his footing, tried hard to regain it by clawing the rock, and finally came sprawling into the water within a few yards of the boat. The peregrine all the while sat on a ledge of the rock waiting until we passed, when no doubt he would renew the chase.

Hippobosca equina. In driving through the country near Mandal, my horse was much plagued with a species of Hippobosca, whose manner of running over the horse's back amused me greatly. Wishing

to relieve the poor animal I frequently tried to drive the flies off by touching them with the point of my whip. Instead, however, of flying away they would run along sideways, like a crab, taking no further notice of the whip.

Here my notes must end. I trust the perusal of these cursory jottings may induce other readers of the 'Zoologist' to give us occasionally an extract or two from their note-books relating to Natural-History experiences on the Continent.

GEORGE NORMAN.

Hull, November 23, 1863.

Supposed Capture of the Old English Rat near Beverley.—Two days ago my friend Mr. John Stephenson, of the Hull Bridge House, Beverley, brought to Mr. Richardson, birdstuffer, &c., of this town, a very peculiar looking rat. I saw it, and believe it to be a very first-rate old specimen of this now scarce animal. It had been killed by a dog in a barge lying on the River Hull, close to the Hull Bridge. It was a female. In colour it was very dark, many shades darker than the ordinary rat, and I should describe it as a grayish black above, lighter on the sides and belly. Its ears were unusually large, and its whiskers very black. The tail was unusually long in proportion to the body, and almost black in colour. The fore leg appeared to me unusually short, but as I have not specially observed quadrupeds, my own favourite study being that of Ornithology, I may be mistaken in this last point. Unfortunately the animal had just been skinned when I first saw it, so that I could not ascertain the precise weight. Its measurements were as follows. Total length from tip of nose to tip of tail, 17 inches. Length of tail, 9 inches. Length of fore-leg from toes to shoulder, $1\frac{3}{4}$ inch.—*W. W. Boulton; Beverley, October* 23, 1863.

The Otter in Salt Water.—Having seen but little of the otter in England, I am much interested by a statement on good authority, which lately appeared in these pages (Zool. 8801), that it rarely frequents salt water, for, oddly enough, here it is the exception to find one in fresh. Upon nearly all of our rocky coasts there are deep caves and fissures inhabited by these animals, most of which are some miles distant even from the mouth of a burn of any size. The Shetlanders believe that the "sea otter" is quite a distinct species from the smaller one which occurs in the lochs, but this, it need scarcely be said, is an error,—the fact is that those which appear in the lochs and burns are usually killed before they arrive at their full growth, while those which take up their abode upon the coast, where the inaccessibility of their retreats secures them from persecution, sometimes attain an enormous size. Dr. Edmondston has seen a skin six feet in length, "dealer's measure" (*i. e.*, exclusive of two-thirds of the tail), and I myself have seen specimens taken in Yell and North Mavine, measuring very little less.—*Henry L. Saxby; Baltasound, Shetland, November* 11, 1863.

The Grand Migration of Seals.—Few things are better calculated to strike the observer of nature than the power of various animals to carry out extensive and sustained exertions in the course of their periodical and oft-repeated migrations—extensive, inasmuch as some of these are continued over thousands of miles, and sustained con-

tinuously during many days of great exertions. In most instances we are left to conjecture for much of our information on this subject. It is true some of the bird tribe are seen preparing for their journey. Swallows congregate in great numbers, and suddenly disappear, but precisely how or when they go is but vaguely ascertained. We learn the arrival of our winter visitors chiefly by their presence, and therefore infer that the passage has been performed during the night. That animal, however, regarding whose proceedings I am about to say a few words,—the seal,—affords ample opportunities for watching his whole career. Requiring, as he does, the aid of all the elements, save fire, for the comfort and the continuation of his existence, his motions are not easily hidden. Heavy and awkward as his appearance is when at rest on the land, in the water his actions emphatically refute this charge; activity and perseverance mark all his motions, to which qualities we may justly add cunning and sagacity of no ordinary character. Independently of his constant motion in pursuit of his prey, the migrations of the seal are most extensive. During the summer and autumn numbers of these creatures are met with, scattered in small parties, in all parts of the Northern Ocean visited by the whalers and other fishermen, where they remain until the severity of the arctic winter warns them to retreat southward. Mariners who have been beset amongst the ice, or for other reasons have passed the winter in those hyperborean seas, remark that few seals are met with during the winter, and some of them chronicle the time at which they first appeared on their return. Our information with regard to their general motions is not limited to these somewhat vague records. The habits of the genus (for it consists of many species) are so visible that we must conclude the scattered seals met with during the dark winter of the Pole are only stragglers left behind when the main body moved southward. As the severity of the weather increases it is evident that, like the swallows, an instinctive movement must commence, communicated to and understood by the whole family, like a masonic sign, prompting a general assembly of the clans at some long-frequented, well-known spot of their wide domain, where, it is to be supposed, they enjoy their sport until the gathering is completed. At length the frost commences, and the army is set in motion. This proceeding is keenly looked forward to and watched by the inhabitants of the coast, whose interest is much involved in their passing visit, and who fail not to levy tribute in kind. A fisherman, posted as sentinel on some headland commanding an extensive sea-view, communicates to the hamlet the first indication of the approaching host, the vanguard of which invariably consists of small detachments of from half a dozen to a score of seals; such parties continue to pass at intervals, gradually increasing in frequency and numbers during the first two or three days of the exodus, by the end of which time they are seen in companies of one or more hundreds. The main body is now at hand, and during the greater part of the next two days one continuous, uncountable crowd is constantly in sight. The whole procession coasts along at no great distance from the shore, presenting to an eye-witness a most extraordinary scene. In all quarters, as far as the eye can carry, nothing is visible but seals—the sea seems paved with their heads. Some idea may be formed of the vast multitude when we consider the time occupied in passing, and the rate at which the animals are hurried along by the ceaseless, rapid stream which forms the highway of their long though expeditious voyage. The rear is brought up by small parties, such as formed the leading detachments. In one short week the whole host passes, consisting of many hundreds of thousands. The current of which these sagacious voyagers take advantage is the well-known polar current which proved so inimical to the success of our North-West Passage discoverers, and which

sets through Hudson's Bay, and sweeps the coast of Labrador in a south-east direction; running at all seasons at the rate of several knots an hour, hurling with it, during the winter and spring, quantities of ponderous field-ice, together with numerous icebergs of various size, and frequently of most grotesque shapes. By it the seals continue their passage steadily on in one unbroken course until the island of Belleisle presents an obstacle—situated in the entrance of the Straits of Belleisle, into which a branch of the current sets, carrying with it a portion of the force towards the Gulf of St. Lawrence. The main body continue onward until they reach the Gulf Stream, on the banks of Newfoundland. Here they arrive about the end of December or early in January, and halt for a time in the more still and warmer waters of that locality, resting until the time for bringing forth their young arrives; nor is the rest of long duration. About the end of January it becomes necessary to turn northward. During the southerly migration no ice encumbered the way—all circumstances were favourable; but the now-projected movement is undertaken under many impediments: the animals, heavy with young, must stem the strong current; the bed on which their snow-white cubs are to be laid is solid ice. Onward they struggle until they fall in with the immense continent of this material—one part of which is formed on the shores, and a much larger portion hurried forward by the polar stream. This now covers the identical sea along which they so recently passed, and is to be their home until the duties of the nursery are performed, and their sleek progeny are strong enough to accompany the herd. The detachment which we left on their way up the Straits of Belleisle met their own difficulties: the fishermen waylay them here most assiduously—net after net awaits the toiling emigrants, which are turned to good purpose. Several thousands are taken at the many stations planted on all parts of the shore from Cape Charles to the Gulf of St. Lawrence. In the Gulf many of them pass the winter and bring forth on the ice formed near the shores of this sea; a few of the young are taken by the inhabitants of the Magdalene and other islands; but a considerable section of the original stock circumnavigate Newfoundland, and join the great body on the banks. Those which winter in the Gulf of St. Lawrence quit their quarters in that sea about the end of June, and on their way down the Straits of Belleisle reward the watchful fishermen with a few additional thousands of their much-prized carcases. These are now accompanied by their young, all but as round and bulky as their parents. After clearing the Straits little more is seen of them. It is believed that, in order to avoid the adverse current, they make their passage north to their old summer haunts at a much greater distance from the land.—*J. C. Steavenson, in the 'Field' of November* 28, 1863.

Porpoises at the Zoological Gardens.—Two unsuccessful attempts have been made to introduce living porpoises at the Zoological Gardens. There are a few leading conditions of porpoise life that seem to have been utterly disregarded: *first*, seeing,—and to conquer this propensity the eyes of the poor creatures had been poked out, not I believe by Zoological authority, but by the captors; *secondly*, residence in a medium of salt water; this was denied them, and they were supplied only with fresh. Now we all know that to plunge a marine animal in fresh water is the most certain mode of killing it, and to gouge out its eyes is the most certain way to starve it. I only saw one of these creatures for about an hour before it died. It appeared to be rolling over and over in agony.—*Edward Newman.*

The Whitetailed Eagle at Shoreham.—I have a beautiful specimen of the white-tailed eagle, which was brought to me on Friday, November 13th; it had been killed the day before at Shoreham, where it was first observed flying over the town, and was marked down near the edge of the water. A friend of mine having heard of it, immediately went in pursuit, but before he reached the spot it had been disturbed by a coast-guardsman: it then flew about half a mile, followed by a number of rooks and gulls, anxious to drive it from the neighbourhood. Before my friend came up with it, it again rose, and flew a long distance on towards Worthing: with the greatest haste, he again made towards it, and, creeping behind a ridge of the beach, got within forty-three yards of it; on his first looking over, it was feeding on a gull, but immediately the bird saw him, it rose with great difficulty, when he shot it, breaking the right wing, but even after this it was a very formidable creature to secure. The bird proves to be a female, measuring in length 3 feet 4 inches, and in extent of wings 7 feet 11 inches. The plumage is very fine, having, I suppose, completed its moulting; the tail is about three parts white. It is very remarkable that the wing was broken with No. 6 shot.—*H. Pratt;* 44, *Ship Street, Brighton.*

Osprey near Preston.—I purchased a fine osprey, shot close to this town, on our marsh: it was assailed by a number of crows, and fell a victim to another enemy whilst combating its courageous foes. It is quite astonishing to see with what daring the crows attack the hawk tribe: I have seen them several times this summer beat off hawks when they have ventured near their nests.—*J. B. Hodgkinson.*

A Jerfalcon shot in the South of Scotland.—Mr. W. Scott, gamekeeper to his grace the Duke of Buccleugh, has shot, at Tandlaw Moss, a fine specimen of the jerfalcon, which measures 49 inches between the tips of the wings and 20 inches from the point of the beak to the tip of the tail. When shot it fell into a loch, and, wounded as it was, darted so furiously at the dog that he could not bring the bird out, and Mr. Scott had to wade for it himself. He intends presenting it to the Museum; and when placed there it will complete the collection of the falcon tribe, as the other species are already represented.—*Hawick Advertiser.*

Singular Capture of a Hawk.—A sparrow feeding at the bottom of a newly-made grave, in the cemetery in the parish of Deptford, attracted the attention of a hawk soaring above, who descended from its dizzy height "into the limits of the narrow grave." The narrowness of "the last mortal resting place" prevented the hawk from again rising, and it was easily caught by Fletcher, the gravedigger. The bird is now in the possession of Mr. Hurlstone, of Ladywell, Lewisham.—'*Field.*'

Honey Buzzard at Goodwood.—In the first week of the present month a large bird was seen on Halnaker Common, near Goodwood, by one of the Duke of Richmond's gamekeepers, in the act of scratching out a wasp's nest. The man, being without a gun, allowed the bird to escape, but, on returning to the place with a gun, found it enjoying its meal of wasps, and shot it. From the circumstance of the bird feeding on the contents of a wasp's nest, I conclude there is no doubt of its being a honey buzzard.—*W. Jeffrey, jun.; Ratham, Chichester, November* 27, 1863.

Barn Owl's Nest with Eight Eggs.—I do not know whether it is generally known that the barn owl lays eight eggs; I certainly had no idea myself, having consulted no works on the subject. During my stay at Witherslick I took a nest with eight eggs, and then again the old bird laid six more. I much wanted the eggs, and had very much difficulty in getting them, owing to the great store set upon the barn owl for its services in thinning the mice in the barns. It was the only instance in which

the natives took a favourable view of the idea of preserving any birds except game: as to small birds, they wished me to kill all but goldfinches. I tried to convince them of the utility of the great bulk of the feathered tribe, but it would not avail: the poor jay is in very bad favour, owing to its depredations among the peas: there are traps in all the gardens for them, which destroy more than ever the gun does.—*J. B. Hodgkinson; Preston, Lancashire.*

The Shorteared Owl perching.—Last winter, when out shooting on a marsh in Cumberland where heath was abundant, a shorteared owl (*Strix brachyotus*) rose about fifty yards in advance of me. I fired a long shot at it, but could not be certain whether the bird was struck or not: however, I marked it down again about four hundred yards off, and cautiously approached the place: when within about a hundred yards I saw the head of the bird peering out from among the heath, but on going a few paces nearer it took to flight. This was repeated two or three times, when the bird, instead of settling on the ground, perched on a stick which projected from a fence. Here I was again foiled in attempting to get a shot, but continued to follow it for half an hour, at the end of which time the bird perched on a rail in a fence, and, approaching under cover of some bushes, a second shot brought it down. It is by no means a rare bird on some of the Cumberland marshes, but, though I have frequently met with it, the above is the only instance of its perching that I am aware of. The bird is now in my collection.—*Joseph J. Armistead; Queenwood College, Stockbridge, Hants; November* 20, 1863.

Large Flocks of Fieldfares near Moundsmere.—Last month the fieldfares appeared in this neighbourhood in unusually large quantities. I first observed two or three on the 6th of November, but on the 11th I observed large flocks near Bradley: they feed on Preston Down, and keep a sentinel perched on the topmost bough of some tree hard by, which, on the approach of danger, soon gives notice to the whole flock; they immediately fly up, as if to ascertain the quarter in which the threatened danger lies, and, as soon as they have discovered this, fly off generally in as near as possible the opposite direction. I saw a small fir plantation, not far from Bradley, literally swarming with these birds, which, however, were too wary to allow me to get within gunshot of them. The fieldfares now appear to resort more to the woods, as I have observed very large flocks, at all times in the day, perching on the trees in Inham's Coppice. Those about Bradley appear to roost in the woods near that village, as I have often of an evening seen them flying off towards the woods in that direction. When going to roost they generally fly very high, and only once have I seen them, when going to their roosting places, flying low enough to be within gun-shot; this was only a few days after their arrival, and they flew hardly twenty yards from the ground in a tremendous flock: I fired and killed one, which was very plump and fat. —*Anthony S. Bradby; Moundsmere, Hants, December* 3, 1863.

Late Blackbird's Nest.—While out shooting, a few days ago, I was startled by a very peculiar noise issuing from the adjoining hedge. I immediately proceeded to the place, and to my astonishment saw a nest of young blackbirds (four in number), half startled out of their wits; and no wonder, for a snake was at the foot of the bush. Is not this altogether an uncommon occurrence, for two reasons: *first*, I think it quite unprecedented for a blackbird to build its nest at this time of the year; *secondly*, I think a snake never appears so late, unless the weather is very warm indeed, which, to a certain degree, it was. I have heard of blackbirds building their nest in September, but never so late as the second week in November.—*Arthur Freeland, in the 'Field.'*

Ring Ouzel in Yorkshire.—The ring ouzel (*Turdus torquatus*) is, I believe, very plentiful in some localities: here, however, it is only an occasional visitant; indeed, I have only seen four specimens during the last four years, actually shot in the neighbourhood. On the 10th of October a nice female specimen was shot on Swinemoor, one of the common pastures belonging to the town of Beverley, and in its immediate vicinity: the bird was killed by Mr. W. Boyes, of this place, and given to me by himself. On the 12th of October another female specimen of the ring ouzel was sent to me from Malton, near which town it had been shot: it came to me in the flesh, and had been recently killed. The man who shot it did not know what it was, and supposed it to be a variety of the common blackbird (*Turdus merula*): I presume, therefore, that it is not common about Malton, which is distant from Beverley about twenty-five miles. —*W. W. Boulton; Beverley, November* 4, 1863.

Eggs of Grasshopper Warbler.—I received, in June, 1862, a nest of three eggs of the grasshopper warbler (*Sylvia locustella*), quite fresh laid: the person who took them informed me he found them near Surlingham, Norfolk.—*T. E. Gunn; Surrey Mews, Norwich, November* 20, 1863.

Scarcity of Summer Migrants.—Might not the scarcity of our smaller summer migrants this year, as complained of by various correspondents, such, for example, as Mr. Boulton (Zool. 8726), be satisfactorily accounted for by the fact of the unusual scanty existence of insect-life, their principal subsistence in this their transitory home? I may add, my experience quite confirms that adduced by Mr. Boulton. Even the merry voice of the charming little sedge warbler met the ear less frequently this year than is its wont.—*S. P. Saville; Dover House, Cambridge, October* 3, 1863.

Scarcity of Singing Birds.—The scarcity of singing birds has been already noticed by some of the contributors to the 'Zoologist,' and I beg to append another reason I intended to have named, which, in my opinion, tends greatly to diminish the number of our favourite choristers of the woods. I allude to the extraordinary mania in schoolboys, and indeed in "children of a larger growth," to make collections of the eggs of small birds of all descriptions. Next to the collection of postage-stamps, the "Ovomania" (a vocable coined or *hatched* for the occasion) stands predominant; and no wonder that we see complaints made of the diminished numbers of our charming native songsters, as well as of garden warblers, and indeed of all the migratory birds.—*H. W. Newman; Hillside, Cheltenham.*

Varieties of the Corn Crake, Yellow Bunting, Sparrow, Linnet, Blackbird and Common Bunting.—During last year I added the following varieties to my collection. Corn Crake: upper parts rufous, fringe of the feathers gray; wing-coverts and quills bright ferruginous, the former barred with white; under parts white, slightly rufous on the breast. Yellow Bunting: upper parts deep cream-colour; tail and wing-quills white. Sparrow: cream-colour. Linnet: head entirely white, rest white and brown. Blackbird: pied. Common Bunting: head and upper parts white.—*H. Blake-Knox; Bartragh, Dalkey, Co. Dublin, November* 4, 1863.

Notes about Robins.—I have been much interested in and fully agree with Mr. Ranson's remarks (Zool. 8843) about the robin, and may record as very singular that every robin we have given to our tame fox has always made him sick; he was sure to vomit it after having swallowed it. He is the best animal to kill rats and mice I ever had; in fact he will leave any sort of food for a rat. Query, Where are the hen robins during the winter? are they in the woods? I only see the male birds during that season in the town, and only one within a certain radius; for should another encroach

upon his beat, there is sure to be a fight until one of them retires. What is the reason they never sing in confinement? I have had one for some years in my aviary, but he has never been heard to sing unless a wild bird should visit him, when he will utter a few notes of defiance, and then they begin to fight one another through the wires. The fox as well as the cat will not eat the shrew mouse.—*G. S. Wintle; Gloucester, December* 3, 1863.

Query about the Robin.—Though I have no wish to prolong the discussion on the habits or the supposed scarcity of the robin, I have one or two remarks to offer in reply to Mr. Ranson's observations on my note of May last. He says (Zool. 8843), "The Captain's communication reads as if I had vouched for the truth of the popular notion, which I carefully avoided doing," but by a reference to my note at Zool. 8523 it will be found, that in commenting on Mr. Whatt's paper I said, "He does not answer Mr. Ranson's query, 'Are there any grounds for it?'" clearly showing that I did not consider Mr. Ranson "had vouched for the truth of the popular notion," though it would now appear that he is somewhat credulous, for he remarks, "neither has he convinced me that the popular notion is incorrect." It was hardly to be expected that I should, considering the innate love of the marvellous more or less common to all. He then remarks, "The mistake into which the writer has fallen is one that is very common, namely, that the robin leaves the gardens and retires from the villages to build its nest. My experience goes to prove that the robin rarely withdraws from its winter haunts to build its nest, and it will not leave the garden if it can find a convenient place to build in. This year I have had two nests in my garden, both in holes in the wall." That I am not mistaken as to the robin's habits I have only to refer your correspondent to 'Macgillivray' (vol. ii. p. 267), where he says, "Although most of the redbreasts retire from the vicinity of human habitations in summer, and betake themselves to the woods and hedges, yet some go to no great distance." This tallies with my own observations. Formerly, when Ventnor was but a mere village, I have had two and three robin's nests in the garden; of late years none, though during the autumn and winter the redbreast is as numerous as ever. Seemingly they differ somewhat in habits in the north; possibly for want of green lanes, mossy banks, hedgerows and ivy-grown walls, wherein to build their nests; and Mr. Ranson's remarks as to the odd holes and places to which they resort favours this opinion; for he speaks of these "slits and holes" as convenient places. But in his endeavour to show that robins do not quit the vicinity of towns and villages to breed, he proves the species to be more numerous in the north than Mr. Whatt's remarks would have led one to suppose. Mr. Ranson observes, "This year I have had two nests in my garden," and says he has occasionally found three. Let us see then what the latter number would give. Three pairs of old birds with two broods each, would make about thirty-six, allowing for an addled egg or two, but nothing for casualties, seeing that the robin is as distasteful to the northern breed of cats as is the shrew. (By the bye, I should like to exchange cats with some northerner, mine having a peculiar fancy—a kind of depraved French taste—for the robin). At this rate, as there can be few gardens without such "convenient places," redbreasts should be numerous enough. When I remarked that it was "so unnatural, too, that the young should destroy the parent birds," it was not intended in the restricted sense in which it has been taken. Again, who is there that does not know that the robin is instinctively pugnacious? The "gentleman" referred to must be an uncommon old gentleman if he made the discovery. In the fight instanced there is one thing

wanting—proof of its being the attack of a young bird on an old one; besides, the result appears to have been that both birds perished; however, it is another instance of the well-known pugnacity of the species. There are other passages that might be remarked on, but I shall refer to but one more; however it is one that convinces me that I am not the only person "but little acquainted with the habits of the robin." It is this: "I believe it suffers less from cold and hunger than any of our small birds." Than the house sparrow? Never do I remember seeing one that had perished from cold, but dead robins I have found frequently; nor do I know of any bird that suffers more in severe frosty weaather, unless it be the thrush; but the latter has not the "cottage kitchen to take refuge in."—*H. Hadfield; Ventnor, Isle of Wight, December* 4, 1863.

The Blackcap feeding on the Berries of the Mountain Ash.—A pair of these birds were obtained in 1860 feeding on the berries of the mountain ash, which they swallowed whole with perfect ease. The male was shot on the 16th of October, and the female on the 28th of the same month. In October of the following year (1861) a few specimens were again observed, and last year a male remained with us till the 8th of November. On the 27th of September of the present year a female made her appearance, and in a day or two was joined by a male and a second female; but owing to some workmen being employed near the tree which supplied them with food, they soon disappeared. This, then, establishes the fact, before doubted, that the blackcap warbler is a regular summer visitant in Caithness, and that even in this northern climate it prolongs its stay until the winter months. The statement as to its feeding upon rowans was also doubted, and I am not aware the fact has been recorded in any one of the numerous works devoted to British Ornithology. It is, however, indisputable; and since the question was first mooted I have observed that the robin, a bird of the same or even less size, occasionally treats himself to a diet of rowans, despatching them, too, with as much ease as the blackcap, or as the thrush or blackbird.—*H. Osborne, jun., Wick, November* 21, 1863.

[I have been favoured with a sight of the pair first alluded to by the excellent observer, whose record I extract from the 'Field' newspaper, and they were certainly blackcaps, male and female.—*Edward Newman*].

Great Arrival of Goldencrested Regulus at Wick.—During the prevalence of a severe gale from south-east, which commenced on the 9th of October, and lasted some days, extraordinary numbers of that beautiful little bird, the goldencrested regulus, appeared suddenly at various places on the east coast of Caithness, forced apparently in this direction, from their usual line of flight while migrating, by the fury of the tempest. The tiny creatures were much fatigued on their first appearance, and great numbers were picked up in an exhausted or dying condition. On the evening of Sunday, October 11th, numerous specimens were captured by boys in the streets of Wick, the buffetings of the gale rendering them quite helpless; and on the same day they were also obtained among the furze bushes at Noss Head, so that the flight must have been of very considerable magnitude. For some days after their arrival there was scarcely a garden in or near Wick and Pulteneytown left unvisited by a company of goldcrests, who flitted over every bush and tree in search of insect food. With the return of fair weather, however, the flock quickly disappeared. There can be little doubt that this flock was brought over here under circumstances similar to that which drove the immense flight on the east coast of Northumberland in 1822, as recorded by Mr. Selby, although, as mentioned by that author, the wind was from the north-east at the time; while, as

stated above, the gale that forced them on this coast was from the south-east. The goldcrest, however, appears to reside with us during the winter, and in February last I observed them in considerable numbers in the woods and hedges near Forse House, —*H. Osborne, jun., in the 'Field.'*

[The following is the notice by Mr. Selby, to which Mr. Osborne refers:—"On the 24th and 25th of October, 1822, after a very severe gale, with thick fog, from the north-east (but veering, towards its conclusion, to the east and south of east), thousands of these birds were seen to arrive upon the sea-shore and sand-banks of the Northumbrian coast; many of these so fatigued by the length of their flight, or perhaps by the unfavourable shift of wind, as to be unable to rise again from the ground, and great numbers were in consequence caught or destroyed. This flight must have been immense in quantity, as its extent was traced through the whole length of the coasts of Northumberland and Durham. There appears little doubt of this having been a migration from the more northern provinces of Europe (probably furnished by the pine forests of Norway, Sweden, &c.), from the circumstance of its arrival being simultaneous with that of large flights of the woodcock, fieldfare and redwing. Although I had never before witnessed the actual arrival of the goldcrested regulus, I had long felt convinced, from the great and sudden increase of the species during the autumnal and hyemal months, that our indigenous birds must be augmented by a body of strangers making these shores their winter's resort."—*E. N.*]

Waxwings near Hull.—Several waxwings have been shot near Hull within the last few days.—*N .F. Dobrée; Hull, November* 12, 1863.

Waxwings in Norfolk.—There appears every probability of these beautiful, but most irregular winter visitants being plentiful during the next few months: already I have seen eight specimens, shot in different parts of the county between the 10th and 14th. They have been very scarce with us since their extraordinary visitation in the winter of 1849-50.—*H. Stevenson; Norwich, November* 14, 1863.

Waxwing at Wick.—On Thursday, the 12th inst., I was informed that a rare and beautiful bird had been seen among some trees near Rosebank House, Wick, which, from the description, I judged to be the Bohemian waxwing. Not long after I stood beneath the tree, on the top branches of which the stranger sat, trimming himself, and occasionally ruffling his plumes, and raising and lowering his ample crest. As I supposed, the bird proved to be a specimen of the Bohemian waxwing: it was exceedingly tame and fearless, and did not appear in the least frightened by the many people moving about in its vicinity, or the vehicles which noisily rattled past, the tree in which it sat being quite close to the road. It is rather curious that the only other specimen of the waxwing found in this county was obtained some years ago in the same grounds; it is now in Dr. Sinclair's collection. I did not disturb the bird on Thursday, as I fully expected it would soon pay our own place a visit, the temptation held out being a mountain-ash, with an abundant crop of rowans; and directions were given that the tree should be closely watched for a day or two. On Friday, as anticipated, the waxwing made its appearance, breakfasted heartily off the rowans, and betook itself to the branches of a neighbouring elm, where it rested during the day, only occasionally leaving the prominent position selected for an attack upon the rowans. It was so far fortunate that the presence of the workmen near the tree in question earlier in the season had a deterring effect on the host of thrushes, blackbirds, &c., which every previous year had robbed it of its fruit, as the waxwing had thus plenty and to spare of its favourite food. Pleased with its quarters it remained during the following

Saturday and Sunday, affording by its lengthened stay and familiar habits ample opportunities for observation. It was in perfect plumage, and afforded much pleasure to those who saw it during its stay. So fearless was it that, while selecting the cluster on which to operate, and picking off the berries, it appeared perfectly unconcerned at an approach to within a few feet of the tree; where also, as long as it remained, two or three men were employed in dressing slates for roofing purposes. Judging from what I saw of this specimen, I should say the waxwing is rather an indolent bird. During these three days it seldom left its perch, and then only, so far as could be observed, to visit the rowan tree for food. When not thus engaged it was continually preening and arranging its rich silky plumage; but it is possible that the apparent indolence of the bird in this instance was induced by the fatigue it had endured in its long journey hence from some Norwegian forest. Whatever may be the character of the bird while with its fellows, this specimen certainly belied its appellation of "chatterer," as the only sound it was heard to emit was a low whistle, and even this but seldom. On its first appearance, the sparrows—as is usual with these quarrelsome gentry when the presence of a stranger among them is detected—"mobbed" it, and regularly followed it in its flight from one tree to another; but the waxwing showing on all occasions a bold front to the enemy, they soon learned to keep at a respectful distance, and ceased to persecute it. On one occasion a sparrow, rather perter than its fellows, advanced and made some threatening demonstration, but the waxwing darted so suddenly upon him, and used his bill to such excellent purpose that his would-be tormentor showed no disposition to renew the combat. On the morning of the 16th the waxwing disappeared, and has not since returned.—*H. Osborne, jun.; Wick, November* 21, 1863.—'*Field.*'

Waxwing in Aberdeenshire.—Last week I had two very fine male specimens of the waxwing sent me from Aberdeenshire for preservation.—*W. M'Leay; Inverness, December* 7, 1863.

The Bohemian Waxwing on the West Coast of Argyllshire.—A very fine specimen of the above species in full plumage was given to me on the 25th ult. It was found lying dead on the road between East Tarbert and West Tarbert, by Mr. Wotherspoon, of Gigha. It was quite fresh when I received it, so that it had lain a very short time. There was no wound upon it. In the 'Zoologist' of 1861 Mr. Thomas Edward, of Banff, reports a specimen having been shot at that time, and mentions that one was procured in the same locality eleven years before, which came down a chimney. I do not know of the occurrence of other specimens in Scotland.—*Thomas Chapman; Glasgow, Deeember* 5, 1863.

Notes on the Occurrence, Capture and Dissection of the Waxwing at Beverley.—It is just about twelve or fifteen years since this exquisite and rare bird visited the neighbourhood of Beverley. Several were shot during the winter of their last occurrence, one of which, a young female, I obtained; and I have seen others that had been shot about the same time. On the 4th of November, 1863, the following curious circumstance was detailed to me by a fellow townsman, whose word I can rely upon, *viz.*, Mr. Timothy Lundie, of Beverley, an old and respected inhabitant. He states that on going to his field on the morning of the 4th inst., he heard a most unusual noise, which arrested his attention, but the source of which he failed to detect in the first instance. The noise continuing, Lundie called the attention of Mr. Coxworth, of Woodmansey (who was passing at the time), to it, and at first they both attributed it to an unusual disturbance of the telegraph wires, which pass close to his field.

Coxworth, however, soon pointed out to Lundie a large flock of birds which had alighted on a hawthorn fence, and from which they found the noise originated. Seeing that these birds were unusual in appearance as in voice, both the men advanced sufficiently near to detect the species. They turned out to be a large flock of the Bohemian waxwing or waxwing chatterer (*Bombycilla garrula*), numbering at the least, on a rough computation, several dozens. On the two preceding days this locality was visited by a severe storm, to which circumstance Lundie attributed the presence of this flock of Bohemian waxwings in the immediate vicinity of the town of Beverley. I have no hesitation in accepting this story as correct, inasmuch as I have known the narrator all my life, and have reason to consider him an honest and respectable man; moreover, he has been more or less an observer of nature for many years, and a birdstuffer also (after a fashion) into the bargain, so that he was not likely to confuse the species, which is at once so striking in its characteristics and so rare. On Sunday, November 8th, 1863, Robert Parks, bricklayer, resident in Beverley, saw three strange birds in his orchard, which is close to the town. On the following day they were still in the orchard, and at various intervals during the day Parks succeeded in shooting all of them. Mr. John Stephenson, of the Hull-Bridge House, Beverley, was fortunate enough to secure them, and they were forwarded by him to Mr. R. Richardson, of Beverley, for preservation. I saw these birds at his house, and they were good specimens of the Bohemian waxwing in various stages of maturity. On dissection one proved to be an old female specimen in splendid plumage; another a male, probably of the second year; and the third was a young female of the present year. On November 19th a young female of this species was brought to me. It had been shot by John Mundy, a bargeman, whilst feeding amongst some hawthorn bushes on Figham, one of the common pastures of Beverley. It was alone. On November 21st a very fine mature male specimen was brought to me by Mundy. He had just shot it, and it was still warm. He saw and shot it near to the place where he shot the first specimen. This bird also was alone. No other specimen has since been shot in this neighbourhood to my knowledge. On dissection I found in the case of all the five specimens recorded that the only food in crop or gizzard was the fruit of the hawthorn. I had previously supposed that all hard-billed birds, were in the habit of swallowing grit and small portions of sand or gravel to aid the gizzard in the mechanical trituration of the food. I found, however, that in all these five specimens of this bird there had not been the smallest portion of grit swallowed with the food. I observed, however, that natural instinct had suggested a most efficient substitute for those ordinary mechanical aids, so necessary to the digestive process in hard-billed birds. The haws or haw-berries were evidently swallowed whole. On entering the gizzard they became subjected to a rotatory rubbing or grinding action between the muscular walls of that organ, the effect of which process was that the hard stones containing the seed of the hawthorn rubbed forcibly one upon another, ground off their own fleshy coverings (the necessary food of the bird), and reduced these to a pulp ready for assimilation. The stones themselves, having performed their office of grinders or triturators, passed gradually, one by one, into the intestine, from whence they were eventually voided with the excrement, still unbroken and unaltered. These stones or seeds were in no instance broken, and I found them both in crop, gizzard and intestines. In the crop they were still covered by the flesh of the hawberry intact. In the gizzard they were more or less denuded of their fleshy covering, caused by mutual pressure and friction, under the action of this muscular organ or natural mill. In the intestines they presented them-

selves as naked, useless, foreign bodies; and as such fit only for exclusion. I observed that by far the greater number of these stones were to be found in the gizzard itself, which would lead me to suppose that they were retained in that organ for a longer period than their fleshy coverings. These, having been removed and passed on for the purposes of assimilation, left space for a further supply of ingesta, whilst the stones remained behind to assist in triturating the fresh accession; until, owing to mechanical inconvenience from their accumulation, they were passed away one by one, simply making room for other and similar triturating aids.—*W. W. Boulton; Beverley, November* 25, 1863.

Waxwings near Warrington.—A small party of waxwings were seen in this neigh- between a fortnight and three weeks since. They perched on some alder bushes in the garden hedge within eight or ten yards of the windows of Mr. C. Claus, and remained about ten or fifteen minutes picking off a few berries that had been left on. *James Cooper; Museum, Warrington, December* 14, 1863.

Brambling in Sussex.—A male and female mountain finch have been shot in this neighbourhood, and are now in my possession.—*C. S. Maurice; East Court Cottage, East Grinstead, Sussex, December* 14, 1863.

[These birds have been unusually abundant near London this winter.—*Edward Newman*].

Hawfinch Shot near Beverley.—I have just obtained a good male specimen of this peculiar looking bird, whose chief peculiarity, however, really exists in the very perfection and development of mandible, on the immense power of which its ability to procure fitting sustenance depends. My specimen was shot yesterday, November 24th, amongst some bushes, on Westwood, one of the common pastures of Beverley, by Mr. Gamsby, of this town, who saw and shot another, but so shattered it that he did not consider it worth bringing home. Until last winter, when several specimens were obtained on Westwood, I only remember having seen a single hawfinch, shot in this neighbourhood. In the well-wooded portions of the midland counties I believe this bird is not uncommon; but in the East Riding of Yorkshire I have always heard it spoken of as more or less rare, and in this immediate neighbourhood undoubtedly so. On dissection I observed a curious combination of circumstances, in some respects resembling the internal economy of the Bohemian waxwing, and in others exactly the reverse. Both crop and gizzard were full of the kernels and broken portions of the stones of the sloe or bullace as it is termed in this locality. In this instance the bird evidently had fed upon the contents of the stone, and not upon its fleshy covering, as in the case of the Bohemian waxwing; but on the other hand, in this instance, as in the case of that bird, I found that the stone of the fruit upon which the bird had fed was used instead of grit, as a triturating medium during the process of digestion, not a single portion of the latter being present, although both crop and gizzard were heavily charged with food. In the case of the hawfinch, however, the stone had been broken by its powerful mandibles to extract the kernel, on which it feeds; a sufficient number of stony particles being retained in the gizzard with the kernels to assist that organ in their trituration. In the hawfinch, then, we find portions of the stones of fruit acting as triturating media in the gizzard; and which, together with the assistance of the powerful mandibles, prove sufficient to accomplish that process. In the waxwing we find the stones of fruit unbroken, and contributing to the same end. In the former case it becomes a necessity for the bird to break the stone, inasmuch as it feeds on the contents. In the latter case it is equally necessary for the bird to preserve

the stone intact, so that several of these stones may serve as the grinders of their own fleshy coverings, when rubbed together by the muscular action of the gizzard, acting upon one another more perfectly in the unbroken state than they possibly could do if broken, in which latter case they would cut the flesh (which is the food), and not reduce it to a pulp fit for assimilation, as they actually do crush and prepare it. I have only had the opportunity of dissecting this single specimen of the hawfinch, and therefore beg to submit my remarks with the utmost deference to the experience and opinion of other observers. In addition permit me to suggest as an inquiry, Would not both these birds, *viz.*, the Bohemian waxwing and the hawfinch, swallow grit, &c., like other hard-billed birds, if compelled to feed on other food than stone fruit? or, do they live entirely on stone fruit when in a wild state? I have kept the hawfinch in captivity, when I fed him upon hemp seed, but as I often collected haw berries for him, and eventually set him at liberty instead of dissecting him, I cannot decide the question. I certainly never saw him crunching sand, although I have frequently watched him crush the haw stones as though they had been made of paper. Is it not singular that the hawfinch I dissected should have fed upon the kernels of the sloe, which is by no means abundant here, when he was in the midst of hundreds of hawthorn bushes well stored with the fruit, which I always imagined he preferred to any other, and from which circumstance, indeed, I believe he derives his name?—*W. W. Boulton; November* 25, 1863.

Nesting of the Lesser Redpole at Dalkey.—On the 19th of July I found a redpole's nest in our shrubbery. It was situated between the trunk and a bough of a lime tree, about eight feet from the ground. The young were fully fledged. This is the first instance of the redpole breeding in this neighbourhood to my knowledge.—*H. Blake-Knox; Bartragh, Dalkey, Co. Dublin, October* 28, 1863.

Food of the Rook.—Mr. Edmund Harting (Zool. 8816) seems to doubt that rooks feed on "birds, field-mice, young rabbits, different animals and decaying substances." As the rook is a much persecuted bird I have the more pleasure in being able to fully endorse M. Prevost's observations on its food. The rook is omnivorous, but its chief delight is carrion, and this, from a rat to a sheep, it greedily devours, no matter how decomposed; in fact, the more disgustingly putrid, the more the rook appears to enjoy it; in short, the rook may truly be termed the British vulture. They will also readily kill and devour young birds and field-mice; and instances have even come under my own observation in which young lambs, in a weak state, have been attacked by rooks, the onslaught being made by their first picking out the eyes of the lamb. Non-naturalists and the public generally appear to be impressed with the very erroneous idea that naturalists wish to infer that no birds should be destroyed: this is a very palpable mistake. The great pleading of naturalists is to do away with the present wanton and indiscriminate destruction of small birds. Nothing appears to me more simple than to draw a well-defined line between the wholly insectivorous and partly granivorous birds, for as a rule, with few exceptions, the wholly insectivorous are unfit for food, whereas the partly granivorous, such as the sparrow, greenfinch, &c., are delicious when nicely cooked; and although by eating "sparrow pie" we may not visibly enlarge our intellectual faculties, still we have the gratification of having partaken of a most wholesome and nourishing dish. Since, therefore, by man the natural destroyers of these birds have become nearly exterminated, by man must they necessarily be kept within reasonable bounds. By-the-bye, can you or any of your readers give me any information as to the northern winter range of the ringdove or woodpigeon?

At this season of the year they visit the south of England in immense flocks, and in severe winters do an incredible amount of damage to green crops, such as rape, turnips, &c.—*Henry Reeks; Manor House, Thruxton, November* 10, 1863.

The Food of Rooks.—I see at Zool. 8816 a note on the food of rooks, doubting the assertion of M. Prevost that the food of rooks consists amongst other things of "birds, field-mice, young rabbits, different animals and decaying substances." As to young rabbits I can quite bear out the assertion of M. Prevost; for in the spring of 1862 I saw and watched for some time a rook busily engaged in feeding on something close by a hedge. So busy was he that he let me approach quite close before he flew away, and joined a flock of his companions in the next field, so that I am quite sure of the fact that the bird was a rook and not a crow. On going up to the place to see what the rook was feeding on, I found a young rabbit quite warm and only just dead, but with part of the entrails eaten. I cannot of course say that the rook killed the rabbit, but I should think it extremely probable, as the rabbit had been so recently killed when I came up and drove the rook away. We may also add sand eels to the list of articles forming the food of the rook given at Zool. 8762, as I have frequently seen them at Teignmouth feeding with the gulls on sand eels, especially just after the seine had been thrown for these fish. Walnuts I know also, to my cost, form a large part of the food of the rook in September and October.—*Cecil Smith; Lydiard House, November* 3, 1863.

Rooks Breeding in November.—On Thursday last, November 19th, Mr. J. Thorpe, of Rye Common, near Odiham, examined four rooks' nests on land in his occupation, all of which had young in them.—'*Reading Mercury*,' *November* 21, 1863.

Domesticated Magpies.—My uncle, Major Mortimer, resided for some years in the very secluded hamlet of Sandypark, in the parish of Drewsteignton, Devonshire. A magpie had built a nest at a little distance from the house, and when the two young magpies which it contained were about half-fledged, my uncle carried the nest and its contents into one of the bed-rooms, and placed it in a large wicker cage, leaving the door open, and at the same time the window of the chamber. The old bird very soon mustered sufficient courage to come and feed them, and when the young ones became old enough to fly away they were not prevented from doing so. My aunt and a niece occasionally fed these birds, and on their being set at liberty they would fly to them, when they were walking in the garden, and indeed sometimes at a very considerable distance from the house, and they were so familiar as to eat out of their hands. They were also in the habit of flying in at the windows of the cottagers, and of carrying off anything that was portable within their reach; so that to prevent Lynch law from being executed on her pilfering pet *protegées*, my aunt had to manufacture net blinds for all the cottage windows in the hamlet. After this things went on very well for some time, the magpies joining them in their walks, sometimes hopping and chattering just before them, then taking a flight and after a time rejoining them again. At length Good Friday came, and with it some idle lads from Mr. Berry's manufactory at Chagford, one of whom, armed with a fowling-piece, thought he had performed a prodigy of sportsmanship in shooting one of these familiar birds, who, alas! had been too tame to keep bad company at a sufficient distance. The other bird pined away, surviving his companion but a very short time.—*Thomas Mortimer; Braunton.*—[*Communicated by P. H. Gosse, Esq.*]

Two Cuckoos' Eggs in one Nest.—A correspondent (Zool. 8822) mentions that he found two eggs of the cuckoo in one titlark's nest; but it must be inferred that two

females laid one egg each,—that wonderful instinct implanted by the Creator seldom fails,—as the foster-parents could not find food for two such ravenous young ones. I have never heard of two young cuckoos being brought up in one nest; so that, somehow or other, one of the two eggs or young must have been got rid of, and the question is, how? I was acquainted with the late Dr. Jenner, who wrote by far the best history of the cuckoo extant, and he never met with two cuckoos in one nest: the hedgesparrow's, the wagtail's and the titlark's are the three favourite nests visited by the cuckoo, but indubitable proof has been shown that, when hard pressed, several others are chosen. In a former notice of the cuckoo I gave a short account of a young one having been found in a hedgesparrow's nest, in Northamptonshire, by a schoolboy friend and myself, which bird was kept in a cage for six weeks, and was fed by its foster-parents, until one of the latter was found dead, and the cuckoo died soon after. The cuckoo was supposed by Dr. Jenner to lay three or four eggs, but each egg in a different nest.—*H. W. Newman.*

Kingfishers' Nests.—Will Mr. Charles Stubbs, who writes (Zool. 8818) that he has "repeatedly taken kingfishers' nests," but "never found anything more than a few fish-bones and scales mixed up with the loose mould on the floor of their burrow," be so kind as to say whether there were eggs in each instance that he refers to, or whether he ever saw young birds in such quarters as he describes? The author of 'Life in Normandy' has broached a curious theory, founded on personal observation of the habits of these pretty birds,—that the eggs are laid on the bare ground, and when the brood is hatched a wall is gradually built up of pellets of half-digested fish-bones, &c., thrown up by the young birds in a soft state. Each day's addition is carefully arranged and smoothed down from the inside, and the whole hardens into a round whitish nest, which, by the time the family is fledged, is generally sufficiently firm to be dug out of the bank without breaking. It would be interesting to know how far Mr. Stubbs' experience (which must be considerable) would agree with this suggestion. —*T. Digby Pigott; Pinner Wood House, Watford, November* 3, 1863.

Scarcity of Swallows.—A correspondent (Zool. 8824) says, as far as martins are concerned, their scarcity may be accounted for by their being turned out of their nests by the house sparrows, and then adds, "No wonder that the martins are diminished in number;" and concludes by remarking, "What will the small-bird preservers say to this my true and unvarnished tale!" There can be few of them, and no ornithologists who are not aware of the house sparrow's habit of appropriating the nest of the martin, but how that is to account for the scarcity of the latter this season (referred to by more than one writer) I cannot conceive, unless the house sparrow has increased two-fold, and there is reason to believe the contrary. Owing to the innumerable houses, barns and other buildings of superior elevation, constructed of late years throughout the length and breadth of the land, there can be no doubt that martins, and swallows too, have greater facilities for nesting than at any other former period, notwithstanding the increase of sparrows, which has yet to be proved.—*H. Hudfield.*

Late Stay of the Swallows.—A great deal of nonsense was written in the 'Gardener's Chronicle' and elsewhere about the late stay of the swallows, when we were not half through October. I have been watching them all my life, and never before had the gratification of seeing them so late as I have this year. The latest swallow I have ever seen in previous years was on the 5th of November. Several chimney swallows were flying about here on the 15th: since then I have looked out for them daily in vain.—*W. C. Hewitson; Oatlands, November* 21, 1863.

[None of my correspondents have forwarded those later accounts of the stay of swallows and martins, which are of still greater interest: thus an anonymous writer in a provincial paper says that at Tenby, on the 7th of December, swallows were flying about the cliffs in undiminished numbers; a very similar report comes from Hastings, and a third from Torquay: will any naturalist attest these statements, giving his name and address? Such statements, if founded on fact, ought to be preserved: I now allude to them only as newspaper cuttings.—*Edward Newman*].

A White Swallow.—About a fortnight since, when the Earl of Stamford was staying at his seat at Bradgate Park, Leicestershire, his lordship was informed that for a month past a white swallow had been seen about in the neighbourhood of the mansion, and was asked whether he would have it shot. The noble earl directed that his rare little visitor should not be molested.—'*Field.*'

Late Departure of the Swifts.—More than one correspondent of the 'Zoologist' has noticed the late stay of the swifts with us this year: the explanation which occurs to me for these wonderful birds deviating from their usual habit, is that the summer of 1863 has been a most eccentric one: the month of May was very cold, the last fourteen days of it particularly so, and retarded their nidification; then came June, with its twenty-five days of continued rain, which added to their discomfort. I have taken great pains to watch these birds, and in the late summer they did not commence their joyous scream of delight at a warm temperature until much later than usual. The scream of the swift is often a sure sign of approaching heat, and when the temperature is from 75° to 80° Fahrenheit they may be heard early in the morning until past mid-day uttering their peculiar cry: in cold, wet or windy weather they are very silent. At present I do not live near any of their nesting places, but I have noticed the great bulk of them leave between the 10th and 14th of August: those which remain I have always observed were birds which were hatched very late in the season, and these I have frequently seen, with the parent birds, as late as the 24th of August. The swift has seldom more than one hatch of young ones during a summer in England. As showing the unusual state of the past summer, I may mention that the bees were retarded a full month by the wet in June (generally the real honey-gathering month), and nearly all the honey, where no heath was to be found, was gathered in July, thus reversing the order of things: some swarms, which came off as late as the first week in July, made from 20 lbs. to 30 lbs. weight of honey—a very rare occurrence.—*H. W. Newman.*

Turtle Dove near Beverley.—On Friday, October 2, 1863, an extremely fine specimen of the turtle dove (*Columba turtur*) was shot at Catwick, a village near Beverley, by Charles Russell, of Hornsea. The bird was in splendid plumage, and on dissection proved to be a mature female. I received it in the flesh, and it is now in my collection. Catwick, close to which village the bird was shot, is about eight miles and a half from Beverley, and five miles from the sea.—*W. W. Boulton.*

Sand Grouse in the Baltic.—During the summer a flock of sand grouse, about eighty in number, made their appearance on the small island of Borcum, a bathing-place off the coast of East Friesland, belonging to Hanover. Unfortunately there resides on the island a revenue officer of destructive propensities, who, with the assistance of some of the visitors, has succeeded in reducing their numbers to less than one half, and was a few weeks ago still at work waging a war of extermination against the pretty little strangers. They have now become so wild and shy that we may have some hope for the remnant. A second flock is settled on the neighbouring island of

Nordeney, and one out of a pack of ten was shot in the vast range of heath and moorland which separates Hanover from Holland.—'*Field.*'

Pallas' Sand Grouse in Wiltshire.—I am sorry that absence on the Continent has prevented me from sending you earlier notice of the occurrence of the above bird in this county. It was a female, quite alone, and evidently a straggler from the main body, which seems to have directed its flight along the eastern coast. It was observed on the 29th of June last, and was killed by Mr. Joseph Dean, in the parish of Imber, a very exposed, not to say desolate, district on Salisbury Plain, and very nearly the same locality whence I obtained my specimen of the pratincole, as recorded in the 'Zoologist' (Zool. 3843). Mr. Dean adds that its flight was rather rapid, and that it was flying, when he met with it, over some arable land, the direction being from north to south.—*Alfred Charles Smith; Yatesbury Rectory, Calne, November* 5, 1863.

Pallas' Sand Grouse in Shetland.—This remarkable bird, so long expected, has at last appeared in these islands. On the morning of the 28th of October, after a steady breeze from S.W., I caught a glimpse of one as it dashed out of a clump of elders in the garden at Halligarth, and next day I obtained an equally brief view of one beneath a willow hedge not far from the same spot. About the same time birds precisely answering to the description of this species, were seen at Haroldswick, and also in the island of Balta. On the 2nd of November I saw one in a stubble field close to the sea-beach, where, after much trouble, I shot it two days afterwards. It usually kept to the most exposed situations, and was so extremely shy that I am sure I should never have got it had I not chanced to see it as it rose from some long grass, which served to screen me from observation. It always took wing at the slightest appearance of danger, at the same time uttering a succession of clear, distinct notes: its wildness and its similarity in colour to the soil prevented me from seeing much of its feeding habits, but it appeared to advance with a gentle gliding motion, keeping the breast so low that the feathers of that part came in contact with the ground, as was evident by their wet and muddy state when the bird was shot. The flight was much like that of the golden plover, and sometimes extremely rapid: once, when the bird happened to get among some starlings, it was surrounded and mobbed by them, as though it had been a hawk, but a few strokes with its wings soon carried it beyond the reach of annoyance. It proved to be a female, the ovary containing a large cluster of eggs, many of which were about the size of turnip-seed: the elongated feathers of the wings and tail were in perfect condition. The only fat was at the lower part of the neck, where it was present in considerable quantity, and there was a peculiar want of firmness in the flesh. The crop was distended to about the size of a chestnut with seeds, a few of which were of a kind unknown to me, but the greater number were those of Stellaria media and Plantago maritima; in the gizzard there were crushed seeds and a large quantity of clear, rounded fragments of quartz. I was disappointed in my expectation of finding barley in the crop, as a great deal of that grain was strewn about the portion of the ground most frequented by the bird. The appearance of the sternum is remarkable, partly on account of the depth of the keel, which is very great in proportion to its length, and, among British birds at least, only equalled, but not exceeded, in that respect by that of the swift: it is very different from that of the true grouse (and I think also of the quail and the partridge), in which there are always two sinuses, and the furcula is long, slender and furnished with a large flattened process at the junction of the crura, whereas, in the sternum of the present species, there is but one sinus, and the furcula, besides being short and rather stout, is merely

furnished with a small and somewhat rounded knob.—*Henry L. Saxby; Baltasound, Shetland, November* 9, 1863.

Pallas' Sand Grouse breeding in Denmark.—I have much pleasure in giving you all the information in my power respecting the breeding of Syrrhaptes paradoxus in Denmark. On the 1st of August Professor Reinhardt, of Copenhagen, wrote to me that at least six or seven nests had been found in Jutland. He had received four eggs thence. As in Pterocles, three is the regular number laid in each nest. Both sexes assist in incubation. I have written for further details, and mainly on account of their non-arrival, I have deferred till our April number the article on Syrrhaptes which Dr. Sclater requested me to write for the 'Ibis.' The facts above mentioned I announced at the meeting of the British Association at Newcastle-on-Tyne, but the paper I then read was very short, and scarcely went into details. My chief object in drawing attention to the subject then, was, if possible, to stay the slaughter of our visitors; but I fear, from what has since transpired, that I did no good. The reports given by the various newspapers were extremely inaccurate, and very much misrepresented what I said.—*Alfred Newton; Magdalene College, Cambridge, December* 6, 1863.

Sand Grouse in Caithness.—Two specimens of the sand grouse were procured in Caithness last summer, one being shot from a covey of ten or twelve birds, on the farm of Westerseat, near Wick, on the 8th of June. The second was shot a few weeks after on a piece of hilly ground about eight miles from Wick.—*H. Osborne, jun.; Wick, November* 21, 1863.—'*Field.*'

Sand Grouse near the Moray Firth.—Around the sandy shores of the Moray Firth at least three specimens of this rare visitor have been obtained; doubtless many others have been associated with these. One was killed near Lossiemouth by a labourer who occasionally shoulders his fowling-piece: the particulars of the capture I have not ascertained. I saw a specimen of the sand grouse in the possession of Mr. M'Leay, a taxidermist, living at Inverness: it was shot near Dornoch in August last. In a note dated the 8th of December, Mr. M'Leay states, "I had another specimen (of sand grouse) in September, that was shot by some one of the Duke of Richmond's party at Gordon Castle,—a female. The one I had before (from Dornoch) was a male. The female does not appear to have the pinnated feathers in the tail and wings."—*George Gordon; Manse of Birnie by Elgin, December* 12, 1863.

Sand Grouse in Cheshire.—A fine male specimen of Pallas' sand grouse (*Syrrhaptes paradoxus*) was shot early in this month near Leasowe Castle, by Mr. Simpkins, of Chester Street, Birkenhead, who has placed it in the hands of Mr. Newby for stuffing. I have seen it at Mr. Newby's, and find it has the lengthened first primary in each wing quite perfect, and the two central tail-feathers also perfect, the prolongations extending full five inches beyond the rest of the tail. The plumage is, however, rather sooty-looking. This is the second occurrence of this bird in our district.—*Thomas J. Moore; Derby Museum, Liverpool, November* 20, 1863.

Abundance of the Corn Crake.—With regard to the corn crake, I think I can afford some striking information. In the old stage-coach time I have travelled through a summer night, at the rate of eight miles an hour, without ceasing to hear for five successive minutes the dissonant discord of this singular bird: conceive by this fact the vast number of birds that I must have heard. The fact of their being singularly prolific I afterwards ascertained, on cutting some hay in a small field of less than an acre, when the mower's scythe revealed two nests of this bird, with eggs to the number

of twenty-three. This bird, being nocturnal and very shy in its habits, is rarely seen: I have lived in the country over forty years, and I do not think I ever saw a dozen of them, though I must have heard thousands. I think them much too weak on the wing to migrate across the channel.—*Thomas Mortimer; Franklin Cottage, Braunton, May* 25, 1863.—[*Communicated by P. H. Gosse, Esq.*]

Spotted Crake in Hampshire.—A very good specimen of the spotted crake (*Crex porzana*) was brought to me some time ago by a labouring man, who informed me that he had caught it in a trap set for water-rats. It was a female, and the gizzard contained the remains of water plants and small shells.—*J. J. Armistead; Queenwood College, October* 25, 1863.

Spotted Crake in County Antrim and Storm Petrel in Dublin Bay.—During a stay in Belfast last September I purchased a spotted crake, killed by a poor boy with a stone. Last autumn I killed a storm petrel in Dublin Bay.—*H. Blake-Knox; Bartragh, Dalkey, County Dublin, October* 30, 1863.

Spotted Crake near Beverley.—This elegant species appears to be of very local occurrence. A few are generally to be found amongst the sedges along the banks of the river Hull each year. I have seen no less than sixteen specimens already this year, and others have been seen that were not captured. Up to October 13th three specimens were shot; from the 13th to the 26th there were twelve shot and three seen; and on the 2nd of November a specimen was taken alive; making a total of nineteen specimens, of which fifteen were shot, one was brought to me alive and uninjured, having been caught by a boy, and three were seen by Mr. W. Stephenson, of Hull Bridge, near Beverley. I am inclined to believe that the spotted crake breeds with us, although I have not obtained the egg. Out of the sixteen specimens taken on the river Hull this season, a majority have proved to be young birds; several, indeed, were so young that I think they must have been bred in the neighbourhood. On the evening of the 26th of October I dissected three specimens, one of which proved to be a mature female; the other two birds were, one a young male and the other a very young female,—so young that it could not have travelled far on the wing. The old and young birds too have been observed and sprung together, or within a few yards of one another. I have observed that, as a rule, the young are smaller than the old birds; that the belly of young birds is whiter than in mature specimens; that the feathers on the sides and thighs of the young are not so richly striated with black as on those of older birds; that the chin of the young bird is whitish gray, that of the old one slate or ash-coloured; and that the band over the eye and outer half of the forehead in the young is speckled with white, whilst in old birds it is almost uniform ash-colour. In the craw of the mature female I found nothing but six or seven water and marsh snails, in their shells: in the gizzard of the same bird I found a collection of the remains of similar snails and their shells mixed up with vegetable matter.—*W. W. Boulton.*

Gray Phalarope in Caithness.—A gray phalarope was shot in Wick Bay, on the 7th of October, by Mr. John Tudor; and on the 19th of the same month a second specimen was procured near the South Head, by Mr. W. Peach. These are the first instances of the occurrence of this species in Caithness.—*H. Osborne, jun.; Wick, November* 21, 1863.—'*Field.*'

Solitary Snipe near Beverley.—I saw last evening a splendid specimen of the solitary or double snipe in the flesh; it had been brought for preservation to Mr. R. Richardson, taxidermist, of this town. The bird had been shot yesterday by Mr. W. Stephenson, of Hull Bridge, on the river Hull, about half a mile above the bridge.

Its weight was eight ounces and two drachms, the bird being loaded with fat. On dissection it proved to be a female. Length, from tip of bill to tip of tail, 12 inches; across the extended wings, 19 inches. Its gizzard contained nothing but a few seeds and vegetable matter: is not this remarkable? I thought that snipes lived wholly upon insects, larvæ and worms. I called the attention of two or three witnesses to the fact, in order to avoid mistake. I now much regret that I did not keep the contents of the gizzard.—*W. W. Boulton; Beverley, October* 23, 1863.

Little Stint in the Isle of Wight.—A fine specimen of the little stint (*Tringa pusilla*) was shot here by Mr. S. Parry, R.A., on the 29th of October. This is a new addition to our list of Isle of Wight birds. I have preserved the bird.—*Henry Rogers; Freshwater, Isle of Wight, December* 7, 1863.

Sclavonian or Dusky Grebe near Beverley.—I have just purchased, in the flesh, a beautiful female specimen of the Sclavonian grebe (*Podiceps cornutus*). It was shot on the river Hull, where it flows along the eastern boundary of Figham, one of the common pastures of this town, and about a mile below Beverley. The bird was shot by William Hoggard, of Beverley, on Monday, October 12th, 1863. The eggs in the ovary were about the size of millet-seed.—*W. W Boulton.*

Habits, &c., of the Little Grebe.—Having kept this bird alive I have had ample opportunities for observing its habits, which I have not seen particularly noted elsewhere. I had a very large glass globe with small living fish in it, and into this the bird was able to go when inclined to feed. It was so tame that in my presence it would dive after the fish, bring them up, and swallow its capture whole. It was very fond of fresh meat, which it took from my hand. When resting it does not place its feet upon the ground, but turns them up so as to place them under its wings, which it covers with its side feathers, and thus entirely hides them from view: it will also rest in the same manner upon the water. The grebes are generally figured as sitting erect, and I was anxious to see if this bird did so, but could not discover that such was the case: it always sat with its breast on the ground, but when walking or running its posture was nearly erect, and it proceeded along with a waddling gait.—*R. Reynolds;* 10, *Brownlow Street, Liverpool; November* 10, 1863.—'*Scrap-Book.*'

Graylegged Goose near Penzance.—I have just seen a specimen of the graylegged goose (*Anser ferus*) sent from Scilly. It is a fine example; the shoulder part of the wing and greater wing-coverts bluish light gray; the bill considerably elevated at the base, uniform in colour with the nail, white. I scarcely need add that the large flights of wild geese which appear in the West of England in severe weather are, in 90 per cent., the bean goose, with an occasional sprinkling of the whitefronted goose.—*Edward Hearle Rodd; Penzance, November* 30, 1863.

Little Auk in Somersetshire.—I write to record the occurrence of the little auk (*Uria alle*) in this county in two instances; the first was on the 3rd of this month, when Mr. Haddon, of Taunton, had one brought to him alive, which had been caught the day before under some loose faggots on the top of a wood-rick, in the parish of Kingston, near Taunton. The other was picked up dead on the mud at the mouth of the river Parrot, near Burnham, by Mr. Welman: the bird was quite fresh when picked up, and apparently only just dead.—*Cecil Smith; Lydiard House, November* 7, 1863.

Young Puffin in November.—I have to-day received what I believe to be a young puffin of this year, which was shot on this coast last Saturday. I find these birds generally leave this country in August; so this is no doubt a straggler which has been

left behind to shift for itself. The beak is much smaller than in the adult bird, and without the yellow markings; the gape has a yellow tinge; the eye-lids are quite without the yellow; the black ring round the neck is perfect; the cheeks are a dark dusky gray; and the feet are a pale flesh-colour: the other parts resemble the mature bird: it is 11½ inches in length. I send these particulars because I can find no description of the young bird in Yarrell, and suppose by this omission that they are but seldom met with so late in the season.—*Edward Neave; Leiston, near Saxmundham, Suffolk, December* 1, 1863.

Wilson's Petrel in the Isle of Wight.—On Friday last I picked up a specimen of the rare Wilson's petrel (*Procellaria Wilsoni*) lying dead, a couple of hundred yards or so from the sea-shore. It was very thin, had probably been driven here in an exhausted state, away from its latitude. There were evident traces of its having been "finished" by a sparrowhawk, which apparently had tasted enough of petrel (no doubt new to him) after one mouthful. Luckily it was quite fresh, and I gave it to Mr. Rogers, naturalist and bird-stuffer, of Freshwater, and I have just seen it admirably prepared and set up by him. I have taken several specimens of this petrel far at sea, south of the equator, towards the South-American coast. I believe there are very few recorded instances of its having been found in, or in the vicinity of, the British Isles.—*C. Delmé Radcliffe; Freshwater, Isle of Wight, November* 24, 1863.—[*Communicated by Mr. Rogers.*]

Proceedings of Societies.

Entomological Society.

November 2, 1863.—Frederick Smith, Esq., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the respective donors:—'Proceedings of the Royal Society,' Vol. xii. No. 57; presented by the Society. 'Catalogue of Halticidæ' (being a continuation of the British Museum Catalogue, Part i. 1860), by the Rev. Hamlet Clark, M.A., F.L.S.; by the Author. 'Motchulsky, Etudes Entomologiques,' 9e Année; by the Rev. H. Clark. 'The Zoologist' for November; by the Editor. 'The Farm and Garden,' Nos. 30, 31, 33 and 34; by C. A. Wilson, Esq. 'The Journal of the Society of Arts' for October; by the Society. 'The Athenæum' for October; by the Editor. 'The Reader' for October; by the Editor. 'A Catalogue of British Coleoptera,' by G. R. Crotch; by the Author.

The following additions by purchase were also announced:—'Genera des Coléoptères d'Europe,' Livraisons 112—116 incl. 'Skandinaviens Coleoptera synoptisk bearbetade af C. G. Thomson,' Vols. 1—5 incl.

New Member.

A certificate in favour of Henry Walter Bates, Esq., as a Member of the Society having been read, it was moved by Mr. S. Stevens and seconded by Mr. Dunning, "That, as in the recent case of the election of Mr. A. R. Wallace (and the consent of the Council having been obtained), the Bye-Laws relating to the election of Members be *pro hac vice* suspended, and that Mr. Bates be now declared to be a Member of the

Society." This was carried by acclamation, and Mr. Bates was thereupon admitted as a Member, and signed the Obligation Book.

Alteration of Bye-Laws; Notice of Special Meeting.

Notice was given that, in consequence of a requisition presented to the President and Council, signed by six Members, a Special General Meeting would be held on Monday, the 25th January, 1864 (the next Anniversary), at 7 P.M., for the consideration of certain alterations in the Bye-Laws specified in the requisition, and the object of which was, to abolish the Library and Cabinets Committee and the Publication Committee, and to vest their powers and duties in the Council, to change the title of Curator to that of Librarian, and to repeal the clause by which it is enacted that no resident in Great Britain shall be an Honorary Member of the Society.

Exhibitions, &c.

The President exhibited the nest of Trigona carbonaria referred to in the 'Proceedings' of the last Meeting; it had been recently received from Queensland, and was constructed in an artificial situation, in the interior of a box, by reason of which its appearance was probably different from the normal form of the nest; on the upper (or free) side was a quantity of matter, of a coralline structure, which was apparently made for the purpose of carrying the nest up to the top of the box, and thereby of attaining additional support. Externally the nest seemed to consist simply of rude spherical honey-pots in contact with one another, or connected by means of the coral-like work before alluded to, but the President thought it probable that there was comb, more or less irregular, in the interior. It was remarkable that not a single female of any of the numerous species of Trigona was known.

Prof. Westwood remarked upon the extraordinary difference of habit between the Brazilian and Australian Trigonæ; the Brazilian species made hexagonal cells in single layers, and the difference was as remarkable as if a species of Apis in England were found to make honey-pots like a Bombus instead of the ordinary nest of a true Apis. This structural modification was so great as to suggest a doubt whether Trigona carbonaria had been rightly placed in the genus Trigona.

The President also exhibited nests of Deilocerus Ellisii, *Curtis*, one of the social Tenthredinidæ: the nests had formerly been exhibited by Curtis at the Linnean Society, and were figured in vol. xix. of the Linnean 'Transactions.'

A lively conversation subsequently took place, on the origin or causes affecting the hexagonal form of the cells of bees, in which the principal participants were the President, Mr. Waterhouse, Mr. Bates and Prof. Westwood.

The President exhibited specimens of Hyponomeuta padella, which had been given to him by one of the assistants in the British Museum, and which were said to have been bred from larvæ feeding on unripe grains of corn. The gentleman in question (to whose general accuracy of observation the President bore testimony) had been walking through a corn-field in Suffolk, plucking some of the ears and eating the grain, when he noticed an unpleasant taste, and on examination found numerous larvæ feeding on the grain; he had put some into a box, and from them had emerged the exhibited specimens of H. padella. It was, however, thought probable by the Lepidopterists present that some mistake must have been made as to the identity of the larvæ from which the moths had been raised.

Mr. Bond exhibited a coloured drawing of the larva of Sphinx Convolvuli, of which

seven specimens had been taken on the 17th of September last, at St. Leonard's, feeding on the small bindweed (*Convolvulus minor*); also a specimen of the dark variety of the larva of Acherontia Atropos, found near London, and preserved by Mr. Baker, of Cambridge.

Mr. F. Moore exhibited some impressions of Indian Lepidoptera taken on wax-paper by means of pressure applied to the original specimens.

Mr. Francis exhibited specimens of Anthribus albinus, *Linn.*, taken at Folkestone in the second week of September last; and of Chrysomela fulgida, so arranged as to expose the deep red wings of that species.

Mr. M'Lachlan exhibited a collection of cases of the larvæ of various genera of Trichoptera, showing the different materials, and the different dispositions of those materials, used by the larvæ in forming their defences; some were composed wholly of vegetable matter, others wholly of shells or small pebbles, others again had these substances mixed heterogeneously; whilst one case of the genus Setodes appeared to be composed entirely of silk, without being covered externally with any other substance.

Prof. Westwood exhibited a large sheet of whitish silky matter of extreme smoothness, resembling the finest kid, which had been sent to him by Dr. Cuthbert Collingwood, and had been taken from the bottom of a biscuit-chest; the biscuits themselves were found to have been attacked by larvæ, which were described as resembling those of Diptera. The Professor, however, thought it more probable that the web was the work of Lepidopterous larvæ.

Mr. Stainton said that his first suspicion had been that the sheet in question had been made by the larvæ of Tinea granella; but the matter was more opaque than any he remembered to have seen, and which had been ascertained to be the workmanship of that species.

Mr. Jenner Weir, however, had seen pieces even more dense and opaque, which had undoubtedly been done by the larvæ of Tinea granella feeding upon grain.

Mr. Waterhouse exhibited two specimens of a species of Scymnus, not noticed in his 'Catalogue of British Coleoptera,' and read the following notes thereon:—

Note on Scymnus quadrilunulatus, Muls.

"The exhibited specimens of a species of Scymnus are from Kirby's British collection. In Kirby's catalogue they stand as the Coccinella bis-bipustulata of Marsham (Ent. Brit. No. 46, p. 167), but upon comparing them with the specimen in Stephens' collection, which in the 'Illustrations' is said to be the Marshamian type, I find that Kirby's insect is quite distinct, it being the Scymnus quadrilunulatus of Mulsant's 'Coléoptères de France' (Sécuripalpes, p. 237, sp. 6), a species which is identified by several authors with the Coccinella quadrilunulata of Illiger.

"I have re-examined the Marshamian insect, and believe that my former conclusion respecting it is correct, *viz.*, that it is a four-spotted variety of S. frontalis, a variety which does not appear to be uncommon on the Continent, but which is apparently very rare in England, since no other British example has come under my notice than the one referred to. The statement in the 'Illustrations' and in the 'Manual,' that of the two spots on each elytron the posterior "is the largest," is incorrect, for the anterior spot is the larger.

"The Scymnus from Kirby's collection is a considerably smaller insect, being rather less than S. discoideus. It is of a short ovate form, with the elytra obtusely rounded

behind; moderately convex; well clothed with whitish pubescence; black, with the antennæ, parts of the mouth, legs and apex of the abdomen, as well as the spots on the elytra, testaceous; the femora, however, are dusky at the base. The upper surface is densely and finely punctured, but on the elytra the punctuation is rather less dense than on the thorax. The anterior spot on each elytron is moderately large and oblong, extends from the humeral callosity inwards and slightly downwards, and terminates far short of the suture; it is somewhat contracted in width in the middle, and most dilated on the inner half. The second spot is much smaller, placed about midway between the anterior spot and the apex of the elytra, and nearer to the suture than the upper spot; it is slightly transverse, broad and rounded on the side nearest the suture, and gradually contracted in width externally. Both spots show a slight tendency to a lunate form. The reflected margin of the apical portion of the elytra is rufous.

"I have seen no other reputed British examples of this species, and hope that this notice will elicit further information.

"Stephens, in his 'Illustrations' (Mand. iv. p. 393, sp. 7), very briefly describes an insect (Scymnus colon) in these terms:—'Shining black, slightly pubescent; thorax immaculate; elytra each with two small luteous spots placed longitudinally; apex of abdomen rufescent. Length 1 lin. I have seen one specimen only of this species, which was captured at Wood Ditton, May 19, 1827; Rev. L. Jenyns.' Should this be identical with the insect exhibited (and I think with Mulsant that such is the case), we have here a locality for the species."

Paper read.

Mr. Stainton read a paper "On the European species of the Genus Cosmopteryx;" this was illustrated by a single coloured figure, which, by an ingenious contrivance, was made to display the characters of and distinctions between four of the closely-allied species.

December 7, 1863.—Frederick Smith, Esq., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the respective donors:—'Proceedings of the Royal Society,' Vol. xiii. No. 58; presented by the Society. 'Journal of the Proceedings of the Linnean Society,' Vol. vii. No. 27; by the Society. 'Proceedings of the Royal Physical Society of Edinburgh,' Sessions 1858-62; by the Society. 'Bulletin de la Société Impériale des Naturalistes de Moscou,' Année 1862, Nos. 2, 3, 4; by the Society. 'The Journal of Entomology,' Vol. ii. No. 9; by the Proprietors. 'On Parallel Relations of the Classes of Vertebrates, and on some Characteristics of the Reptilian Birds;' 'The Classification of Animals based on the principle of Cephalization;' by the Author, James D. Dana, Esq. 'On the Genus Acentropus;' by the Author, Edwin Brown, Esq. 'Notes on some new or little-known species of Freshwater Entomostraca;' by the Author, John Lubbock, Esq., F.R.S., F.L.S., &c. 'Sepp, Nederlandsche Insecten,' 2e Série, Nos. 11—34; by the Author, C. Snellen van Vollenhoven, Esq. 'The Intellectual Observer,' Nos. 22 and 23; by the Publishers. 'The Zoologist' for December; by the Editor. 'The Farm and

Garden,' Vol. iii. Nos. 35, 36, 38—41 ; by C. A. Wilson, Esq. 'The Journal of the Society of Arts' for November ; by the Society. 'The Athenæum' for November ; by the Editor. 'The Reader' for November ; by the Editor. 'Stettiner Entomologische Zeitung,' 24 Jahrg. Nos. 10—12 ; by the Entomological Society of Stettin.

Election of Member.

George Bryant, Esq., of the India Office, Victoria Street, Westminster, was balloted for, and elected a Member of the Society.

Alteration of the Bye-Laws.

Notice was given that a Special General Meeting would be held on Monday, the 25th of January, 1864, at 7 P. M., for the consideration of certain proposed alterations of the bye-laws.

Exhibitions, &c.

Mr. S. Stevens exhibited a large box of Coleoptera collected by the Rev. Mr. Gerard in the Zulu Country ; and a specimen of Polyommatus, taken in the Isle of Wight, which appeared to be intermediate between P. Adonis and P. Alexis.

Sir John Hearsey exhibited some Indian Lepidoptera, principally Noctuidæ and Geometridæ.

Mr. W. W. Saunders called attention to the injury done to an Orchid by one of the Cimicidæ : the Orchid was a Catasetum, which had been imported from Brazil about eighteen months before ; the bug was a Bryocharis, probably also an importation, but Mr. Saunders was inclined to think that it had come from Hayti, from which locality he had, only two months ago, received a collection of Orchids, among which a species of ant (Formica herculanea ?) had been found. The Bryocharis, when disturbed, exhibited extreme activity, and destroyed the plant in a manner similar to Thrips.

Professor Westwood produced a MS. entomological journal of the late John Curtis, being a volume containing a page for each day of the year, and comprising upwards of two thousand entries, written without very careful attention to grammatical rules, but with the exquisite neatness which characterized the author's caligraphy. The observations of successive years were recorded on the same page belonging to the day of the month on which they were made ; the year was entered in one column, the plant or material attacked or infested was named in a second column, and the insect attacking or infesting in a third ; these were followed by more particular details as to the nature and extent of the injury done, and generally as to the habits of the species under observation. The Professor observed that perhaps, on the whole, there was no better plan of keeping an entomological journal, but the manifest objection to it was that it was merely chronological (or rather seasonal), and there were no means of referring at once to all the observations on the same subject ; but an index was required both of the attacking insects and of the objects attacked.

Professor Westwood also produced, as another Entomologico-literary curiosity, a MS. page of the Proceedings of the Norwich Entomological Society, of which the following is a copy :—

"Third Meeting. At Mr. Curtis's, December 4, 1810.

"A paper was read (No. 4) from Mr. Curtis, on the powers of sound possessed by some individuals among the Coleoptera.

"A paper was read (No. 5) from Mr. Wilkin, on the genus Geotrupes of Latreille and Dumeril, defining its characters and dividing it into sections.

"A paper was read (No. 6) from Mr. Wilkin, on the Linnean species of the Carabi, with observations resulting from an examination of the original specimens labelled by Linnæus, and preserved in the Linnean collection now in the possession of Dr. Smith.

"Some remarks were made on the subject of Mr. Curtis's paper, in opposition to the hypothesis proposed by him, *viz.*, that the sound produced by C. fuliginosus and others when captured arises from the friction of the abdominal segments on each other. The majority rather attributed the sound to friction of the edges of the elytra.

"Mr. Wilkin communicated to the Society the result of an experiment which he had made on Blaps lethifera. The ammoniac scent attributed to the insect by Mr. Sparshall suggested that possibly some crystallization of ammonia might be obtained from it. But after destroying a large number of specimens by hot water in a confined vessel, and thereby obtaining a strong solution of the juices of the animal, Mr. P. Taylor (who assisted Mr. W. in the experiment) ascertained by the test of a strong solution [*here a blank occurs*] that there was not the smallest portion of ammonia. By dissection, the discriminating characters of the sexes were ascertained, the male being considerably broader and shorter; the mucro of the elytra is shorter, and at the base of the abdomen is seated a small tuft of yellow hairs. In size and punctuation this species varies considerably. Some specimens are smooth, others much more roughly punctured. In the collection of the late Mr. Beckwith is preserved a specimen of the male having one elytron smooth, the other so deeply punctured as to be rugulose. And among the specimens captured at the Horse Barracks by Mr. W. he was fortunate enough to meet with the female of this singular variety, which, together with some of the Carabi mentioned in No. 6, were exhibited.

"At the request of Rev. W. Kirby, of Barham, we elected him a Member of the Norwich Entomological Society."

Professor Westwood exhibited specimens of two new Coleoptera, each of such singular form as to necessitate the creation of a new genus for its reception: they were characterized as follows:—

Genus Ogcocephalus, *Westw.*

Genus (vel potius subgenus) novum in familia Malachiorum Cephalogoniæ, *Wollast.*, proximum. Differt capite in maribus prothorace fere duplo latiori, postice excavato, excavatione latâ, antice trisinuatâ, in medio tuberculo minuto obscuro instructâ; facie in utroque sexu antice brevi nec conica. Antennæ breviores, simplices, articulo 2do minuto, 3tio et 4to sequentibus haud multo brevioribus. Prothorax brevis late cordatus. Palpi labiales articulo ultimo subovali (nec subsecuriformi). Elytra modice elongata, apice in singulo rotundato.

Ogcocephalus Capito, *Westw.*

Lutescens nigro varius. Capite nigro excavatione ♂ luteo variegata. Prothorace fulvescenti macula magna media, alterisque duabus parvis lateralibus (interdum confluentibus). Elytris luteis, humeris late, cum scutello maculisque duabus magnis subapicalibus nigris.

Long. corp.

Habitat in Insula Canariensi. D. Wollaston.

Genus Aglycyderes, *Westw.*

Genus anomalum, et quoad affinitates dubium, quamvis Anthribidibus, ut mihi videtur proximum. Corpus oblongum, depressum obscurum setosum. Caput in maribus ante oculos prominentes in cornu utrinque productum, postice in collum angustum contractum. Antennæ rectæ, filiformes, 11-articulatæ. Mandibulæ breves crassæ trigonæ obtuse tridentatæ. Maxillæ planæ subtrigonæ margine interno spinis rigidis curvatis armatæ. Palpi maxillares abbreviati, conici, articulis 3 basalibus brevissimis. Labium rotundatum corneum, valde setosum. Palpis labialibus minimis, conicis. Prothorax subquadratus lateribus rotundatis. Pedes breves crassi, tarsis brevibus articulis 2 basalibus subbilobatis, 3tio minimo nodiformi, 4to longiori clavato, ungues 2 simplices instructo.

Aglycyderes setifer, *Westw.*

Obscure fusco-nigricans punctatus, elytris striato-punctatis, punctis setas albidas emittentibus.

Long. corp.

Habitat in Insula Canariensi. D. Wollaston.

Mr. W. F. Kirby produced a copy of Dr. Loew's recently-published work on the European Trypetidæ, illustrated with twenty-six enormous photographic plates of the wings.

Captain Cox sent for exhibition a series of admirably-executed photographic pictures of groups of insects, accompanied by the following:—

Notes on the application of Photography to Entomology.

"I beg to forward a few notes on the method of applying Photography, as a means of illustrating single specimens or cabinet drawers of insects; and I believe from the success that has attended my first effort that I do not over-estimate the great value this art will ultimately prove in rapidly delineating, with most perfect accuracy, either single specimens or groups of insects; and I also believe we are on the threshold of a very marked period in the advance which the science of Natural History is now likely to take, aided by a power so quick in action, so accurate in detail, and so exquisitely beautiful in its general character as Photography; and I think before long the appliance of this new Science will enable us to have our entomological *cartes de visite* in the form of photographic groups of classes of insects, according to the speciality of the collector's taste; and I am led to believe that, as we progress in this knowledge, all who have fine collections, and have also the command of moderate means, will not rest satisfied until they have had them copied by means of Photography, thus handing down to posterity a faithful record of what once existed,—the result of long, patient and assiduous collecting, of untiring zeal, of minute and close application. Again, as the knowledge and appliances of the photographic art are now so generally diffused over the civilized world, it may occasionally occur that rare or interesting specimens of insects may be collected, and yet no means of preserving them be at hand; as from very many causes, unless the greatest care and attention be constantly used, in overlooking a collection (so perishable as insects are in a warm climate), they are liable to be destroyed. Now, if these were copied by means of the camera, which would be but

the affair of a few minutes, and a trifling expense, we should then possess forms and markings which no labour of the engraver's tool could supply, even if time alone did not at once offer an insurmountable difficulty. Forms obtained in perfection and in high relief, in fact, the insects, as seen in the accompanying proofs, seem literally to stand out from the flat surface of the paper: minute markings are clearly defined, and although we lose colour, yet there is an approximation to it in many instances which is very remarkable. I may call attention to the Atlas and Strix major, and also to the singular appearance of the green under the wings of Pontia Rapæ, P. Napi and P. Daplidice; in fact, the insects seem to possess in the plate a faint tinge of green. But this art is more particularly serviceable when we wish to illustrate the difficult forms we often meet with among the Coleoptera. Here it is of the highest value, for whatever the eye can see, Photography will unerringly pourtray, and when once we have a perfect drawing, with its lights, shades and half tones, the engraver (should his assistance be required) will find his labours materially lessened, and a very large amount of time saved.

"Again, to illustrate its easy applicability, I may mention that the accompanying drawings, with the exception of the one of the Ornithoptera, were prepared to be exhibited at the late Meeting of the East Kent Natural History Society, which was held on Tuesday, the 24th of November. I prepared my plates on Saturday, the 21st, and printed and toned them on the following Monday; therefore in the short space of two days a series of drawings was finished which no art of the engraver can approach, either for fidelity or beauty. Even this did not occupy two days; the plates and prints were only taken whilst the light was good. But to still more clearly illustrate the advantage and rapidity of this method of copying specimens, I may mention that Mr. W. W. Saunders kindly attended the late Meeting of our Society in Canterbury, and communicated a paper on the Ornithoptera: the next morning he drove over to see me. At half-past ten I took two plates of his beautiful box of Ornithoptera, a copy of which is forwarded; at a quarter past eleven he was obliged to leave to meet the train, on his return home: thus in this short space of time we were enabled to obtain a photographic picture of a most beautiful and rare box of butterflies, and also to retain for our Society a happy reminiscence of a most agreeable evening passed with one of the late Presidents of the Entomological Society.

"I now hope that sufficient has been said to point out how useful the photographic art may be in connection with the study of several branches of Natural History, and more particularly with that of Entomology.

"The following apparatus is what I have used. Mr. Thomas Ross's new triplet lens, well stopped down; it covers a plate of ten inches by eight. The camera is by Burfield and Rouch, expanding and lined with black cotton velvet. The bromo-collodion is by Mr. Linford, of Canterbury. This collodion works quickly, is very clean, and is remarkably strong and tough. My developer is made as follows:—

Sulphate of iron . . .	2 drams	
Nitrate of potash	2 „	1 scruple.
Acetic acid	2½ „	
Spirit of wine	5 „	
Distilled water . . .	10 ounces.	

I clean the plates with a solution of cyanide of potassium, the usual form.

"*Method of arranging the Object.*—As a rule all light-coloured insects ought to be set on a dead black paper, dark insects on a white one. Insects ought to be arranged if possible in some measure according to colour and texture, thus·

"*First*, colour. Black velvety wings are good absorbers, but bad reflectors of light, therefore they will require about five times the length of exposure to that of a white wing. Yellow colours are most difficult to take; they require a great deal of forcing, even more than the black: I am not yet in a position to give any accurate time, as the yellows vary from the pale lemon to the deep orange; but, as a rule, I should expose two minutes longer than the black; thus, if in a box of insects black, white and yellows are mixed up, it is extremely difficult to obtain a satisfactory result, as may be seen in No. 1 plate, containing the swallow-tail, the Bath white and orange-tip. The swallow-tail is not brought out, whilst the whites and greens are perfect; the orange is blackish.

"*Secondly*, texture. The wings of the Coleoptera are mostly glazed, therefore good reflectors. These insects take admirably, as in plate 7; all their salient points come out remarkably well, and stand sharp and clear. In these insects form is everything, and colour next to nothing; so that by Photography we are enabled to trace the most minute variations, if the insects be correctly focussed. The clear-winged insects are also beautifully brought out by this Art,—the Neuroptera especially,—but care must be taken to have a back-ground suitable for throwing up the exquisitely delicate tracery of the wings; the Orthoptera also come out well. Specimens of these two insects are seen in plate 7.

"*Size of Specimens.*—This is a very important consideration. If we wish to exhibit a single specimen, it ought to be taken as near the full size as possible, but where a series is to be photographed the expense must be kept down by diminishing the size (as seen in plate 5), for here we have a specimen of the largest moth known, which would have occupied more space than the whole plate, yet brought out so clearly and forcibly in the reduced size as to be in every way satisfactory, for I think so long as we can have all the markings well developed, it is not of much consequence that the actual size should be adhered to.

"In conclusion I beg to state that I shall be happy to answer any communications forwarded to me on this subject."

The President read the following note:—

On the Nest of Trigona carbonaria.

"At the November Meeting of this Society I exhibited a nest of Trigona carbonaria, a stingless honey bee, from Queensland, Eastern Australia. I have had opportunities since that time of more carefully inspecting the structure of the nest, and I think the results may be sufficiently interesting to lay before the Meeting. On cutting away a portion of the back of the box in which the nest was built I at once obtained a view of the interior. The spaces between the combs, and also every hole and crevice, was crammed with the bodies of dead bees; I obtained from four to five hundred, all of which I carefully examined in the hope of finding a female. All appeared to be ordinary working bees; I could not detect any difference among them. The combs in the nest of Trigona carbonaria are arranged precisely similar to those of the common wasp, that is, they are single, placed horizontally, and attached, or rather kept apart from each other, by short columns or foot-stalks; the mouths of the cells are, as in the

nest of the wasp, downwards. The cells were entirely filled with brood; I could find very few not occupied. None of them contained honey; all the honey collected I concluded is always stored in honey-pots at the foot of the nest.

"In one particular the nest of Trigona differs materially from that of the wasp in the mode of its construction: the combs are built over each other, the lower comb being first constructed, so that it increases in size upwards, that of the wasp being enlarged downwards. Thus it will be seen at once that the arrangements of the hive of Trigona are very different to those of the hive bee. In the latter case the combs consist of a double series of cells, and are suspended vertically, and on the receptacles proper of the honey itself as well as of the brood. I am, however, inclined to the opinion that the hive of Trigona contains several prolific females; the accounts given of the multitudes inhabiting some nests is too great I think to render it possible that one female could produce them all. Mr. Stretch described a hive that he saw occupying the interior of a decaying tree that measured six feet in length, and the multitude of bees he compared to a black cloud. That there is more than one female in the hive of Trigona is, I think, rendered almost certain, from the fact of M. Guérin having found six in a nest of Melipona fulvipes, a genus very closely allied to Trigona.

"In Mr. Gosse's 'Naturalist's Sojourn in Jamaica' is a very interesting account of a nest of a species of Trigona. It is extracted from the journal of his friend Mr. Hill, who writes as follows:—'The wax of these bees is very unctuous and dark-coloured, but susceptible of being whitened by bleaching. The honey is stored in clusters of cups, about the size of pigeon's eggs, at the bottom of the hive, and always from the brood-cells. The brood-cells are hexagonal,—they are not deep, and the young ones, when ready to burst their cerement, just fill the whole cavity. The mother bee is lighter in colour than the other bees, and elongated at the abdomen to double their length.'

"The wax of which the nest of Trigona carbonaria is constructed differs in quality materially from that of the hive bee. Mr. Woodbury, who obtained the nest from Australia, had tested it in some degree, and scarcely considered it to be properly wax, taking that of the hive bee as the standard of quality. On holding it in a flame it does not melt as bees'-wax does, but ignites and burns with a red flame. If analysed it would probably prove to be composed principally of resinous gum."

During the Meeting the Secretary received from Charles Williams, Esq., Resident Surgeon of the Norfolk and Norwich Hospital, a living female specimen of the common wasp, which had on the previous day (December 6th) flown into Mr. Williams' bedroom.

The following was communicated by Mr. C. A. Wilson, of Adelaide:—

Notes on the South-Australian Calosoma Curtisii.

"The genus Calosoma being a remarkable one in a favourite family, I have thought that a few notes, from personal observation, on the economy of our only known species would be interesting. (There is said to be another species of Calosoma native of our province, smaller and of a black colour, but I cannot hear of any one who either has found or possesses it.) C. Curtisii was first found about five years after the establishment of this colony. In the month of November, 1841, they were brought singly into town from the North (as a few miles north of Adelaide was then called), being picked up by carters as 'something curious.' I was asked to name the insect

(being, I believe, then the only entomologist in the colony), and found it a Calosoma. The following year a few more were found, and three or four were also said to have flown into one of the shops in Adelaide at night, attracted by the oil lights.

"After this came a lull for a few years, during which this much-prized beetle was rarely seen; but in 1851 several were again observed, and in the following year they immensely increased, and appeared to reach in numbers their culminating point, for in 1853 and since they seemed gradually to decrease again. Last year (1862) they were rather more numerous than usual, and about two dozen were taken altogether, in the same spots as those of previous years. Their time of appearance is almost always through the month of November, and so strictly is this the case that they are never looked for and seldom seen even a few days before or after that month. On one occasion, however, I found a solitary one a few days before Christmas.

"The habitat of these beetles has been hitherto exceedingly local, first a few miles north of Adelaide, and since almost confined to the foot of the North Adelaide hills; thence spreading to the park lands between them and South Adelaide, and occasionally to adjacent outskirts of the town. I hardly ever heard of their being found anywhere else, though on one occasion I took one myself thirty-two miles north, or six beyond Gawler Town, in a garden. My idea is that once found in North Adelaide and neighbourhood, they were retained there by the quantity of cow-dung scattered about, under the drying pieces of which they frequently hide. In the above places they kept almost exclusively to the foot-paths, and were thus at once perceived: there they were seen often crossing briskly enough, but not so swiftly as to prevent their being easily taken. Occasionally I have perceived one at a distance, standing motionless in the middle of a path, the sunlight playing brilliantly on his polished elytra, and not moving till I was close upon him. They are continually trodden under-foot, being considered from their aspect 'venomous'! They evidently avoid the grassy spots, and come out into 'the clearings,' as the weeds and grass seem to incommode them and prevent their walking. I have never in a single instance known them attempt to fly, nor ever observed them on the wing, though they have ample organs for that purpose.

"These beetles are fond of all damp situations, but still do not like rainy weather, which seems to clog them; and again the hot weather of December I think but few of them could stand, so the term of their full-fledged existence is but of short duration. Their food, I think, must be the different kinds of caterpillars about in October and November, and occasionally those naked ones (of the Noctuidæ) found under cow-dung, where I have sometimes observed the beetle. They often exude too, when caught, a brown liquid from their mouths, smelling strongly of stercorarious matters.

"The larva I have enclosed is one of the larger ones I have taken, shrunk, of course, a little in size: it was probably full grown. I never found any of these larvæ till the year 1852, when the greatest number of the imagos were taken; all were found at the same places as the beetles, at the same time, and nearly all of their full size. These facts are singular, and seem to prove that these insects remain in either the larva or pupa state several years, and then are all perfected at the end of so many years at the same time. I have seen the perfect beetle and full-grown larva together under cow-dung, and on the surface of the ground. The length of the pupa-condition (whose place of rest is, I suppose, beneath the surface of the ground) I know not yet. There has lately been a rumour of these Carabidæ being found in the far north (from three to six hundred miles inland), but this has not been authenticated.

"The following notes are copied, almost *verbatim*, from those I made at the time in my entomological note-book:—

"*Calosoma Curtisii.*—Nov. 1, 1852. The first of the season taken and brought to me; smallest had yet; very bright green; found below N. Adelaide hills.

"Nov. 2. Found self another Calosoma in foot-path between N. and S. Adelaide, in Square near the Church; also small; running quickly.

"Nov. 3. Found three more Calosomas, foot of N. Adelaide hills, 4 P.M.; running across paths. (Caterpillars of Plusia abundant).

"Nov. 5. Five Calosomas; two in morning; three in afternoon; morning at same place—ford or crossing place.

"Nov. 6. Four more Calosomas; always found at foot, never top of hills; always in paths with grass at sides; all those found last few days full-sized.

"Nov. 8. Four more Calosomas; same places.

"Nov. 9. Five more, one of these for first time *in* grass, and not very near path.

"Nov. 10. Extraordinary day for Calosomas; found altogether twenty-four in compass of half a mile.

"Nov. 11, 12 and 13. Respectively four, two and one of these beetles.

"Nov. 15. Two Calosomas; one a female burrowing in ground, as if to lay.

"Nov. 16. Four more Calosomas, under cow-dung in park lands N. Adelaide; two under one piece, also two large larvæ; first I have seen; probably larvæ of these beetles; very active indeed, jumping about when touched; exuded a dull white matter. Colour dull black with red bands. (Figure here drawn). In evening of same day one Calosoma flew into room.

"Nov. 17. Another Calosoma-larva under cow-dung.

"Nov. 19. Saw the curious larva of the Calosoma crossing the road quickly, nearly as quickly as the beetle itself, in same spot as before—*i. e.* near ford.

"Nov. 20. Another larva, same kind, crossing the road."

Paper read.

Mr. M'Lachlan read a paper "On the Types of Phryganidæ described by Fabricius from the Banksian Collection." In this paper the Limnephilus intercisus of Walker was identified with the Phrygania irrorata, *Fabr.*, and the Dipseudopsis capensis of Walker with the Phryganea notata, *Fabr.*, it being conceived that Fabricius was in error in stating that the latter was from North America; and the third type-species, P. signata, *Fabr.*, was referred to the genus Brachycentrus of Curtis, possibly B. incanus of Hagen.—*J. W. D.*

Note on Miarus.—I think it must be this time three years since Douglas first showed me how to find the little Miarus on Blackheath, in the Campanula there. The hare-bell growing here is nearly two feet high, and has eight or nine flowers on a stem. The Miarus attached to the plant is rather larger than M. Campanulæ, but not so big as M. Graminis. Nearly every flower has its tenant. It is a great treat to meet thus with an old friend, and finding, as I did, Apoderus in the same bank, the hunt along the old city walls was a great success.—*George Lewis; Kiu-Kiang, September* 28, 1863.

Enormous gathering of Drypta.—Towards the end of December last, heavy floods occupied some acres of the low ground extending along the river here. While out shooting in a sampan, I happened to come to a little island, as it were, made of loose earth and clay, about 20 feet in diameter. This was literally riddled, pierced through and through, by one vast colony of Drypta: some dozens laid huddled together in every crevice. The insect is red, with the margins of elytra and suture blue. I bottled nearly a hundred specimens, so that those cabinets which require the species can easily be provided. Three or four species of Steni and two of Clivina occupied the same spot.—*George Lewis; Foo Chow, April*, 1863.

Hylastes angustatus taken in England.—

Hylastes angustatus (*Herbst. Kaf.* v. iii. 9, tab. 48, f. 9, h; Bostricus angustatus, *var.* nigra), *Erichson, Weigmann's Archiv.* 1836, Bd. i. 51, 8; *Redt. Faun. Austr.* 825 (*nec Gyll.*).

The name of this species is included in Mr. Crotch's recently-published 'Catalogue of British Coleoptera,' but it is somewhat doubtful whether it may not be therein intended to represent H. palliatus, as the latter (though certainly British, and indeed a common insect) is omitted from the work in question; and this supposition is by no means improbable, since there is some confusion in the nomenclature of certain members of the genus. I have, however, determined H. angustatus from a specimen taken by myself at Holme Bush, and have no doubt that it is mixed with H. opacus in collections. It differs from the latter in the following points: it is narrower and more elongate; the punctuation of the thorax is rather coarser, the small spaces between the punctures being shining, instead of dull; the tibiæ are a little more dilated, differing also slightly in the spines on their outer edge, and the rostrum exhibits a delicate but decided longitudinal channel, the rostrum in H. opacus being without any groove. H. palliatus, which also has the rostrum grooved, is a larger, stouter and broader insect, generally brownish in colour instead of black, with the elytra more deeply and roughly punctured, and the thorax decidedly constricted in front, and with an elevated middle longitudinal line. It differs from both H. opacus and H. angustatus in having the third joint of the tarsi more decidedly bilobed, and Redtenbacher (*loc. cit.*) places it in a section apart from both these species, on account of its mesosternum being armed, between the middle trochanters, with a small blunt tubercle, which is turned forwards. —*E. C. Rye;* 284, *King's Road, Chelsea, S.W.*

Capture of Coleoptera on Penmaen Mawr.—At Zool. 8793 Dr. Power has kindly given notice of the occurrence of Quedius auricomus and Stenus Guynemeri in North Devon. Having myself captured both insects during a visit to North Wales, in July last, it may be interesting to some of the readers of the 'Zoologist' to know where they were found. As my friend Mr. Garneys had obtained, in the early part of the same month, a few specimens of the former on Penmaen Mawr, I was led to make special search for it in various localities, and the following furnished me with a tolerable supply of both, *viz.*, Aber, Penmaen Mawr and Penmaen Bach, Dwggyfylchi and Falls of Dolgwrog. Mr. Garneys was fortunate in meeting with a fine specimen of Euryporus picipes on Penmaen Mawr.—*Arthur Hewgill; Repton, October* 26, 1863.

Breeding of Varieties.—In 1860 I captured a pair of Biston betularia *in côp.*; the male quite black, and the female of the ordinary colour. From this pair I obtained a few eggs, and in 1861 these eggs produced eleven perfect specimens, of which eight were males and three females, six of which were black and five the ordinary colour. From a pair of black specimens I obtained eggs, the larvæ from which I fed upon sallow, as before, and the progeny, excepting a few I have given away, are now before you:—grandfather and grandmother; 11 children of ditto, 6 black and 5 ordinary colour; 41 children of black parents, 32 black and 9 ordinary colour; total progeny 52, exclusive of many specimens which did not fully develope their wings. Here we have the history of three generations of one family, and though we cannot draw any very accurate deductions from this experiment, still we may feel justified in saying there is more in variety breeding than some people admit; but from the facts before us I cannot see anything in favour of what is generally known as the development theory, for with black and white to start with, the produce is nearly even, and from two blacks (artificial, if I may so call them) the produce is not all black, as some expected. Again, Mr. Stephenson bred as many black as white ones. All that we can arrive at is, that varieties will produce varieties for a time, but, as in the case of the specimens before you, they then refuse to copulate, and no eggs can be got. It may be that other specimens or species would breed further than the third generation; but, drawing my deductions from past experience, I am inclined to the opinion that it is one of those wise, inscrutable provisions of Nature by which her original plan is kept in its original course, deviating sometimes, from causes we do not understand, but rarely, if ever, diverging so far that even a dull naturalist is at fault to place it. Mr. Gregson, who has long made the study of variety breeding his pleasure, does not say we can produce varieties *ad libitum* by change of food, as some people assert he does; he only says that if we change the food of larvæ the chances are that, amongst a great number bred, far more will prove varieties than if fed on their ordinary food or in a state of nature, and, from my own experience of variety breeding for the last four years, I have arrived at the same conclusion. When the question of variety breeding reduces itself into one of our acknowledged facts, and the "pooh, pooh!" of some of our contemporaries is forgotten, when men join to work out this singular question, and the results of a large number of experiments are brought together, then, and not until then, will it be safe to generalize on this question; but at that time, I have little doubt, we shall find that Nature always resumes her course [eventually], although she allows us to force her out [of it for a time].—*N. Greening, in 'Proceedings of the Northern Entomological Society.'*

Early appearance of Diurnal Lepidoptera in 1863.—Various notices appeared in the spring of butterflies seen flying about at a time when they are usually hybernating, but I do not recollect that any one has remarked the fact that most of the spring and early summer butterflies made their appearance considerably earlier than is the case in ordinary seasons, some of them anticipating their usual time by two or three weeks. I noted down the earliest dates on which I met with many of the common species.

January 31. Gonepteryx Rhamni, flying by a sunny hedge-bank. This species had been seen in the neighbourhood flying on Christmas Day.

February 13. Vanessa Io, flying in company with G. Rhamni.

March 3. Vanessa Urticæ, common.

March 21. Lasiommata Ægeria, just emerged from the pupa, in a warm lane: I have noticed four broods this season.

March 23. Pieris Rapæ, flying by a garden. Hybernated species plentiful.

April 1. Pieris Napi.

April 24. Pieris Brassicæ, Anthocharis Cardamines, Lasiommata Megæra and Lycæna Argiolus; the last named was out till June 15th, but worn.

April 25. Lasiommata Megæra, plentiful; and Chrysophanus Phlæas appeared.

May 2. Satyrus Pamphilus.

May 5. Argynnis Euphrosyne.

May 7. Leucophasia Sinapis, Thymele Alveolus and Thanaos Tages. T. Alveolus had evidently been out some time, as some of the specimens were worn: I had not before visited the spot where it occurred.

May 8. Lycæna Alexis.

May 18. Argynnis Selene; was still out, and in fine condition, in July.

May 27. Melitæa Artemis, common.

May 29. Pamphila Sylvanus. For years I have thought there must be some mistake about the reputed appearance of this species in May, and again in July and August. When, however, I took it in May, this year, I thought the matter was settled, and looked eagerly for a second brood, but was disappointed. The insect was common enough till late in June, but by the beginning of July had disappeared, and when P. Linea made its appearance, on July 8th, it was without its usual companion, and remained so. I am satisfied that there was no second brood of P. Sylvanus here this season; possibly there may be in warmer localities, but I am inclined to think that there is only one brood in the year, which appears earlier or later, according to the season.

June 20. Satyrus Janira, common.

July 17. To my great surprise, I met with a specimen of Arge Galathea in a rough field: I had not the slightest expectation of finding it in this neighbourhood, and it seemed still more remarkable to see but one specimen of so gregarious an insect. —*Charles Golding Barrett; Haslemere, November* 3, 1863.

Time of Emergence from the Pupa in Lepidoptera.—The Rev. J. Greene, in his 'Entomologist's Companion,' remarks that "There is no doubt many species have fixed hours of emergence from the pupa." It appears very probable that there is a particular time in the case of each species, of course liable to occasional variations. Thus I have observed that Smerinthus ocellatus usually appears about 7 A.M.; S. Tiliæ between 1 and 2 P.M.; Sphinx Ligustri about 6 P.M.; Biston hirtaria between 10 and 12 A.M. Some interesting observations might probably be made in this direction.—*John R. S. Clifford;* 21, *Robert Street, King's Road, Chelsea.*

Acherontia Atropos in Cambridgeshire.—About the second or third week of last September I purchased of a woman a fine coloured and perfect specimen of this singular species, which the woman's husband had discovered in his potato-field at Cherryhinton, in this county. The death's-head moth has not been of nearly so frequent occurrence this last year or two: about six or seven years since the species was prodigiously abundant, scarcely a potato-field but what produced its dozens of pupæ.—*S. P. Saville; Dover House, Cambridge.*

Abundance of the Larvæ of Sphinx Ligustri.—The larva of this moth has been unusually common in various places at the west end of London this season, occurring upon the privet and also upon the wild apple and pear. It was feeding much later than usual: since I first made the acquaintance of this larva, some twelve years ago, I have seldom seen it after the first week in September. This autumn I found it all

through that month, and even took an unusually fine larva as late as the 3rd of October. The young larva of S. Ligustri is, I believe, seldom found. I have been disappointed in obtaining it myself, having tried both beating and searching in localities where I had no difficulty afterwards in obtaining the nearly adult larva. If, as has been supposed, its mode of concealment is merely to retire to the interior of the bush, it should be discovered by one or other of those methods. I am inclined to infer that it descends to the surface of the ground during the day.—*John R. S. Clifford.*

Larva of Chærocampa Porcellus near Chelsea.—I found three larvæ of Chærocampa Porcellus, feeding upon Galium aparine? in a lane on the outskirts of Chelsea, at the beginning of last August. When full grown it changes to a pupa on the surface of the ground, forming a slight cocoon of considerable size by drawing together the withered stems of the plant.—*Id.*

Statices versus *Geryon*. By the Rev. Edward Horton, M.A.

Although I agree with Dr. Staudinger (Zool. 8403) that "a young naturalist should, if possible, avoid" asserting that two similar insects are of the same species because they happen to be similar, I think that older naturalists are not without danger of falling into the opposite error, that of making out similar insects to be of different species. Perhaps the popularity of the Divorce Court, under the able administration of the late Sir Cresswell Cresswell, is beginning to have its effect in entomological quarters; for the case of Statices *v.* Geryon has been decided in a way which threatens a facility in dissolving the specific tie very dangerous at a time, when the very existence of that tie is called in question. I am no lawyer, but I think that the heading of this important case should rather be Statices *v.* Statices than Statices *v.* Geryon; and, with all respect to the judicial bench and the jury, who may have weighty reasons, not known to the world, for their decision, I have taken upon myself to review the evidence, as it has appeared in print in the 'Zoologist.' The earliest notice I can find is at p. 8403, where Mr. Newman quotes a long passage from Dr. Staudinger's Monograph of the genus Ino, published in 1862. The first statement in that extract will be accepted by all who are acquainted with the two insects under consideration: "This species (Geryon) is altogether less than I. Statices."

The next assertion that "there is scarcely any difference between the two sexes" of I. Geryon in size, does not agree with my observations. From the numerous specimens that I have examined, I should say that there is a noticeable difference, though not perhaps quite so great as in I. Statices. Individuals of each sex differ considerably

from each other in size, and I have occasionally seen a female quite as large as a small male, but generally speaking the females are decidedly smaller than the males. In colour there seems the same variety in both insects, and I cannot see that the hind wings in I. Geryon "are more transparent than those of I. Statices," nor that they "appear somewhat blacker," which seems rather inconsistent with the greater transparency. With regard to the antennæ, which Dr. Staudinger describes as "shorter and stouter" than in I. Statices, I can only say that I cannot detect any difference with the naked eye; they appear to me in the same proportion to the size of the insect, and the result of an examination by a good microscope is, that the number of joints is the same in each, namely, 32 or 33; and the corresponding joints in each are of the same shape, as well as the pectinations. Whether the *number* of joints in the antennæ of Lepidoptera, irrespective of their shape, be a good specific distinction I cannot say. Curtis, in his description, illustrated by a very accurate anatomical drawing, of the antennæ of I. Statices, appears to think *not*, as he only mentions the joints of the pectinated portion, which are all similar, as "numerous," while he gives the number of the peculiarly shaped joints in the clavate portion as eight or nine; but great reliance seems to have been placed on mere number in separating Bombyx Callunæ from B. Quercus (Zool. 1656), the antennæ of the former being there stated to be 84-jointed, and of the latter only 64-jointed, though in the specimens that I have examined I find the number the same in both.

But to return: Dr. Staudinger further says, "I am the more inclined to think I. Geryon a good species, since the typical I. Statices is common near Vienna, which is almost the only locality where the real I. Geryon is found!' This is an argument for the distinctness of the two insects derived from their proximity to each other in a certain locality, and would do just as well, when we consider their very limited locomotive powers, for proving them to be of the *same species*. The same may be said of a sentence further on, in which the same argument is more fully set forth: "The important fact that for many consecutive years the two races have been found unchanged in character at a short distance from each other (I am not aware whether they have been found on exactly the same spot) is a certain proof that they are distinct as species."

The way in which I imagine the variety I. Geryon may possibly have originated is this. Some perfect specimens of I. Statices (one impregnated female would be sufficient) were caught up by a violent wind

from a low meadow luxuriant in sorrel, and carried a mile or two to a dry hill-side clothed with Helianthemum. There the female deposited her eggs, and the young larvæ, after searching in vain for sorrel, at last put up with the Helianthemum, and lived upon it for generations; and, as Helianthemum is much less juicy than sorrel, they became a diminutive race, just as sheep and cows fed on mountains are smaller than those always pasturing in valleys. The non-roving character of the larvæ and the sluggish flight of the imago would both tend to keep them in the locality where accident had first deposited them, though but a short distance from their former home; and this isolation, from the necessity of breeding in, would still tend to dwarf the race, as noticed by Wollaston, Darwin and others. That this *may* have been the origin of I. Geryon is confirmed by the fact that, although Helianthemum is now its undoubted food, it *will* eat sorrel—its old taste for acids is not lost: "Naturam expellas furcâ tamen usque recurret."

The next notice is at Zool. 8468, where Mr. F. Beauchamp says, "On the question whether I. Geryon be a variety or a species, I will only observe that we get the normal I. Statices in plenty within a mile or two of the hills where I. Geryon abounds, but that I never took them in company, nor did I ever take any form intermediate between them." There is nothing here at variance with the theory just proposed, but rather in accordance with it. Mr. Beauchamp says he never took them in company; but Mr. Newman, after quoting Staudinger in the last passage, says "*I believe* that all three British species of Ino occur in company in Sussex, more especially on the south coast." This, of course, would be inconsistent with the above theory, and would go far to prove the distinctness of I. Geryon as a species, but it is not asserted as a fact, and requires confirmation.

The next passage is at Zool. 8606, a description of the larva of I. Statices by Mr. Newman, which I shall compare with a description of the same larva by M. Guenée, kindly sent me by Mr. Doubleday. There is a general agreement between these two descriptions, but there are the following details noticed by Mr. Newman and not by M. Guenée:—

1. That the black papillæ, described by M. Guenée as covering the whole body, are not discernible on the warts.

2. That a few long silky hairs are mixed with the bristles clothing these warts.

Also the following noticed by M. Guenée and not by Mr. Newman:—

1. A black spot on each incision along the dorsal vessel.

2. A series of black oblong spots along the subdorsal line.
3. That the hairs are mixed black and white.
4. The head black.
5. Second segment brown, bordered with purple in front.

In the following particulars the descriptions vary :—

Ground-colour of upper surface *yellow, Newman.* *Greenish* yellow, *Guenée.*

Claspers dingy yellowish white, *Newman.* Rather rosy, *Guenée.*

In the next passage (Zool. 8694) we have a description of the larva of I. Geryon by Mr. Newman, which agrees exactly with the same writer's description of that of I. Statices, except—

1. Head black (omitted in description of I. Statices).
2. Second segment dingy yellow in front, black and rather shining on the disk, which differs from M. Guenée's description of the same part of I. Statices.
3. The *yellow* of I. Statices is here *dingy* yellow, and there is this addition—
4. "The sinuous exterior margin of the yellow stripes is bordered with black, gradually shaded off into reddish purple."

I have no description of the larva of I. Geryon by M. Guenée to compare with this, but, in his description of the larva of I. Statices, before referred to, he has underlined those characters which, he says, distinguish it from I. Geryon. These, therefore, are all that we need consider, and are—

1. The *greenish* yellow.
2. "The black spot on each incision along the dorsal vessel."
3. The "black oblong spots along the subdorsal line."
4. The mixed black and white hairs.

Now it is remarkable that these distinguishing characters, according to M. Guenée, are the very parts of the description which are altogether omitted by Mr. Newman, who holds the same opinion as to the distinctness of I. Geryon, but evidently could not regard these characters as the specific distinctions, because he did not think them worthy of observation. What then are Mr. Newman's specific distinctions? I see no others but—

1. The black head, which M. Guenée truly ascribes also to I. Statices.
2. The colour of the second segment, which he could scarcely have intended to lay much stress on, as he does not describe that part in I. Statices.
3. The *dingy* yellow, as distinguished from the *yellow* of I. Statices;

but which is very little distinction, if we allow *that* yellow to be "*greenish* yellow" with Guenée.

4. The black border along the sinuous exterior margin of the yellow stripes, which might very well be the same as "the series of black oblong spots along the subdorsal line" noticed by M. Guenée in I. Statices. A sinuous black line might easily, to another observer, have the appearance of an *interrupted* black line, or, in other words, "a series of black oblong spots."

In the descriptions of the pupæ of the two insects (Zool. 8608, 8695) there is no marked difference except a "longitudinal series of darker dots" in I. Geryon, not noticed indeed in I. Statices, but not therefore necessarily wanting in that insect.

The egg of I. Geryon is pale yellow, but that of I. Statices is not described.

In habits the two insects exactly agree, as far as is known. The egg is laid about the same time. The larvæ of both hybernate (I have just ascertained this with regard to I. Geryon). They double up and fall off the food-plant when touched in the same way. They are full fed at the same time, remain the same time in pupa, and emerge together into the imago state.

I offer these remarks with great respect for the authorities named, and not at all in a controversial spirit, but merely for the sake of nature and of truth. My position is this, that there is no greater evidence at present in favour of the diversity than of the identity of the two insects. Good entomologists have adopted either opinion, and the instance mentioned of H. Lederer (Zool. 8403), who, from a very strong opponent of Ochsenheimer's view, afterwards became its advocate, ought not to be forgotten. We are naturally prone to hasten the settlement of all difficult questions; we do not like suspense. But in the study of nature especially, impatience is to be checked. "Most haste worst speed" is nowhere more true than here, and it appears to me that to adopt I. Geryon as a distinct species on the evidence examined above is a very hasty proceeding indeed. Let the living larvæ be examined together at different stages of growth. This can easily be done next spring. Let the experiment of interbreeding be tried with the two insects. Let I. Statices be fed on Helianthemum and I. Geryon on sorrel. Let it be ascertained by entomologists residing near localities of both races whether they are ever found in company, or at what distance from each other. These are all interesting subjects of inquiry, and their elucidation will doubtless contribute something towards the true solution of this question.

It may be thought, from the theory that I have proposed, that I hold the opinions of Mr. Darwin. This, however, is not the case: I am one of the old school of naturalists, with regard to the permanence of species, and it will be seen, from what I have said, that I am inclined (at present and until further evidence) to regard I. Geryon as an offshoot of I. Statices, differing in nothing from the original stock, except *size*.

I would anticipate one objection that might be made against the theory advanced above, by eliciting information from the readers of the 'Zoologist' as to any other instances which may have come to their knowledge (for I am persuaded that this of I. Geryon cannot be a solitary one) of diminutive races among Lepidoptera. Mr. Wollaston, in his work on the 'Variation of Species,' before alluded to, mentions several British beetles that have suffered in this way, and one foreign butterfly, Vanessa Callirhöe, as being permanently smaller in the island of Porto Santo than in Madeira. The only other probable instance that I can call to mind among British Lepidoptera is that of Peronea potentillana, which Mr. Doubleday considers to be a small variety of P. comparana; but perhaps there are others which more experienced entomologists can supply, and their doing so will tend much to throw light on this interesting subject.

Since writing the above, I have examined the hind wings of both insects under the microscope, and I find the fact to be the direct contrary to Dr. Staudinger's statement. The scales, which are black and of precisely the same shape in each case, are scattered much more thinly over the transparent space in I. Statices than in I. Geryon. The number of scales appears to be about the same on the wings of both; but, as I. Geryon is smaller, the scales are closer together, which is just what one would expect in a dwarfed specimen, and is strongly in favour of the identity of the species.

E. Horton.

Lower Wick, Worcester,
November 20, 1863.

Ptilodontis plumigera in November.—On the 27th of November I found a newly bred specimen of Notodonta-Ptilodontis plumigera in one of my breeding-cages. Is not this a very unusual period for the appearance of any of the Notodontidæ? The room in which the insect was bred has no fire-place, and is rather calculated for retarding than forcing insects.—*W. O. Hammond; St. Alban's Court, near Wingham, November* 30, 1863.

Description of the Larva of Oporabia filigrammaria.—Eggs received from Mr. J. Swinden, of Sheffield, hatched 17th of February; the young larvæ chose for food willow and sallow; went to earth about 10th of April. In figure this larva is stoutish and smooth; the general colour is rich velvety green; the belly pale whitish green. Head and second segment shining, with a blackish tinge. On each side of the dorsal vessel is a line of pale yellowish green; the subdorsal and spiracular lines are sulphur-yellow, the latter being the more distinct, and between them is a faint interrupted yellowish line. On the back of each segment the tubercles appear distinctly as minute yellow dots. Segmental divisions orange-yellow. Spiracles yellow, and between them and the region of the belly are a few speckles.—*Rev. J. Hellins, in 'Entomologist's Annual' for* 1864, p. 137.

Description of the Larva of Cidaria sagittata.—The eggs, which are of a pellucid violet tint, subsequently changing to orange, are laid in little bunches of four or five, on the seed-vessels of Thalictrum aquilegifolium, and more rarely of T. flavum; the larvæ, orange-coloured when they first emerge, are hatched about the 1st of August, and have a habit of biting through the stalks of the food-plant and feeding on the leaves, which they have thus caused to become partly withered: they feed through the month of August, and some of them feed far into September. The full-grown larva is rather short and stout, generally being in a hump-backed posture, but not curling in the front segments. The head is small and sunk in the second segment; the skin on the front and hind segments is wrinkled, whilst across each of the segments, from the fifth to the 10th (both inclusive), there runs a handsome elevated ridge, which, on each side of the spiracular line, meets a longitudinal ridge, and forms with it a lateral hump. The ground colour is a pale sulphur-green, along the region of the spiracles, running into a rich pink, edged below with black, which blends into a broad lateral stripe of dark olive; the belly is of the pale ground colour; on the front segment are four dorsal stripes of a full green; the transverse dorsal stripes are of a velvety olive-green, softening anteriorly into the pale ground colour, with a tinge of pink, and becoming black at the sides. The hind segments are blackish green on the back, and much suffused with pink. The spiracles are pink, six of them being enclosed in the black of the transverse ridges. The pupa, which is enclosed in a slight earthen cocoon, is remarkably short and stout, and much tinged with green. This larva and its history were discovered by Mr. Alfred Fryer, in his garden at Chatteris, in Cambridgeshire.—*Id.*

Dianthœcia capsophila not a Species.—The President commenced the proceedings of the Northern Entomological Society, by remarking, "I wish to call the attention of the Meeting to a letter that appeared in the 'Zoologist' (Zool. 8471) from Mr. Barrett, in which he states that the Northern Entomological Society, or, at any rate, a certain portion thereof, ventures, from the examination of a single specimen, to decide that the Irish species of Dianthœcia is only a variety of D. carpophaga. Now I wish this Meeting to understand that a certain portion of the members present at that Meeting did not come to that decision on the examination of a single specimen, whatever the other portion might have done. I, for one, was at that Meeting, and gave it as my opinion that the Irish insect was only a variety of D. carpophaga. My reason for doing so was, that, after careful examination of specimens of the Irish insect, in Mr. Doubleday's and Mr. Bond's cabinets, and after seeing some of Mr. Barrett's, Mr. Cooke's, and Mr. Birchall's, and my own specimens, I came to the conclusion that the Irish insect called D. capsophila was only the Irish form of D. carpophaga.

Since that Meeting I have had the pleasure of seeing many more specimens of the Irish insect, some of them bred, and I am now more convinced that I am correct in the opinion I gave at that Meeting, and I have not the least doubt but that when the larva of the Irish insect is seen by those who know the larva of D. carpophaga, it will be found identical with the larva of that species. If it is a good species, how is it that none of our great English entomologists will point out the difference between the two insects? for I cannot believe in a species without distinct characters, which I have looked for, but have failed to find. I grant that the Irish specimens differ in colour; they are darker, and have little, if any, of that ochreous colour which we find more or less in the English specimens; but this, to my mind, is not sufficient to make a species, for when we look at the variety of colour, from light yellow to dark brown or dark ochreous-brown in the English specimens, we may surely go one shade further, and then we have the colour of the Irish insect, but when we come to compare the two insects in the markings, they are exactly the same, and not a mark on one that is not to be found on the other. They feed in the same plant, at the same time of the year, and appear together. Another thing in favour of their identity is, that though Mr. Birchall and Mr. Cooke have taken the species in Ireland and bred it from larvæ, they have neither taken nor bred the ordinary form of D. carpophaga in or from Ireland. This seems very strange to me, for I believe that wherever the food-plant of D. carpophaga grows the insect has been taken. Again, Mr. Birchall gave me a description of the larva he bred his Irish insect from, and he described the larva of D. carpophaga exactly. I have now stated why I think the Irish insect only a variety of D. carpophaga. I have freely given my opinion on this subject, and shall be glad to hear others give theirs. I am aware that, after all, I may be mistaken, and if, when the question is re-opened, I should be wrong, I shall at once own my error. In giving our opinions we avail ourselves of the advantages we possess in having a Society amongst ourselves, but at the same time let me say that when we give our opinion let us by all means respect the opinions and prejudices of others, and whatever we say or do let us say or do it without ill feeling towards any one. *I believe we may all express an opinion without giving offence to any gentleman, if we do so in a generous spirit, and without trying to make ourselves great at the expense of others. This is a sad mistake, and will always return to the man who attempts to do so; for depend upon it that no man ever made himself great by taking any credit to himself that belonged to another.* Now, in all fairness, and with the best feeling, may I ask that some of our leading entomologists in England will be kind enough to point out the difference between the Irish insect and the English D. carpophaga. If they will give us some distinctive character I am quite sure they will be conferring a great boon on us and Science generally. I will not now say anything about the attempted difference being made out in the 'Zoologist' (Zool. 8292), for the differences pointed out apply as well to the dark English specimens of D. carpophaga as they do to the so-called D. capsophila, and the gentleman had then only seen one specimen, which I think is not sufficient for anyone to give an opinion upon. I must confess that I am very much disappointed this evening, for I was led to expect, from what is printed on the cover of the 'Zoologist' for the present month, that many members of the Society would protest against the decision of the Meeting held in December last. I was in hopes that we should have had some letters from those members who do not agree with the decision of that Meeting, stating the reason why they do not; and of course they would have been expected to point out the difference

in the two insects, which is the very thing we want some of our members to do. In the 'Zoologist' (Zool. 8472) Mr. Newman remarks, "I think that the Secretary of the Society would do well not to give any decision as that of the Society collectively, but assign each opinion to the member who expressed it." I quite agree with Mr. Newman on this point, so that the opinion of any member will only go for what it is worth; but, at the same time, I must say that *our Secretary was quite right in the report, in stating that the Society decided the question, for I see in the 'Zoologist,' 'Proceedings of Societies,' 'Entomological Society,' which means the report or proceedings of a Meeting. If so, then the Meeting was the Society, and if the Meeting was unanimous in a decision, then the Meeting being the Society for the time being, it is quite correct to say that the Society settled the question."—Noah Greening, in 'Proceedings of the Northern Entomological Society.'*

[With regard to the specific distinctness or otherwise of Dianthœcia capsophila, I am perfectly willing to bow to Mr. Greening's judgment, or to leave the question *sub judice*, for I do not conceive it possible that an error so grave as the making a variety into a species, or sinking a species as a variety, can be maintained for any length of time in this age of searching inquiry, but I quote the paper at length and *verbatim*, because, as a lover of fair play, I was desirous of learning what could be said in reply to Mr. Barrett's observations (Zool. 8471) on the same subject, and no other reply had previously reached me that I could possibly print. Then, again, I have italicized two passages to which I particularly wish to invite attention: the first contains a sentiment which I most heartily endorse; the whole paragraph is severe, but not more so than was absolutely necessary; and I cannot sufficiently eulogize the courage and good sense of a President who dare so express himself. With the second italicized paragraph I also entirely concur: I regard the Proceedings of an authorized Meeting as the Proceedings of the Society: what I object to is that the responsibility and the merit of certain individual opinions is taken from the individuals expressing them and given to a collective body. I never recollect seeing such a decision recorded in the Proceedings of any other scientific meeting: if the Secretary had informed us that the Rev. Joseph Greene, or Mr. Doubleday, or Mr. Bond, or Mr. Birchall, or any other competent entomologist, expressed decided opinions on a question of this kind, we should all peruse those opinions with respect, but a Society forms no decision of the kind reported.—*E. Newman.*]

Description of Dianthœcia Barrettii of H. Doubleday.—Thorax fuscous, mottled with whitish. Abdomen fuscous, conical in the female, the ovipositor slightly produced. Anterior wings fuscous, with a pale patch at the base, an oblique interrupted pale fascia extending from about the middle of the costa to the anal angle. Posterior margin of the wings also pale, bordered by an indistinct paler striga, forming a rather obscure W towards the anal angle. A very distinct black line, emitting a branch, connects the ordinary strigæ, as in Hadena Genistæ; the branch from this line divides the oblique pale fascia into two unequal portions, of which the upper is the larger; cilia spotted with fuscous and white. The whole of the anterior wings are thickly irrorated with minute fuscous dots, which renders all the markings very undefined; the ordinary stigmata are indicated by two pale spots. Posterior wings fuscous, with paler strigæ. Antennæ of the male ciliated. This conspicuous and singular species was discovered near Dublin by Mr. Barrett, who captured a fine specimen of the male; a female was subsequently taken by Mr. Birchall. I cannot identify it with any described European species, and have great pleasure in naming

it after its discoverer, a very zealous and persevering entomologist. From the pointed abdomen of the female it appears to belong to the genus Dianthœcia, but seems, in some respects, intermediate between this genus and Hadena. In the disposition of the markings it bears some resemblance to Hadena contigua, but the colours are very different. It cannot possibly be confounded with any other British species.—*Henry Doubleday, in 'Entomologist's Annual' for* 1864, p. 124.

Description of Luperina Guenéei of H. Doubleday.—Thorax pale griseous, mixed with white. Abdomen very pale. Anterior wings pale testaceous, irrorated with black and white atoms; an indistinct interrupted pale striga before the middle, then a second arcuated striga composed of black lunules, edged externally with whitish; the first striga terminates in a rather conspicuous black dot on the inner margin of the wing; the ordinary stigmata are placed between these strigæ, the reniform one being distinctly edged with white. Between the black dots on the inner margin of the wing and the thorax is a slender black line. Hinder margin pale testaceous, with an indistinct undulating pale line, commencing at a pale patch on the costa near the apex. A distinct row of black marginal lunules; cilia spotted with deep and pale fuscous. On the costa near the apex are two oblique white spots. Posterior wings pure white in both sexes, with black marginal lunules. Antennæ of the male rather strongly ciliated. Three specimens of this insect were taken in Wales, in the autumn of 1862; it is closely allied to Luperina testacea, L. Nickerlii and L. Desyllesi, but apparently distinct from either. The Rev. Henry Burney most kindly sent me his pair for examination, and allowed me to forward one of them to my valued friend M. Guenée, who informs me that it is identical with a specimen in his cabinet taken in France, which is described in his work as "Luperina testacea, *var.* A.," accompanied by a remark that it will probably prove a distinct species. In this opinion I coincide, and, with the consent of Mr. Burney, I propose to name it after my friend. It differs from L. testacea in the thorax and abdomen being slenderer, in the peculiar mottled appearance of the anterior wings, and in the absence of the three round white dots on the costa near the apex, which are so distinct in L. testacea and L. Nickerlii. The posterior wings in both sexes are of a much purer white than in L. testacea.—*Henry Doubleday, in 'Entomologist's Annual' for* 1864, p. 123.

[It is previously noticed by Mr. Doubleday, Zool. 8539.]

Description of the Larva of Eudorea coarctalis.—Greenish gray, with scattered short bristly hairs. Head light brown; a black plate on the back of the second segment. Spots black, shining; on the back large. In silken galleries, in moss on a stone wall. Full fed early in September. Pupa light brown, in a slight silken cocoon under the moss.—*Charles G. Barrett; Haslemere, Surrey, November* 3, 1863.

Curious Habit of the Larva of Tortrix costana.—Having frequent occasion, during the spring of the past two or three years, to pass through Aspley Meadows, near Warrington, I observed what I then took to be the accidental fracture of the footstalk, and consequent shrivelling of the terminal leaflet, of the queen of the meadows (*Spiræa Ulmaria*, L.). Struck by the coincidence of its frequent occurrence, I opened the rolled and shrivelled leaflet, on the next instance I met with it, when the brown larva of Tortrix costana wriggled out, fell to the ground and was lost. From other specimens similarly circumstanced I subsequently bred the straw-coloured T. costana. In each of the above instances the midrib of the leaf, which forms the footstalk of the terminal leaflet, was nibbled half through, and the leaflet itself hung down at right angles to the rest of the leaf. The probable explanation of this pheno-

menon is that the larva, finding its efforts to "screw" or draw together the edges of the leaflet unavailing, is prompted by its instinct to cut the midrib, thereby rendering the leaflet flaccid and easily contorted.—*John Peers;* 64, *Butter-Market Street, Warrington, November* 18, 1863.

Zelleria hepariella and Z. insignipennella the same Species.—During my stay at Witherslack, in Westmoreland, I took a good number of specimens of Zelleria hepariella and of the insect named Z. insignipennella. I had long suspected the were identical, from having taken several intermediate forms, until I at last beat out of a yew one of each *in cop.*, which confirmed my previous suspicions, and Z. insignipennella must therefore be struck out of our list. I took the variety Z. Haighii very scantily, and always small compared to some of the specimens of Z. insignipennella, which are full half an inch across the wings.—*J. B. Hodgkinson;* 31, *Christchurch Street, Preston.*

Affinities of Acentropus. By Edwin Brown, Esq.*

I have here, at the risk of wearying the reader, brought down the bibliography of the genus Acentropus, from the first published description of a species in 1791, to the present time; I will now draw a few conclusions in as concise a manner as I can.

Among the specimens described by authors under the name of Acentropus niveus, I believe there are confounded at least three species:—

1. Acentropus niveus = A. Garnonsii of Curtis. To this species will belong the specimens obtained by Mr. Dale and by Mr. Curtis at Glanville's Wootton, and by myself at Burton-on-Trent. The male has been well described and figured by Curtis. The female is apterous, and is furnished with long silky white fringes to its hinder tibiæ.

2. Acentropus Hansoni = Zancle Hansoni of Stephens. This species occurs in the neighbourhood of London and at Reading, and is undoubtedly the insect placed by Stephens, without any description, under the genus Zancle, in his 'Nomenclature.' The males of this species are almost identical with those of A. niveus, but appear, from the specimens kindly given to me by Mr. Wormald, to be slightly smaller and with the upper wings somewhat less cuneated; but the difference is so slight that if specimens of the two species once become intermixed in the cabinet, it is almost impossible to

* Extracted from the 'Natural History of Tutbury,' by Sir Oswald Mosley, Bart., D.C.L., F.L.S., and Edwin Brown.

separate them. The female is, however, strikingly different; so far from being apterous, it is furnished with wings of twice the area of those of the male.

3. Acentropus Newæ of Kolenati. This form, from Kolenati's figure, I judge to be distinct. It will there be seen that the insect is smaller than A. niveus. The upper and under wings have different relative proportions, and the body is shorter and more hairy, whilst a very definite difference exists in the two blunt teeth on the hinder tibiæ, of which I cannot detect any trace in A. niveus. It is probable that A. latipennis of Möschler will prove to be the female of this species.

The larvæ of A. niveus may be found, when fully fed (I have failed in discovering them earlier), in silken cocoons, which are strengthened by small pieces of the leaves incorporated longitudinally in the fabric, and which are placed in the submerged axils of Potamogeton perfoliatus and P. pectinatus. The larvæ are of a light green colour, and possess every Lepidopterous character, and make no approach to the Trichopterous type. The pupæ are of the "masked" character, and the external case enables one to see clearly which will produce males and which females. The pupæ exhibit three remarkably prominent spiracles on each side.

The male imago of A. niveus sits sluggishly on any object that protrudes from the water where it occurs, or it flies slowly over the surface. I saw it on one occasion deliberately enter the water, and, after creeping down a pond-weed stem for an inch or two, it emerged again with unwetted wings. This act was probably done in pursuit of the virgin female. I regret, although I have bred the apterous female, I have never had an opportunity of studying its habits in a state of nature; but, from the long tibial fringes which it possesses, I presume it to be endowed with active swimming and diving powers, to enable it to deposit its eggs upon the food-plant, which, excepting in flowering time, is almost always totally submerged. For several seasons, owing, I imagine, to floods in July and August during previous successive years, I have been unable to find the insect in its old haunts. I have thus been disappointed in the hope I entertained of being able to complete its history from the egg to the imago, and hence the cause of the delay in giving my observations to the public.

With regard to the position of Acentropus in nature, the opinions of entomologists, as I have stated, have varied very widely. The

following tabular statement will show the orders in which authors have placed it at one time or another:—

Neuroptera. Olivier, Latreille, and Stephens in 'Nomenclature.'

Trichoptera. Curtis, Stephens in 'Systematic Catalogue of British Insects,' Doubleday and Guenée.

Lepidoptera. Westwood, Kolenati, Haliday, Newman and Stainton.

The facts of the case do not any longer admit of doubt that the true place for the genus Acentropus is in the order Lepidoptera; but it is not so easy to say in what section of that great order it should be located. Misled by the great similarity in the habits of A. niveus to those of the various species of Hydrocampa, I at first suggested its being made to follow that genus in the Pyralidæ, and it has been so placed in the systematic part of the present work, which has been some time in type; but further consideration of the trophi of the perfect insect disposes me to alter that opinion. The absence of spurs on the tibiæ and the abortive state of the maxillæ place Acentropus entirely out of accord with the Pyralidæ; and these characteristics of the genus, in like manner, put it beyond the pale of the Yponomeutidæ or the Crambidæ, where Westwood and others have placed it. I am compelled, after long consideration of the problem, to seek for a place for it in the tribe Bombyces. It is true the British, and as far as I know the European, species of Bombyces differ widely from Acentropus, but it is very possible that some of the small and little-known exotic species may be found, when they shall have been thoroughly examined, to approach much nearer to our genus; at all events, there are two British families of that tribe which are more nearly allied to Acentropus than are those of any other tribe. These are the Hepialidæ and the Zeuzeridæ. With the Hepialidæ, Acentropus agrees in the general shape of its larvæ, in the absence of spines on the legs of the imago, and in the substitution for them of hair, in the want of a labrum, and in the almost total absence of maxillæ. With the Zeuzeridæ it agrees in the shape of larva, small development of maxillæ, and general form of the palpi, which in Acentropus may be either labial or maxillary.

Many objections to this classification of Acentropus may be brought forward, but I do not see any group in which the genus can be so well placed. Wherever they may be eventually located, the Acentropidæ must form a separate and distinct family. I would myself like to see the Psychidæ placed in the same section of the Bombyces; the Acentropidæ would then have neighbours possessing further points of affinity in addition to the absence of maxillæ, *viz.* in the possession of

apterous females and case-bearing larvæ; and they would together form a subsection of the Bombyces, haviug many points of structure in common. Against this location of the Acentropidæ it may be urged, that the antennæ do not accord in character with the Zeuzeridæ, the Hepialidæ, or the Psychidæ; but the Hepialidæ resemble the Acentropidæ in the comparative simplicity of this organ much more than they do the other two families; and the grouping would not be more anomalous in this particular than is that of placing the Tineidæ with pectinated antennæ in the group of Tineæ, which nearly all possess filiform antennæ.

It is a singular fact the Acentropidæ, which resemble so much the Trichoptera in the perfect state, do not approach that order in the least degree in the preliminary stages. This curious circumstance forms another thread in the inextricable web of partial relationships which prevail throughout nature, and which renders the study of family groups so especially instructive and satisfactory; whilst, as soon as we step beyond the limits of family alliances, we are lost in the cross relationships of affinity and analogy that prevail on all hands.

[This history is preceded by a lucid summary of all that had been previously written on this most interesting subject: the species Acentropus Newæ, distinguished in the figure by the broad velvet-umber belt round the abdomen, is the one most commonly seen in cabinets: the beautiful belt has been mistaken for *grease* by some of our entomologists. I shall recur to Mr. Brown's valuable dissertation when I have more space.—*Edward Newman.*]

Beetles at Sea.—The following communication was read, and the specimens referred to exhibited, at the Meeting of the Manchester Natural History Club, September 28, 1863:—

No. 1. This small Longicorn beetle was observed by a friend of mine to fly on board a vessel 500 miles off the west coast of Africa, and settle on his person: a remarkable instance of the power of so small a creature to traverse a long distance when going with the wind.

No. 2. This African beetle (genus Apate, species not named) was observed by me to emerge alive from a wood carving of an idol brought many years previous from the west coast of Africa, and kept as a curiosity in the house of my friend, an African merchant, in Bristol. The larva must have been burrowing in the piece of wood from which the idol was carved, but never came to the surface until the last change into the imago state took place. It is well known that the larvæ of wood-boring beetles exist for many years in timber. This is a similar instance to one recorded, which took place in one of the Government offices, where a rare species of exotic Buprestis (another wood-boring tribe) was observed to emerge from a mahogany desk which had been many years in the office.—*J. A. Turner; Manchester.*

New Chinese Drypta.—I found yesterday a few specimens of the Chinese Drypta [mentioned p. 8904 of 'Zoologist'], and so am enabled to send you a rough description of him. Please let me know if you recognize the gentleman as a known species. Got a fine brimstone butterfly, too, which does not differ from Gonepteryx Rhamni, I fancy. The great Acherontia Atropos has been very common this summer, squeaking in our verandahs when most folks were nearly dead with heat.—*George Lewis; Kiu Kiang, November* 2, 1863.

Description of Drypta Lewisii of Newman.—Ferruginous-red, with the margins of the elytra broadly steel-blue, but terminating before the apex. Head thickly and rather coarsely punctured; eyes black and projecting. Palpi and mandibles red. Antennæ pitchy black or brown, with the long joint alone red at the base. Thorax thickly and coarsely punctured, cylindrical, hairy. Elytra somewhat elongate, widest towards the apex; interstices finely punctured; striæ punctate. Size slightly larger than D. emarginata, *Fabr.*—*Id.*

[Mr. Waterhouse having most kindly undertaken to compare Mr. Lewis's description with the species in the British Museum, but without success, I propose to give it the provisional, and I would hope permanent, name of its amiable captor.—*Edward Newman.*]

Hydnobius Perrisii taken in England.—

Hydnobia Perrisii, *Fairmaire, Ann. de la Soc. Ent. de France*, 1855, *Bull.* p. lxxv.

I have much satisfaction in adding this fine insect to our lists. The single example (a male) taken by M. Perris in the neighbourhood of Mont-de-Marsan, in France, on the authority of which the species was founded, seems to be the only recorded specimen, but I have recently detected three more (a male and two females) among some undetermined Anisotomidæ in the British collection of the Rev. Hamlet Clark, who has liberally presented a specimen to me and another to Mr. Waterhouse; they seem to have been taken some time ago, though in very fine condition, being mounted on the old-fashioned triangular point of card, but unfortunately I am not in a position to give any definite locality for them. The large size, short antennæ, and extremely coarse punctuation of this species at once distinguish it from its allies, though at first sight it is not unlike a very fine specimen of Anisotoma furva, from which its five-jointed hinder tarsi remove it generically. It seems to vary a little in size, the largest of Mr. Clark's specimens being a little over two lines in length; it is reddish brown in colour, shining, obese and rather short; the head and thorax are very strongly and rather closely punctured, the latter being decidedly transverse, margined on all sides, with the lateral margins slightly reflexed, its anterior angles obtusely rounded, and the posterior angles rounded off so that it is almost impossible to define the point of junction of the sides and hinder margin. The antennæ are very short, the first six joints being testaceous, and the club (of which the two penultimate joints are the largest) pitchy black; the apex of the mandibles is also pitchy black. The elytra are short-ovate, rounded at the shoulders, rather closely and very deeply and coarsely punctured, the punctures running into somewhat irregular lines near the suture and at the sides, but elsewhere being confused. The sutural space is rather darker than the rest of the elytra, the suture itself being blackish; the sutural stria is rather remote from the suture for the upper half of its length, and is thence gradually deepened and contracted until it nearly touches the latter at the apex. Fairmaire

(*loc. cit.*) seems to lay great stress upon this peculiarity, which is, however, more conspicuously exhibited in the well-known H. punctatissimus. The tibiæ in both sexes are widened at the apex, and in the male the posterior femora are also very wide, the apex being somewhat emarginate on its lower side, with the angle nearest the body dentate; in the male also the hinder tibiæ are rather strongly arched. H. Perrisii differs from H. punctatissimus, its nearest congener, as follows:—It is much larger, broader, rather flatter, much lighter in colour, with the head and thorax much more deeply punctured, and the elytra not so closely but much more coarsely punctured; in the antennæ the club is also larger, and the seventh joint is pitchy black, instead of rufo-testaceous. The hinder femora in the male of H. punctatissimus are also wider, the angle on the lower side of the apex being more acute, and the dentation more pronounced.—*E. C. Rye; 284, King's Road, Chelsea.*

Locust in Scotland.—It may interest the readers of the 'Zoologist' to know that a locust was caught lately on the estate of Balfour, near here: it is at present in the possession of a man in the Miltown of Balyonie.—*Robert W. Leven; Kennaway Burns, Windygates, September* 28, 1863.

Sirex Gigas at Warrington.—On the 14th of August, on retiring for the night, I found on the window-blind in my bedroom a fine specimen of Sirex Gigas. It had evidently been attracted thither by the light, having entered the room by another window which happened to be open. In the week previous to this two fine specimens had been brought to Mr. Cooper at the Museum, one of which had been taken in a builder's yard, and the other in some houses erecting in the neighbourhood. Can any of your readers oblige me with any remarks on this species? Does it usually occur in similar localities? and, if so, under such circumstances as to induce one to conclude that it has been imported with the timber? Why should it be so unusually plentiful this season? All three of the above-mentioned specimens were females. Is the male less frequently met with?—*W. Kendrick; Warrington, October* 14, 1863.

[I am not aware that Sirex Gigas was unusually numerous last year, nor do I see any reason for supposing it imported in timber. This species breeds very abundantly in some of our fir plantations, the larvæ causing great mischief, by burrowing in the solid timber.—*Edward Newman.*]

Proceedings of Societies.

Entomological Society.

January 4, 1864.—Frederick Smith, Esq., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the respective donors:—'Sitzungsberichte der Königl. bayer Akademie der Wissenschaften zu Münnchen,' 1863, Heft 4; presented by the Akademie. Hewitson's 'Exotic Butterflies,' Part 49; by W. W. Saunders, Esq. 'The Entomologist's Annual' for 1864; by the Editor. 'The Zoologist' for January; by the Editor. 'The Intellectual Observer,' No. 24; by the Publishers. 'The Athenæum' for December; by the Editor. 'The Journal of the Society of Arts' for December; by the Society. 'The Reader' for December; by the Editor.

The following addition by purchase was also announced:—Kiesenwetter, H. von, 'Naturgeschichte der Insecten Deutschlands.' Erste Abtheilg. Vol. iv. Part 4.

New Member.

Herr G. Semper, of Altona, was ballotted for and elected a Foreign Member.

Alteration of Bye-Laws.

A requisition, presented to the President and Council, signed by six Members, was read; and it was announced that, in compliance therewith, a Special General Meeting would be held on the 25th of January, 1864, at 7 P. M., for the consideration of certain alterations in the Bye-Laws specified in the Requisition, and which were taken as read to the Meeting.

Exhibitions, &c.

The Secretary read a communication from the Lords Commissioners of the Admiralty, enclosing a copy of a circular letter from the Governor of St. Helena, respecting the ravages committed in that island by white ants. It was therein stated that the insects were, it is supposed, accidentally introduced from the coast of Guinea about twenty years since; that almost every dwelling, store or shed in Jamestown, containing nearly 4000 inhabitants, has been seriously injured by them, involving, in many instances, complete ruin and abandonment, and imperiling the lives of large numbers of the poorer classes, who are still living in houses of doubtful security: the Governor was especially anxious for detailed information as to the most successful mode of finding the ants' nests and effectually destroying those receptacles, and as to the description of timber which has proved to be the least susceptible of injury from the insect, and the average market price of that timber at per cubic foot.

Gen. Sir J. Hearsey, after detailing some of his own experiences in connexion with white ants in India, said that the nests must be sought in the plains, for if once the ants effected a lodgment in the walls of a house, the walls themselves must be taken down before the insects could be eradicated. He thought the best preventative of their attacks was to steep the timber, before building, in a solution of quick-lime, and completely saturate it therewith; whilst store-boxes, furniture, and small articles should be painted or coated over with a solution of corrosive sublimate.

Mr. E. W. Robinson said that, on the Indian railways, the plan was to make the sleepers of kyanized timber, *i.e.* timber to which a solution of creosote had been applied; it was, however, found insufficient merely to dip the wood or coat it over with the solution, but the whole block must be impregnated with the creosote, which, in fact was forced through the timber by the application of hydraulic pressure.

Mr. Bates said that the houses on the banks of the Amazon were not much infested with white ants, which he attributed, in a great measure, to the use of a very hard wood, called Acapù: it was the habit to rest store-boxes, &c., on sleepers or cylindrical pieces of that wood, which in many cases afforded sufficient protection. When the white ants had effected an entry into the walls (which in the Amazon country were principally composed of upright posts, with cross laths, filled up with mud, and covered with lime or cement), he had found it an unfailing remedy to fill up the holes in the walls with arsenical soap; pure oxide of arsenic might be used, but that of course was attended with danger: the arsenical soap was cheap, and might be diluted with water, and boxes, &c., washed over with the solution. The

most effective method would doubtless be to completely saturate and poison the timber, as General Hearsey had mentioned with respect to the quick-lime.

A conversation subsequently took place on the habits of the Termites, the principal speakers being Gen. Hearsey, Mr. Bates and Prof. Westwood. In the course of the discussion Mr. Bates expressed (though with some hesitation) an opinion that the copulation of white ants occurs on the surface of the earth, and not, as was commonly supposed, in mid-air.

Mr. Newman exhibited a series of coloured drawings, life-size and magnified, of larvæ of the genus Anticlea, admirably executed by Mr. Buckler.

Captain Cox also exhibited a large number of drawings of Lepidopterous larvæ, exquisitely coloured by Mrs. Charles Cox: he also read the following:—

Notes on collecting Lepidopterous Larvæ.

"I have now for some years been collecting larvæ of Lepidoptera for Mrs. Charles Cox to colour, and I may mention that in our neighbourhood there has been almost an entire failure, even of the most common kinds, during the past two years, so that we have done comparatively little.

"To those unacquainted with larvæ it may appear an easy matter to collect them and recognize their forms; but so much do many larvæ resemble each other that experience shows that it requires a large amount of study and constant practice to be able only approximately to say to what kind of moth such and such a larva belongs. We have found that no hitherto-known scientific arrangement could assist us in deciphering rapidly, after a hard day's or night's beating and collecting in a favourable season, the various captures made; so we have been obliged to have recourse to a conventional system, which has assisted us materially. We divide all known larvæ into three great classes: the Hairy or Spined, the Smooth-skinned and the Looper.

"The Hairy or Spined we subdivide into those thickly covered and those moderately covered or tufted (we do not take account when the hair is only sparsely seen). Each of these subdivisions is again subdivided into the colours, brown or reddish, black or very dark, and yellow, green or gray.

"The Smooth-skinned are divided into those with a caudal spike, and those without; these are subdivided under colours, green or yellow, brown or reddish, black or very dark. Each of these divisions is again subdivided into the striped, the lined longitudinally and the plain.

"The Loopers are divided into those with 10 legs (perfect loopers) and those with 12 legs (imperfect loopers); and these are subdivided in the same manner as the two divisions of the Smooth-skinned.

"We keep a book in which is entered a description of the larva to be drawn; to this a numeral is attached: the larva is placed in a case, and on this, as well as on the drawing, the same number is marked. We then patiently await the arrival of the imago, to verify the name of the larva.

"In prosecuting our work, no name is affixed to our list until we are certain of the insect by its appearance in the breeding-cage. It is this great anxiety to verify, by actual fact, every insect that we find or is sent to us, that causes such an infinity of trouble; for it is painful, from one cause or another, to find how often our hopes are baffled by the untimely death of the larva or pupa, and then another year or two must pass away before we may obtain specimens again. Thus we have now considerably more than a hundred drawings unnamed, and consequently unregistered in the finished series.

"In breeding larvæ, some feed only at night, others in the direct sun-light, others at any time: care must be taken to favour each peculiar habit; if not, failure will ensue. Also, as some bury themselves in the earth, either to hide or to change into the pupa state, others spin a cocoon on a branch, others on the surface, collecting the loose material around; so in every case the insect ought to have the means of following its natural instinct. Thus, peat or broken turf and white sand make a good soil for the larvæ to retire into; this ought to be covered with close clean moss, free from insects, and kept moderately damp, and with a few upright pieces of wood for the insect to stretch itself upon after feeding, as we observe it is the habit of the nocturnal feeders to lie at full length for a short time after their evening diet.

"In seeking nocturnal feeders, generally but few make their appearance until about an hour after sunset; on the low herbage and banks the lamp and bent position must be the order of search; on spare and leafless brushwood the light will detect the insect, either feeding or at rest; but amongst brushwood, when it can be used, an inverted umbrella will save much time, and a quick tap with a stick will cause the larvæ to drop off into it. The lamp should be strapped round the waist. Many small larvæ, after feeding, hang suspended by a silken thread; all these the umbrella will receive.

"During the night or day the quick eye must be ever ready to see the nibbled leaf, the exuvial deposit, the web or any other sign of insect presence. It was by examining the entrance of a wood, by the light of my lamp, that I discovered a piece of exuviæ; on further search I came upon a number of larvæ of Vanessa Cardui, before which time I had never seen in this neighbourhood the caterpillars, and the perfect insect but once. I found them feeding on the cudweed (*Gnaphalium sylvatica*): I have not seen this given before as its food-plant.

"In collecting by day, a large sheet spread under the trees at the proper season of the year, and the trees beaten by a long pole, will generally send down many larvæ.

"Thus the sheet and umbrella by day, the umbrella and lamp by night, a quick eye and a strong frame will be sure to meet with success.

"There are other larvæ, some of which mine in the leaves, others in roots or stems of plants, or enclose themselves by drawing the ends of a single leaf or many leaves together. There are also many larvæ that rarely appear above ground: these are to be obtained only by digging them out; therefore, whenever you have an opportunity, ask the men turning up the soil to save all the 'bugs' and 'slugs' they find; for by these names only are they known by our unenlightened clodhoppers.

"Mrs. Charles Cox has now completed 170 coloured drawings of larvæ, the names of which are correctly authenticated, with about 120 not yet named. We are most anxious to continue our work, and we shall be indebted to our entomological friends if they will contribute to our wants. I need not say how pleased we shall be at all times to exhibit the progress of our work, and to forward lists to any Members of our Society who may desire to give a helping hand."

Prof. Westwood exhibited a selection, containing several novelties, from a collection of Coleoptera sent to this country from the River Shire by the Rev. Henry Rowley (attached to the Oxford and Cambridge Mission to the Zambesi); and remarked upon the identity of many of the insects from Zambesi with those from Mozambique. One of the new species exhibited, belonging to the Cetoniidæ, was very remarkable for the variation in colour in the different individuals.

Prof. Westwood also exhibited a specimen of Hylotorus bucephalus, *Schönh.*, one of the Paussidæ; and read the following descriptions of three new species of that family:—

1. Cerapterus Kirbii, *Westw.*, n. sp.

Subangustus, prothorace capite vix latiori, subquadrato, angulis anticis rotundatis, elytris pone medium latioribus; glaberrimus et lævissimus; capite inter oculos biimpresso; antennarum clava 9-articulata, subangusta, lateribus parallelis, articulo basali clavæ parvo; prothoracis lateribus acute marginatis; rufo-piceus, prothorace rufescenti, lateribus elytrorum cum macula ovata prope angulos posticos apicibus, suturaque lutescentibus; femoribus anticis subtus concavis; pedibus omnibus (tarsis piceis exceptis) corporeque subtus magis rufescentibus, nitidis.

Long. corp. lin. $3\frac{1}{3}$.

Habitat in Natalia. D. Guienzius. In Mus. Hopeiano Oxoniæ.

2. Paussus Spencii, *Westw.*, n. sp.

Oblongus, subdepressus, subnitidus, castaneo-rufus; elytris (basi apiceque exceptis) nigris; minute punctatus, punctis setas luteas emittentibus; capite antice emarginato et impressione longitudinali notato; antennarum clava reniformi, subdepressa, margine antico acuto, postico supra in medio impressione semiovali distincto; prothorace capitis latitudine, bipartito, angulis lateralibus partis anticæ rotundatis, disco hujus partis inermi; medioprothoracis excavatione profundo impresso; elytris subangustis; femoribus tibiisque omnibus compressis sublatis.

Long. corp. lin. $2\frac{3}{4}$.

Habitat in India Orientali? In Mus. Hopeiano Oxoniæ.

3. Paussus Curtisii, *Westw.*, n. sp.

Elongatus, subcylindricus; lævis, subopacus totas obscure rufus; antennis pedibusque granulatis; capite supra lineis duabus angulato-elevatis longitudinalibus anticis; alterisque duabus obliquis verticalibus (tuberculum medium includentibus), carinato; antennarum clava gracili cylindrica, apice incrassata, subclavata et 3-denticulata; prothorace bipartito parte antica in medio canaliculata margineque postico acuto; impressione magna quadrata mediana ad latus utrinque producta; elytrorum singulo prope marginem lateralem tuberculis duobus glabris (uno ante medium altero versus angulos posticos) instructis; tibiis omnibus subangustis, subcylindricis.

Long. corp. lin. 4.

Habitat in Natalia. D. Gerrard. In Mus. Hopeiano Oxoniæ.]

Paper read.

Prof. Westwood read a paper entitled "Descriptions of new Lucanoid Coleoptera," supplemental to his recent Memoir on Lucanidæ published in the 'Transactions'; the species described were all exotic, and illustrated with figures.

New Part of the 'Transactions.'

A new Part of the 'Transactions' (Third Series, Vol. i., Part 8), being the fourth quarterly Part for 1863, was on the table.—*J. W. D.*

The Crocodile: Herodotus the Father of (Natural) History.—In Mr. Petherick's interesting account of the crocodile in the White Nile district, reprinted in the 'Zoologist' (Zool. 8833) from the 'Field,' that enterprising and well-known African explorer casually writes, "Cuvier observes that of all animals, the crocodile attains the greatest dimensions, considering its size at birth." But as this observation was made, more than 2000 years before Cuvier was born, by another great African explorer, even by Herodotus, and as the Natural History attainments of that invaluable historian are often ridiculed and despised by modern *savans*, as I think very unnecessarily and often most undeservedly, it is only fair to give him credit for a fact, which he, first at any rate of all extant writers, recorded; and Mr. Petherick will, I am sure, excuse me for correcting the name of his referee, and for pointing out the true author of the observation alluded to. The passage occurs in Book II. chapter 68, and is as follows:—"Of all known animals, this is the one which from the smallest size grows to be the greatest; for the egg of the crocodile is but little bigger than that of the goose, and the young crocodile is in proportion to the egg; yet when it is full grown, the animal measures frequently seventeen cubits, and even more." Perhaps, while calling attention to the zoological information imparted by the father of history, I may observe that, though undoubtedly sometimes imposed upon by his informants, in this as in other subjects, and at times over credulous, yet he does impart much that is of the deepest interest to us, of the various members of the animal kingdom, as known in those early days. Indeed, it is not impossible that, as in the kindred science of Archæology, deeper investigation and more accurate research have served to verify even the minute details recorded by Herodotus of the works and domestic life of the various nations he described; so in Zoology, as we learn more of the vast unexplored districts of Central Africa, for example, of whose Natural History we are still profoundly ignorant, we may perchance at length discover some foundation for assertions which we have hitherto declined to believe. But, at any rate, I maintain, without fear of contradiction, that, even as naturalists, we are indebted to Herodotus for much that is of exceeding value to us; and that, remembering the numerous popular delusions with regard to members of every department of Zoology, even now rife in this nineteenth century, and in this highly civilized country, and that too amongst men of education as well as intelligence, it is rash to launch the shaft of ridicule against the credulity of our earliest historian, recollecting the famous adage, that they who live in glass houses should beware of throwing stones.—*Alfred Charles Smith; Yatesbury Rectory, Calne, November* 5, 1863.

Frogs climbing Trees.—In answer to the inquiry of the Rev. C. A. Johns (Zool. 8861) as to whether any of your readers have observed frogs climbing trees, I beg to say that, although I have never had the good fortune to observe them in actual progression up trees, I have frequently found them in, apparently to them, inaccessible places, such as the tops of pollard willows, in the vicinity of streams—situations, in fact, which could only be attained by climbing. The common toad is also, I should say, an adept in climbing, having often found them in the nests of small birds, in hedges, and, sad to record, often incubating (?) most recently emptied egg-shells. I am a great friend to toads, and therefore, even with such strong circumstantial evidence before my eyes, very loath to blame them as the actual perpetrators. Probably, from the well-known fact of their climbing, might have arisen the expression, *vulgo*, "Did you ever observe a toad hedging?"—*Henry Reeks; Manor House, Thruxton, December* 18, 1863.

Climbing Propensity of Frogs.—In the 'Zoologist' for December (Zool. 8861) there is a communication from Mr. Johns concerning the climbing powers of the frog. I have myself observed a very similar instance. In one of my fern-cases I had a small specimen of the common frog, which was in the habit of mounting the fronds in pursuit of flies, &c. He used to climb, in the manner described by Mr. Johns, up the middle of the upper surface of the fronds (which were often nearly vertical), placing the fore and hind feet alternately on the successive pinnæ of the frond. The motion greatly resembled that of a sailor ascending the rigging, only that the movements were of course performed slowly and leisurely, lest the fly should be disturbed. He would proceed in this manner until he arrived within a little distance of the insect, when he would make a spring, seldom missing his prey, though sometimes rolling over to the bottom with it. Should it happen to move to an adjoining fern before he was near enough to spring, he would follow it, climbing from one fern to the other in the most deliberate manner. He spent his time almost exclusively on the ferns, when he was of a beautiful bright yellow colour; but when he was on the soil his colour was a dull brown. Unfortunately my little pet, after above twelvemonths' confinement, succumbed during the early part of the autumn.—*Charles Adcock, jun.; Stafford Street, Birmingham, December* 4, 1863.

Capture of Coronella lævis in Dorsetshire.—It was in Dorsetshire last spring that I captured the new British snake. I well remember the day, and will endeavour to reproduce a portion of it for your entertainment. We are out to sun ourselves and taste the sweet pure air in the vicinity of Wareham. We saunter pass the tall elms that shelter the farmer's rick-yard, and behold the miscreant rats dangling overhead suspended by their tails from the branches (a mode of warning rats below much affected in these parts): we cross the fragrant fresh meadows, where village urchins have left traces of their idle industry in the shape of broken daisy chains, withered cowslips and the scattered leaves of "lords-and-ladies." On the foot-path lies the mangled form of hapless shrew-mouse, snatched from the sheltering hedge-row by some passing cur. Under the trees the ground is strewn with fallen catkins and the brown glossy scales from bursting leaf-buds. Other forms and other sounds are all about and around us. The bee hums jubilant above the clover; the pretty lizard, flat and extended, pants on the broad hot stones, and the amorous toads sing guttural love-ditties in all the weed-choked ditches. We stoop to note some glittering object on the ground, when it speedily resolves itself into a vivacious long-bodied "Staph.," a brassy bright Amara or a mimic Hister motionless and feigning death. We pass a shady pool, where we see the fish-like Tritons swimming in the deeper parts, the little imp-like tadpoles wriggling in the weedy shallows, and in the open spaces between the leaves of the floating duck-weed the burnished Gyrini performing their circling, mystic, mazy water-dances. We cross a wild brown moor, where the timid brood of a lapwing is detected cowering among the "zedge-mocks," and we stand by the flag-fringed margin of the dark weir where the comfrey grows, and where the sluggish waters are green with arrow-heads and lily-leaves. Here stands the patient miller, rod in hand, fishing for roach at the mill-race, and here in the hollow trunk of an old black poplar the bats have chosen for themselves a citadel. And now, as we enter Holme Lane, long, green and fringed with trees, we note the undulating vertical flight of the green woodpecker (not uncommon in these parts), and observe in profusion the golden stars of Ranunculus Ficaria and the purple flowers of the Lamium, and, crossing the road, unconscious of his fate, my Coronella lævis! As I arrest his progress by a gentle

pressure of my stick, he looks aronnd, as it were reproachfully, but not indignant; for he neither hisses nor emits that most unpleasant odour peculiar to our Natrix. His harmless nature having been carefully ascertained (for having once been bitten by an adder, we were, so to speak, "twice shy"), and being taken up, he becomes somewhat spiteful, and attempts to bite the hand. Our worthy, but I must add ignorant, friends who are working in the fields readily distinguish my prize from the ringed snake and the adder, calling it the "whip-snake" or "viper," believing it to be extremely venomous, declaring, with looks of unfeigned aversion, that they "would na touch un for a hunder puns." These worthy but unsophisticated husbandmen, however, believe the lizard and the slow-worm to be equally venomous. Thinking the reptile would be interesting to many, he was shortly imprisoned in a tin box, with a bed of leaves to repose upon, and sent to Dr. Sclater for the Zoological Gardens, where I believe it may yet be seen.—*Arthur Adams.*

Notes on the Food and Parasites of the Salmo salar of the Tay.

By W. Carmichael McIntosh, M.D., F.L.S.*

The nature of the food of the Salmo salar has been variously estimated. Dr. Knox read a paper to the Linnean Society "On the Food of certain gregarious Fishes,"† including the salmon, in which it is stated, "From the time the salmon enters the fresh water it ceases to feed, properly speaking, although it may occasionally rise to a fly, or be tempted to attack a worm or minnow, in accordance seemingly with its original habits as a smolt. But after first descending to the ocean and tasting its marine food, it never again resorts to its infantile food as a constant source of nourishment." He goes on to state that nothing whatever is found in the stomach or intestines of the fresh sea-salmon but a little reddish substance, which he found to be the ova of some species of Echinodermata, and affirms that such is the sole food of the salmon in the sea. He combats the views of M. Valenciennes, who describes the salmon as voracious and a devourer of fishes, and maintains that there is not a single fact in the history of British salmon to support this opinion, and concludes thus:—"As to their feeding regularly in rivers, Mr. Young's experiments have negatived the assertion beyond all doubt." Yarrell gives the authority of Faber to support the assertion that it feeds on small fishes and variously small marine animals; and Dr. Fleming says,

* From the 'Proceedings of the Linnean Society,' vol. vii. p. 145. Read December 4, 1862.

† The late Dr. Knox's invaluable paper with this heading is published in the 'Zoologist' for 1855, at p. 4709: it was rejected by the Linnean Society, and the learned author at once brought it to me.—*Edward Newman.*

"Their favourite food in the sea is the sand-eel." Others confirm the latter statement, and add that within flood-mark some salmon have been taken with two and some with three full-sized herrings in their stomachs.

In order to test the accuracy of the above conclusions with regard to the Tay, I examined the stomachs and intestines of upwards of a hundred salmon and grilse caught in the river from the commencement of the season in February to its ending in the September of this year. The salmon in its young condition feeds freely enough; for the stomachs and intestines of the parr from Stormontfield ponds are gorged to an extreme degree with beetles, flies, larvæ, larvæ-tubes and minute Crustacea, while those of the smolts are also well filled. Indeed the voracity of young parr has cost them their lives in instances where they have been too freely fed with small flies. Such being the nature of the fish from its earliest age, one is sceptical at first sight in regard to the statement that the grilse and salmon do not feed in fresh water at all. Professor Owen observes that the salmon, in common with many other fishes, when hooked or netted, empties its stomach by an instinctive act of fear, or to facilitate escape by lightening its load; so that the stomach, thus cleared of its contents, exhibits subsequently, for reward to the investigator, only the tiny animalcules which, having been swallowed with more substantial fare, escaped ejection by lurking in the gastric mucus. Were such the case an explanation would be readily given to the fact that the stomach of a fish which possesses so powerful a circulatory apparatus, and whose mucular tissues undergo a continual waste, should thus frequently be found empty. But if the salmon so fared we should expect to find the intestines at least well filled with the *débris* of such food, since it cannot very easily vomit it after it has passed the pylorus; and the very terror which impels it to disgorge in one case may entirely paralyse its efforts to do so in another.

In its usual condition the stomach is coated internally with a consistent white mucus of great tenacity, well calculated to hold any "animalcules" introduced from without; yet in few or none did such occur, cellulo-granular matter and oil-globules alone appearing. In ten instances only did remnants of fishes occur, and in all these nothing remained but vertebral columns, cranial and other bones, with the denser tissues, as the lens, &c. The number of bones in several cases showed that the animals had enjoyed a most ample repast, since they belonged to fishes from eight to ten inches in length, of what species I have not as yet been able to determine. Some pieces

of cartilage, skin and pigment-cells seemed to belong to smelts, but most of the vertebræ belonged to larger fishes. The other kinds of food found in the stomach consisted of fragments of small fresh-water Crustacea, with a portion of a shrimp in one or two fishes, and an occasional piece of insect cuticle.

The duodenum is generally supplied in abundance with a less cohesive mucus of an orange tinge, and which is continued along the intestine. A constant accompaniment of this mucus, in almost all fishes, is a number of whitish or yellowish masses, extending far down the gut as a fragile knotted cord surrounded by the mucus—in some instances nearly to the anus. When a small portion of the white substance is put between glasses it is gritty, and is found to consist of a vast number of calcareous crystals like those of the triple phosphate. They are quite unaffected by ether, but effervesce much and disappear on the addition of hydrochloric acid. Some of the larger crystals showed roughness on their surfaces, as if smaller crystals adhered or had adhered to form compound masses; others had a somewhat radiate arrangement of the constituent crystals. They occurred in all portions of the intestine from the pylorus downwards, but not in the pyloric cæca, and appeared in the fasting as well as in the full-fed fish. The mucus which more immediately surrounded them had a fibro-granular aspect. The exact origin of these crystals is an interesting question. So constantly were they present in all conditions as regards food, that they could not have been much influenced by the varying state of the latter. The intestinal surface being an eliminating as well as a secreting surface, we may conclude that these crystals had their origin in fluids produced by the mucus membrane. The skeleton of this fish being of small specific gravity and deficient in earthy matter, it may be that the excessive elimination of salts keeps down the specific gravity; or again, the circulating fluid by this means may so adapt the bones to the varying density of the salt and fresh water that their specific gravity is in accordance with the medium. At any rate, and whatever be the explanation, the presence of these crystals is an interesting physiological fact. In a greater number of instances than in the case of the stomach, bones, leuses, and other dense textures occurred in the intestines; for they were present in several instances where no trace occurred in the former, and vertebræ could readily be detected as far down as the anus. In addition to those in which the *débris* of ascertained food in the stomach was found in the intestines, I met with crustacean hairs in several instances, Diatomaceæ, sand-particles, fragments of an insect, masses of solid fat, and portions of

liver belonging to a fish like the sporling. In every other instance there was nothing in the intestinal tract but parasites, mucus, crystals, and an abundant supply of fatty globules and particles of all sizes. The rapidity and power of digestion in this fish is extraordinary; but there is no doubt that, if the fish had fed regularly, the food could never have disappeared so rapidly and well as to defy even a microscopic investigation of the intestinal tract throughout. It is, however, a mistake to suppose that they never feed in fresh water at all, just as it is one to suppose they feed voraciously, but vomit their food when captured. The true state of matters would seem to be that the salmon when in fresh water feeds rarely and at intervals, but not from want of voracity, as the contents of the stomachs above mentioned show; and further, that such food is occasionally found in its stomach from February till August. *

Capture of the Swordfish off Plymouth. — On the 17th of September last a specimen of Ziphius gladius was captured by some fishermen while engaged pilchard-fishing. It was entangled in their drift-nets and secured. The specimen was purchased by the Curator of the Devon and Cornwall Natural History Society, for the Museum at Plymouth. The dimensions of the fish are: — Entire length 7 feet 7 inches; length of sword, 2 feet 10 inches; girth 3 feet 4 inches. Its weight is 147 lbs. Although not a large example of this species, yet it is an old fish, the sword being long, and the dorsal fin having been worn away throughout its whole length, except at the base of six or seven of the foremost rays, and even these are mere stumps. The stomach contained pilchards and cuttle-fish.—*J. J. Reading; Plymouth, November* 1, 1863.

The Boring Snail of the Bois Des Roches. — In the commune of Retz, Picardy, and on the right of the road between Hardinghen and Marquise, about ten miles from Boulogne-sur-Mer, is situated Le Bois des Roches—a small wood, deriving its name from the numerous masses of calcareous rock there collected, which have been thrown up by some convulsion of nature. These rocks are extremely solid and impenetrable, formed of what is called "marbre Napoléon," from being the material of which the column at Boulogne is built, which, from its perfect preservation and sharpness of outline, notwithstanding its complete exposure to wind and weather for nearly sixty years, is a proof of the hardness and durability of the stone. Nevertheless the sides of these rocks which face the north-east and east are covered with myriads of round holes, funnel-shaped externally, about 1½ inch in diameter at the mouth, contracting suddenly to about half an inch, and sometimes extending 6 inches in depth, irregular and

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* They have often been seen to void several vertebræ per anum, when landed on the bank of the river.

winding in the interior, and invariably terminating in a cup-shaped cavity. These holes are the winter retreat of a peculiar species of snail—Helix saxicava—which, during the summer months, inhabit the surrounding wood, retiring to their stony habitations during the winter. The snails in question not only live in the holes, but excavate them themselves at the rate of about half an inch during each hybernation. In their selection of winter quarters they never choose the upper surface of the rock, but always a more or less vertical face of it, and that which is least exposed to the prevailing wind and rain, keeping the actual entrance to their dwelling narrow, although the mouth of the hole is expanded, thus using every precaution to render their habitations secure against the weather during the most inclement season of the year. The mode in which they effect this excavation has hitherto been a source of considerable controversy amongst the French *savans*, some affirming it to be mechanical, others chemical. From the investigations, however, of my friend M. Bouchard-Chatereaux, the well-known *savant* of Boulogne-sur-Mer, who has studied their peculiarities for years, and who, living so near to them, has had opportunities of observation which render him the most able authority on the subject, it would appear that the chemical theory is the correct one, and that the excavation is made by the dissolution of the rock by means of an acid given off from the fore part of the foot of the snail. M. Bouchard has pointed out that the Helix saxicava, when in its winter retreat, unlike the rest of its tribe, which form one or several epiphragms over the mouth of their shells, protrudes half its body from the shell, and fixes itself firmly against that portion of the rock which it selects for its winter habitation. Here it remains motionless until the return of spring again brings it forth from its hole. During this period it, as it were, *sucks* the rock away in the form of a cup, leaving the stone around the excavation, for about one-sixteenth of an inch in depth, impregnated with a sort of greasy matter, which disappears after exposure to the atmosphere. If the snail be forced from its hold, and litmus paper be applied to its foot and the place it has just left, it at once shows the presence of an acid by turning violet, more or less tinged with red according to the degree of moisture on the spot to which it is applied. Moreover, the surface of the rock is furrowed all over with tracks leading from one hole to another, doubtless caused by the corrosive action of the feet of the snails in the passage to and fro during many centuries. The Helix saxicava also differs from other tribes, in the fact that, whilst *they* generally congregate in heaps during the winter, *it* is almost always solitary. When more than one are found in the same hole, they are invariably at some distance from each other, as though fearing the action of the acid on their shells. Again, whilst in summer its tracks are marked by the usual slimy, shiny mucus, in its progress over the rocks, on the approach of winter none of this is perceptible. Hence it would seem that the acid secretion is quite distinct from the mucus, and is probably derived from a separate system of organs. The facts here stated seem to me to prove the chemical nature of the proceeding. The effect of the gastric juice of animals in dissolving calcareous substances is well known, and some very interesting experiments made by M. Bouchard prove that that of fishes possesses an equivalent power. May we not regard these facts as additional proofs of the wisdom and benevolence of the Almighty in furnishing the means not only of comfort, but also of the preservation of life? It is well known that when, from any cause, the stomach is allowed to remain empty for a lengthened period, the gastric juice acts prejudicially upon it, destroys its coats, and at the same time the life of the creature. The Helix saxicava has no employment for its stomach during winter: may we not believe that

the gastric juice, instead of being allowed to remain in that organ to its prejudice, is diverted to the foot, and is thus made the means of procuring shelter?—*Henry J. B. Hancock;* 37, *Hanley Street, September* 18, 1863.—'*Field.*'

[Where is a description of Helix saxicava to be found? The writer mentions three modes whereby these snails may possibly make their burrows—1st, by mechanical means (trituration of the stone is probably intended); 2nd, chemical, *i.e.*, the dissolution of the stone by means of an acid given out by the snail; and 3rd, suction, *i.e.*, by sucking the rock away in the form of a cup. A fourth solution has, I confess, occurred to me. Does the snail make the holes which are described? or does it find them ready made, and merely avail itself of them, as do *all* other snails of *all* similar cavities? Will my valued correspondent Mr. Merle Norman express an opinion on this subject?—*Edward Newman.*]

Hidden Shells, and the Tracks they make.—These long, winding marks, sometimes extending several yards, are formed by three species of Littorinæ, *viz.*, L. littorea, L. rudis and L. littoralis: they are generally made in the soft mud or sand, and are usually met with where Fuci are abundant. The very small tracks, varying from a few inches to a foot long, are formed by Rissoæ, nearly all belonging to one species, *viz.*, R. Ulvæ; these are terminated by a small raised dot of sand. Some openings, as if cut with a blunt instrument, with a raised button at the end, are produced by the Tellina solidula; the animal buries itself edgeways in the sand. The one close by, with a small perforation in the raised portion, is made by the common cockle (*Cardium edule*). On the sands between West Kirby and Hilbre, small tracks, very similar to those of the Rissoa, may be seen; these belong to a small white shell of the Bulla tribe—Cylichna obtusa. The two Mactræ, namely, stultorum and solida, may be observed coming to the surface as the tide rises over the sand in which they are buried. Sometimes the animal may be seen leaping like the Pecten. At the verge of low water, at spring tides, a curious hole, contracted in the middle and somewhat like a key-hole, may be found; this is the burrow of the Solen, but it is generally too deep to be dug out, and, as it bores very rapidly, cannot be obtained. Donax anatinus bores about two inches beneath the surface of the sand near low water: I have not seen any traces left above ground. Pholas candida is imbedded in stiff clay, and may be obtained between New Brighton and Leasowe (I would advise persons shell-hunting in this locality to put on waterproof boots). Pholas crispata bores into the sandstone rock at Hilbre: they must be extracted with a small pickaxe or a hammer and chisel, and occasionally another shell is obtained when searching for these, *viz.*, Tapes pullastra.—*F. P. Marrat;* 2, *Peveril Terrace, Edge Lane, Liverpool.*—'*Naturalist's Scrap-Book*,' Part 8, p. 126.

Pallas' Sand Grouse in Ireland.—I have before me a specimen of Pallas' sand grouse, the capture of which has not, so far as I am aware, appeared in the 'Zoologist.' It was shot at Ross, in the county of Fermanagh, on the 8th of June, 1863. This and another were seen flying about together in the evening by a labouring man who thought they were a curious kind of swallow. He got a musket, and when one of them alighted on the ground shot it.—*Clermont; Ravensdale Park, January* 15.

Notes on the Ornithology of Iceland.

By Alfred Newton, Esq., M.A., F.L.S., &c.*

[After giving a list of all the works and papers on the Ornithology of Iceland of which he is cognizant, Mr. Newton proceeds as follows:—]

From a consideration of the above-mentioned works, or at least of such of them as I have examined, coupled with my own personal experience of the country, I am inclined to believe that Iceland offers a field of considerable promise to the ornithologist; and though it is not to be at all expected that any previously undescribed species of birds will reveal themselves, yet many possessing great interest commonly frequent both the coast and the interior. Besides which, it is not beyond the bounds of probability that one or two of those whose places of retreat during the nesting season, if not altogether unknown, are still shrouded in much mystery, may be found breeding on some lonely Icelandic "heithi." Of these I may mention the knot and the sanderling, and perhaps even the gray plover (*Squatarola helvetica*),—though this latter bird, of almost ubiquitous occurrence, does not seem hitherto to have been met with in the island,—as likely to reward the search of some future investigator. The character of the Avi-fauna of the country, as might have been expected from its geographical position, is essentially European; just as that of Greenland has American tendencies. Indeed, dismissing from our consideration the species of purely Polar type, which are common to the whole arctic region, there are, as far as my knowledge extends, only four or five which make Iceland their home without inhabiting some other part of continental Europe. These are the Iceland falcon, the northern wren (which, however, does occur as a resident in the Færoes), the Iceland ptarmigan, the Iceland golden-eye, and the harlequin duck. The first is by most ornithologists of the present day recognized as distinct from the true gyr-falcon, and, though the differences between them are but slight, I believe no one has ever observed the characteristics of the Scandinavian form in an Icelandic specimen. The second has been but lately separated from our own common wren, which is a bird as well known throughout the greater part of the Continent as in this country, but I believe the separation is deserved. The third, the ptarmigan, certainly differs in some respects very considerably from the bird which occurs in Scotland and Norway, and much more nearly resembles the form

* Extracted from 'Iceland: its Scenes and Sagas.' By Sabine Baring-Gould.

found in Greenland. The fourth and fifth are most unquestionably distinct species; and both are found breeding over a good part of the arctic portion of the New World, while neither occurs in the rest of Europe, except accidentally. I am only aware of one species which does not properly belong to Europe, and which yet occurs frequently in Iceland without breeding there—this is the Greenland falcon.

Before proceeding to a detailed and technical list of the birds of Iceland, the reader of this work might perhaps wish to have placed before him a sort of general summary of the Ornithology of the country; for it always happens that many of the species which swell the bulk of a local catalogue make but little show in the eyes of a traveller, and are entirely wanting in the pictures which memory recalls to his mind. To begin then with the falcons, which (for so many centuries more highly prized than any others by all the nations of Europe) are yet to be found in greater plenty in Iceland than elsewhere, and are as much sought for by collectors now as formerly by kings or emperors. Almost exterminated in the British islands, in Iceland the whitetailed eagle is still constantly seen perched in solitary grandeur on the rocky shore, while the courageous little merlin glides over the hill-tops, striking fear and silence into the titlark and the wheatear, the white wagtail and the snow bunting. Wherever the birch or the willow attains the height of a man, there may the monotonous twitter of the redwing, followed by a low inward warble, be heard by the traveller. Companies of ravens throng every fishing settlement, and obtain a plentiful subsistence from the offal by which it is surrounded. The ptarmigan, as I have above said, in plumage if not in species distinct from that which haunts the mountains of Scotland, the fjelds of Norway, or the Alps and Pyrenees of Southern Europe, utters its strange guttural croak among the contorted slabs of the lava streams. Where the turf is softest and greenest, the golden plover, by its tameness, provokes the passer-by to unsling his gun—unless, indeed, his hunger being satisfied (not an every-day event in Iceland), he is disposed to take a more merciful view of its familiarity. Along the shore, flocks of wheeling turnstones, ring dotterells, dunlins, and other less common kinds of sandpipers, attract the attention of even the most unobservant. The merry whistle of the redshank contrasts with the discontented wail of the wary whimbrel, as, keeping well out of shot, he rises lightly from the barren moor. While from the marsh the "zick zack, zick zack" of the snipe sounds cheerily, and suggests to the sportsman recollections of former, or visions of future, visits to some well-remembered bog or fen, far away across the

south-eastern sea. As he strives to ascertain the source of some secluded hot-spring, which in more accessible districts would outrival Buxton or Aix, he may perhaps catch a glimpse of a water rail creeping stealthily through the luxuriant herbage. At almost any of the numerous pools throughout the country, the rednecked phalarope is to be seen busily seeking its food round the margin, or, like a graceful Naiad, reposing quietly on the smooth surface in the softened glow of the northern midnight. Here, on a patch of semi-natant bog-bean, the weird-looking horned grebe piles a mass of water-weeds, dragged from the muddy bottom, whereon to deposit its chalky eggs; while overhead a swarm of arctic terns assail the wayfarer's ears with their shrill shrieks, and, should he stop to examine one of the mottled living powder-puffs he finds crouching in the grass, almost threatens his eyes with their sharp beaks.

On some wide lake or far-receding fjord, a single northern diver may be descried, spirit-like, disappearing and reappearing almost without causing a ripple, until, having finished his fishing, he flaps heavily along the surface, leaving a wake like that of a steamer, and then, mounting to a vast height, finally vanishes in quest of his mate, whom he left brooding her dingy eggs far beyond the rocky ridge, to cross which would cost us two hours' hard work; while, long after he is out of sight, his wild scream, like a cry of human agony, reaches us, and jars our feelings by its discord with the placid scene so lately before us.

Where the stream rushes fastest and foams most furiously over its stony bed there is the home of the quaintly-marked and yet beautiful harlequin duck, so rare a visitant to other parts of Europe. To the upland tarn resorts the longtailed duck, while the teal, the widgeon, and the pintail frequent the less bleak lakes, on the islands of which, secure from the ravages of the arctic fox (the only beast of prey in the country), they rear their young, in company with the scoter, the scaup and the Icelandic goldeneye. On yonder grassy plains, intersected by the innumerable rivers that spring from those distant jökuls of eternal ice, there yet assemble (but not, alas! in numbers as of yore) a goodly company of wild swans. There they make their domestic arrangements, proclaiming their completion with the glorious sound of the trumpet. There they lay their elephantine eggs; and there—O joyful moment!—they lead forth their infant train, too often, indeed, only to suffer capture and death at the hands of the neighbouring peasants, or, if they survive these casualties, to fall the victims of southern gunners.

The Eider, throughout Northern Europe the chief friend of man amongst birds, inhabits islets, either naturally or artificially constructed, which are guarded from intrusion by the lords of the soil as jealously as any Norfolk game-preserve or Oriental harem, and testifies, by its familiarity, to the effectual means taken for its security. It is, indeed, in Iceland, as in other lands over which it ranges, almost a domesticated fowl, and readily occupies the nesting places prepared for its accommodation, paying valuable tithe and toll in down and eggs for the protection it enjoys.

Seawards small parties of gannets may be seen circling over the same spot, heavily plunging one after another beneath the surface, and each, as it emerges with its prey, shaking the water with its wings, and joining its brethren aloft to repeat the same process. That ridge of seaweed-covered rocks, left bare by the falling tide, is surmounted by a cluster of cormorants, some slumbering in the sunshine, while others are intent on preening their feathers. Near the mainland, the great blackbacked gull soars in dignified majesty around the intruder, expressing his anger in notes of the deepest bass, until the alarm being spread abroad, a cloud of kittiwakes, obedient to his summons, hurry from the neighbouring shallows and awaken the echoes with their petulant exclamations; which are redoubled, should a skua, that Víking among birds, make his appearance. Still and ghost-like in the distance, buoyant fulmars wing their way, wheeling round with scarce a beat of their wide pinions.

The insulated stack or precipitous cliff affords a footing, and where a footing a nesting-place, to countless razorbills and guillemots, which crowd there in numbers even more confusing than may be seen by a London excursionist to Flamborough Head or the Isle of Wight. But of all the birds of Iceland the greatest interest centres in the gare-fowl, or great auk (*Alca impennis*, Linn.), the only wingless, or rather flightless, species of the northern hemisphere. There is no doubt that in former days it was plentiful enough, at certain seasons, in certain localities to which it resorted to breed. From such of these as were easy of access to the inhabitants of the nearest villages it has been thoroughly exterminated; but until the farthest rock of the group called the "Fuglasker," lying off Cape Reykjanes, be examined, I think the question of its utter extinction must not be considered settled. Indeed it is probable, from the interest that has now been excited on the subject, that no great period will elapse before this rock, the Geirfugladrángr, is visited. But the expedition is one of no small danger, and during the last five years the weather has not

admitted of its being undertaken. I can only express my sincere wish that whenever this rock is reached, the bold adventurer may reap a fitting reward; but at the same time I must declare my hope that in such case he will be careful to see that the best possible use is made of the spoil. The mere addition to the already considerable number of stuffed skins and blown egg-shells of the species which are dispersed in various collections will be no addition whatever to Science. If the bird is doomed to extinction, and such, I fear, is its fate, all who are concerned in bringing about the catastrophe are bound to see that the most is made of whatever chance may throw in their way. It should accordingly be their object, if possible, to capture the examples alive, and transmit them as speedily and carefully as possible to the gardens of the Zoological Society of London, where they are sure of receiving every attention; where their gestures may be studied, and their attitudes transferred to the painter's canvass. Or should circumstances hinder the birds from being taken alive, the whole bodies should be preserved in spirit or brine, or by the application of pyroligneous acid, and thus rendered serviceable for the anatomist's scalpel. The same may be said of the eggs; their contents should on no account be thrown away. but taken care of in the same manner as the birds, for it is difficult to exaggerate the value of embryology in the present state of scientific research. Professed naturalists are of course aware of all this, but these words may haply be read by some who would otherwise think that by neatly preparing the skins, and according to the most approved method blowing the eggs of the very last of the gare-fowls, they were advancing the study of Natural History.

Having thus indicated the most prominent features in the Ornithology of Iceland, I will conclude by giving a list of the birds, which, as nearly as I can ascertain, have been hitherto met with in that country; in drawing it up my object has been to exclude all, about the occurrence of which any reasonable doubt may be said to exist, though reference is made to most of them in the notes. This list is rather intended for the scientific than the general public. It will be found that I have quoted especially from Faber, whom I consider by far the best authority on the subject, and I only hope I have not been unnecessarily critical, especially when speaking of the labours of Herr Preyer, from whose opinion I am unfortunately so often compelled to dissent.

Whitetailed Eagle (*Haliaëtus albicilla*, Linn.) Generally distributed throughout the island in the vicinity of water, but nowhere very abundant. Breeds and, according to Faber, remains during the winter.

Iceland Falcon (*Falco islandicus*, Gmel.) Probably of universal occurrence in Iceland, but certainly more common near Myvatn than anywhere else in the island, owing perhaps to the great facilities for breeding afforded them by the inaccessible precipices in the neighbourhood, and to the abundance of food in the immediate neighbourhood.

Greenland Falcon (*Falco candicans*, Gmel.) [One seen.]

Merlin (*Falco æsalon*, Linn.) Arrives, according to Faber, at the end of March, and goes away at the beginning of October. Very common everywhere, and breeds on the moors.

Snowy Owl (*Surnia nyctea*, Linn.) Not unfrequently observed in winter, but rarely seen in summer.

Shorteared Owl (*Otus brachyotus*, Gmel.) [Doubtful.]

House Martin (*Chelidon urbica*, Linn.)

Swallow (*Hirundo rustica*, Linn.) Both the above-mentioned species seem to occur annually, but do not remain long in one place.

Northern Wren (*Troglodytes borealis*, Fischer).

Blackbird (*Turdus merula*, Linn.) Seems to have occurred on two occasions in Iceland. [Doubtful.]

Redwing (*T. iliacus*, Linn.) An annual migrant, and found in suitable localities throughout the island. Breeds early, beginning its nest before the snow is well off the ground.

Black Redstart (*Ruticilla tithys*, Scop.)

Wheatear (*Saxicola œnanthe*, Linn.) Rather plentiful over the whole island, but, of course, only a summer visitant.

White Wagtail (*Motacilla alba*, Linn.) Arrives at the end of April, leaves in September.

Meadow Pipit (*Anthus pratensis*, Linn.) Common on low grounds over the whole country. Migratory.

Lapland Bunting (*Emberiza lapponica*, Linn.) Very seldom observed in Iceland.

Snow Bunting (*E. nivalis*, Linn.) Perhaps the commonest of Icelandic small birds. The nests are pretty easy to find with a little patient watching, but difficult, and sometimes impossible, to get at, from being situated so far in crevices of the rock.

Mealy Redpoll (*Linota linaria*, Linn.) Rare in Iceland.

Raven (*Corvus corax*, Linn.) Very abundant, and resident all the year.

Hooded Crow (*C. cornix*, Linn.) Does not inhabit Iceland, but occasionally pays a visit thither.

Iceland Ptarmigan (*Lagopus islandicus*, Faber.) In Iceland these

birds are pretty numerous, and not confined to the mere mountain tops, as are their brethren in Scotland and other parts of Europe, but may be found in almost all places where berries grow.

Water Rail (*Rallus aquaticus*, Linn.) Rare in Iceland, though apparently a resident there.

Coot (*Fulica atra*, Linn.) [Very rare.]

Lapwing (*Vanellus cristatus*, Meyer). Occasionally wanders to the south-west portion of the island, chiefly in autumn.

Golden Plover (*Charadrius pluvialis*, Linn.) Quite the commonest bird in Iceland, and of great use to the traveller, who by its means often obtains a good meal in the desert.

Ringed Plover (*Aegialites hiaticula*, Linn.) Not rare on the sea-coast and on some of the moors in the interior.

Turnstone (*Strepsilas interpres*, Linn.) Arrives in Iceland about the last week in April; and I have little doubt breeds there, for Mr. Proctor has received its unmistakeable eggs from the north.

Oystercatcher (*Haematopus ostralegus*, Linn.) More common in the south than in the north.

Gray Phalarope (*Phalaropus fulicarius*, Linn.) In 1858 I discovered two pairs on a lake, but in a few days afterwards they had disappeared, and they certainly did not remain to breed there that year.

Rednecked Phalarope (*Phalaropus hyperboreus*, Linn.) Very common all over the island on all ponds and lakes. Arrives late in May, and at once begins the duties of nidification. On one occasion, in the month of June, I saw a flock of at least a hundred sitting on the surf, between the breaking waves and the shore.

Redshank (*Totanus calidris*, Linn.) Very commonly met with throughout the island. Arrives about the middle of April, and, according to Faber, some remain till the end of the year.

Blacktailed Godwit (*Limosa ægocephala*, Linn.) Arrives the last week in April, according to Faber.

Ruff (*Philomachus pugnax*, Linn.) Faber records a single instance of the occurrence of this bird in Iceland, a female, near Reykjavik, at the beginning of September, 1820.

Knot (*Tringa Canutus*, Linn.) On the south-west coast it is very well known as a bird of passage. One morning, at the end of May, 1858, I found the shore at Kyrkjuvogr literally alive with a large flock of knots, all in their beautiful red plumage. There had been none there the day before. They stayed about a week, their numbers gradually diminishing, until at last only two or three were to be seen.

Purple Sandpiper (*T. maritima*, Gmel.) Common everywhere in

the neighbourhood of the coast, and occasionally to be seen inland, where it also breeds. Hatches its eggs about the middle of June.

Dunlin (*Tringa alpina*, Linn.) Not so abundant, according to my observation, as the last species, but frequents the same localities.

The Tringa Schinzi of Herr Preyer is doubtless the small race of dunlin well known in some parts of Europe, and not the American bird to which that name is often misapplied.

Sanderling (*Calidris arenaria*, Linn.) Possibly more common in Iceland than has been thought.

Common Snipe (*Gallinago media*, Leach). Fairly abundant in suitable localities.

Curlew (*Numenius arquatus*, Linn.) [Seven specimens recorded.]

Hudsonian Curlew (*N. hudsonicus*, Lath.) [One specimen recorded.]

Whimbrel (*N. phaeopus*, Linn.) A very common bird, and one of the most characteristic of Iceland. Arrives at the end of April, breeds on the moors, and departs by the middle of September.

Common Heron (*Ardea cinerea*). [A straggler.]

Whooper [*sic*] (*Cygnus ferus*, Leach). According to all accounts, common in some districts of the country.

Goose (*Anser*). [Species left undecided.]

Whitefronted Goose (*Anser albifrons*). On the 11th of May, 1858, I saw several freshly-killed examples at Reykjavík, one of which I purchased, and had it preserved as a specimen.

Bernacle Goose (*Bernicla leucopsis*, Temm.)

Brent Goose (*B. brenta*, Linn.)

Garganey (*Anas querquedula*, Linn.) [Doubtful.]

Teal (*A. crecca*, Linn.) Very common. Arrives the third week in April, and departs the beginning of October.

Wild Duck (*A. boschas*, Linn.) Common in Iceland. Most remain through the winter, but some migrate.

Pintail (*A. acuta*, Linn.) Arrives on the coast at the end of April, and reaches Myvatn the beginning of May, where it breeds pretty commonly. Probably of general distribution throughout the country. Disappears at the beginning of September.

Wigeon (*A. Penelope*, Linn.) Not so common as the preceding, and arrives later. The time of its departure not ascertained. Breeds at Myvatn, and probably elsewhere.

Pochard (*Fuligula ferina*, Linn.) [Twice observed.]

Scaup (*F. marila*, Linn.) The commonest duck breeding at Myvatn, where they arrive about the middle of April, having reached the

south a month earlier. In the beginning of October they resort to the fjords in flocks, and shortly after leave the island.

Iceland Goldeneye (*Clangula islandica*, Gmel.) Frequents the sea-coast in winter, and about the middle of March repairs to its breeding quarters, of which Myvatn seems to be chief.

Harlequin Duck (*Histrionicus torquatus*, Bonap.) A common resident in Iceland, but changing its quarters from north to south in winter. Frequents the most rapid rivers, on the margins of which it generally breeds.

Longtailed Duck (*Harelda glacialis*, Linn.) As abundant in Iceland, where it appears to remain all the year, as in other northern countries.

Eider (*Somateria mollissima*, Linn.) Very numerous on the coasts and some of the lakes. Appears not to migrate.

King Duck (*S. spectabilis*, Linn.) By all accounts a rare bird in Iceland, and generally only a straggler from Greenland or elsewhere.

Scoter (*Oedemia nigra*, Linn.) Only to be found at Myvatn, where it breeds.

Goosander (*Mergus Castor*, Linn.) Less common in the south than in the north, where it stays even the whole winter. Breeds.

Redbreasted Merganser (*Mergus Serrator*, Linn.) Far commoner than the preceding, and has much the same habits.

Cormorant (*Phalacrocorax Carbo*, Linn.) Breeds only in the north, and is but a winter visitant in the south.

Shag (*P. graculus*, Linn.) Pretty common, and a resident.

Gannet (*Sula bassana*, Linn.) Very abundant in many localities, and has several breeding places on islands, among which Grimsey, the Reykjanes Fuglasker, and some of the Vestmanneyjar are chief. Remains all the winter.

Arctic Tern (*Sterna macrura*, Naum.) Has many breeding places in various parts of the country.

Kittiwake (*Rissa tridactyla*, Linn.) Exceedingly common all round the coast. Arrives in the beginning of March, and goes away the middle of August.

Common Gull (*Larus canus*, Linn.) [Doubtful.]

Iceland Gull (*L. leucopterus*, Faber). A winter visitant only, arriving towards the end of September, and mostly leaving by the end of April, though some, chiefly birds in immature plumage, remain later into the summer.

Glaucous Gull (*L. glaucus*, Fabricius. Common and resident.

Great Blackbacked Gull (*L. marinus*, Linn.) A resident, and not

so common as the foregoing; but, from my own observation, I should say it was more abundant than that, at least in the south-west and in the breeding season. It breeds on the inland waters, which the other is not known to do.

Great Skua (*Stercorarius catarrhactes*, Linn.) Pretty common along the coasts, and occasionally breeding some distance inland.

Pomatorhine [*sic*] Skua (*S. pomatorhinus*). Not common, but has been observed occasionally by several travellers in Iceland.

Arctic Skua (*S. parasiticus*, Linn.) Common enough throughout the island, for it occasionally occurs, and even breeds, on the moors far inland.

Buffon's Skua (*S. Buffoni*, Boie). In 1858 Mr. Wolley and I observed it several times at Kyrkjuvogr; and a very beautiful one, killed a day or two before at Keflavík, was brought to me on the 10th June.

Fulmar (*Procellaria glacialis*, Linn.) Abundant in many parts of the Icelandic seas. Never enters the bays.

Greater Shearwater (*Puffinus major*, Faber). [One seen.]

Manx Shearwater (*P. Anglorum*, Temm.) Remains on the Icelandic seas all the year. Commoner in the south, and especially on the Vestmanneyjar, than in the north.

Stormy Petrel (*Thalassidroma pelagica*, Linn.) [Doubtful.]

Little Auk (*Mergulus alle*, Linn.) Occurs all the year round.

Black Guillemot (*Uria grylle*, Linn.) Resident in Iceland.

Common Guillemot (*U. troile*, Linn.) Breeds in very many spots on the coast, and in some places in countless numbers.

Brunnich's Guillemot (*U. Brunnichi*). [Doubts entertained as to its distinctness: Mr. Newton did not see it.]

Gare-fowl (*Alca impennis*, Linn.) [Not now known to exist.]

Razorbill (*Alca torda*, Linn.) Frequents the same stations as the guillemots, and breeds among them.

Puffin (*Fratercula arctica*, Linn.) Very common, and breeds in numerous localities around the coast.

Northern Diver (*Colymbus glacialis*, Linn.) Not uncommon, a pair or so breeding on nearly every lake.

Redthroated Diver (*C. septentrionalis*, Linn.) More common than the last-mentioned species, especially in the south-west.

Horned Grebe (*Podiceps cornutus*, Gmel.) Very generally distributed on lakes.

ALFRED NEWTON.

[A great number of valuable extracts and criticisms are of necessity omitted.—*E. N.*]

Porpoises and Salt Water.—Is there not some error in supposing that salt water is necessary in keeping the porpoise in confinement? (See Zool. 8874). At this moment I cannot state my authority, but somewhere I have read of shoals of a species of porpoise being frequently seen in the Amazon River, far beyond tidal influence. Again I think I have heard of these creatures occurring in the Trent, near Gainsborough, which, if I mistake not, is beyond the reach of salt water. Certainly in the Norwegian fjords I have seen both porpoises and the grampus sporting about where the water was only perceptibly brackish.—*George Norman; Hull, January* 2, 1864.

Supposed Old English Rat.—I think I can explain the occurrence near Beverley of the rat, as recorded by Mr. Boulton (Zool. 8872). The fact of the rat having been killed in a barge on the River Hull, furnishes, in my opinion, the explanation. The barge had, in all probability, brought a cargo of foreign produce from Hull, and the rat along with it. A rat, nearly black in colour, and with an unusually long development of tail, has long been known to me here, occurring as it does very frequently in cargoes from warm climates. Only a fortnight ago I saw a specimen on board a vessel which had brought a cargo of wheat and rosewood from San Francisco. It was in the hold of the vessel, sitting on a log of rosewood, nibbling away at some stray grains of wheat. Some years ago I had a colony of these "interesting foreigners" in my own warehouse. They came among some bundles of cork-wood from Spain. Possibly, after all, it may be the same as the old English rat, now nearly exterminated. It is smaller than the common or Norwegian rat; and, like many other foreigners, lank and apparently ill-conditioned.—*Id.*

Anecdote of a Weasel.—I witnessed yesterday a curious instance of cunning in a weasel. We were all at dinner when the tortoiseshell cat appeared on the lawn carrying a large weasel by the back of the neck. I at once ran out, and made the cat loose her hold; the weasel was alive and struggled to get away, but the cat again seized him by the neck. The weasel, finding that his struggles were useless, ceased to move, and hung like a dead weight in the cat's mouth. The latter then dropped him on the walk, apparently as dead as a stone, and moved away to a little distance. I approached the weasel, who lay on his side perfectly motionless, and, just as I was going to turn him over, I saw him open one eye and take a rapid look round, and in another second he had darted across the lawn and under a thick Acuba. The cat caught sight of him at once and bounded after him. Then followed a most exciting chase. The weasel got between the laurels and the fence on Mr. Forbes' side close by the kitchen door, ran from there to the little gate with the cat after him, then doubled back like a fox and almost went into the kitchen, making the laurels rattle as they rushed through them. Finding no escape at either end of the fence, the weasel made a bold dash across a corner of the lawn, and got very nearly into the row of laurels between the two gates, when the cat sprang upon him, and I thought it was a case of a "kill in the open," as a fox-hunter would say. However, the little weasel fought most pluckily, and for about ten seconds there was a very sharp skirmish. The cat tried to seize him by the neck, and the weasel showed wonderful activity in eluding her grasp. Twice he sprang at her face and tried to seize her, but got knocked down both times, first with a right-hander and then with a left, which the cat most scientifically delivered as he rushed in. Finding, therefore, that he had little chance of winning the fight, the weasel made another bolt, almost running up against me as I stood quite still looking on, and hid himself among some rolls of turf that were heaped up by the new walk. The cat evidently did not hunt by scent, but only like a grey-

hound, as long as the weasel was in view. She was now quite "at fault," and crept cautiously about, peeping under every bush and shrub, but all to no purpose, as I am glad to say my little friend escaped; and I think he deserved to do so, for the cunning and pluck which he displayed. Whenever the cat seized him or struggled with him, the weasel made a very peculiar kind of screech, and chattering something like one of the small monkeys I have heard at the Gardens.—*J. Edmund Harting, in a letter to Mr. Bond; December* 14, 1863.

Peregrine Falcon and Shorteared Owl near Alton.— A female peregrine falcon was shot at Froyle, about three miles from here, last Monday. Its weight was 2 lbs. 5 oz. I could not get to measure it until skinned, but I believe it to be a very fine one. This is the third I have known shot in this neighbourhood: this one and one of the others are in the Museum at Alton. I have also to inform you of a shorteared owl being taken about two miles from here last week. We every now and then get a specimen of it at this season of the year.—*Philip Crowley; Alton, Hants, December* 19, 1863.

A Honey Buzzard's Nest in the New Forest.— I have been informed that a pair of honey buzzards built a commodious nest in the New Forest this year; but, from the continual watch which was kept on them by the discoverer of the nest, who, I was also told, was offered a guinea each for the unblown eggs, were he so fortunate as to obtain them, no eggs were deposited, which was attributed to their being both males, yet this I very much doubt; at any rate it is a pleasing fact to know that these birds are not yet extinct in this once much-favoured locality.—*Henry Reeks.*

Ring Ouzel near Malton.—Mr. Boulton, who has recently recorded a specimen from Malton (Zool. 8877), rightly supposes that this bird is not common in that neighbourhood. There are no rocks near Malton, consequently this bird is only an accidental or occasional visitor. About ten miles from Malton the picturesque valley of Pickering commences, and among the rocky *débris* which has fallen from the high moorlands above this bird is by no means uncommon.—*George Norman; Hull, January* 2, 1864.

On the Redwing singing in England.—In late numbers of the 'Zoologist' there have appeared several notes on the redwing singing in this country; a fact which, judging from the tenor of the remarks, seems to be doubted. If this is really the case, it will be satisfactory to your correspondents to know that I am able to settle the question from my own personal experience. About the middle of March, when the weather has been fine and warm, I have on many occasions heard the redwing sing, and under circumstances which rendered a mistake impossible. During the spring it was a common custom with my brothers and myself to go in the evening to the neighbouring woods for the purpose of shooting hawks, when they came in to roost: many valuable birds have in this way fallen to our guns, such as the peregrine, merlin, buzzard,—and among multitudes of the common sparrow-hawk, some in very remarkable plumage. Kestrels we never shot at, feeling convinced that the good service they perform in destroying mice more than compensates for any misdeeds of which they may be guilty; indeed, I cannot remember having ever detected a kestrel in any felonious proceeding, save that recorded in the 'Zoologist' of stealing a roasted

pigeon from our dinner table. The thousands of redwings and fieldfares which congregated in these woods preparatory to their quitting the country, without doubt formed the great attraction to the birds of prey; and often, very often, while lying in ambush for their enemies, have I been charmed with the concert of this melodious host. I think I shall be within the pale of strict veracity, if I say that I have heard hundreds in full song at the same moment. But perhaps some of your readers may require more positive evidence that this enchanting concert was the actual production of redwings and fieldfares; and on that point also I will endeavour to satisfy them. When on the look-out for hawks, we always placed ourselves against the body of some large tree surrounded by tall underwood, chiefly hazel and ash, and in these bushes I have seen at the same moment many redwings and fieldfares with open bills and distended throats, in the full torrent of song; some occasionally within two or three yards of my head, as I stood motionless at my post. In such close vicinity their plumage was as plainly seen as if I had held them in my hand: there was the clear bright stripe over the eye, and the unmistakeable rufous colour on the sides of the breast; and, though I blush to own it, to make certainty doubly sure, I have shot them in the act of singing. I think this must be sufficient to convince the most sceptical, even the author of the last note on the subject. But I must add a word on the song itself. Except the nightingale, I do not know a more beautiful songster than the redwing: its notes much resemble those of the song thrush, but are fuller, sweeter, and more melodious, many of them in tone approaching those of the blackbird. The song of the fieldfare is much less varied, and not so long sustained; its notes are both louder and coarser, but still it ranks high in the feathered choir.—*A. Matthews; Gumley, Market Harborough, December* 10, 1863.

Redwing singing in England.—While I and my brother were walking in the fields on Saturday, December 12, a beautiful and sunny day, we were surprised to hear from some trees near at hand a low, sweet, mellow, and easy-flowing warble, having somewhat of the character of that of the thrush, but greatly differing from it, and such as we had never heard before. On an accurate examination of the bird with our pocket Dolland, we were perfectly satisfied that it was no other than a redwing (*Turdus iliacus*); it was perched on an outer spray, about three-quarters of the way up a good-sized oak.—*Henry T. Wharton; Willesden Green, December* 14, 1863.

[This note and the preceding are of great interest, but I could wish that all such records should be verified by obtaining the bird itself and sending it here for verification. I shall be excused, I am sure, if I remind my readers that in every instance when this has been done, the record has proved erroneous.—*Edward Newman.*]

Blackbird's Nest on the Ground.—On the 3rd of May, 1862, a blackbird (*Turdus merula*) selected as a site for its nest a hole in the nearly perpendicular side of a ditch, close to a foot-path at Willesden Green; it was very carefully concealed, and overhung by luxuriant grasses. It afterwards contained four eggs, but before they could be hatched the nest was taken. We more than once saw the parent fly away from the hole.—*Charles B. Wharton; Willesden Green.*

[A similar instance is recorded in my 'Birdsnesting,' p. 10.—*Edward Newman.*]

Query on the Robin: some Notes on its Habits.—The suppositions put forward in the pages of the 'Zoologist,' to account for the scarcity of the robin in Britain, seem to me very futile. The popular notion of the young birds killing the old ones extends to Ireland; but it seems too absurd, as well as unnatural, and, like most other popular legends concerning Natural History, is scarcely worthy of a thought.

If the notion had been reversed it would not seem so preposterous, as we have instances of old birds preying on their young among the Falconidæ, and indisputable proof of the young being driven from the haunts of their parents; also among the Gallinæ the old cocks are very destructive to the young of their sex. Cats do eat robins, but surely this would not thin their numbers in any great degree. Robins may die in severe winters, and undoubtedly do; but after mild winters they do not seem more plentiful. The last four winters, in the county of Dublin, have been remarkably mild, yet there is no perceptible increase in their numbers. My answer to the query would be, that the robin migrates: every British species of the family migrates, though the stonechat remains in limited numbers in our southern counties of Ireland during the winter, though let it be distinctly understood not those individuals that breed; they always migrate from this locality, at least, in August, new arrivals appearing in October. This species bears, in this respect, a close analogy to the robin, and equally with this bird might it bear the odium of killing its parents. The robin being more plentiful in summer than winter, clearly proves migration. That it is pugnacious there is no doubt, yet not more so than others of the Sylviadæ, the whitethroat, the blackcap, and the stonechat, (familiar examples), which are most jealous birds of a favourite locality, as is also the robin. That it seeks a fight I do not believe; but when stirred to rivalry by song, or its ground encroached upon, a fight is most probable. Neither does the robin, from choice, seek man's habitation, either in winter or summer; it is as plentiful in the lonely country as near the cottage. Without taking into consideration a lonely country hedge-row in a cultivated district, I will go to the far west of Ireland—to the wilds of Erris, where the eye will not see a tree for miles upon miles, not even a furze-bush to shelter this little warbler, and the month is December, where only marshy bog and heathy mountain meets the eye, yet there the ear of the hardy sportsman is gladdened occasionally by the song of this little pet, as he sits up on a feathery branch of heather. I go back again to the county Dublin,—to Dalkey Island,—on the lonely and rocky coast of which the robin may be seen in winter: but here I never heard it sing—it seems too intent on hiding itself in the crevices of the rocks, not gazing at you with its mellow eye as from the roof of a shed in the farm-yard. In its rocky retreat what cares it for man's habitation, while the sand-flies hybernate in thousands in the cracks of the granite, and the silken huts of spiders are in hundreds; but snow and frost come—then the dung-hill and the warm thatch are welcome—a rafter makes a snugger perch for roosting than the frozen rock. The snow is frozen from the chimney; here he perches and gives forth his wild song—he is aroused by a rival—see how intent he listens; all his soul, I might say, is centred now in his song—nothing disturbs him; there he sits for an hour or more singing, regardless of cold, till a window is opened, some crumbs are laid on the sill; he flies to it because his natural food, insects and berries, are now scarce. The spring has come, and with his mate he builds a nest in the ivied wall, the rafters, the thatch, the hay-rick, the mossy bank, the root of the monarch of the forest,—anywhere he is at home, but he does not feel safe from enemies; materials to match the surrounding objects of his home are always collected for the nest—withered leaves in the woods, moss for the mossy bank, hay for the farm-yard, and stalks to match the gray wall and ivy. Poor little bird! happy would you be if your nest was not taken by ruthless schoolboys, for in Ireland you are not spared.—*H. Blake-Knox; Bartragh, Dalkey, Co. Dublin, January* 22, 1864.

Dun Variety of Robin.—I had sent me, last week, the most perfectly dun-coloured robin I ever saw, shot near Lynn. Its entire plumage is of an uniform dun-colour, much lighter in its shades than I ever saw a specimen presenting before. The beak and legs are much lighter than in the ordinary examples; the eyes were light hazel. It has been my fortunate lot to have examined two or three varieties of this familiar species, and I have in every case particularly observed the tail and plumage of these to present a singular chafed and rubbed appearance, as though their oddity of garb had caused them to become subjected to severe battles—in fact, this was the case of one recorded by myself in a former volume of the 'Zoologist.'—*S. P. Saville, Dover House, Cambridge, January* 5, 1864.

Scarcity of Robins during Winter: Does the Female Migrate?—That there is a scarcity of robins in the winter must be apparent to all observers of nature resident in the country; moreover, it is a subject of great interest to ornithologists, although I have seen no plausible theory advanced to account for it. Naval officers and passengers on board ships frequently record the appearance of migrants *en route* to and from Britain, and, among other birds, nearly invariably mention the robin: this always appeared strange to me, as, when in the country, never a day, either in winter or summer, elapses without my seeing one or more of these familiar little birds. At last a thought struck me that there may be a sexual migration, and, with this supposition in view, I commenced, about a month prior to Christmas, to make a slaughter of robins, solely for the purpose of dissection; and, although I am ashamed to say how many I killed, I can firmly assert that the whole of them proved, on dissection, to be males. I have therefore come to the, I think, very rational conclusion, that the female robin migrates, and that nearly to a bird. Again, the pugnacity of the robin towards its own species in winter would naturally lead one to suppose that the birds were males, or, at any rate, of the same sex; for it is a well-known fact, that animals of the higher orders (man alone, I am sorry to say, excepted) seldom, if ever, quarrel with the opposite sex of their own species. In advancing the above theory I do not wish to be considered dogmatical, but I do wish to call the attention of competent ornithologists to this very interesting subject, for I feel confident that practical observations will be fully repaid.—*Henry Reeks; Manor House, Thruxton, February* 3, 1864.

Note of the occurrence of a pure Albino Hedgesparrow.—Mr. H. French, solicitor of this town, while out enjoying the day partridge-shooting last September, was not a little pleased in adding to his bag a pure white hedgesparrow, not a single feather of its wonted hue being visible; the feet and beak being of a lightish dirty yellow, the eyes of a most complete pink. A white variety of this species is recorded as having been in the collection of the late Dr. Thackery, Provost of King's College, but nevertheless the pure albino is of very uncommon occurrence.—*S. P. Saville; Dover House, Cambridge, January* 5, 1864.

Note on the Lesser Whitethroat's Nest.—For the last four years a pair of lesser whitethroats have regularly built, in the tall hedge of our garden at Willesden Green, at the height of nearly six feet from the ground. It is the lesser whitethroat's usual habit about here to place its nest higher than most of its congeners, excepting sometimes the blackcap. The lesser whitethroat is one of the earliest to arrive of our summer warblers, and usually has its nest completed early in May: last year we found an egg on the 28th April. The common whitethroat, on the contrary, seldom builds till the end of May or June.—*C. B. Wharton; Willesden Green.*

Migration of Goldencrested Wrens.—There is no doubt whatever about this bird arriving on the Yorkshire coast from abroad (see Zool. 8879). After the 12th of October, as regular as clockwork, the first easterly wind brings us large flights of woodcocks from Scandinavia, and these flights are almost invariably preceded by large flocks of goldcrests: so regular, indeed, are these arrivals, that on the first occurrence of an easterly wind after the above-mentioned date, all the gunners on the coast of Holderness turn out, and frequently immense numbers are slaughtered. The largest flights of woodcocks occur when the weather happens to be drizzly. The lighthouse-keeper at Spurn, I have been told, frequently finds large numbers of goldcrests dead under the lights, having killed themselves by flying against the plate-glass. These goldcrests invariably precede the woodcocks.—*G. Norman; Hull, January* 4, 1864.

The Waxwing in Norfolk.—These very beautiful and interesting birds have again paid our shores a visit, and, should the present state of the weather continue, I have no doubt their stay will be of some duration. Their appearance has extended over a considerable radius of ground, records now appearing for Norfolk, Yorkshire, and Scotland. During their last visit, *i. e.* 1849-50, this county (Cambridgeshire) was rather fortunate in producing specimens. I do hope we shall yet have the honour of their presence: as yet I have failed to discover any traces of them, nor can I hear of any of my ornithological friends having been more fortunate. A friend from Norfolk has sent me notice of four having been obtained in that county, *viz.*, male and female shot on the chase, Lynn; another male he says was shot at Titchwell, near Thornham; the fourth, and by no means the least interesting record, is that of a male having been captured alive (also in the vicinity of Lynn), and is now in the possession of the Rev. T. White, head master of the grammar school. I hope to be able to send you something further upon this most deeply interesting capture, should it continue to live. The appearance of this singularly handsome species is at most uncertain periods, but generally its presence is precursory of severe weather, and I think this instance will prove no exception. The most frequent number of wax-like feathers upon the wing of this bird is about four in number, but they occasionally, I believe, reach upon each wing as many as seven or eight; and a friend of mine assures me, in very old examples, these peculiar wax-like appendages are found upon their tails. The years 1810, 1822, 1823, 1827, 1849, and 1850, were particularly notable for the appearance of the waxwing. It will be observed that long intervals, however, are by no means a rule, as to witness 1822 and the succeeding year. Upon the Continent its residences are subject to similar uncertainty.—*Samuel P. Saville; Cambridge.*

A Yellow Sky Lark.—When out shooting with my brother, on the 26th December, our attention was attracted, on putting up a flock of larks, to one of a yellowish colour flying among them. Anxious to preserve so great a curiosity, we marked it down, and eventually succeeded in shooting it. The bird is entirely buff-yellow—the belly, wing, and tail-feathers slightly lighter. On dissection it proved to be a male. My brother has also obtained a sparrow, with the head, belly and rump cream-coloured.—*Richard Tyrer, jun.; Weston Turville. Tring, January* 13, 1864.

Hawfinch at Weston Turville.—At the close of last month I shot a fine hawfinch in our garden: it had made its appearance several times before, and invariably under a yew tree, where it found something to eat—perhaps was swallowing grit. On dissection his crop proved to be empty, but his gizzard was quite full of the kernels of plums or damsons (not sloes), which are very abundant in this neighbourhood,

together with a quantity of flint grit: not a single piece of the broken fruit stone, however, could I discover, though I examined the contents of the gizzard very carefully. Perhaps the presence or absence of the fruit stones can be accounted for by the abundance or scarcity of grit in the soil where the bird has been living. I do not know the nature of the soil about Beverley,—perhaps Mr. Boulton will tell us. A few more examples from different parts will decide the question, whether this bird swallows the stones only when it cannot obtain grit in sufficient quantities.—*Richard Tyrer, jun.; Weston Turville, Tring, January* 13, 1864.

Lesser Redpole building in Kent.—On the 18th of May, 1863, we found a lesser redpole's nest at Tunbridge Wells: it was placed about four feet from the ground, in a furze-bush considerably overgrown with a bramble, in a small, unworked, and totally over-grown chalk-pit, on the south side of a hill. The hill was principally surrounded by wood and thicket, but itself meadow land. The nest looked like that of a linnet, but on going to it three days afterwards we were instantly undeceived: the male was singing, or rather twittering, in the small trees close by, and we soon recognized him as a lesser redpole, with whose song in confinement we were well acquainted, as I had lately had one in my possession for some time. This bird of mine had died a few months previously, but not before he had paired with a hen canary; and his only son I have now got. We were further satisfied as to the identity, by the female allowing us to examine her within half a yard of herself, and almost to touch her on the nest. The nest subsequently contained six eggs, exactly agreeing with the description in your 'Birdsnesting': three of these we still possess; the rest we left to the care of the parents. The nest was composed of dead grass and a little moss, and lined with horse-hair and a small quantity of cow's-hair; there were no willow trees near, which may account for this strange lining.—*Charles B. Wharton; Willesden Green.*

The Redwinged Starling in Sussex.—On the 28th of December I obtained a specimen of the redwinged starling (*Sturnus predatorius*, Wilson), which was killed on the 25th, at Sidlesham, Sussex, by a person out blackbird-shooting. It was found in a hedge-row, and not in company with the common starling. I believe it to have been a male, but, as it was shot in the back, I was unable to tell by dissection. The measurements were—length, 8¼ inches; extent of wing, 14 inches. Wilson gives 9 in. by 14 in. for the male—perhaps this may include the beak. The plumage was black, with the exception of the red patch on the wing; some of the feathers on the back being slightly edged with brown, also a slight streak of brown behind the eye. The gizzard contained, besides small gravels, some round black seeds, which I am not botanist enough to name; they are precisely the same as some which I took from the gizzard of a chaffinch a few days before. As some persons, on reading this, may doubt the genuineness of the bird, I may mention that I had it, in the flesh, of the person who shot it, and I am well acquainted with a gentleman who saw it shot. What induced it to take so long a trip as it must have done to get from America here I know not, but we have had, this autumn, some severe gales from the west and north-west, and the wind here had been westerly for a week or two before the bird was shot. It was in very good condition, and showed no signs of having been caged. I send you some of the seeds found in the gizzard, perhaps you may know what they are.—*W. Jeffery, jun.; Ratham, Chichester, January* 2, 1864.

The Food of Rooks: Are they so carnivorous as described?—Having been a preserver of these sagacious birds for many years, I must say a few words in answer to

Mr. Reeks (Zool. 8884) and Mr. Cecil Smith (Zool. 8885), who seem to paint them in colours too much like the vulture. I have watched the rooks at all seasons, and seldom have seen them near carrion; but when they were in that situation, it could be plainly seen they were in search of the maggots with which the putrid carcase abounded. Fowls of all sorts eat maggots of every description most eagerly, and gamekeepers often collect them, as well as ants' eggs, to feed young pheasants with. I have inquired of old gamekeepers into the damage done by rooks, and their answers have been invariably that rooks never destroy young birds of any sort. Magpies destroy many young birds; and I can attest that myself, as to young blackbirds, which I have seen killed and commenced to be eaten by these birds, and so do carrion crows. The only damage a very old gamekeeper mentioned to be done by rooks was one of an extraordinary character: in the year 1826, we had the hottest and driest spring and summer in this century; water was so scarce that cattle in many places were obliged to be driven for a mile or two to procure it. This gamekeeper observed some rooks busy near a spot where there were some pheasants' nests, and, on going to examine the spot, he found that the rooks had sucked the whole of the eggs in several nests, no doubt entirely from the fact of being unable to meet with water near, all the ditches and water-courses being dried up. I by no means doubt the statement as to the localities described by the gentlemen who have noticed the rooks to have been attacking carrion, but, in many instances, I have seen carrion crows mistaken for rooks; but if rooks have been inclined to be carnivorous, it may have been through want of food of the right sort, and only a casual thing: they generally feed in the centre of large open fields, and seldom skulk near hedges and close places where carrion abounds. I can verify the fondness of rooks for apples and pears, walnuts, seed corn, ripe wheat and oats, potatoes (both newly-planted and young), cockchafers, and numerous sorts of insects and larvæ and worms. Rooks may also be seen in large flocks feeding on the sea-shore with gulls and jackdaws; but this does not furnish any proof of rooks being so very carnivorous as described by the writers alluded to; and I certainly put these birds down, as they have been described by many close observers, as decidedly granivorous birds. Granivorous fowls are all extremely fond of unhatched young wasps, pulled from the combs: this, I hope, would not be considered a reason for calling them carnivorous, nor would the congregating of the rooks on the sea-shore to pick up the numerous small insects which a high tide may have left. In 1837, a very late cold spring prevented the rooks from feeding their young with the usual food, and numbers of the young died from apparent starvation: this does not look as if the young birds were fed by anything like carrion. —*H. W. Newman; Hillside, Cheltenham, January* 7, 1864.

Defence of the Magpie and Rook.—For some years past my attention has been directed to the wanton destruction of small birds, by means of poisoned grain scattered recklessly about the fields, gardens and lanes, of my part of the country—more especially during the breeding season; and I have, on several occasions, brought the matter fully before the East Kent Natural History Society, and the local Press, and endeavoured to disprove the excess of damage done by birds generally, and to prove that grain, so poisoned, will destroy other life than that for which it is laid out. One morning a gentleman brought me a dead magpie, in very fine plumage, which he had picked up whilst crossing a field, with other birds, and amongst them a partridge. On examining the crop of the magpie, seven grains of poisoned wheat were found, nine wireworms, and about a tablespoonful of beetles of various sizes, and larvæ. The

same spring I had a tame magpie, in a large cage on my lawn; a pair of wild birds came down to it daily, and endeavoured to enter the cage, but, as the prisoner could not get out and they could not get in, it terminated by their building a nest and bringing up a brood in a large fir-tree in the garden, and, since then, I have had one or two nests yearly; by this means I have had an opportunity of watching their habits very closely: I also never allow, in my garden, a nest of any bird to be disturbed; so that yearly I have the nightingale, whitethroat, wren, robin, missel thrush, song thrush, blackbird, tomtit, longtailed tit, greenfinch, chaffinch, yellowhammer, starling, hedgesparrow, house sparrow, magpie, &c.; and on my lawn I have yearly brought up pheasants and partridges. I have, moreover, inserted earthenware pipes in the walls, to induce the birds to remain with me and build; by this means I have been enabled to watch over them most satisfactorily during incubation, to feed them on their nests, and even on one occasion to move the nest, in a rose bush, without the old bird ultimately forsaking it. Now this has been done by rendering the birds familiar to my approach and voice. Having, then, watched over many nests for years, I am prepared to say that the magpie is not so destructive to eggs and young birds as is generally believed, for I have not missed one bird, or one egg from any nest to which my especial attention has been directed; therefore, although I do not say the magpie will not steal a young bird, or egg, or a few grains of wheat when exposed to view, what I do maintain is founded upon close observation, that the magpie is not only one of our handsomest and most interesting birds, but that he is one our greatest benefactors; for let any one who has the opportunity examine the surface of the ground under a magpie's nest, and he will be astonished to find numerous pellets, about three-quarters of an inch long, and nearly half an inch in diameter, which have been cast up from the crop, and composed almost entirely of the undigested hard wing-cases of small beetles —a class of insects injurious both in the imago and larva state: many of these pellets I have placed before the Natural History Society. Again, I am prepared to state that I have never found any portion of the eggs of other birds under the trees where the magpies build in my garden. I have found four heads of mice, and once that of a young mole; and although I am aware that the rook, magpie, &c., are what we may almost term omnivorous, under certain circumstances, still the immense amount of good these birds do is incalculable, for they are in general insectivorous,—that is, they feed upon what is usually termed grubs, the larvæ of beetles and other insects so highly injurious to our crops. Again, with regard to the rook, two years since when returning from Ramsgate I beheld a piteous sight—nine rooks were lying dead in a field, and several more were dying, all from the effect of poisoned grain. Some years since a friend of mine, in Bedfordshire, imagined that his magnificent rookery was an evil to him, and that the birds did him considerable damage; in a thoughtless moment he sent his order forth, and every engine was employed to destroy the poor birds; this was so effectually done, that in a very short time but a poor wreck was left. The next year not a bird was allowed to build, but a fearful day of reckoning came; for the third year the wireworm, the larva of the cockchaffer, and other crop-destroying insects, abounded to an alarming extent, and then, too late, his eyes were opened to the folly he had committed, and it was years before he could restore his rookery. Now, with all these birds in my garden, if the theory were correct of the great harm they do, I should not have been able to preserve any fruit, but the contrary has been the case. I have had moderate crops of most things, and have had nearly always some to spare; a net cast over my strawberry-beds and bushes, when the fruit is ripening, is my

simple safeguard, and answers admirably; and I am always cheered by the warbling of some little pet, from the nightingale in the spring to the robin in the winter. I would here remark, that it is easy to keep birds destructive to our crops within due compass without the dangerous use of poisoned grain, which will most assuredly kill every moderate-sized animal that may by any chance be allured to pick up the scattered seed; the songster and the sparrow, the partridge and the pheasant, and, worse than all, the poor skylark, may by its subtle aid be destroyed by hundreds, and sent through the poulterer to our tables as an article of food. Who can foresee what amount of misery may arise even from this act alone? In conclusion I would call the farmer's attention to the comparison of the damage done by birds to that perpetrated by rats; and, instead of sparrow clubs, let rat clubs be substituted and established in every town and village, and the trifling injury done by the feathered race would be speedily saved by clean ricks, undamaged homesteads, and a full return of the grain stored both in barn and rick.—*C. J. Cox; January*, 1864.

The Spotted Woodpecker.—On the 10th I was fortunate enough to have been able to watch, for a short time, a greater spotted woodpecker, but it evidently knew I was criticising it, for its manners were unnatural and constrained. These birds are seldom met with here, and they rarely give one an opportunity to notice their habits. In this case the bird alighted on the branch of a tree over my head, and moved quickly about in a state of great excitement, at intervals altering its peculiar cry: as long as it was visible I watched it carefully, and, had it not been somewhat foggy, I might have kept sight of it for a long time, as it took its departure gradually, flying from tree to tree.—*C. J. Maurice; Mickelmarsh Rectory, Romsey, January* 16, 1864.

Kingfishers on the Carron in Stirlingshire.—This beautiful bird, three years ago, was very common on the banks of the Carron; but I am sorry to say that now only two pairs remain. Last year there were three pairs, but one pair out of the three has since disappeared. Last spring I knew two nests; one of these—the contents of which (seven eggs) I took for my collection—was placed about ten feet above the surface of the water in a sand-bank, and the other was at least thirty feet above the surface, also in a sand-bank, and perfectly safe from molestation from almost any bird-nester. In this last I fully expected the old bird would bring out her young, but "alas, for human expectations!" I was doomed to disappointment. The sand above the nest slipped down, covering up the entrance of the hole, and the poor bird on her eggs was buried alive; I hope, however, the remaining two pairs will be more successful this season in bringing out their young, otherwise I fear they bid fairly to be totally exterminated in this district.—*John A. Harvie Brown; Dunipace House, Falkirk, January* 3, 1864.

Abundance of Kingfishers in Norfolk.—Upwards of forty specimens of the kingfisher have been shot in this neighbourhood during the past three weeks, and several have likewise been picked up completely starved out; most of the specimens being in very good plumage.—*T. E. Gunn; Norwich, January* 16, 1864.—*In 'Corresponding Naturalist's Circular.'*

[A still larger number have been killed or picked up dead in the Woolwich Marshes and the fens of Lincolnshire, but much earlier in the winter season, and before any starvation could have taken place from the freezing of streams: indeed, October and November were the months when these birds were most abundant.—*Edward Newman.*]

Nesting of the Kingfisher.—In answer to the question of Mr. Pigott (Zool. 8886), respecting the nesting of the kingfisher, I reply that I certainly never found anything

solid or firm in its burrow. I have found nothing but what I stated in my former communication (Zool. 8818), *viz.*, "a few fish-bones and scales." I once swept out, with my hand, enough to half fill a tea-saucer; there were six eggs in the burrow. Whenever I have found young, the burrow has been in a very wet, fetid state, and I should scarcely have thought anything could have hardened in such a place.—*Charles Stubbs; Henley-on-Thames, January* 18, 1864.

The late Stay of Swallows.—Swallows were here in considerable numbers up to the middle of November, when we lost sight of them; but on the 3rd of December I again saw them (I believe both swallows and martins), to the number of a dozen or more, hawking for flies over the rosery, which is a sheltered spot, and they were our visitors in smaller numbers up to the 7th.—*Alfred Wheeler; Devon Rosery, Torquay, December* 16, 1863.

[I have the most unexceptionable evidence of martins being observed up to the end of the year; swallows are often mentioned, but I think martins are generally intended.—*Edward Newman.*]

Notes on the Swallow Tribe, their Stay and Departure.—On November 30th, 1864, I saw a house martin flying about quite strong and active. The day was very bright and sunny, with a cold easterly wind. I have never before observed any of the swallow tribe later than November 23rd. For some years past I have seen sand martins here from the 20th to the 23rd March, and swifts from the 20th to the 29th April; the latest date at which I have seen swifts is September 6th, 1852. The fact that in this neighbourhood we have some members of the swallow family for eight months out of the twelve is attributable, I imagine, to the abundance of food and shelter which the valley of the Abon affords, both early and late in the year as well as all through the summer.—*T. Beaven Rake; Fordingbridge, January* 5, 1864.

Whitebellied Swift near Manchester.—At a meeting of the Manchester Natural History Club, held the 26th October, 1863, a stuffed specimen of alpine swift was lent for exhibition by Mr. C. R. Jones; it was taken during service in St. Mary's Church, Hulme, Manchester, on Sunday, October 18th. It had been observed since the previous Friday, and on Sunday while flying about it suddenly fell and was taken up dead.—*Communicated by Dr. Alcock.*

The Willow Grouse and the Red Grouse.—I was much surprised, on reading Mr. Norman's very interesting notes on the Fauna of Norway, to find that he still maintains the opinion that the willow grouse and red grouse are identical. Certainly he cannot have read the very able remarks on this subject in the 'Field,' of July 18th, 1863, from the pen of Mr. Wheelwright, than whom no man has had greater facilities for studying the economy of these birds. By the kindness of the Editor I will here quote part of Mr. Wheelwright's observations, "Although perfectly willing to admit Professors Rasch and Esmark to be, as they undoubtedly are, great authorities on the Norwegian Fauna, I consider it very probable that neither of them is conversant with the habits of the red grouse of Scotland in its native home; and I differ entirely from their opinions, that 'the Norwegian grouse is only a variety of the Scotch; their habits are similar, and the difference of plumage is solely owing to climatic influences.' I contend that their habits are perfectly dissimilar, and, without dwelling too much on the difference of plumage as a mark of specific distinction, I cannot help remarking that I never yet saw a red grouse nearly so light in colour during the summer as the willow grouse; and even allowing that the seasonal change in the winter may be owing to climatic influence, this is hardly a reason why the wing

primaries of the willow grouse should be white at all seasons, and that the belly in the summer is always much lighter than the back; in fact, often pure white. I will now, however, ask any one conversant with the habits of the red grouse, whether he ever observed one perch in a tree? did he ever find a nest in the forest? or did he ever know the red grouse, even accidentally, frequent the small birch, willow, or fir forests which lie remote from the moors? In all these particulars the willow grouse differs from the red grouse, and in so great a degree that you never, by any chance (at least I never did), find the willow grouse on the open moors or fells, never higher than the willow and birch bushes afford them a good shelter. And I may notice another great difference in the habits of the two birds. I have always, in August and September, found that the red grouse are partial to dry situations, whereas at this season of the year the willow grouse invariably select the moistest places they can find—small belts of willow bushes by the sides of forest streams, often on wet woodland mosses or morasses, but never out of covert; and I consider the name of willow grouse most appropriate. I still maintain my original opinion, that although there may be a slight resemblance between the willow grouse and red grouse in summer plumage (and this resemblance is very slight), here it ends. * * * I wish (if we are not to consider such striking differences in the habits of life in two birds of the same family as I have just pointed out are not to justify us in considering them as two distinct species) some one or other of your more learned readers would tell us in plain English what constitutes the difference between a species and a variety. Surely it is scarcely consistent for us to set down the willow grouse as nothing but a variety of the red grouse, when we retain in our Faunas as distinct species the thrush nightingale, the lesser whitethroat, the willow warbler, the pied wagtail, the grayheaded yellow wagtail, the tree pipit, the short-toed lark, the firecrested wren, the lesser redpole, the tree sparrow, the parrot crossbill, and some other birds which I could mention. In all those which I have named the differences existing between them and their nearest relations in the same family are no more striking than between the willow and the red grouse; in fact, in many not nearly so striking, for their habits of life are in nearly every case the same, and yet we admit these as undoubted species (with, perhaps, the exception of the wagtails), while at the same time we wish to make two birds whose habits of life are so totally at variance with each other, as one and the same species." Dr. Bree, in his beautiful work on the 'Birds of Europe not observed in the British Isles,' says, "In the present day it is more difficult than ever to define the character of species." Grant says that "species-mongers" have been destroyed for ever by the all-powerful wand of Mr. Darwin. I for one, however, refuse to submit to a dogma of this kind, and will take the liberty of considering the Tetrao Saliceti as a species perfectly distinct from that of T. scoticus. Its affinities are more with the ptarmigan than with the red grouse, but it is distinct from both. Again Mr. Norman says (alluding to the eggs of the willow grouse in the possession of Lord Garvagh) "perhaps his lordship would allow these to be examined, and by this means tend to clear up this disputed question." Now, in my humble opinion, nothing tends to mislead so much as the eggs of closely allied species; for instance, what would Mr. N. say to calling the blackbird (taking that bird as the normal type), the ring ousel, the fieldfare and the redwing, all Turdus merula? and yet the eggs of these birds assimilate so closely that not even our best oologists are able to specifically separate them, when any quantity of each species is intermixed. And again, who could specifically determine Larus fuscus from L. argentatus by examining their eggs? But to come nearer

the question under consideration, could Mr. Norman separate the eggs of the ptarmigan, red grouse and willow grouse, if several of each species were thrown promiscously together? I certainly think not, and yet by this means Mr. N. supposes the "disputed question" may be settled. Further on in the "Notes," and speaking of the redwing, Mr. Norman says, "Several times nests were found closely resembling those of the song thrush, with particles of blue eggs, undistinguishable from those of the thrush: these were, in all probability, nests of the redwing." I have certainly never seen the nest and eggs of the redwing *in situ* in the forests of Norway, but I have examined dozens of eggs, said to be those of the redwing, and which were, to me at least, undistinguishable from eggs of the blackbird, except perhaps being slightly smaller. Mr. Hewitson, the best authority on British birds' eggs, also figures it resembling the blackbird's.—*Henry Reeks; Manor House, Thruxton, January* 4, 1864.

[My valued correspondent Mr. Reeks approaches the grouse question as though it were recently imported into the pages of the 'Zoologist.' This he will find not the case; see Zool. 6209, 6242, 6264—6266. Mr. Wheelwright's opinion, cited by Mr. Reeks, is that of a sportsman rather than of a naturalist; and I think also it can only be cited as an individual opinion, not as settling the question; *that* will require far more research than the "Old Bushman" has brought to bear on this difficult question.—*Edward Newman.*]

Pallas' Sand Grouse in Norfolk and Suffolk.—Through the kindness of Mr. Southwell, of Fakenham, I am able to announce what I believe to be positively the last appearance of the sand grouse in Norfolk for the season of 1863. Mr. Dodman, of Titchwell, near Lynn, in a letter to Mr. Southwell, says, "The time of this sand grouse being procured was about the last week or end of November. From what I could learn it was a male bird. It was shot on the salt marsh, a different locality to that where all the other birds were obtained in this district, which were found on the Marram, or sand-hills; but this may be attributable to the bird having been disturbed from the latter during the morning previous to being found in the marshes." This bird was killed at Holme, near Hunstanton, where several others had been procured during the summer; indeed, many have remained about those sand-hills, which are more or less preserved, from their first appearance in the county, and here, if the females did nest at all, it is quite possible they might have done so, without being observed. The only other late examples, in this district, are thus referred to by Mr. Hele, in the 'Field' of November 28th, 1863:—"A pair were seen by Colonel Thelusson at Thorpe (Suffolk) one day last week."—*Henry Stevenson; Norwich, January* 22, 1864.

Pallas' Sand Grouse in January.—The extraordinary migration of Pallas' sand grouse into these islands, during the early part of last summer, was chronicled from almost every county; so many had been seen, so many shot, and so many preserved. From that time to the present I believe they have not been noticed anywhere, and have probably been forgotten by the great majority of the public: the 'Zoologist' catalogued these occurrences as they were observed by its contributors, and also those communicated to newspapers and periodicals, and with few remarks the interesting visitor disappeared from the public gaze. Why? Did it leave our shores as suddenly and unexpectedly as it made its appearance, of its own free will? or was it hunted down and extirpated? or has it gone back to where it came from, to tell of the barbarous treatment it received? Many doubtless left, but not all: there are one

or two stragglers still here. One specimen was picked up by a farm-labourer in the parish of Upper Kilcot, towards the close of the late frost, about the second week in January: it was found lying under a stone wall in a wheat-field, and had evidently been starved to death, as the bird was in a miserably thin condition: it was taken to Mr. R. B. Hall, of Alderley, who has forwarded it to Leadbeater for preservation. It had probably been dead some two or three days when found, as the head, on one side near the eye, had been slightly gnawed by vermin, but the plumage was in other respects good. The man who found it was questioned as to whether there were any more about, and he replied that he had seen two more, live birds, in the same neighbourhood, exactly similar in colour and size, that when approached they rose with a shrill whistle and fled very fast close to the ground, skimming along much like a hawk, and were strong on the wing. I do not think there is any reason to doubt that these were two specimens which had survived the severe weather which ushered in the new year. Gloucestershire was one of the counties which did *not* contribute its quota of information at the time of the irruption of the sand grouse (at least I am not aware that it did); but for all that I feel quite confident, the more so now, that there has been a flock of these birds in this neighbourhood throughout the whole of the late summer and autumn. I told you when I was last in town that what first gave rise to this supposition was one of my men, driving a little distance out of the town, put up, as he said, a large flock of "doves," more than ever he had seen before, that they shot across the road, and fled down towards a stone quarry some distance off; and one or two birds of the same description have been seen since then about the same place.—*V. R. Perkins; Wootton-under-Edge, February* 9, 1864.

Pallas' Sand Grouse in Devonshire.—On the 11th of December a gamekeeper at Heanton Court, near Barnstaple, shot a Pallas' sand grouse. The specimen was a female, old and in very good condition: it measured 14½ inches in length, and in expanse of wing from tip to tip 24 inches. In colour it was beautifully mottled with black and buff, and underneath the throat was a narrow dark band, and a large dark chesnut patch under the vent and part of the breast; the quill-feathers and the beak were of a pale bluish or ash-colour; the eyes were dark hazel. Its weight was 9½ ounces. It was stuffed by Mr. Fraine, High Street, Barnstaple.—*J. L. Langdon Fulford; Woodbury, Exeter.*

Pallas' Sand Grouse near Barnstaple.—A few days before Christmas the keeper of Mr. Williams, of Heanton Court, about three miles from Barnstaple, killed a specimen of Pallas' sand grouse. Only this single bird, which was a female, was seen.—*Murray A. Mathews; Weston-super-Mare, January* 8, 1864.

Pallas' Sand Grouse in Cheshire.—Having seen a specimen of Pallas' sand grouse (*Syrrhaptes paradoxus*), which was shot about four miles east of this town, on the 28th of November, I have thought it as well to send a notice of it to the 'Zoologist,' as showing the wide distribution of these persecuted little strangers. The person who received it for the purpose of mounting did not examine it to ascertain its sex, but from previous notices I think it is a male. The centre tail-feathers measured 3⅛ inches beyond those next to them. I do not think it so certain as Mr. Sinclair (Zool. 8690) and Captain Hadfield (Zool. 8770) suppose that these birds would not breed in Great Britain. According to Mr. Sinclair's statement, the birds he killed were quite plump; this would show that the food they found was suitable. Captain Hadfield's question, "Would they be allowed to lay an egg?" suggests the most probable reason why they are not likely to breed here. It might be asked, Where was the common

pheasant brought from? — *James Cooper; Museum, Warrington, December* 26, 1863.

Pallas' Sand Grouse in Scotland.—A fine male specimen of the sand grouse has been obtained in the neighbourhood of Lossiemouth. It was struck down by a hawk, and was just on the point of being disfigured, when it was rescued by a person who had seen the attack. The bird is now preserved, and is to be sent to the Elgin Museum. The specimen was plump and in good condition. It is very difficult to say what is the cause of this northern migration. The sand grouse is a native of the dry sandy deserts of Southern Tartary, and is rarely seen in the cultivated parts of the country. The question may arise, Is the bird a regular summer visitant of Moray? If wastes of sand are its favourite habitat, we have plenty of that description extending along the shores of the Firth; and it is evident that the bird has been in this country for some time, otherwise the labour in so long a flight would have reduced it to a mere skeleton. We expect to hear soon of the Tartary grouse breeding on our shores. Our summer temperature is not too low for that purpose, especially in the extensive tracts of hot dry sand which border the Firth.—*Banffshire Journal* [no date].

Pallas' Sand Grouse at Dornoch.—On the afternoon of the 5th of June, 1863, while riding along the edge of the sandy bent-hills which form the south-eastern corner of the county of Sutherland, and where, at this season of the year, there is a breeding place of terns (*Sterna hirundo*), my attention was attracted by a number of these birds flying about in a noisy and excited manner, and swooping down upon what I at first conjectured would turn out to be a weasel or other unwelcome intruder. On going up to the spot, I saw a bird, which, as I approached, at first crouched down, but then flew up, with a harsh, grating cry, and after a short but elegant and very rapid flight, during which it was pursued by the terns, it alighted not far from where I had started it. Going home immediately for a gun, I was fortunate enough to fall in with it again, and shot it. From a plate I had previously seen, I knew it was a sand grouse, and believing this to be its first occurrence in Scotland, I sent the bird to Macleay, bird-stuffer, Inverness, for preservation, along with a short description of it, which appeared in the 'Inverness Courier' of the 11th of June. I had consequently no opportunity of examining the contents of its stomach, or of making any obervations of its structure. The bird was a solitary male, and in good plumage, though, when shot, the upper parts were somewhat soiled with the chalky excretions squirted out upon it by the terns, a means of offence frequently adopted by these birds, though I am not aware that it has been generally noticed by ornithologists. Although I have frequently looked for other specimens of the sand grouse on the same ground, I have never been able to fall in with more. I may mention, however, that at Brora, about fifteen miles directly north, on the 1st of June, 1863, I saw in a field of young corn a flock of seven birds, which attracted my attention at the time as being somewhat unlike golden plovers, which I then fancied them to be, but which I am now convinced must have been sand grouse, and very probably was the same flock which soon afterwards appeared in Caithness, and supplied at least one specimen to that county. The male bird shot by me, as stated above, is now in my possession. —*Thomas Mackenzie; Dornoch, January* 14, 1864.

The Bittern shot near Beverley.—On the 4th of January, 1864, a splendid mature female of this bird, now so rare in the East Riding, was brought to me. It had been shot by Mr. Denison, of Beverley, on the River Hull, a few miles above the town. No other specimen was seen, or has since been heard of in the neighbourhood. From

twenty to thirty years ago, before sheep farming and turnip cultivation had worked their wonders on the "Wolds," and even in the "Carrs" of this Riding, the bittern used to be of common occurrence; so much so, indeed, that a farm-house situated on a particular bend of the river, known as Eske, was formerly called "Butterbump Hall," from the continuous booming of these birds which lived around it. It is now exactly fourteen years since a specimen of this bird has been seen on our river or in our neighbourhood. The specimen I allude to was stuffed, and still belongs to the man who shot it, Mr. James Runton, of the Leven Carr, near Beverley. I dissected my specimen, and was much struck by certain facts thus revealed. The bird was loaded with fat, and yet there was no food in the stomach, with the exception of a very small beetle and a little confervoid weed: thus I infer (as the specimen was shot about mid-day) that the digestion, as in the snipe, is very rapidly completed, for the confervoid remains had probably been swallowed *with* the last food taken, and not *as* food. The small beetle was most probably entangled in the weed, and taken unconsciously, being too small a prey to tempt so large a bird singly. I may here refer to a remark I made on my dissection of Scolopax major (Zool. 8890). I was astonished to find the gizzard containing seeds and vegetable matters only. The most probable explanation of this, I think, must be, that such ingesta are swallowed by the Grallatores inadvertently *with* their food, which is rapidly digested and passes from the stomach for the requirements of assimilation more speedily than the useless, or almost useless, matters swallowed at the same time. Having remarked on its contents, I must now describe what struck me as the great peculiarity of the stomach itself, for this bird has a *true stomach*, similar, so far as appearances are concerned, in all essential parts and powers, to that of an animal, and only resembling in one respect, and that very slightly, the ordinary gizzard of a bird. The stomach is of a more or less oval form, and is suspended, like a bag, in the body of the bird: it is narrowest at the cardiac or œsophageal end, gradually dilating towards the opposite, or pyloric end; at the pyloric extremity the organ dilates into a somewhat considerable pouch, capable of containing a quantity of food, and the capacity of the organ is also further increased by a certain amount of elasticity in the walls themselves. The walls of the stomach are very muscular, in proportion to the size of the organ, and in this respect only does it somewhat resemble the ordinary gizzard of birds. Externally is an arrangement of longitudinal muscular fibres, interlaced with others of either spiral or circular direction: this layer is thin. In the centre is a great thickness of muscular tissue arranged in bundles side by side, which take a circular direction, embracing the circumference of the organ: when cut across, these bundles in their appearance remind one of a piece of "crimped skate," more than anything else I know. Internally to this layer lie the mucous digesting membranes, with their glands, &c., and the surface presented is precisely similar to the internal digesting surface of the stomach of any ordinary mammal. The duodenum, or first portion of bowel, is also highly organized and provided with glands and a villous surface. As might be expected, in conjunction with such a highly organized stomach, evidently digesting, rather than merely triturating its contents, after the manner of most birds, I found a lengthened and complicated intestine. The intestine was in the diameter of its cylinder, very narrow, but it was of remarkable length, and in consequence of this circumstance, as well as to economise space, was closely convoluted on itself, coil upon coil. The length from pylorus to anus was five and a half feet. I have preserved both the stomach and intestines, in spirit, should any of your correspondents desire to inspect

or still further investigate their physiological peculiarities.—*W. W. Boulton; Beverley, January* 14, 1864.

Bitterns near Chichester.—On the 8th instant a bittern (*Ardea stellaris*) was shot at Fishbourne, and, about the same time, another at or near Lavant, both within a few miles of Chichester. The former was brought to me soon after it was shot, and is now in my collection: it is a male, and I think a very good specimen. The stomach contained the remains of a flat-fish, some sea-weed (probably swallowed with the fish), and a hard pellet of the fur of some animal, apparently that of the water-rat and shrew mixed: there were also a few feathers in the stomach. Does the bittern *throw up* pellets of the fur of those animals which it eats.—*W. Jeffrey, jun.; Ratham, Chichester, January* 19, 1864.

Bittern in Kent.—An extremely fine male specimen of the bittern was killed last week at Orpington, in Kent.—*Edward Newman.*

Ruff at Weston-super-Mare.—On the 6th of this month a specimen of the ruff was shot on the sands near this place.—*Murray A. Mathews; Weston-super-Mare, January* 8, 1864.

Spotted Rail near Beverley.—I have previously reported the numbers of this local bird which occur in this neighbourhood. During the year 1863 no less than sixteen individuals of this species were killed or captured alive on the River Hull, to my certain knowledge. Mr. Hurd, of Beverley,—a poor man, but one on whose word I can thoroughly rely,—tells me he has shot certainly not less than ten other specimens, and he could be sure the number was considerably beyond ten: he used them all for the table, finding them excellent eating. Hurd also states that he has seen many more that he failed in securing on different occasions: twice his dog caught this bird alive, and Hurd brought them home living: he could not mistake the species, for he knows both the moorhen and water rail, the latter bird being decidedly rarer than the spotted rail in this neighbourhood. One of Hurd's neighbours, a "gun man" tells me that what Hurd states is perfectly correct, as he has himself seen more than the stated number of spotted rails brought home by him. Mr. William Holmes, farmer, of Arram, near Beverley, has shot three spotted rails during the last summer and autumn, and Mr. Simpson, of the Loch House, also three specimens of this bird. These individuals have each of them seen other specimens, but have failed in bagging them, the birds being difficult to rise. This makes a total of thirty-two specimens in all captured, besides what have been seen. The summer and autumn seem to be those periods of each year during which the spotted rail visits this locality. Next season I purpose doing my best to secure the nest and eggs, so convinced am I of their breeding amongst the sedges and on the marshy flats that occur here and there along our river banks.—*W. W. Boulton; Beverley, January* 22, 1864.

The Purple Gallinule in Scotland.—At a Meeting of the Natural History Society of Glasgow [no date], Dr. Dewar exhibited a specimen of the purple gallinule (*Porphyrio hyacinthinus*),—a species which has not yet been recorded as British,—shot in the neighbourhood of Campbeltown. The present example, however, bore no traces of having been in confinement; and, as the bird is found abundantly in many parts of Europe, its occasional occurrence in this country should excite less surprise than that of other birds whose geographical range is not so extensive.—*Edward Newman.*

Bewick's Swan in Derbyshire.—I have just seen a very fine adult male of Cygnus minor in the shop of Mr. John Cook, birdstuffer, Market Place, Derby. It was shot on the 18th instant, on the Trent, at Newton-Solney, near Burton-on-Trent, by

Mr. J. A. Smallwood, of The Rock, Newton Solney. When killed it was in company with a pair of mute swans (*C. olor*). It weighed 11 lbs. The specimen has been most admirably preserved by Mr. Cook.—*H. Harpur Crewe; The Rectory, Breadsall, Derby, January* 22, 1864.

Bewick's Swan on the Humber, near Patrington.—On the 16th instant a very fine old male of this noble and graceful bird was shot near Patrington, in the East Riding of Yorkshire, by Mr. Pickering, of that town: it is now added to my collection. Several flocks of the wild swan, both Cygnus musicus and C. minor, have been seen in or flying over this locality, and one was shot a few days ago by Mr. W. Woodhouse, farmer, near the lighthouse at Flamborough.—*W. W. Boulton; Beverley, January* 21, 1864.

Bewick's Swan near Woburn.—During the present week three wild swans have been procured within a mile of Woburn: they are of very rare occurrence in this neighbourhood. One has been sent to me: they are Bewick's swan.—*C. Hervey Smith; Aspley Guise, January* 23, 1864.

Gadwall Duck near St. Austell, Cornwall.—The gadwall is a rare duck in the West of England. A male specimen, in fine plumage, was killed last week in a field near St. Austell.—*Edward Hearle Rodd; Penzance, February* 11, 1864.

American Wigeon in Essex.—I shot on the Essex coast, last Saturday, a beautiful female specimen of the American wigeon.—*Samuel Howell Carter, Marsh Lane, Tottenham, in 'Field' newspaper.*

[The claim of this bird to a place in the British list is very questionable: the first supposed specimen was bought in Leadenhall Market; the second record was never substantiated by the production of the specimen.—*Edward Newman.*]

The Velvet Scoter off the Sussex Coast.—A velvet scoter, a female, was shot near Selsey, about the end of November, 1863, and is now in the Chichester Museum. The general plumage above was rusty brown; under, speckled; a white spot behind and rather below the eye. This is a rare bird in Sussex.—*W. Jeffrey, jun.*

The Tufted Duck near Romsey.—The tufted duck, which is seldom met with here, except in severe weather, has been unusually plentiful during the late frosts. I have secured three fine specimens, one drake and two ducks. I had hoped, should the cold weather have continued, to have made acquaintance with many strangers whose visits are worth recording. A large duck-preserve belonging to Lady Mill, situated in a most inviting position on the banks of the River Ust has been abundantly stocked with wild fowl of all descriptions, but, strange to say, no geese have been seen, as is usually the case in such hard weather.—*C. J. Maurice; Micklemarsh Rectory, Romsey, January* 11, 1863.

Smews shot in Yorkshire.—On the 9th instant a fine old female smew (*Mergus albellus*), in fine winter plumage, was brought to me: it had been shot by John Rudd, of Ellerker, on a drain between the village of Ellerker and the Humber, and about seven miles from Beverley. On the 16th instant an old male smew, in perfect winter plumage, was sent, in the flesh, to me by Mr. George Wright, of York: it had been shot on the River Derwent, at Elvington, near York, by Mr. John Bowman or Mr. George Danmell, who were out wild-duck shooting. Mr. Wright, who sent me this bird, tells me he has had no less than three old male specimens of the smew in full winter plumage, and that it is thirty years since he saw one in the flesh before. When opened my specimen of the male smew had no less than five small roach in his stomach, varying from three to five inches in length.—*W. W. Boulton; Beverley, January* 21, 1864.

Goosander near the Lizard.— The goosander at uncertain intervals makes its appearance on our coast. The few that have come under my notice have all been in the "dun diver" plumage, which, both in the female and immature states of plumage of the goosander and redbreasted merganser, is very nearly alike. I have had a strong impression that this plumage is assumed more generally than is supposed after the autumnal moult by old male birds; but I have just seen a very beautiful specimen of an adult male, in its full maroon-coloured plumage and head crest, which was shot near the Lizard, and forwarded for preservation to Mr. Vingoe.—*Edward Hearle Rodd; Penzance, January* 20, 1864.

The Goosander near Richmond, Yorkshire.—I had brought to me, on the 9th of January, a very fine specimen of the goosander (*Mergus merganser*), which is considered to be of very rare occurrence in this part of Yorkshire: the bird was a male in the very finest adult plumage, with beautiful crest, and deep buff-salmon colour underneath: it was, in company with another, on the wing at the time, but the man was not so fortunate as to bring down the pair. With the exception of a young male, or an old female (I cannot say which, for I did not set it up), some seven or eight years since, this is the only instance that I can remember of its being obtained here for at least twenty years. My specimen was shot on the River Swale, not more than two miles from here. I bought it of the person who shot it. I also had sent me for preservation another full-plumaged male goosander, shot on the Swale, in this immediate neighbourhood, by the keeper of Mr. R. M. Jaques, of Easby Abbey: the bird under notice, when brought to land by the retriever, had a barbel, 12 inches long, protruding out of its mouth, not in the least mutilated. In July, 1862, I bought a fine osprey, which was shot over the same pool that the goosander was on.—*W. J. Millegan; Richmond, Yorkshire, February* 10, 1864.

Goosanders on the River Hull, near Beverley.—On the 12th instant a female of the goosander (*Mergus merganser*) was shot and brought to me by Mr. W. Holmes, farmer, of Arram, near Beverley: it was shot on the River Hull, two or three miles above Beverley. On the 15th instant a splendid old male goosander was shot on the River Hull, close to the Hull Bridge, Beverley, by Jonathan Gray, of Hull Bridge. This is the only specimen I have ever seen of the male goosander in full plumage, shot near Beverley, although two or three immature specimens are generally shot each winter on our rivers.—*W. W. Boulton; Beverley, January* 21, 1864.

Scarcity of the Redthroated Diver and plenty of the Great Northern Diver in Dublin Bay.—The great northern diver (*Colymbus glacialis*) has been unusually plentiful this winter in Dublin Bay, and the redthroated diver (*C. septentrionalis*) very scarce; about, on an average, fifty to one. The redthroated diver, in other years, is a most abundant species.—*H. Blake-Knox; Dalkey, Co. Dublin, January* 25, 1864.

The Little Auk near Beverley.—Having observed several notices of this truly oceanic bird, captured some distance inland, and which have appeared to create considerable interest amongst the readers of the 'Field' newspaper, I thought that the following capture might not prove uninteresting to some of your readers. During the autumn of 1861 two specimens of this bird were shot on the River Hull, above Beverley; one late in October, and the other on the 9th of November, of that year: they were both brought to me, and are now in my collection. I did not dissect them, and cannot therefore be certain of their sex. It was rather remarkable that the weather, both previous to and at the time of their capture, was unusually mild and calm. The distance from the sea, at the point where they were shot, would be at least from seven

to eight miles or more, and between twenty and thirty miles from the nearest point where these birds are usually met with.—*W. W. Boulton.*

Razorbill at Lewes.—A very fine specimen of the razorbill was shot in the Lewes Levels, by Mr. Thomas J. Jenner, in January last, during the hard weather.—*E. Jenner; West Street, Lewes.*

Abundance of Wild Fowl in Lincolnshire.—On the 16th inst., eleven swans passed over Epworth, just above the tops of the houses, and great numbers of ducks, &c., are seen daily passing over from the extensive bogs to the west of the above place to the marsh lands on the eastern banks of the River Trent. I have been informed that 1100 wild fowl have been taken in Mr. Healey's decoy, near Ashby, during the last week or ten days: the ducks taken in this decoy during the months of October, November, and December, are almost exclusively mallard, teal, and wigeon; but as the new year advances these are joined by many of our rarest ducks, including ruddy shieldrake, common shieldrake, shoveller, garganey, &c. I visited this decoy in October last, and saw a specimen of the little auk sporting among the ducks in the open part of the decoy; I was informed that it would often advance with the ducks to the mouth of the pipe, then seemingly not liking its narrow limits suddenly diving, re-appearing far down in the open decoy.—*Samuel Hudson; Epworth, January* 20, 1864.

Birds' Nests in December.—Two instances have come to my knowledge of birds building during the past month in this neighbourhood. One nest came into my possession about the middle of December; it had been taken from a ledge in a wheat-stack made last autumn, and contained three eggs. These eggs differed greatly in ground colour,—one being a light bluish green, the other two pale brownish yellow; but the markings were alike in all three. I showed them to a collector of experience in this town, and, as neither of us could feel certain as to what bird they were to be referred, I sent them to Mr. Doubleday, who is also unable to decide, thinking with us they have characteristics both of the linnet and the greenfinch. The nest was somewhat shaken and disarranged when I received it, but it appeared to me to be neither as round nor as deep as both those birds usually are; possibly the unusual situation may account for this. I may say that the person who took the nest has much practical knowledge of the habits of birds, and satisfied himself that no deception had been practised; one of the eggs he blew, the other two I saw the contents of myself: they certainly had not been laid more than a week. The other instance I referred to was that of a hedgesparrow; singular to say, this was also in a rick—in this case of beans: it also contained eggs.—*W. G. Rawlinson; Taunton, January* 1, 1864.

"*Notes on the Ornithology of Iceland.*"—I must trouble you to insert in the 'Zoologist' a few words from me, in consequence of the form into which you have thrown my "Notes on the Ornithology of Iceland," extracted by you from the Appendix which I contributed to Mr. Baring-Gould's recently published work, and reprinted in your Magazine (Zool. 8935, *et seq.*). In these notes I strove to compress into the smallest space possible all the information which seemed to me of importance respecting the different birds enumerated in my list, to which you have done me the honour of giving further circulation. Accordingly I doubt if it would be possible for any one to make extracts of the particulars I therein gave, and yet preserve my meaning accurately. This is shown in several instances, of which I will here only specify two. With respect to the Greenland falcon (*Falco islandicus*, Gmel.), you append

to the name of the bird "[one seen]" as the result of my remarks on that species. Now this produces an impression totally different from what is conveyed by my statement in the paper from which you quote. I myself, having been in the island only from April to July, never saw the Greenland falcon alive at all, but I referred, on Herr Preyer's authority, to a single case of its occurrence *in summer*, which has led I presume to the misconception, for the bird itself, as I have said in that portion of my general remarks which you quote at length (p. 8936) "occurs frequently in Iceland," and in the portion which you do not quote at all I have spoken of it as "of regular occurrence in winter." Again, in regard to Bruennich's (not Brunnich's) guillemot (*Uria bruennichi*, Sabine), it would appear to an ordinary reader of the summary of my note—"[Doubts entertained as to its distinctness]"—that these doubts were entertained by me, whereas all I said on that score was that Faber "seems to have been in doubt" on the subject, and neither I, nor as far as I know any naturalists who have been familiar with the bird, have ever hesitated about the matter. I shall be much obliged, therefore, if the readers of the 'Zoologist' will have the kindness to draw their pen through my name, which appears at the bottom of page 8944, as its presence there might induce the supposition that I had signed, and was consequently responsible for, all the statements as they stand in the abstract of my paper, many of them having been in the original much modified by their context. I must further beg those persons who are really interested in the Ornithology of Iceland, to refer in all cases that may require it to Mr. Baring-Gould's work, as I fear otherwise my authority may be quoted for some unqualified opinions that I had no intention of uttering. Permit me also to add here, that certain rather important corrections and additions to my list of Icelandic birds are to be found in the last number of the 'Ibis' (pp. 131-133), as well as to notice that the specific name applied by Faber to the ptarmigan of Iceland, and rightly quoted by me, is "*islandorum*," and not "*islandicus*," as printed in the 'Zoologist' (p. 8940).—*Alfred Newton; Magdalen College, Cambridge, February* 2, 1864.

[Not only for Mr. Newton's information, but for that of all my contributors who may not understand the editorial brackets, I beg to state that the words or paragraphs so inclosed are mine, whether signed or not: I do this for the express purpose of showing that for passages so inclosed I take the sole responsibility. I endeavoured within such brackets to express the truth, but I had no idea that any one would consider them Mr. Newton's because his name appears at the foot of the article to which they refer.—*Edward Newman.*]

Occurrence of the Redeyed Flycatcher in England.

By Edwin Brown, Esq.*

A male specimen of the redeyed flycatcher (*Muscicapa olivacea* of Linneus and Wilson) was trapped by a birdcatcher, together with its female companion, at Chellaston, near Derby, in May, 1859. The specimen of the male is in my possession; the female was unfortunately not preserved.

* Extracted from the 'Natural History of Tutbury,' p. 385.

This appears to be the only recorded occurrence of the redeyed flycatcher in Europe. It inhabits the continent and islands of North America. Wilson says that during the summer months "it inhabits from Georgia to the river St. Lawrence, arriving late in April, and leaving Pennsylvania about the middle of September." He was under the impression that it winters in Jamaica and the other West India Islands, but Gosse distinctly states that it does not spend the winter in Jamaica—that it arrives there in March from the East, and departs in October: it is, therefore, probable that it spends the winter months in Venezuela or New Granada, or adjoining countries, reaching them by the Isthmus of Panama. It is very common in the United States, and also in Jamaica, and, owing to the peculiarity of its note, it is a very well-known bird. Mr. Gosse furnishes us with such a vivid sketch of its habits, that I am tempted to extract rather largely from his 'Birds of Jamaica.' He says it is "much oftener heard than seen, though not unfamiliar to either sense: this sober-coloured bird is one of those whose notes have such a similarity to articulations as to procure them a common appellation. The flycatchers in general are not very vociferous, but this is pertinacious in its tritonous call, repeating it with energy every two or three seconds; it does not ordinarily sit on a prominent twig, or dart out after insects, though I have seen one in eager but unsuccessful pursuit of a butterfly (*Terias*), but it seems to love the centre of thick trees, where it sits announcing its presence, or flits from bough to bough as you approach, so that it is not easy to get a sight of it.

"On the 26th of March, on my return to Bluefields, after a visit to Spanish Town, I heard its well-known voice, but my lad had noticed it a week before: from this time every grove, I might almost say every tree, had its bird, uttering with incessant iteration and untiring energy, from its umbrageous concealment, Sweet-John!—John-to-whit!—Sweet-John-to-whit!—John-t'whit!—Sweet-John-to——whit! I can scarcely understand how the call can be written 'Whip-Tom-Kelly,' as the accent, if I may so say, is most energetically on the last syllable. Nor have I ever heard this appellation given to it in Jamaica. After July we rarely hear John-to-whit, but To-whit—to-whoo; and sometimes a soft simple chirp, or sip-sip, whispered so gently as scarcely to be audible. This, however, I have reason to believe, is the note of the young, for I have heard young ones repeatedly utter it, when sitting on a twig, receiving from time to time, with gaping beak and quivering wing, the food contributed by the dam."

The redeyed flycatcher feeds chiefly upon insects, but varies its diet with ripe berries of several kinds. This mixed diet indicates the species at present under consideration to be more nearly related to our warblers than to the gray or pied flycatcher of Britain. The two last-mentioned species are purely insectivorous in their habits, but most of our warblers will commit depredations upon our currant trees and strawberry-beds. The redeyed flycatcher is said to build a pretty nest, composed of dried grass and leaves, mixed with lichens, insect cocoons, spiders' nests, cotton, bits of paper, fragments of hornets' nests, and any odd thing it can lay hold of, lining it with vegetable fibres, and suspending it firmly between two twigs. The eggs are three, four, or five in number, and are of a clear white, dotted with a few minute spots of reddish brown about the larger end.

My specimen measures five and a half inches long. The top of the head is smoky gray, vanishing as it were on each side into narrow stripes of smoky black, beneath which and over the eyes are broad streaks of ashy white. The sides of the neck, the back, the wings and tail are olive-green; the inner portions of the wing and tail-feathers brownish black; the chin, throat and belly white. The bill, as Wilson remarks, "is longer than usual with birds of its tribe, the upper mandible overhanging the lower considerably, and notched, dusky above and light-blue below." The legs and feet are bluish, and irides red.

It may give a good general notion of the appearance of the bird to say that at first sight it appears to partake of the characters of the sedge and garden warblers.

Breeding of Varieties, &c.—There have of late years been such extravagant theories broached on this somewhat vexed question, that it is quite refreshing to read the observations of Mr. Greening (Zool. 8905), and he cannot, I think, fail in carrying the more sober-minded naturalists with him where he says, "I have little doubt we shall find that Nature always resumes her course." This has been my impression, not to say conviction, for years. There is, I think, the same tendency in mixed breeds; for instance, at my native place, Bonchurch, tame rabbits were occasionally turned out among the wild ones, with which they associated and bred, gradually assuming the grayish brown coat, and assimilating in habits to the wild species. In after years none of varied colours were to be met with. The feathered tribe is no exception; the rock doves, for instance, frequenting the caves and cliffs of the northern coast of Scotland, are often found to be of a mixed breed, in a transition state, and doubtless will eventually return to the original stock. European dogs in the East soon degenerate,

and, where the breed is intermixed, gradually assume the native character or die out. This I believe to be the case with the mixed breed of the human race; for instance, the "half-castes" of India are a tolerably numerous class, but I much doubt whether their descendants of the third or fourth generation are proportionately so, and think it not unreasonable to suppose that they will eventually prove sterile, or die out; for, considering the long period that has elapsed since India was first colonized by Europeans, and the paucity of white women, it might have been expected that a far greater number of a mixed breed would have been found, had there not been a counteracting influence at work. The mixed remnant of the Portuguese race are so degenerated that they are now barely distinguishable from the lower-caste natives, and will probably, ere many generations, have become extinct, or undistinguishable; for where the mother is a woman of colour, the offspring, I am inclined to believe, generally bear a greater resemblance to her than to their white or semi-white progenitor. *Henry Hadfield; Ventnor, Isle of Wight, February* 6, 1864.

[Captain Hadfield introduces a very interesting and important subject when he alludes to the varieties of man, but one which I fear cannot be fully discussed in the 'Zoologist;' individually I have not the slightest objection to it, but I fear, were all the facts connected with the question fully discussed, some readers of the 'Zoologist' might consider them rather out of place: under these circumstances I suggest that that particular branch of the subject may be dropped, while I would earnestly invite the publication of all the facts relative to quadrupeds, birds, or more especially insects, and the tendency of species to depart from or return to their normal character.—*Edward Newman.*]

Scarcity of Sphinx Ligustri in the Neighbourhood of Newark.—A correspondent (Zool. 8906) records the unusual abundance, in the neighbourhood of London, during the summer of 1863, of the larvæ of Sphinx Ligustri. I was surprised at this announcement, as the very opposite is the case here. It is known that this portion of the Valley of the Trent formerly produced S. Ligustri very freely. One seldom walked alongside a privet-hedge, or cast his eye over the privet and lilac plantations in the nursery-grounds or cottage-gardens, without observing the velvety-green larva resting on a towering twig, and any collector known to "buy grubs" was pretty safe to have some half-hundred brought in during the season. With us this insect now seems a thing of the past. Since the wet summer and intensely severe winter of 1860 I have not seen, nor been able to procure, a single larva, and I am assured, both by collectors and also by intelligent nurserymen (who here know the insect in all its stages) that they have not seen either larva, pupa or imago since 1860; this is another instance of how particularly severely the belt of the Trent suffered at that time. I cannot agree with your correspondent as to the habit of the *young* larva of this insect, namely, that it descends to the surface of the ground for the purpose of concealment during the day. Long observation brings me to the conclusion that at no stage of its growth does it descend, so long as food is abundant, and that its first extended "constitutional" is when instinct prompts it to seek a suitable place for transformation. I have collected the larvæ at all ages, from the thickness of a straw upwards: they are quite readily found while young on the privet plants in nursery-grounds, but on larger bushes and in hedge-rows they are proportionally difficult to discover. I am satisfied that they do not in any stage attempt concealment, but depend entirely for protection on colour and attitude.—*George Gascoyne; Newark-on-Trent, February*, 1864.

Crowding of Non-gregarious Larvæ.—I once bred a number of larvæ of Sphinx Populi from the eggs; they quarrelled desperately; they walked over each other in the most reckless manner—the one walked over usually contenting himself with jerking about and butting the assailant with his head, unless his claspers were interfered with, when he turned and snapped his jaws most viciously. Occasionally two of them got their claspers locked together, and then the fight was furious; but their savage bites did not appear to penetrate the skin, at least in general, for it is different at the time of a moult. I had observed that the tails of several had disappeared, leaving a black scar; and one evening I noticed the head of a healthy young larva in suspicious proximity to the tail of a much bigger one laid up for moulting; on close inspection I found the caudal horn of the invalid much shortened, and the stump of it bleeding copiously, and furnishing the cannibal with a plentiful supply of what, I suppose, may fairly be turned "hawk's-tail soup." How differently these really solitary larvæ behave from those which are gregarious when young, such as Saturnia Carpini and Endromis versicolor; these, though separating as they grow older, never quarrel when they meet, but crawl over each other without any unpleasantness.—*F. Beauchamp; Brighton.*

Hybernation of the Larvæ of Liparis auriflua.—About the middle of last October, while beating a hawthorn hedge, I found to my surprise two larvæ of Liparis auriflua. Not having reared this moth from the egg I could not decide their age precisely, but I should imagine they had just passed through the first change of skin. After feeding a few days, they both retired to corners of the box in which they were kept; here they spun a large cocoon: after remaining motionless for about a week they cast their skins, and then formed an inner cocoon of much closer texture, in which they of course still remain. I was not aware that it was the habit of this larva to hybernate occasionally.—*John R. S. Clifford; 21, Robert Terrace, King's Road, Chelsea, February* 10, 1864.

[Is this fact new?—*Edward Newman.*]

Habits of Young Larvæ of Endromis versicolor.—I do not know whether any of your readers have observed that if one or two larvæ out of a batch of eggs come into the world a little later than the rest, or for any reason fall back, they rarely do well. One year I had five eggs of Endromis versicolor; the last of the five did not associate with the others, and did not seem to grow from his birth; he never took his station on the leaf with the rest, but kept wandering about the muslin bag within about an inch of them, every now and then crawling close to them, when one of them would stretch out and with his head appear to feel the new-comer all over, as if to find out whether he was their real brother or not. It was just about the time of the final settlement of the Jewish Disabilities Bill, and I could not help being reminded of the scene in the House of Commons, the members tendering the oath to Baron Rothschild, which he could not conscientiously take. On the third day I pressed the muslin bag into such a shape that the birch-leaf touched it, and the poor outcast must have come into contact with its edge; but whether he had been exhausted by his former wanderings, or felt bullied by his big brothers, and broken-hearted by their want of sympathy and pined at being sent to Coventry—or for whatever reason, certain it is that he never took up his station among them, and on the following morning was found lying on his side, within a quarter of an inch of his hard-hearted relations, stone dead.—*F. Beauchamp.*

Description of the Larva of Numeria Pulverari.—Some eggs laid about the end of May last hatched in a week or two. The larvæ, kept in a very cold room, fed very slowly and did not begin to spin-up until quite the end of August. General colour purplish brown, varied with ochreous; head bifid, light ochreous-brown, especially in front; a broad ochreous stripe, lightest at the upper edge, along the upper part of the side of the 5th segment. On each segment, from the 5th (inclusive) backwards, a pair of very small points, which are light in front and dark behind; besides smaller points just behind the spiracles. A pair of large warts on the back of the 9th segment, a pair much smaller on the back of the 10th and 12th, and a pair smaller still on the back of the 11th segment. The 10th, 11th and 12th segments have some dark arrow-head lines (not however, quite meeting in a point) on the back, margined outwardly with ochreous; sides wrinkled, especially of fore part of body; belly purplish brown, with ochreous blotches on each side, the claspers underneath being dark bluish green, and the space between a pair of claspers yellowish; sometimes a lighter line down the middle of the belly. They fed on sallow, spinning up among leaves and moss.—*F. Beauchamp.*

Larva of Cidaria sagittata.—In July, 1855, I obtained some larvæ from eggs, found in a pill-box in which I had an hour or two previously captured a female C. sagittata. A description of the larva may be found in the 'Zoologist' for 1858 (Zool. 6030). I observe in the 'Annual' for 1864 another description of larvæ, said to be those of C. sagittata, upon the authority of Mr. Farren, who says that he bred the imago from the larvæ there described. Evidently both descriptions cannot apply to the same insect, and I hope that either Messrs. Hellens or Fryer will be fortunate enough to rear some of their pupæ, and satisfactorily determine whether the larva described in the 'Annual' is that of C. sagittata.—*Thomas Brown;* 13, *King's Parade, Cambridge, January* 23, 1864.

Larva of Cidaria sagittata. — The breeding of Cidaria sagittata has satisfactorily proved that insect to be not only not a Cidaria, but, if it is any relation at all to that genus, the cousinship is very distant indeed. Now that being the case, the question arises—to what genus does it belong? is there any family that will own it? If not, most probably some one of our leaders will set up sagittata on its own account. As it is somewhat of a vagrant at present, and as sagittata is evidently an aristocrat, judging by beauty of form and colour, the sooner it is put in a more respectable position the better. Now I have a notion that sagittata has near relations—in fact, very near relations in a respectable and extensive family, vulgarly termed "pugs" (*Eupithecia*), a family which, if they were little known until of late, are none the worse for that; it was not their fault. They were always "at home," if any one sought to make their acquaintance (see the agreeable way in which the Revs. H. H. Crewe and J. Greene have made friends with this neglected genus). I am aware that the larva and pupa of C. sagittata are not quite the thing for Eupithecidæ, but are all the larvæ of the Eupithecidæ stiff, and all the pupæ slender? Still they are very like, especially in their ways of living, in their markings, &c. They feed at the same time, go down to pupæ at the same time, construct their cocoons in the same way; and as for the imago of Cidaria, surely it must be a Eupithecia, or at least first-cousin to one. Why, look at it and any of the "pugs" side by side: does it not agree in every respect with them—the ample upper wings, and the very small rounded under wings? The habits of the imago, too, are just the same as with the Eupithecidæ. Mr. Bond and Mr. A. Fryer both agree with me that, when at rest, it is a Eupithecia to the

back-bone, sitting flat against the object on which it rests, such for instance as a barn, as only Eupitheciæ can do: and Mr. Fryer tells me that C. sagittata rests at night on the flowers of Thalictrum aquilegifolium, in the very manner of the Eupitheciæ, with their wings up like those of a butterfly! I am aware that some of the characters mentioned agree with others of the Geometrina, but in no one family do they all agree as they do in the Eupitheciæ. Mr. Stainton, in his 'Manual,' says of Eupithecia:—"Antennæ of the male pubescent; abdomen often crested, sometimes with a dark band on the first segment; wings smooth, cloudy, concolorous, with numerous wavy slender lines; fore wings more or less prolonged at the tip; hind wings proportionably small; in repose the wings are spread out, and closely applied to the surface on which the insect rests." This is a generic description that agrees in every particular with the so-called Cidaria sagittata. I do not know that C. sagittata is really a true "pug," and I do not know that all "pugs" are really true Eupitheciæ, but I must say I think it comes very close. I hope some one better acquainted with the structure of the Geometrina will take up the subject, and put C. sagittata in a more fitting position than the one it now holds.—*W. Farren;* 10, *Crescent, Cambridge.*

Origin of the name "Puss" Moth.—I used to doubt whether this name was derived from the downy appearance and tabby-like markings of the imago, or from the queer face of the larva; but a recent incident has nearly removed my doubt. Some children, in describing to me the other day some which they had taken off willow in August, mentioned as their most striking feature that they had "cat faces." Soon after a boy was describing one, and when I asked him if it had a cat face, he exclaimed "It had a face like a lion;" not that boys are always very accurate observers. I have heard of one who stood one day trembling and crying in the dock, and when the bewigged judge asked him kindly what he was afraid of, at last stammered out that the judge looked like a lion! "Where have you ever seen a lion?" asked his lordship. "I've seen a great many on Blackheath, carrying sand," was the answer; at least, such is the story; and it is added that the judge, seeing that the boy was a stupid one, who did not know a donkey from a lion, said no more.—*F. Beauchamp.*

Heliothis armigera near Arundel.—My first notice of this insect being in this neighbourhood occurred through observing a pair of fore wings amongst a heap of lepidopterous *débris* left by a colony of bats in an arbour in my garden, in September, 1855. The year following, observing that the bats chiefly took their prey over the surface of some high-grown ivy, I had some long ladders so placed as to enable me to explore the blossoms at its upper growth, twenty feet high; at the same time causing all the ivy blossom on the trees in the immediate neighbourhood to be entirely cut away. The result was the capture of a pair of H. armigera, which settled near me with quivering wings. During seven years I have taken ten specimens, eight in comparative motion and two at rest, and almost all at a high elevation.—*R. D. Drewitt; Peppering, Arundel, January* 7, 1864.

Offer of Euplocamus Boleti [*Scardia chorargella of Doubleday*].—I have a quantity of this insect, which I shall be glad to distribute. Any one collecting Tineæ can have specimens on sending box and stamps for return; as I have somewhere about thirty dozen, let no one be afraid of asking for a full series, stating what that series consists of. Any one pretty liberally disposed, who has Tortrices, Tineæ, or Plumes in duplicate, and who can help me to a species, will be thanked very much; still it must be understood, there is only one condition to this offer—that is, to send box (a strong one) and return stamps.—*W. Farren.*

Micro-lepidopterous Larvæ Mining in the Leaves of Lofty Trees.—It is but seldom that an entomologist has an opportunity of examining the tops of lofty trees. Last autumn, however, a heavy gale brought down some of the highest boughs of some old oaks and elms in Wimbledon Park. Examining these, I was surprised to find numerous mines and blotches of Tineina; not having studied the Micros, I cannot particularize the species. The fact struck me at the time, because I had always imagined, from the delicate structure of their wings, and their manner of flight as far as I had observed it, that the Tineina did not fly to any considerable altitude, and that their larvæ fed only upon the lower boughs of trees. My search was rather a hurried one, but I found no external-feeding larvæ upon these branches; they might, of course, have been dislodged by the fall.—*John R. S. Clifford;* 21, *Robert Terrace, King's Road, Chelsea, February* 10, 1864.

Note on Zelleria hepariella and Z. insignipennella.—In the Proceedings of the Northern Entomological Society, Mr. Hodgkinson claims to have proved that these two supposed species were only the sexes of one, and moreover mentions having taken them *in cop.* I hope I shall not offend Mr. Hodgkinson, if I ask if he thoroughly knows the two insects. In the autumn of 1862 these species were unusually abundant amongst the yews on Mickleham Downs: I captured a considerable number of both, and have at the present time both sexes of both species in my collection; the two insects appeared to me to have different habits. Notwithstanding all that has been said on the subject, I shall certainly consider them as what the world calls two good species until they shall both have been bred from the same kind of larvæ. I presume Mr. Hodgkinson took his specimens after hybernation, as, according to rule, hybernating insects do not copulate till the spring. I may add also that the fact of two closely allied insects having been seen *in cop.* does not necessarily prove that they are one and the same species.—*Robert M'Lachlan; Forest Hill, February* 8, 1864.

Occurrence of Eryx atra in the Ash.—When out one evening last summer, in the beginning of June, I found a specimen of this insect on an ash tree, in company with an old friend, Dorcus parallepipedus: on visiting the tree every other evening or so, I managed to get about twenty specimens in all: Dorcus was very plentiful, but were allowed to escape. I found the best time for them was from 9 to 10 P. M., and, from getting the first to the last, was about four or five weeks. The tree is a decayed one. Although there are several other ash trees apparently in the same condition in the same field, I could find no Eryx in them, although plenty of Dorcus.—*W. Farren.*

Cicindela maritima and C. hybrida.—I should be obliged for information any readers of the 'Scrap Book' can give as to the distinctive features of the two (?) species of Cicindela, C. maritima, and C. hybrida, and of their respective habits, &c. Mr. Curtis says of C. campestris that it emits a scent of roses when handled;—has any one else observed this?—*F. Archer, jun.;* 10, *Rodney Street, Liverpool, in 'Naturalist's Scrap-Book.'*

[I should also be greatly obliged for this information, never having been able to distinguish the two species: a slight difference is said to exist in the outline of the middle spot on each elytron, but surely this is insufficient to constitute a species.—*Edward Newman*].

Captures of Donaciæ.—I have met with the following species of Donacia in Epping Forest, during the month of June, in 1862 and 1863:—D. dentata, D. dentipes (plentiful), D. Sagittariæ (1), D. thalassina, D. impressa, D. linearis, D. Typhæ (common), D. sericea, and D. Hydrochæridis. D. Hydrochæridis is plentiful on

Typha angustifolia growing in a large pond in the forest, but I have not found any other species with it. The other species I find most frequently on Sparganium, growing in a small stream which runs through the forest, and in the summer dries up into a series of pools. D. simplex I found very common on the banks of the River Wey, near Weybridge, at the beginning of July last.—*R. G. Keeley;* 79, *Marlborough Road, Chelsea, S. W., February* 5, 1864.

List of Coleoptera taken in the Liverpool District during 1862 *and* 1863:—

Anchomenus peliduus, *Payk.* Bidston Marsh, one specimen, by shaking the bundles of dried reeds. November.

Ilybius sexdentatus. This species has been added to the British list since Waterhouse's Catalogue of 1861. I have one specimen found in the district; I believe I took it in the brook which runs on to the shore at Little Brighton.

Hydroporus reticulatus, *Fabr.* In ditches in the Altcar rifle-ground. September.

H. lepidus. The same situation, and at Crosby; also at New Brighton.

Bledius fracticornis. I found several in May, 1862, by examining the floating weeds, &c., brought down Wallasey Pool in a flood.

Hydnobius punctatus of Sturm. One by sweeping close to Hightoun. September. This is new to the British list.

Saprinus quadristriatus. Not uncommon at New Brighton, at the base of the bare sand-hillocks. Most abundant in May.

Ips quadripunctatus. The Fungi near Mostyn, Flintshire.

Sarrotrium clavicorne. Abundant on the sand-hills behind Mr. Barucheon's house, Crosby shore. June.

Trogosita mauritanica, Tribolium ferrugineum. Abundant feeding on the inside of matting on the Crosby shore. June. These two species are probably introduced with the food.

Niptus hololeucus. Mr. Brockholes has sent me this species from Paddington.

Helophorus nubilus. Bidston Marsh. By sifting damp flood refuse. December.

H. intermedius. Abundant in a shallow flash of water, Crosby sand-hills, near the mouth of the Alt; also on the banks of the Alt. This species has hitherto been unique in England, one specimen only being in Dr. Power's collection.

H. æneipennis. Ditches, Altcar rifle-ground. September. Also by sweeping grass overhanging a drain near the Alt. March. This species is new to the British Isles.

H. dorsalis. Abundant in the ditches, Altcar rifle-ground. This is also new, being distinct from H. dorsalis. March.

Cis villosulus. In Fungi near Halewood, associated with C. Boleti.

Anaspis ruficollis. On Umbelliferæ flowers, Mostyn Wood. July.

Adimonia Tanaceti. Sand-hills, New Brighton. October.

Cryptocephalus ameolus. Common on New Brighton sand-hills (on sunny days only), or flowers of Hieracium pilosella and dandelion. May and June.—*F. Archer, jun.;* 10, *Rodney Street, Liverpool, January* 18, 1864, *in* '*Naturalist's Scrap-Book.*'

Note on Fulgora laternaria.—In all branches of Natural History there are certain species indelibly connected with some cherished history of childhood,—some that no doubt have been so united for centuries past: these we care not to separate, even

though stubborn facts would ruthlessly dispel our long-dreamt dream; thus the robin covered the Children in the Wood "painfully with leaves;" the wolf glared on Little Red Riding Hood; and amongst insects, does not the glow-worm trim her lover's lamp, and does not the lantern fly, like a wandering star, flit before us in the forests of South America? Any matter-of-fact person who ventures to explode any of our popular beliefs meets with a cold reception; therefore, on looking over the July number of the 'Zoologist' (Zool. 8656), and meeting with an article headed "The Lanthorn of Fulgora Laternaria," in which Mr. Robert John Treffry, of New Granada, says, "I cannot tell why it is called the 'lanthorn fly,' for it gives no light," in being able to answer his question by replying, "Because other people have been *more fortunate* than yourself, and have seen its beautiful luminosity." Had I possessed no further knowledge of the subject than Mr. Treffry, what had I thought of the following?—"The so-called lanthorn appears to answer as a drum to reverberate its hum, and as a 'buffer' to protect it, when in its rapid flight it strikes against an obstacle, as it is elastic and horny. . . . . I think its use is what I have stated—an instrument of sound and a 'buffer.'" I am expected to believe that the lamp of the winged torch-bearer is no more than this. No! do not believe in any such degrading fact. I will bring evidence before you of such weight as to settle the question of the luminosity of the lantern fly, and restore it to its legitimate position in your minds as a light-bearing insect. At a Meeting of the Royal Physical Society of Edinburgh, held November 24th, 1858, a specimen of the lantern fly (*Fulgora Laternaria*) was exhibited by Dr. J. A. Smith, who observed that it was still an undecided question amongst naturalists whether these flies were really at any time luminous or not. It was therefore of importance that the undoubted evidence of eye-witnesses should be produced. Mr. Banks, of Prestonpans, who forwarded the Fulgora to Dr. Smith, was therefore at once requested to obtain further information from his correspondents on that particular point. On the 27th of April, 1859, at a subsequent Meeting of the same Society, Mr. James Banks communicated, through Dr. Smith, the reply of his correspondent at Honduras to the question raised at the Society. Mr. Banks had received various letters upon the subject of the luminosity of Fulgora Laternaria: they all bore testimony to the truth of the statement of this fly really emitting a light. One from Mr. Alexander Henderson, of Belize, furnished the following details:—"In answer to the question, 'Is it really luminous?' certainly the fly possesses light, and therefore emits it. The light is evidently under control, for it increases and diminishes at pleasure. When the wings are closed there are three luminous spots on each side of the head-part, on the upper part (like a cat's staring eyes) of a beautiful sulphur-coloured light, in rays that spread over the room. The third luminous spot is seen when the fly is on its back, half-way down the abdominal part of the insect. When quiescent the lumination is least; in daylight the upper spots are nearly white, emitting no light whatever (its lively time is at twilight). Immediately on being agitated, or moving about, the spots become sulphur-colour, and radiate forth streams of light, clearly seen, although the sun be shining into the room, as it now does at the moment I write, with the creature in the glass tumbler before me. We shut out the light, and to test the power of the fly I took up a book and read two verses of the 109th Psalm. Mr. Robert Gregg also took up a book and read by its light. I hope this will satisfy all that the lantern fly is luminous." In the 'History of the West Indies,' by R. M. Martin, 1837, vol. ii. p. 104, being vol. v. of the "British Colonial Library," is a statement fully corroborating the truth of the lantern fly being luminous.

The question must, I think, now be considered as settled; and this, I hope, wipes away the last stain cast upon the fair fame of Madame Merian: romance, as it has hitherto been considered by many, becomes plain reality.—*President's Anniversary Address to Entomological Society, January* 25, 1864.

[I believe the Honduras firefly, with intermittent light, is an Elater; if so, the Fulgora question remains *in statu quo.—Edward Newman.*]

Life History of Anabolia nervosa.—The eggs of this insect are deposited by the parents in September and October; the young are hatched, I presume, the same autumn, but of this I am not sure; from the small size of the larvæ when found in the early spring of the succeeding year, I am led to believe they are hatched the preceding autumn. These larvæ live in very slightly running water, and even in still water; when in still water they appear to me to make larger cases than they do in running water; the reason for this I cannot understand. When these larvæ are very young they might be easily mistaken for those of another genus, namely, Leptocerus; for the construction of their cases is very similar—both are composed of fine glutinous silk, coated with grains of fine sand, the tubes slightly curved. The principal difference, however, is that the Leptocerus larva rounds off the posterior end of its case, whereas the Anabolia larva either cuts off the end quite straight, or it is slightly truncated; but, as the animals grow and build up their cases, the difference becomes very apparent. The Anabolia uses larger materials, and builds a larger case; it then has a considerable curve, something in appearance to a long cornucopia coated with grains of coarser sand and small stones; up to this stage no balancers or vegetable materials are used. While the animal is at this stage of its existence it does not move very far from the place of its nativity; but, as it approaches to maturity, it appears to have gained somewhat of a roving disposition, and then it is that he adds a piece of straw, grass or stick, as a balancer; this is, it appears to me, to give greater buoyancy to its case, so that it can move through the water with greater facility and ease. There are other pieces added as the animal grows older and requires to move about further in search of food, of which at this period of its existence it requires a great deal. The number of straws, sticks, &c., attached to its case renders it very buoyant; two of the sticks are longer than the others, and are so nicely adjusted as to keep the animal's head lower than the other end, so that it can lay hold of stones or other things at the bottom. If the case was equally poised the animal would not have the power over the direction of its case, particularly in rapidly running water. There is a wonderful piece of engineering skill, termed instinct, (or, a better name for it would be common sense), displayed here by a humble creature like this; in other words, means adapted to certain ends. When the larva is full fed, which is about the middle or towards the end of July, it then goes into the pupa state, in which it remains about a month or six weeks; the perfect insect emerges from about the end of August through September and October. Before the larva goes into the pupa state, a grating of a gelatinous-looking substance, which hardens, is placed over the hole at the posterior end of the case; at the same time the anterior end is firmly affixed to a stem of grass, a bit of stick, or a stone, by thickly woven silken threads, which prevents all intruders from getting in at that end, and the grating prevents anything from prying in at the other; at length the imago wakes up, and is ready to perpetuate its species, as its parents had done before.—*Edward Parfitt.*

Psyche Neuropterous.—"Mr. Newman has latterly expressed a real or a feigned doubt about the lepidopterous nature of the insect [Acentropus niveus], notwithstanding

his taking credit in 1857 for having been one of the earliest to predict that it would prove to be a Lepidepteron. This is, however, not more extraordinary than that the same writer should at one time have maintained the genus Psyche to be neuropterous." —*Edwin Brown, in* '*Natural History of Tutbury*,' p. 400. Now this paragraph, which the reader will see is penned in rather an adverse and depreciatory spirit, is very useful to me as reminding readers that, in common with the great European entomologists, I entertain doubts as to the lepidopterous nature of Acentria: doubts neither feigned when I expressed them, nor dissipated now that Mr. Brown has published *in extenso* his valuable observations on the subject (Zool. 8917); but also that thirty-three years ago I suggested the possibility of uniting the Psychidæ with the Phryganidæ through Talæporia and Tinodes. As to calling Tinodes neuropterous, we all used to do so formerly, and it is only the idea of annexing Psyche and Talæporia to Tinodes, and the other Phryganidæ that was new. Copernicus was not only ridiculed but imprisoned for asserting that the earth travelled round the sun; he contented himself with saying that it was true notwithstanding; he knew that neither ridicule nor imprisonment could turn aside the course of Nature; that if it were the appointed duty of our globe to move in the course he suggested, the movement would continue whether the authorities and the wits approved of it or not; and thus it will prove with all novel suggestions: they will be ridiculed for a time, but if true adopted hereafter. I may also remark that Mr. Brown will see, on a careful reperusal of the passage in question, that the word "maintained" is somewhat inappropriate. I only "suggested" that "Tinodes or Psyche be placed on the circumference of the circle containing the Phryganidæ;" and I go on to say, "supposing Psyche to be the approaching genus to Lepidoptera." I am sure that it will be known to all entomologists that I have not the merit of placing the Phryganidæ among the Neuroptera; I found them so placed by Linnæus and Latreille, and all the greater entomologists, and I only let them alone.

Before concluding, I must say that I hail with unmixed satisfaction every attempt to reopen the discussion on the affinities of Acentropus: and I rejoice that Mr. Brown can believe himself to have settled so difficult a question; at the same time I cannot help recommending to him a much more careful examination of the larva and pupa, for if the figure drawn by himself of the former be correct, in appearing to have eleven spiracles and six pairs of claspers, it is utterly impossible that such a larva should produce a lepidopterous imago; and again, if the figures of the pupæ approach to correctness, the insect can have no affinity to Zeuzera and Hepialus, near which he proposes to place it: all the Xylophagi are distinguishable in their pupa state by the singular form and by the double series of hooks surrounding every segment. — *Edward Newman.*

Manual of British Trichoptera.—"Notes on British Trichoptera," by Mr. M'Lachlan, is a paper full of valuable information, particularly that portion which treats of the interesting habits of this family. I can fully appreciate the regret expressed by the author that so few Entomologists pay any attention to the Phryganidæ; were it otherwise, many interesting discoveries would no doubt be made. Let us hail, then, with marked approbation, the announcement of the intention of the author to commence at once a Manual of the British Phryganidæ; and let us hope that the production of this work will prove the means of bringing into the same field a number of labourers as energetic and accomplished as the author of the promised Manual.—*President's Anniversary Address to Entomological Society, January* 25, 1864.

Proceedings of Societies.

Entomological Society.

Special General Meeting. — *January* 25, 1864. — Frederick Smith, Esq., President, in the chair.

A Special Meeting was this day held, pursuant to notice, for the purpose of considering certain proposed alterations in the Bye-Laws, the objects of which were (1) to change the title of the Curator to that of Librarian, (2) to transfer to the Librarian certain duties hitherto performed by the Secretary, (3) to abolish the Library and Cabinet Committee, (4) to abolish the Publication Committee—and to vest in the Council the powers and duties of both those Committees, and (5) to repeal chap. XVII. sec. 3, whereby residents in the United Kingdom are excluded from Honorary Membership of the Society.

The alterations necessary for effecting the first object were proposed by Mr. Dunning, and seconded by Mr. May; that for effecting the second object was proposed by Mr. Dunning, and seconded by Mr. Grut; those necessary for and consequent upon effecting the third object were proposed by Mr. Dunning, and seconded by Mr. Edward Sheppard; those necessary for and consequent upon effecting the fourth object were proposed by Mr. Dunning, and seconded by Mr. Wilkinson. The above were carried without division.

The repeal of chap. XVII. sec. 3, was proposed by Mr. Pascoe, and seconded by Mr. Baly. The Meeting was addressed on this question by Mr. Dunning, Mr. McLachlan, Mr. Edward Sheppard, and Mr. Waterhouse; and by Mr. Pascoe in reply.

On a division the numbers were—For the motion, 6; against it, 14. The motion was consequently lost.

Annual Meeting.—January 25, 1864.—Frederick Smith, Esq., President, in the chair.

An Abstract of the Treasurer's Accounts for 1863, and the Annual Report of the Council on the general concerns of the Society, were read.

The following gentlemen were elected Members of the Council for the ensuing year:—Messrs. Bates, Rev. Hamlet Clark, Dunning, Grut, McLachlan, May, Pascoe, Edwin Shepherd, Frederick Smith, Stainton, Samuel Stevens, Alfred R. Wallace, and J. Jenner Weir.

The following Officers for the ensuing year were then elected:—Mr. Stainton, President; Mr. S. Stevens, Treasurer; Messrs. Shepherd and Dunning, Secretaries; Mr. Janson, Librarian.

The retiring President delivered an elaborate Address, at the conclusion of which a vote of thanks to Mr. Smith for his uniformly courteous conduct in the chair, and for his constant attention to the affairs of the Society during his biennial Presidency,

was carried by acclamation. The vote was accompanied by a request that the Address might be printed in the 'Journal of Proceedings.'

The President returned thanks; and a complimentary vote to the other Officers and Members of Council for 1863 was subsequently carried and duly acknowledged.

February 1, 1864.—Frederick Smith, Esq., Member of the Council, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—'Proceedings of the Royal Society,' No. 59; presented by the Society. 'Sitzungsberichte der Königl. bayer. Akademie der Wissenschaften zu München,' 1863, ii. Part 1; by the Academy. 'Tijdschrift voor Entomologie,' Vol. vi. Parts 3—6; by the Entomological Society of the Netherlands. 'The Zoologist' for February; by the Editor. 'The Journal of the Society of Arts' for January; by the Editor. 'The Athenæum' for January; by the Editor. 'The Reader' for January; by the Editor.

The following addition, by purchase, was also announced:—'Genera des Coléoptères d'Europe,' Livr. 117 à 120.

Election of President.

The Secretary gave notice that, in consequence of Mr. Stainton having declined to accept the Presidency, the Meeting to be held on the 7th of March next would be made Special, for the purpose of electing a President; and that the Council recommended Mr. Francis P. Pascoe for election to the vacant office.

Exhibitions, &c.

The Rev. Hamlet Clark exhibited a collection of Australian Phytophaga, composed partly of specimens from the cabinet of Mr. C. A. Wilson, of Adelaide, and partly of the proceeds of Mr. F. G. Waterhouse's journey of exploration across the interior of Australia.

Mr. S. Stevens exhibited specimens of butterflies of exotic hue, but of home manufacture; they were made of feathers, and intended for personal ornament.

Prof. Westwood remarked that great destruction of specimens of the more beautiful species of butterflies had taken place in Paris; large prices (larger than Entomologists could afford) had been given for the finest and most brilliant examples, which were used for ladies' head-dresses, &c., and of course destroyed in an evening. The feathery imitations were equally beautiful, more lasting, and would render unnecessary the wholesale destruction of the originals.

The Secretary exhibited part of the head of a coffee-cask recently received from Ceylon by Mr. R. L. Thomson, of Alderney Road, Mile End; the wood was thoroughly riddled by larvæ, apparently of the genus Anobium.

Prof. Westwood remarked that a Committee had for some time been engaged at South Kensington upon the question of the injury done to ancient wood-carving. The Report of that Committee will shortly be ready, and he thought it would be found both interesting and valuable.

Sir J. Hearsey exhibited a collection of Coleoptera from India and China; the principal part from the former country.

Prof. Westwood exhibited a specimen of "wild silk" placed in his hands by Mr. Daniel Hanbury; it had come from the State of Salvador, Central America, and was the work of a colony of larvæ described as "dark bluish, feeding on an oak bearing large acorns," the moth being "dirty gray." The Professor discussed at some length the probability of the silk being made economically useful.

Mr. F. Smith exhibited a collection of wasps' nests—one of Vespa rufa, the rest of V. vulgaris; they were in various stages of formation, the earliest consisting of only a single cup containing the first egg, others consisting of three or four cups, whilst others again were more complete. The whole had been artificially obtained by Mr. Stone, who tempted the wasps to build by excavating holes in banks and furnishing them with foot-stalks; in fact, Mr. Stone appeared to possess the power of inducing wasps to build nests of almost any shape he pleased.

Mr. T. W. Wood (who was present as a visitor) exhibited a mass of conjoined cells which had been found embedded in a piece of Honduras mahogany at Chatham Dockyard; the cells were in form like the honey-pots of a humble-bee, brittle and very light, and composed apparently of comminuted or triturated and agglutinated wood and earth. Mr. Bates suggested that they might possibly be chambers of a species of Termes, though he thought they were too large. No other Member hazarded a conjecture as to the origin of the phenomenon.

Prof. Westwood exhibited a further selection from the captures in the Zambesi country of the Rev. H. Rowley, and read the following description of a gigantic species of Moluris:—

Moluris (Phanerotoma) Rowleiana, *n. sp.*

Species magna et insignis, *M. Bertolonii* fere æqualis. Capite et pronoto nigris, opacis, punctatissimis; prothorace subquadrato, lateribus rotundatis, latitudine majori paullo ante medium. Elytris oblongo-ovatis, prothorace paullo latioribus, luteo-villosis, singulis costis quatuor obliquis nigris nitidis instructis; sutura nigra, nitida. Corpore subtus et pedibus nigris, subnitidis, punctatissimis; abdomine, læviori.

Long. corp. unc. $1\frac{3}{4}$; prothoracis, lin. 6; elytr. lin. 14.

Habitat prope fluv. Shire, Zambesi.

Revdo. H. Rowley capta, et ad Museum Entomologicum Oxoniæ benevole communicata.

Prof. Westwood also read the following descriptions of two anomalous Carabideous beetles:—

Genus Delinius, *Westw.*

Genus novum Carabidorum, *Steropi madidi* habitu et statura. Antennæ breves, graciles, geniculatæ, articulo basali tertiam partem occupante. Caput mediocriter porrectum, labro in medio marginis antici prominenti. Mandibulæ graciles, acutæ, intus edentatæ. Maxillæ spina rigida apicali lobo interno, spinulisque margine interno armatæ. Palpi maxillares externi articulo apicali mediocre subsecuriformi. Palpi labiales magni, articulo ultimo magno securiformi. Mentum in medio emarginaturæ porrectum, truncatum. Prothorax subquadratus, lateribus rotundato-curvatis. Elytra ovalia. Tibiæ anticæ haud palmatæ, margine interno emarginatæ.

Sp. 1. D. Essingtonii, *n. sp.*

Niger, subnitidus; capite sulcis duobus inter antennas, pronoto sulco medio in fossula parva ovali ante marginem posticum terminato, sulcisque duobus prope angulos posticos notato; elytris striatis, costaque submarginali proditis.

Long. corp. lin. 8.

Habitat Port Essington, in Australia. In Mus. Hopeiano Oxoniæ.

Genus Spanus, *Westw.*

Genus novum Carabidorum, statura et habitu *Miscoderæ*; *Axinidio* et *Disphærico* affine. Caput parvum, porrectum. Prothorax globosus. Elytra ovalia, gibbosa, basi pedunculata. Labrum breve, profunde emarginatum. Mandibulæ apice acutæ, dente parvo subapicali marginis interni armatæ. Maxillæ lobo interno elongato, apice obtuso, longe ciliato. Palpi externi maxillares et labiales longi, fere æquales, articulo ultimo maximo, inflato, apice truncato. Mentum late emarginatum, margine antico incisuræ recto. Labium parvum, subtriangulare; paraglossæ elongatæ, tenuissimæ, setosæ. Tibiæ anticæ haud palmatæ, intus pone medium emarginatæ. Tarsi quatuor antici articulis quatuor basalibus brevibus, latis, subcordatis.

Sp. 1. S. Natalicus, *n. sp.*

Niger, glaberrimus; ore, antennis et pedibus piceo-rufis; capitis vertice oblique bi-sulcato; pronoto sulco tenui mediano impresso; elytris stria profunda prope suturam, alteraque marginali, puncto prope basin, alteroque subapicali singulatim impressis.

Long. corp. lin. 3¼.

Habitat in Natalia. D. Guienzius. In Mus. Hopeiano Oxoniæ.

Mr. Waterhouse exhibited a specimen of Psammodius porcicollis and a specimen of Onthophilus exaratus, and read the following notes respecting them:—

"The specimen of Psammodiùs porcicollis I found mixed, in Kirby's British collection, with the Psammodius sulcicollis, which it greatly resembles; the specimen of Onthophilus exaratus I have had for many years in my own British collection, where it stood with a specimen of Onthophilus sulcatus, and was supposed to be the same species; the two insects in all probability having never been compared till within the last few days, when, having determined to clean them, and mount them on card, I then perceived that they were distinct species. The history of the specimen is unknown to me, but I believe it was given me as the O. sulcatus. Both the insects exhibited, it would appear, are known only as inhabitants of South Europe. It is hoped that this notice will induce our Entomologists to examine their British collections, with the view of ascertaining whether they contain these species, and can furnish us with any information respecting them.

"Psammodius porcicollis (Aphodius porcicollis, *Illiger, Magazin für Insectenkunde*, ii. p. 195, 2, 1803) has the same thickly tuberculated head, the transverse ridges on the thorax, and strongly sulcated elytra, as in P. sulcicollis; its colouring, moreover, is the same, being pitchy black, with the legs and fore part of the head dull rufous; but it differs in being decidedly larger. The oblique ridges seen on the head of P. sulcicollis, and which converge and meet at an angle near the hinder part of the head, are scarcely to be traced in P. porcicollis, nor are the large punctures which are visible in the former insect on the back of the head. The thorax is relatively more

ample in P. porcicollis, and the coarse punctures in the transverse sulci are more numerous and more evident, especially on the hinder part of the the thorax, behind the posterior transverse ridge: the elytra are more strongly sulcated, and the punctures in the sulci are larger, and separated from each other, for the most part, only by narrow transverse ridges; the interstices of the striæ are broader; and lastly, the outermost interstice is continued from the base of the elytron only about half-way towards the apex, so that the two outermost striæ become confluent beyond that part. The corresponding interstice in P. sulcicollis is at first (near the humeral angle of the elytron) united for a short distance with the much more prominent interstice which is nearest to it, and then is free, and extends to the apex of the elytron.

"Onthophilus exaratus, *De Marseul, Essai Monographique sur la Famille des Histérides, Ann. de la Soc. Ent. de France*, 3me série, iv. p. 552, sp. 2. Hister exaratus, *Illig. Magaz.* vi. 48, 25 (1807).—The insect exhibited is as large as the largest specimens of O. sulcatus, and is placed by De Marseul and others in the section of the genus in which there is an odd number of longitudinal ridges (5) on the dorsal surface of the thorax,—a section which includes our O. sulcatus; whilst our common smaller species, O. striatus, is placed in the section having an even number (6) of ridges on the thorax. Of course in the former case there would be a mesial ridge, and the species of the second section would be destitute of a mesial ridge, and thus two distinct types of sculpturing might be said to exist in these very closely-allied insects,—a peculiarity which would not be in accordance with our general experience. The O. exaratus, however, shows that such is not the case. All the species have six ridges. The differences in the three species are, that in O. striatus the four ridges on the dorsal surface of the thorax are equidistant and entire, and they extend from the base to the apex of the thorax; the other two ridges are short, confined to the hinder half of the thorax, and situated, one on each side, rather nearer to the lateral margin than to the dorsal ridges. In the other two species the above so-called four dorsal ridges are interrupted, the outer pair vanishing on the anterior third of the thorax, and the middle pair interrupted about midway between the base and apex of the thorax, and reappearing, more widely separated, on the fore part. In O. sulcatus the two middle ridges are almost united into one ridge, being separated only by a slender impressed line. In O. exaratus the two corresponding ridges are distinctly separated by a shallow, densely punctured groove; the space between them and the nearest adjoining ridge on either side is, however, fully three times greater than that which separates the middle pair. O. sulcatus has the abbreviated outermost ridge on either side well developed and glossy. In O. exaratus it is represented by a mere swelling, nearly as densely punctured as other parts of the thorax. In both insects there are four large shallowish foveæ near the hinder margin of the thorax, separating the ridges; in O. striatus the foveæ can scarcely be traced; here the sides of the thorax at the base are parallel for a short distance, then they converge suddenly to the front. In O. sulcatus they converge from the base to the apex, but present a gently convex outline, and the part immediately below the anterior angle is somewhat incrassated and slightly rounded. In O. exaratus the sides of the thorax also converge, but are straight, excepting towards and near the anterior angles (which are depressed), where they gently bend inwards. The surface of the thorax is moderately densely and moderately finely punctured in O. sulcatus; in O. exaratus it appears under a common lens to be densely covered by very minute longitudinal scratches, separated by equally minute ridges; under a strong lens, however, punctures are visible, more especially on the

hinder part of the thorax, but these punctures are confluent in the longitudinal direction. O. striatus presents a nearly similar condition of the sculpturing, but it is scarcely so dense and delicate on the disk of the thorax. The elytra are rather less convex in O. exaratus than in the other two species; in all they are covered by sharply impressed lines, separated by minute longitudinal ridges, besides which in O. striatus the dorsal surface of each elytron presents six equidistant and equally developed costæ, and a row of somewhat isolated punctures between them. In O. sulcatus the intermediate costæ—*i. e.*, the first (or that nearest the suture), third and fifth—are wanting, or rather they are not distinguishable (excepting in a slight degree in certain parts) from the very minute longitudinal ridges filling up the interspaces; of these there are five, the central one representing the costa; there are six rows of somewhat isolated punctures, as in O. striatus. O. exaratus presents an intermediate condition, for each elytron has six costæ, but the alternate ones are rather less raised; the punctures are much larger in their transverse diameter, filling up almost the whole interspace between the costæ. The first, third and fifth costæ (being those which are less elevated) are depressed, and punctured in parts. There are other differences in these insects observable in the structure of the legs and antennæ, but those already pointed out will render them easily distinguishable."

Major Parry read the following:—

Further Remarks on Mr. James Thomson's 'Catalogue of Lucanidæ.'

"Mr. James Thomson having kindly placed at my disposal for examination the type-specimens of some interesting species of Lucanoid Coleoptera formerly belonging to Count Dejean's collection, as well as of those species described by himself in his recently-published 'Catalogue of the Lucanidæ,' I have drawn up a tabular statement upon the synonymy of the species in question. To this I have added a few observations, and the whole may be considered as an Addendum to my Remarks upon Mr. Thomson's 'Catalogue' which have been already published in the Society's 'Transactions.' I am now able to state that the opinion therein expressed, that several of the species in question had previously been published, has, after a careful examination of the type-specimens, been fully corroborated. To those Members who are more particularly interested in the Lucanoid Coleoptera, the types of Count Dejean's species, now exhibited, together with the handwriting of this celebrated Entomologist, cannot but prove interesting.

Mr. J. Thomson's Species.	*Synonymous with*
1. Prosopocoilus bulbosus, *Hope* (var. minor), *Thoms. Cat.* p. 396.	Macrognathus Spencii, *Hope, Cat.* p. 6, (var. max.)
2. Cladognathus astericus, ♀, *Thoms. Cat.* p. 417, *n. sp.*	Prosopocoilus occipitalis, *Hope, Cat.* pp. 4, 13.
3. Dorcus axis, ♂, *Dej. Cat.* (var. minor).	Dorcus bucephalus, *Perty.*
4. D. semirugosus, ♂ (var. minor), *Thoms. Cat.* p. 422, *n. sp.*	D. Tityus, *Hope, Tr. Ent. Soc.* iv. p. 74.
5. D. exaratus, ♀ (*Dej*)., *Thoms. Cat.* p. 426.	D. lineato-punctatus, *Hope, Cat.* p. 23.
6. D. Ceramensis, ♂, *Thoms. Cat.* p. 424, *n. sp.*	D. concolor, *Blanchard, Voy. Pole Sud.* iv. 138, pl. ix., fig. 10.

Mr. J. Thomson's Species.	*Synonymous with*
7. D. Diabolicus, ♂, *Thoms. Cat.* p. 423, *n. sp.*	D. Niponensis, *V. Vollenhoven, Tijd. v. Ent.* iv. p. 113, pl. vii. fig. 3.
8. Ægus cicatricosus, ♂, *Dej. Cat.*	Ægus Chelifer, *M'Leay, Hor. Ent.* p. 113.
9. Sclerostomus leiocephalus, ♂, *Thoms. Cat.* (var. minor).	Dorcus femoralis, *Guerin, Rev. Zool.* 1839, p. 303.
10. Scortizus cribratus, ♀, *Thoms. Cat.* p. 429, *n. sp.*	Scortizus Neotragus, ♂, *Westwood, Tr. Ent. Soc.*, n. s., iii. p. 207, pl. xi. fig. 3.
11. Nigidius cornutus, *Thoms. Cat.* p. 401.	Figulus trilobus, *Westwood, Ent. Mag.* v. p. 263.
12. Figulus Australicus, *Thoms. Cat.* p. 432, *n. sp.*	F. regularis, *West. Ent. Mag.* v. p. 263.
13. F. vulneratus, *Thoms. Cat.* p. 433, *n. sp.*	? F. anthracinus, *Klug., Ins. Madagascar*, p. 85.
14. Ceratognathus Westwoodii, ♂, *Thoms. Cat.* p. 433, *n. sp.*	Ceratognathus punctatissimus, *West. Tr. Ent. Soc.* ser. 3, i. p. 433, pl. xv. fig. 4.
15. C. Helotoides, ♀, *Thoms. Cat.* p. 434, *n. sp.*	Sinodendron ? areolatum, *West. Tr. Ent. Soc.* ser. 3, i. p. 430, pl. xiv. fig. 2.

"Professor Westwood's descriptions of the two last species were subsequent to those of Mr. J. Thomson.

ÆGUS CICATRICOSUS.

"This insect, formerly belonging to Count Dejean's collection, is stated on the label to have been received from Java. I cannot but think this to be erroneous. In the first place, I have had the opportunity of examining various collections containing numerous series of well-known previously-described species from Java belonging to the genus Ægus, and I have never as yet been able to recognize another specimen of the insect alluded to. Secondly, numerous examples of it (now before the Meeting) have lately been received, both from Cambodia and Malacca, evidently identical with Count Dejean's species, and found (upon examination with a specimen in the British Museum collection notified as received from Mr. M'Leay) to be likewise identical with Ægus Chelifer, described by that Entomologist in the 'Horæ Entomologicæ,' p. 113, and stated to be from Australia. The last-mentioned habitat must also be incorrect, in corroboration of which opinion I may further add that Nigidius cornutus, described by Mr. M'Leay (*lib. cit.*) with the habitat of Australia, has recently been received both from Cambodia and Malacca; examples in the collections of Mr. W. Saunders and Count Mniszech being identical with a typical specimen in the British Museum.

"Mons. Reiche, in his 'Critique' upon Dr. Burmeister's 'Handbuch der Entomologie' (*vide* Ann. Soc. Ent. de Fr. vol. i. ser. 3, p. 82), states Count Dejean's insect to be identical with Dorcus cicatricosus of Wiedemann, from Java. In this I cannot agree, as, according to Wiedemann's description in the 'Zoologisches Magazin,' vol. ii. p. 108, it is evident that the insect there characterized represents a female, no allusion at all being made to the male. Wiedemann's species is no doubt, as suggested by Dr. Burmeister, the female of Ægus acuminatus, *Fab.*, a species far from uncommon in Java.

"With all these facts before me, I have but little hesitation in referring Count Dejean's species to Ægus Chelifer of M'Leay with the habitat of Cambodia and Malacca instead of Australia, and a distinct species from Ægus acuminatus of Fabricius.

"The interesting series of this species now exhibited, with their extraordinary variety of form and sculpture, shows the very great difficulty the Entomologist must experience in deciding as to the identity of species from a brief written description only, seeing that the same species may be most conscientiously described under three or four different names,—a fact which has, to my knowledge, already in several instances occurred.

"To obviate this inconvenience I would suggest to Entomologists who may hereafter describe any of the Lucanoid Coleoptera to have regard to and to notify the state of development of the specimens described. In using this expression I allude exclusively to the growth of the mandibles, those organs being of primary importance in this group of Coleoptera, exhibiting as they do the most anomalous character of the group, especially as regards their dimensions in comparison with the insect itself, and their extraordinary variability in form and sculpture. An acquaintance with numerous series of species of the different genera sufficiently establishes that three distinct forms of development exist; these may be specified as—var. max., var. med., and var. minor; and if future describers will notify from which form their description is drawn up, such a notification will, I feel confident, considerably assist the student, and perhaps also prevent other Entomologists from describing as new species insects which, after all, are only subordinate modifications of form of species previously well known and described.

PROSOPOCOILUS BULBOSUS, *Hope* ♂ (var. minor), *Thoms. Cat.* p. 396.

"I have examined the unique specimen in the Hopeian collection which was described by Mr. Hope (together with Lucanus bulbosus and other species) under the name of Lucanus Spencii in the 'Transactions of the Linnean Society,' vol. xviii. p. 589. I have no hesitation in regarding L. Spencii and L. bulbosus as identical. The type-specimen of L. Spencii is one with fully-developed mandibles. The name of Spencii has a slight priority (*vide* the publication alluded to), and, as well out of deference to the memory of that distinguished Entomologist, ought, I think, to be retained. The var. minor of this species appears to be far from uncommon; but the specimen in the Hopeian collection is the only one on record of the var. max.

CERATOGNATHUS HELOTOIDES, ♀, *Thoms. Cat.* p. 434.

"This species is the last of those described by Mr. Thomson in his 'Catalogue,' and, as I suggested in my former remarks, proves to be identical with the insect described and figured by Professor Westwood under the name of Sinodendron? areolatum, ♀ (*vide* Tr. Ent. Soc. 3rd ser. vol. i. p. 430). The general appearance of this species is, as notified by Prof. Westwood, far more in accordance with the genus Sinodendron than with Ceratognathus, but, as the male is at present unknown (although Mr. Thomson appears inadvertently to have described it), it must still remain a matter of doubt to what genus it ought to be referred. Professor Westwood, in a note at the end of his paper (*lib. cit.* p. 437), suggests that, in the event of the two species proving identical, the unintelligible nomenclature and description of Mr. Thomson ought to prevent the retention of the name he has given: although partially agreeing in this respect, the point is fairly open to discussion, and I should be glad to hear Members express their opinions upon it."—*J. W. D.*

Note of Lycæna Acis.—Having received a great number of letters from entomologists, requesting me to send them particulars as to the time of appearance, food-plant, &c., of the above insect, I beg to inform them, through the medium of the 'Zoologist,' that I have always found it between the 10th and 25th of July; but Mr. Allis, of York, is of opinion that it should be looked for earlier; he thinks it should appear about the end of June. I have never yet seen the larva; I find it in meadows near Epworth, but they are of such large extent, and the insect appearing just before the grass is ready for the mower, prevents a proper search being made for it.—*S. Hudson; Epworth.*

Notes on various Lepidoptera. By the Rev. J. Hellins, M.A.

Cidaria psitticata. Can any of your readers tell us which is the best way to obtain eggs of this species? The following unsuccessful attempt was made by my friend Mr. D'Orville. On the 16th of October, 1862, he captured one female; on the 25th, two females; on the 27th, one female; and on the 1st of November one male. All five moths were placed in a large card-box, covered with gauze, and supplied with honey for food, as well as ivy-blossoms, as long as they lasted. The male died on the 10th of November, 1862; two females on the 6th of December; and the other two females on the 27th of February, 1863; but without having deposited a single egg.

Again, on the 24th of March, 1863, Mr. D'Orville captured a female moth at the Lauristinus blossoms, and at that date it might have been expected she would have been impregnated, with her eggs well developed, but she died on the 29th of April, without laying an egg.

The larvæ I obtained last summer, by beating, from some large oaks, getting, after a great deal of hard work, two very small ones on the 15th of June, and two larger ones on the 10th of July; and this small catch furnished me with three varieties, *viz.* the yellowish green one, without markings; one with bright red spots down the back, and pink anal points; and another with pink legs, and pink ventral line.

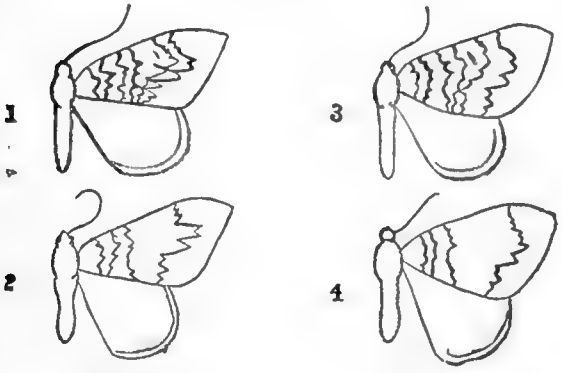
Cidaria picata. The larvæ of this species, and those of C. suffumata and C. sagittata, do not follow the long slender form of the other species of the genus; C. picata and C. suffumata being more stout and fleshy, resembling in their form and habits the larvæ of several species of Melanippe; and C. sagittata, as lately described, being short and ribbed, with transverse ridges.

Cidaria corylata. I have now seen the larvæ of all the species of Cidaria in our British list, except C. reticulata, and find that C. corylata is the only one which has the head bifid; it is singular also in

having *one* anal point; C. psitticata, C. miata, C. russata, C. immanata and C. fulvata having *two*, and the rest *none* at all. I should be glad to hear something of the variety of this larva described in Stainton's 'Manual,' from Freyer, and figured also by Hübner: I have myself taken and bred the larvæ in this locality, and last year had a great many kindly sent to me from Scotland, Yorkshire and Cheshire, but amongst them all could not find one that could be called "rosy" or pink: the ground colour in all was yellowish green of various tints, and the markings of a dark crimson-brown.

Cidaria russata and C. immanata. For the following remarks I can claim no credit to myself, having compiled them from various communications made to me by Mr. H. Doubleday; but, knowing from experience what uncertainty there exists in the minds of many entomologists concerning these two species, I thought that the information, which had been useful to myself, might be welcome to others also.

As the moths are well known in a general way, I am not going to describe them, but shall refer at once to the accompanying cuts, from drawings by Mr. Buckler, from specimens lent by Mr. Doubleday, which are designed to show the shape of the fore wings of each species, with their principal markings: and it will be noticed, first, that there is a difference in the shape of the fore wings; in C. immanata they are narrower than in C. russata, and more pointed at the tip, in some specimens becoming almost falcated; this formation of the wings causing C. immanata, when at rest, to resemble one of the Deltoides, and in that position Mr. Doubleday tells me he can recognise it at a glance.



C. immanata. C. russata.

Again, by reference to figs. 2 and 4, it will be seen that the principal markings of the fore wings consist of two transverse bands, one narrow near the base, the other wider and occupying the centre, and both bordered with angulated lines: in the paler varieties of each, as shown in figs. 1 and 3, there is in the larger band an inner pair of lines, which in the darker varieties does not appear plainly; besides these there are other angulated lines, appearing more or less dis-

tinctly in the different varieties, but those mentioned above are the chief.

Now another point of distinction between C. immanata and C. russata is to be found in the outermost line of the broad central band; in both species this commences on the costa, at about two-thirds of the distance between the base and the tip, and runs across the wing for a little way with very small teeth, then shoots out into a large bilobed (sometimes, in C. russata, trilobed) tooth, which is followed by another not quite half as big, and lastly slants away to the inner margin, forming three more teeth not differing much in size; but the distinction is this, that in C. immanata these teeth, especially the largest of them, are more prominent and acute (Haworth's "fascia valdè producta, et utraque argutè irregulariter dentata"): in C. russata they are not so prominent, and are often rounded ("fascia externè minus producta").

The varieties of C. russata are almost endless, but those that have been named are as follows:—

The type, C. russata (Haworth's centum-notata) has the central portion of the large band white or pale gray. In concinnata of Stephens, a variety from Scotland, this central light portion of the band is narrower, and the borders of it become darker and more clearly defined.

In saturata of Stephens the whole band is of a dusky gray, whilst the tawny markings of the wing have become a dusky brown.

In perfuscata of Haworth the dark scales have so increased in number that the whole band has become nearly black, and the wing generally is so dusky that the markings lose much of their distinctness. In comma-notata of Haworth the central portion of the wing is of a tawny yellow, the lines which cross it there being of a deeper tint of the same colour.

All these varieties, except concinnata, together with intermediate ones, Mr. Doubleday has bred from the eggs of a single moth.

In C. immanata the typical form has the large band almost unicolorous and dark, the central portion being but very little lighter than the edges (Haworth's "fascia solida"); some specimens which were sent me by Mr. Hodgkinson from Westmoreland have the tawny markings of the wings also much mixed with black scales. In the variety marmorata of Haworth the central portion of the wing (as in C. russata) is white or very light gray, but the lines are all acutely angulated, as in C. immanata.

Mr. Doubleday has shown me a variety from the Shetland Isles, in

which the central band is narrower than in English specimens, and altogether of one tint of rusty black, while the hind margin of the fore wings is much paler: the outer portion of the hind wings is also paler, but the line which runs across them is very much darker and more distinct: also two specimens from the Orkneys, in which the outer edges of the large band remain very dark and solid, while the central portion, especially near the costa, has become pale gray. It seems likely that very interesting varieties might be found in these islands.

The difference in the habits of the two species is as follows: C. russata is double-brooded, the first brood appearing on the wing in May and June; and from the eggs deposited then the second brood appears in August and September: the eggs laid by this second brood hatch at once, and the larvæ attain the length of half an inch before they give over feeding for the winter; in February and March they feed up, and at the end of April are in pupa for the May moths.

C. immanata has but one brood, which is on the wing in July and August; and although the eggs are deposited at once it seems they do not hatch till the spring. The great difficulty with them is that they so readily dry up; I have been disappointed in this way again and again, and Mr. Doubleday tells me that out of thousands of eggs which he has had at different times he never had one egg to produce a larva.

Whether I shall be more successful this spring I do not know, but I have the following experiment in hand. On the 11th of August, last year, I took a female of C. russata; she began to lay at once in a pill-box, and her eggs hatched on the 23rd of the same month; the larvæ are now half an inch long, and after hybernation are just beginning to feed again. On the 12th of August I took a female of C. immanata *var.* marmorata; she also began to lay at once, and I managed to make her deposit some of her eggs on growing plants of wild strawberry (*Fragaria vesca*); and some she laid on the calico covering of the glass cylinder which enclosed her: both these batches I have kept out-doors ever since, taking care to shelter them in stormy or frosty weather, and up to this date those on the plant show no signs of shrivelling, whilst of those on the calico the greater part are quite dried up. It may be these eggs require a great deal of moisture to keep them from perishing, but why they should do so more than those of C. populata, C. dotata or C. prunata, which will hatch in spring after being kept for several months in a pill-box, I cannot explain.

I cannot find a better conclusion for this long note than the following extract from one of Mr. Doubleday's letters:—"In closely allied species you will always find specimens, slight aberrations, which appear to be intermediate between the two, and it is often impossible to say to which they belong without knowing something of their history."

My eggs of Cidaria immanata, *var.* marmorata, began to hatch last Saturday, March 5.

I can now confirm Mr. Edleston's description of the young larvæ of C. immanata and C. russata (Zool. 8784), for I find that I had noted in my diary that the larvæ of C. russata, when first hatched (August 23, 1863), were *whitish*, slightly tinged with green, and I call my newly-hatched C. immanata most decidedly *yellow*.

It is worth while noticing that Mr. Edleston speaks of the *first* brood of C. russata, and I of the *second;* also that his C. immanata were the offspring of a moth of the typical colour, mine of the variety marmorata.

Cidaria silaceata. Any one who has seen this larva when at rest, and noticed its resemblance to the seed-vessels of the Epilobium, on which it feeds, will wonder much why continental authors give aspen as its food. Mr. Doubleday informs me that the species is rare on the Continent, and Guenée has taken it only in the Pyrenees.

Cidaria populata. I doubt much if this species feeds on sallow, except when reared on it in confinement. In this neighbourhood we take the moth only where the whortleberry grows, and last spring Mr. Batty, of Sheffield, sent me several of the larvæ, which he had found on that plant: they were remarkably variable in colour, being of one or two tints of green, pale brown, reddish brown, and even dark brown; but the remarkable feature in this species, and one which I have seen in no other larva but that of its congener, C. prunata, is the raised band or collar on the third segment, black or reddish, according as the ground colour of the larva is dark or light, and dotted with white.

Noctua festiva. I think it is worth recording that Mr. Buckler took a larva of this species last April, and bred the moth from it afterwards, whilst feeding on a lichen attached to some dry grass-stems: he is quite sure it was eating the lichen, as he watched it for some time before disturbing it.

Anticlea rubidata. Eggs laid end of June—beginning of July; larvæ hatched in ten or twelve days; varieties gray or reddish; full fed in August. Food in confinement Galium mollugo. Pupa in small earthern cocoon.

Anticlea badiata. Eggs laid in March; hatched in three weeks; when young all green; full-grown varieties green, with buff head or purple (Guenée's "brun-violet foncé"); full fed from end of May to beginning of July. Food wild rose. Pupa in earthern cocoon.

Anticlea derivata. Eggs laid in April and beginning of May; larva full fed end of June and beginning of July; vary in number and size of red dorsal spots, also in presence or absence of transverse red line on tenth segment. Food wild rose, specially flowers. Pupa in earthern cocoon.

Cidaria prunata. Eggs laid in July; hatched next spring, March or April; full fed end of May. Varieties green and brown. Food gooseberry and currant in gardens. Pupa spotty, in very slight and open silk cocoon, attached to food-plant.

Frost. On taking stock after the ten days' frost early in January, during which the thermometer sometimes sank to 16° below freezing point, I found that the single larva of Stilbia anomala which I had, and six or seven larvæ of the little wave, Acidalia incanaria, were lying dead in their flower-pots out-doors, apparently killed by the cold, for there was no wound to be seen on them, and up to the time of the frost they had been thriving, and were all nearly full grown: at the same time two larvæ of Cerigo cytherea, which were in a flower-pot close to the others, received no injury, but I think *they* had the wit to bury themselves under some loose earth.

J. Hellins.

Exeter, March 7, 1864.

Notes on Tineina occurring near Haslemere.—

Tinea nigripunctella. Of this scarce species I took upwards of a dozen specimens in out-houses last July. As yet, however, I cannot find the larva.

T. bistrigella. Taken flying early in June. The mine is not uncommon in the autumn.

Micropteryx Seppella. I found this species from May to July, not uncommonly, among Veronica Chamædrys, but in far greater abundance on low oak bushes, from which I have swept dozens of specimens.

M. mansuetella. I have also beaten this species out of low oak bushes several times in May and June. Possibly the larvæ of both these species will be found to feed on oak.

M. Sparmannella. Among birch bushes in April. Scarce.

Depressaria carduella. I beat two or three specimens out of thatch in September.

D. albipunctella. Beaten commonly out of thatch from August to October.

D. Chærophylli. At the same time and place as the preceding, but not so common. It comes occasionally to ivy bloom, and may also be taken in the spring after hybernation.

Gelechia sororculella. Beaten from hedges in August. I have seen it at sugar, of which delicacy G. Populella also appears very fond.

G. humeralis (Lyellella). Beaten from thatch in September. Scarce.

G. paupella. Among Inula dysenterica in August.

Macrochila fasciella. Hides among grass and low herbage in woods in June.

Œcophora flavimaculella. I found several specimens last August on flowers of Angelica sylvestris, where they look like a small edition of Tricheris mediana, which also frequents blossoms of Umbelliferæ.

Œ. flavifrontella. Beaten from hedges, and also from fir trees in June, but not commonly.

Butalis incongruella. Beaten from a hedge in a heathy place last April.

Röslerstammia Erxlebella. One specimen flying in a wood last May.

Glyphipteryx oculatella. I took a pretty good series of this species at the end of May and beginning of June. It occurs in sheltered spots in wet copses among the rushes and long grass.

Æchmia dentella. Beaten from a hedge in June.

Tinagma resplendella. I took a specimen on the wing in June. In August Mr. Stainton showed me the mine, after which I found it plentifully, and had the good fortune to breed one specimen, as recorded by Mr. Stainton in the 'Annual.'

Coriscium Brongniardella. Beaten from hedges in May and August, and from thatch in October.

Coleophora therinella. June.

C. artemisiella. May. In an open copse.

C. apicella (cacuminatella). In a marsh in June.

C. argentula. Beaten from hedges in September.

C. virgaureella. August and September. Among Solidago.

C. olivaceella. June.

C. limosæpennella. June. I found cases apparently belonging to this species on birch in the autumn.

C. fuscocuprella (fuscociliella). In a marsh in June.

Chauliodus Illigerella. Flying at sunset, in a rough field surrounded by woods, early in June.

Laverna decorella. Beaten from thatch in September, and after hybernation in April.

Elachista biatomella. Flying in abundance at sunset, in a rough field, in June and July.

E. pollinariella. Beaten from a hedge in July.

Lithocolletis Bremiella. Mines plentifully in Vicia Sepium on one wooded bank. Several specimens have already emerged in a warm room.

L. cavella. I took a specimen in May, and believe I have some of the mines.

L. ulicicolella. One specimen in a wood in May.

L. Heegeriella. Mines not scarce in corners of oak-leaves.

L. Emberizæpennella. I took one specimen last May, but cannot yet find the mine.

L. Schreberella. Mines abundant on elm bushes.

Phyllocnistis Saligna. I took a specimen in a shop-window in the town last April. How it came there I cannot pretend to guess.

Bucculatrix Cratægi. Beaten from a hedge in May.

Nepticula betulicola. May. Taken flying.

N. argentipedella. June. Taken flying. — *Charles G. Barrett; Haslemere, February* 25, 1864.

Zelleria hepariella and Z. insignipennella.—In the March number of the 'Zoologist' (Zool. 8244) Mr. M'Lachlan asks if I know the above insects. I certainly know them by name only, as being distinct; I have yet to learn who can separate them: if any one had seen the large and varied series I took last year, nearly a hundred in number, he could not have had much doubt upon the insects being one and the same: I took them from yew and juniper, in every instance, and there was no difference in their habits at all, only in time; the small ones appeared in greater numbers a week or so earlier than the larger ones, which, according to my experience, is a very usual occurrence. I find the females of moths generally later, and the males, as a natural sequence, are over earlier: my observations coincide with those of Mr. M'Lachlan, and this circumstance alone goes a great way to prove the difference is sexual. I took them varying in colour from a black-red (if I may thus express it) to a fine orange and pale yellow, together with others half yellow and half red; some with white heads, others without. I have recently seen southern specimens of Z. insignipennella: still, after all, I shall be equally glad to acknowledge my error, if it should prove that both are species liable to vary in colour, markings and size. The next point is as to when I took them *in cop.*: it was in August, when they were fresh out, and not after hybernation: I only took two hybernated specimens in March; so this still favours my impressions: and, moreover, I admit even taking them *in cop.* does not prove conclusively as much as if the larvæ were found; but it is of very rare occurrence, in a state of nature, that such accidents, as I may term cross-copulation, occur: I never before saw more than one instance, and that was of a female Hadena adusta and a male H. rectilinea, when feeding on sugar; there were several of each feeding with them when this occurred. Of course I am glad, rather than otherwise, to read the remarks of Mr. M'Lachlan: people have no need to conceal an opinion; it is only "an opinion" with us all, and I give mine to subserve truth, not interest: I am sure I shall enter into no personal strife to prove or disprove anything: I admit that I am as likely to be mistaken as any one else, and whenever I find this to be the case I will frankly own it.—*J. B. Hodgkinson;* 31, *Christ Church Street, Preston, March* 6, 1864.

Six Months' Collecting Lepidoptera in Westmoreland.

By J. B. Hodgkinson.

The following brief account of my captures during the unproductive season of 1863 may probably be acceptable. Although six thousand specimens may appear a fair number to capture and set, still is it a miserable return for the labour I bestowed to get even this quantity. I have known seasons when I could have obtained as many in a month, and I might even have increased this number, but I never went out at nights, owing to rheumatism. It may be of use to some to note the district where I was located: all my captures were made

within a circuit of two miles of Witherslack, with a single exception, when I took a journey to Windermere for Eupithecia tenuiata, &c. Witherslack is a village about four miles from Grange, on the other side of Morecambe Bay, and seven miles from Milnthorpe. In ordinary years it is one of the best places for Lepidoptera I ever was at, both for number of species and number of individuals. The locality appears equally rich in other orders of insects, considering how little attention I paid to them. I met with the fine Tipula, before unique, *viz.* Dale's Alpina, and above a score of Empis borealis.

The following are a few of my captures:—

Erebia blandina. In hundreds, from the 4th of August.

Thecla Betulæ. On ash, birch, &c., from the 4th of August, on road-side.

Lycæna Agestis. In plenty. They begin to assume the white spot when taken on the high ground on the face of Whitbarrow.

L. Argiolus. April and May. Rare this season on holly.

Nola cucullatella. Larvæ on sloe, and moths flying before dusk.

N. cristulalis. Odd specimens sticking on branches, trunks, &c.

Nudaria mundana. Larvæ in plenty on walls, in June.

Lithosia mesomella. In July, on the moss, one evening I had five or six in my net at once; they only flew for a short time: I expect a female was somewhere about, as they ceased flying so suddenly.

L. complanula. Larvæ on walls and juniper bushes. Moths beat out of trees, flowers, &c.

Bombyx Rubi. As usual, going pell-mell over the mosses; seldom got a stroke at them.

Ellopia fasciaria. Larvæ on Scotch fir in May; the moths in June.

Hemerophila abruptaria. Flying at dusk.

Gnophos obscurata. On rocks in August.

Nemoria viridata. In June, among Myrica Gale.

Hyria Auroraria. In June, among Myrica Gale.

Asthena luteata. In June, among nut-bushes.

Acidalia promutata. In August, on rocks.

A. immutata and A. fumata. In August, on mosses.

A. inornata. In August, by beating nut-bushes.

Cabera exanthemata. Common among nut-bushes.

Larentia salicata. Double-brooded; from April 8th to September 8th, specimens always to be found during the interval; the females are most willing layers of eggs: the second brood are smaller than the first.

Emmelesia alchemillata. Common.

E. tæniata. Thirty-six specimens, but only very few good ones; they are seldom met with fine. I got a number of eggs, but no one could rear any larvæ.

Eupithecia pulchellata. I found this handsome species in some quantity, and excessively local; the whole area was not more than ten yards square. I found no less than sixteen specimens on one lump of rock, and I had hunted for a month over miles of rocks and only found four specimens. I sent nearly a hundred eggs to several entomologists to try to rear the larvæ, but no one succeeded in bringing them up.

E. venosata. Larvæ on Silene inflata.

E. indigata. On firs.

E. virgaureata. On rocks.

E. —— new species, allied to E. minutata; three specimens.

E. tenuiata. Bred from sallow.

E. sobrinata. In hundreds. Bred.

E. satyrata. Flying freely during sunshine. Mr. Doubleday says they are like the Norwegian species, very pale.

E. abbreviata. On oaks.

E. constrictata. Thirty specimens, chiefly beat out of yews and other trees; also on rocks.

Lobophora lobulata. A hundred specimens on trunks of firs.

L. viretata. Two by mothing.

Thera coniferata. Bred a hundred and fifty specimens from larvæ taken on juniper: the moth is rarely met with.

Melanippe hastata. Only one this year; I have before taken thirty in a day.

M. galiata and M. derivata. On rocks.

Scotosia undulata. Among sallows.

Cidaria miata and C. psittacata. Both in April; hybernated.

C. marmorata. Very fine-coloured specimen.

Platypteryx lacertula. May and July; beat out and flying during sunshine.

P. Falcula. May, and 20th July; fine.

Notodonta dodonea and N. dromedarius. These I merely note as having bred two each from pupæ I had taken with me, and they were two years old; so that entomologists should not throw pupæ away because they do not emerge at the usual time.

Ceropacha flavicornis. Flying during sunshine round birch twigs, and at rest; April.

Bryophila perla. Far from any dwellings, on the rocks.

Acronycta Menyanthidis. Thirty on old fir-stumps.

A. Rumicis. Fine dark and intermediate varieties.

Miana expolita. I took a hundred specimens one afternoon from 1 P. M., which is the time they begin to fly. I was astonished when I found the head-quarters of this rapidly-flying species; it is difficult to walk or stand where it occurs, on the shingle, and I have seen nearly a dozen flying round a little tuft of grass, like so many bees, when there has been a female concealed in the grass. I took fifty males without moving from the foot of a rock: there was no chance of running, so I just knelt down, and waited their coming: I only suppose there was a female, for I never saw one, but the males kept coming, and stopped before me, and I had put no sugar there. It must have been a female that proved so attractive. When there was no sun I smoked them out.

Trachea piniperda. March, and on the 20th of May.

Tæniocampa leucographa. Eight specimens on sallows.

Dianthœcia carpophaga. Larvæ.

Hadena contigua and H. glauca. On stones, at rest.

Stilbia anomala. At rest.

Schrenkia turfosalis. On the moss, in abundance, about 7 P. M. I had to catch six or eight in my net at once, and run off the moss to box them, for the midges were so savage, getting into my eyes and ears, that I could not get to box any under such punishment, without retreating a short distance.

Rivula sericealis. Common among long grass.

Ennychia cingulalis. Flying over wild thyme flowers in June.

E. octomaculalis. Several in open places in woods.

Botys pandalis. On grassy banks.

B. terrealis. Four specimens on the rocks.

Ebulea crocealis. Four specimens on the rocks.

Eudorea truncicolalis. On rocks.

E. gracilalis, E. muralis and E. frequentalis.

Crambus falsellus. Beat out of hollies.

C. selasellus. On the marshes.

C. geniculeus and C. inquinatellus. Among dead ivy at Whitbarrow, an unusual place for the former insect, which I generally found on the coast.

Homœosoma eluviella. Three specimens.

Rodophæa marmorella. Twenty among dwarf sloes.

Sarrothripa Revayana, the variety called undulana. Beat from yew in March.

Tortrix sorbiana and T. semialbana. July.

Dichelia Grotiana. Flying swiftly during sunshine in July.

Amphysa Gerningana. Freely on a grassy bank on road-side; usually on the mosses.

A. prodromana. April; larger and finer than specimens taken here.

Leptogramma literana. Flying during sunshine in April.

Peronea Lipsiana. Several specimens flying in April.

P. hastiana, varieties. Feeding on sallow-blossoms in April.

P. aspersana. Flying freely during sunshine in August.

P. rufana. Common among dwarf brambles in a space about ten yards square; I did not meet with one anywhere else.

Penthina prælongana. Common in June.

P. ochromelana. Scarce this season.

P. sellana. Among P. prælongana.

P. ustulana. One specimen among P. prælongana.

P. marginana. Grassy swamps.

Spilonota dealbana. Common in August.

Orthotænia striana. Mixed with P. rufana.

Eriopsela fractifasciana. Several.

Cnephasia lepidana and C. musculana. Common on the wing during afternoon sun.

C. ——— ? A very variable insect, which appears to puzzle every one as yet, and which I propose to call "instabilana." Any one who saw the habit and flight of this insect would infer it differed from the various forms of C. subjectana. I beat a great many from old hollies, and occasionally from yews. Some are like C. perterana, others like C. octomaculana, and some females are as large as C. penziana.

C. penziana. Probably a hundred specimens on lichen rocks.

Batodes angustiorana. Common among yews, flying round the twigs during sunshine.

Pœdisca bilunana. Among birch in August.

P. occultana. Among larch in August.

P. Solandriana. Among hazel in August, in great variety.

Ephippiphora scutulana. Flying among birch in August; common in sunshine.

E. signatana. Among sloe in June and July; bred some also from sloe.

E. tetragonana. Flying in shady places in July.

Olindia ulmana. Common in July.

[illegible]sia rufillana. Common in July, during sunshine only.

Coccyx ustomaculana. Among fir.
C. vacciniana. Among bilberry.
Retinia pinivorana. Among fir.
Stigmonota coniferana. Among fir.
Dicrorampha saturnana. Common in June.
D. Petiverana. In July.
D. acuminatana. Common in August.
D. consortana. Several in August.
Catoptria hypericana. Bred freely.
Trycheris mediana. On umbelliferous plants in July.
Choreutes scintilulana. May. This species must be double-brooded, or coming out at all times, like Xylopoda Fabriciana: I have taken them in September in swarms.

J. B. Hodgkinson.

31, Church Street, Preston,
March 6, 1864.

Cicindela campestris smelling of Roses.—Mr. Archer asks (Zool. 8972) whether any one has observed the scent of roses emitted by Cicindela campestris. In reply to this query, I may say that in this country I have never done so, although I have frequently caught them with this object in view. In Germany, however, I have captured hundreds flying about sandy places, and have never failed in noticing this fine rose smell. I am speaking of what occurred more than twenty years ago, still the fact is so fresh in my memory that there can be no doubt about it: the scent, indeed, is so powerful that it could scarcely be overlooked. Often have I wished to mention this, and am therefore glad that an opportunity has now occurred.—*George Norman; Hull, March* 1, 1864.

Occurrence of Catops colonoides of Kraatz in Britain.—See Murray's 'Monograph of the Genus Catops,' p. 77, species 55, fig. 48. It is a very distinct species, well named "colonoides," for at first sight it would generally, I think, be mistaken for a Colon, but the antennæ at once mark it as a Catops. It somewhat resembles C. anisotomoides, but is most like C. sericeus; it is, however, smaller than my smallest specimens of that species. The elytra are transversely wrinkled, and are gradually narrowed behind, as in that insect, but are not truncate, and the wrinkling is stronger and more distinct. The antennæ, too, are finer, and *much less* distinctly clubbed. The antennæ are very like those of C. anisotomoides, but are dark towards the apex, the apex itself being pale ferruginous; whereas in C. anisotomoides they are uniformly pale. From this insect it also differs in the form of the body, which is gradually contracted behind from the shoulders, whereas in C. anisotomoides it is ovate; as well as in the transverse strigation, something like that of Colenis dentipes, whereas C. anisotomoides is strongly punctate only. It is covered by a thick but fine golden pubescence, is of a dark brown colour, and has the entire facies of a Colon. I know of but one specimen, which I took at the end of March, 1861, at the Holt Forest, Hampshire, from the *débris* of fern in an old hovel, in company with a

profusion of Oligota apicata, Atomaria nigripennis, Lathridius elongatus, L. nodifer, Comazus dubius, Corticaria serrata, &c., and also a specimen of Lathridius testaceus. —*J. A. Power*; 52, *Burton Crescent*, *February* 18, 1864.

Captures of rare Coleoptera.—I have recently taken a few good insects, including about fourteen specimens of the rare Catops spadiceus; a fine series of Trachys pygmæus, at Mickleham; and of Stilicus geniculatus, at Cowley. During a trip to South Devon, at Seaton, I obtained Ceuthorhynchus hispidulus; and very lately, at Esher, I took some fifty specimens of Ischnodes sanguinicollis in about two hours. I found them, with abundance of larvæ (which I am trying to breed), in an old elm tree, embedded in a mass of perfectly soft and rotten wood, which had much the appearance of old vegetable mould; in this they appeared to have undergone their change, and to be laid up in a torpid state, until the warm weather might call them forth: they were lodged deeply in the substance of the tree, where apparently very little air could penetrate: I found *none* in the semi-decayed wood nearer the surface. Sundry specimens of this insect are taken from time to time, but I have not heard of its having been found so thoroughly "at home" before. Quedius truncicola was in its company.—*Id.*

On some New or Rare British Coleoptera.

By G. R. Crotch, Esq.

University business, coupled with absence from England, have compelled me to forego sending an account of some additions to our list of Coleoptera. In the mean time certain comments have been made upon them, and, in justice to myself, I must beg you to insert this list of "Notices of New or Rare British Coleoptera."

In forwarding you a list of some species of Coleoptera new to this country, I cannot avoid alluding to Mr. Rye's paper in the 'Annual' for the current year.

No less than eighty-eight species are enumerated by him, respecting which he "regrets that it is not in his power to give further information." In the first place, I may remark that no application was made to me for information. Mr. Rye can, however, hardly be at a loss for information respecting the following species, which are enumerated in Mr. Waterhouse's 'Catalogue' as varieties, but which, in common with most recent authors, I have regarded as good species, *viz.*:—Choleva longula, *Kelln.*, Telephorus fulvicollis, *Fabr.*, *Kiesw.*, Sitones lineellus, *Gyll.*, *All.*, and Philonthus trossulus, *Nordm*, *Kraatz.*

That he should ignore the records of Liodes axillaris, *Gyll.*, *Er.*, Paromalus parallelopipedus, *Herbst*, *Mars.*, and Cerylon deplanatum, *Gyll.*, *Er.*, noticed in the 'Zoologist' (Zool. 8301), is not indeed surprising, when we see Ptilium affine, *Er.*, recorded at page 73, and ranked among the species unknown to him, at page 81. Moreover, a very slight acquaintance with entomological literature would suffice to

inform any one that Heterocerus arenarius, *Ksw.*, Agabus sexualis, *Reiche*, and Ocypus Saulcyi, *Reiche*, were described from British specimens. It is to Mr. Rye himself that I am indebted for specimens of Atomaria fumata, *Er.*, or at least of a species bearing that name; and the existence of Agathidium piceum, *Er.*, and Acritus punctum, *Aubé*, in Dr. Power's collection (one sent by me from Weston), might have given him some clew to the localities of those species. Athoüs difformis, *Lac.*, will be found in Mr. Waterhouse's 'Catalogue' under that name, only he regarded it as a synonym of A. cavus, *Germ.*, which M. Caudèze states not to be the case. Tychus ibericus, *Motr.*, Homalota celata, *Er.*, and Stenus pumilus, *Er.*, will be found recorded in the 'Annual' for 1855.

Many persons, I believe, with myself will see with regret Mr. Rye's somewhat uncalled-for attack upon the arrangement adopted by me, and stigmatized by him as "foreign." He is probably unaware that it was laid down by Stephens, and perfected by our most indefatigable entomologist, Mr. T. V. Wollaston, to whose works I would refer any one for an exposition of its merits. It is, of course, however, competent for Mr. Rye to consider himself of equal authority in such matters.

I regret that, through great haste, several species were omitted in my 'Catalogue.'

Ptilium saxonicum, *Gillm.*, and P. discoideum, *Gillm.*, were, however, omitted on the authority of the Rev. A. Matthews, who considers the examples on which he introduced them to be varieties of already-recorded species.

I have now only to give the localities for some of the other Coleoptera introduced by me.

Dromius oblitus, *Boield.* This is the variety of D. sigma mentioned by Dawson as being found in the Isle of Wight. It is described by De Boieldieu as from the Pyrenees, and is regarded by Dr. Schaum as a variety of D. nigriventris, *Thoms.* (fasciatus, *Gyll.*), which is very probably the case. It has no connection with the true D. sigma.

Colymbetes (Ilybius) 6-dentatus, *Schiödte.* Hitherto confounded with C. obscurus, *Marsh.*, from which, and from all other members of the genus, it is at once distinguished by the dentate claws of the intermediate tarsi of the male. I have obtained numerous specimens at Cambridge, and have found others in several collections.

Agabus sexualis, *Reiche.* "Peterhead, Aberdeen." I am informed

by Dr. Schaum that this is a variety of A. Solieri, *Aubé*, a species abundant in Iceland.

Hydnobius punctatus, *Sturm*, and H. spinipes, *Gyll.*, *Thoms.* These two species seem to be closely allied. I have about eight specimens collected in North Wales, Liverpool and Scotland, and have seen others in two or three collections. I have sent my series to M. Thomson for his verdict on the subject.

Anisotoma picea, *Panz.* This species was taken by Mr. Foxcroft in Perthshire, and was sent to Mr. Waterhouse by the Rev. A. Matthews for determination.

A. scita, *Er.* Two specimens of this insect have occurred at Monk's Wood, Hants. It is commonly represented by varieties of A. calcarata.

Cyrtusa pauxilla, *Er.* One specimen from Monk's Wood.

Olibrus liquidus, *Er.* This species, the "Stephensii, *Leach*," of our collections, has been long shown to be O. liquidus, *Er.*, by Mr. Wollaston. The O. flavicornis, *Sturm*, is a mere immaculate variety of O. bicolor, *Fabr.*, and does not occur in this country.

Telmatophilus Schönherri, *Gyll.* This species, distinguished from its congeners by its dark femora, has been universally admitted by authors. M. Kiesenwetter, who has recently described the European species of the genus, says that the sides of the thorax are also much more strongly rounded.

Aphodius borealis, *Gyll.* Specimens of the A. uliginosus, *Hardy*, were referred to this species by M. Reiche, perhaps the best authority on European Aphodii. M. Thomson, in his recent volume, refers the A. borealis, *Gyll.*, to the A. putridus, *Sturm*.

Cyphon nitidulus, *Thoms.*, and C. fuscicornis, *Thoms.* Descriptions of these new species, and of two others formed at the expense of C. variabilis, will be found in Kiesenwetter. Further investigation and a larger series will probably furnish us with one or two more. I may mention that I had types of these from M. Thomson for comparison.

Telephorus figuratus, *Mannh.*, *Muls.* Three or four specimens at Weston. Till lately I had confounded this with the T. rufa, *L.* Mulsant has pointed out the differences with his usual accuracy.

Dryophilus anobioides, *Chevr.* This is the species recorded by Mr. Waterhouse, who erroneously imagined it to be the true pusillum of Gyllenhal. The latter insect is, however, a fir-feeder, and has, I believe, been taken recently by Dr. Power.

Rhopalodontus fronticornis, *Panz.* This species at first resembles E. affine, *Gyll.*, but is distinguished by its totally different clothing. I have seen it in several collections.

Tropiphorus carinatus, *Müll.* This species is the Æcidii of Marsham existing in several collections, and closely resembling the T. Mercurialis.

Clythra læviuscula, *Ratz.* Exceedingly close to the C. bipunctata, *L.*, but distinguished by its hardly perceptibly punctured thorax. I have found two old specimens mixed with the common species.

Cryptocephalus Wasastjerni, *Gyll.*, *Suffr.* I have found two more examples, equally without locality, in an old collection. Its thorax is certainly more rugose than punctate, but its sculpture being visible at all, distinguishes it from all its allies. It appears to be rare, but is found in France, Germany and Sweden.

Graptodera pusilla, *Duftr.* Cambridge.

Thyamis rutila, *Ill.* Weston-super-Mare.

Plectroscelis aridula, *Gyll.* Cambridge. This and the two preceding species were named for me by M. Allard.

Blaps Chevrolatii, *Sol.* Synonymous with the B. mucronata, *Latr.*

Stenus littoralis, *Thoms.* This species, nearly allied to S. crassiventris, *Thoms.* (nigritulus, *Er.*) appears to exist in several collections. I took about sixty examples in Sweden, and have found a few at Weston. It is abundantly distinct from the S. crassiventris in form and habitat.

Trogophlæus halophilus, *Kiesw.* Found by me in salt-marshes at Weston, in some numbers, and distributed in most metropolitan collections.

The other species enumerated by me in my recent 'Catalogue,' are from the collections of Messrs. Wollaston and Janson, and will receive a more extended notice on my return from the Canaries, where I hope to do good work during the coming spring.

G. R. Crotch.

Uphill House, Weston-super-Mare,
March 10, 1864.

[I am aware there is a seeming irregularity in allowing a correspondent to reply in one periodical to a paper published in another; but I trust that in the present instance the irregularity will be in appearance only, if I reprint from the 'Annual' the whole of Mr. Rye's observations, so far as they relate to Mr. Crotch, and if I offer Mr. Rye any space he may desire in reply. I ought, however, to add, in justice to Mr. Crotch, that I entirely agree with him as to the impropriety of stigmatising any arrangement by the epithet "foreign," as though that

were a fault. I am perfectly aware that it is the desire of many naturalists in this country to establish an "insular" nomenclature and arrangement entirely different from that in use on the Continent. I have often heard my friend Doubleday's arrangement of Lepidoptera condemned as "foreign," and so is my own arrangement and nomenclature of ferns. I totally repudiate all such feelings, and if I find a Guenée exhibiting a more profound knowledge of his subject than a Stephens, a Presl than a Smith, I adopt their views without any reference to their country.

Guenée and Presl, like Linneus and Cuvier, wrote for the world, why should *we* write exclusively for England? why should we reckon it a disparagement being "foreign"? Then, on the exclusion of Stylops I have a *very strong* opinion: I would as soon exclude Lucanus Cervus: yet Mr. Rye seems to approve this course, and rather to smile at its introduction by Mr. Crotch. I cannot deny myself the pleasure of expressing my admiration of, and gratitude for, Mr. Rye's most able and carefully worked-out paper in this year's 'Annual'; it is the most entomological paper we have ever had in that periodical; but it is impossible to extend this praise to his criticisms of Mr. Crotch, which are hasty, ill-considered, and, I am sorry to add, seem scarcely to be dictated by that zeal for Science which characterizes everything he had previously written. I have only to add that, after Mr. Rye's reply, the subject must be dropped, unless as regards any mere matter of fact, and I therefore beg of him not to import new matter into the discussion.—*Edward Newman.*]

Mr. G. R. Crotch, of Weston-super-Mare, and St. John's College, Cambridge, well known as an energetic and successful worker, who has done (and will, I hope, continue to do) good service by his personal communications with European coleopterists, and to whom English entomologists are, or ought to be, much obliged for the research and rapidity which he employs in investigating changes of nomenclature, has recently published a Catalogue of British Coleoptera, with an idea of establishing the continental system among us.

When I remark that in this Catalogue it is the exception, and not the rule, for *any* species to remain unaltered, either in position, value, name or parentage, it will be at once seen that the limited space at my disposal, combined with the recent date of publication of the work in

question, will prevent me from giving it such a notice in detail as it deserves.

I have no doubt, however, that Mr. Crotch has ample proofs and reasons, satisfactory at least to himself, for his alterations in the nomenclature now commonly in use with us; and that he will be ready to establish them with sufficient evidence, whenever called upon to do so by any coleopterist who feels an interest in the subject; and with regard to the new species he has introduced, I certainly think it incumbent upon him to furnish all the information that he possesses about them with as little delay as possible.

Every one has a right to be guided entirely by his own judgment as to the combination of characters sufficient to distinguish a species from a variety, or as to grouping and transposing species, genera and families, but the test of correctness of opinion appears to me to consist in being able to persuade other observers to adopt one's views; it is therefore open to Mr. Crotch either himself to elevate varieties into the rank of species, and to sink species as varieties (with or without notes of interrogation), or to follow others who have done so; even when Clivina collaris and fossor, Anchomenus mœstus and viduus, and Geotrupes mutator and stercorarius, are (amongst many similar) respectively considered by him as specifically identical. Nor ought we to make any remark (except perhaps one of surprise) when the highly developed and eminently predatorial Brachelytra are degraded to the end of the list, and made to include the little abortion Claviger and the Pselaphidæ of feeble organization:—nor when the Stylopidæ are introduced into the order:—nor when the Trimera are made immediately to precede the Heteromera (apparently on account of Lycoperdina being a caricature in petto of Blaps):—nor when the Scolytidæ are removed to the beginning of the Rhynchophora, whose usual arrangement is inverted:—nor when the Corylophidæ (including Alexia) are made allies to the Anisotomidæ, with the Trychopterygidæ to follow:—nor when the Lathridiadæ are placed between Atomaria and Mycetophagus, and the non-predatorial Philhydrida with clavate antennæ (the aquatic representatives of the Clavicornes) are ranked next to the raptorial Dytiscidæ with filiform antennæ (the aquatic types of the Geodephaga).

From these examples of the foreign ideas on classification we are required to adopt, it may easily be believed (as indeed is the case) that a similar course of inversion, introduction, suppression and elevation, has been adopted by Mr. Crotch throughout his Catalogue, insomuch that there is scarcely anything left unchanged; and although

credit is due to him for his intention to simplify the difficulties of conflicting nomenclature by endeavouring to place our system on the same footing as that of continental entomologists (who are nevertheless anything but unanimous on this point among themselves), yet I cannot refrain from observing it is too evident that he wishes to depreciate English work; Marsham, Kirby, Stevens and more recent authors, being deposed in favour of foreign describers with a very few exceptions throughout the Catalogue in question: and, even when thus treated, stigmatized by notes of interrogation being placed before the names of their species, as if it were impossible to determine the insects referred to by them from their descriptions and collections. I fear Mr. Crotch has simply altered the names in order to try and extinguish troublesome claimants for priority over his Teutonic favourites, and that he has not endeavoured to make out the species in question by the means at the disposal of every one *willing* to make use of them; had he done so he would not have had occasion to place queries before so many species, of which several are easy to determine.

Let the first instance in the genus Homalota (wherein the notes of interrogation placed before Stephensian species are very numerous) be taken as an example, *viz.* H. vicina.

Has Mr. Crotch placed this insect, with a prefixed query, as a synonym of H. umbonata, *Erichs.* (to which it is confessedly anterior in date), because, after using his best powers of investigation upon the descriptions in Stephens' 'Illustrations' and 'Manual,' he is not satisfied that both names refer to the same species?

Passing over the additional evidence of the types in the Stephensian Collection, which any one can examine, is not even the following abbreviated description in the 'Manual' (p. 360), combined with the sectional characters given by Stephens, sufficient for identification?

2807. Shining black, smooth, disc of elytra, tibiæ and tarsi reddish; antennæ with terminal joint elongate; male with a dorsal tubercle on the second segment of the abdomen, penultimate segment thickly punctured, female smooth; length one line and a half.

Of the enormous number of species known of this genus I am confident there is but this one to which the above description could possibly apply; and Mr. Crotch pays his own powers of discernment a very poor compliment by confessing, as he does, that he cannot make out his insect by it. Others, however, *have* taken the trouble to make these investigations, and have satisfied themselves of the soundness of the evidence that can be adduced, before bringing forward and supporting the Stephensian names (amongst others), but the publica-

tion of fifty catalogues adopting foreign names where they are not deserved will never alter the opinion of any one who has looked into the matter carefully, or, I trust, that of English coleopterists in general.

Mr. Crotch has very properly collected at the end of his Catalogue numerous species hitherto included in our lists, but which require further evidence before they can be considered British. It is, I believe, generally known that these names were included in the Catalogue of British Coleoptera now generally in use, with a view to directing attention to their claims, and that they would have been expunged therefrom, after a certain interval, in a future edition, provided they received no corroboration in the mean time; but there are, in addition to these, forty or fifty species entirely omitted by Mr. Crotch, probably intentionally, but still it would have been as well to have placed them amongst the appendix of doubtful claimants, since many of them are not more apocryphal than those to whom another chance of establishing themselves as British has been given.

The following, however, surely ought to have had a place as British:—

Otiorhynchus sulcatus, *Fab.*
Trachyphlæus alternans (*Schön.*), *Walton*
Polydrosus micans, *Fab.*
Rhynchites cupreus, *Linn.*
Adimonia sanguinea, *Fab.*
Mordellistena pumila, *Gyll.*
Dinoderus substriatus, *Steph.*
Telephorus ater, *Linn.*
Hylastes palliatus, *Gyll.*
Ptilium saxonicum, *Gillm.*, *Matth.*
„ discoideum, *Gillm.*

I can now only give a list of the names of the numerous species introduced as British in Mr. Crotch's list, regretting that it is not in my power to give further information about them. I may, however, remark that it is possible some of them are representatives, under other names, of species already recorded, and that the queries put by Mr. Crotch after some of the new species are, I suspect, not undeserved, but no definite opinion can be given when we have no evidence or sufficient synonyms.

Want of space also prevents me from noticing the very numerous new names brought forward as confessedly representing species already enumerated in our lists, and thereby necessarily causing confusion, which is not lessened by divers small inaccuracies, such as Strangalia attenuata, *Linn.*, appearing as a British species, and also being included in the list of doubtful insects, &c.

Dromius oblitus, *Boield.* (hitherto considered a *var.* of sigma).

Patrobus rubripennis, *Thoms.*? With respect to this insect, I may

remark that I have examined a very large number of specimens of the mountain species of Patrobus from different parts of the North of England (in one instance about eighty examples kindly sent to me for that purpose by my friend Mr. Morris Young, of Paisley), and that I am pretty confident we have only one species, *viz.* P. picicornis, *Zett.* (septentrionis, *Dej.*, *Dawson*), excepting of course P. clavipes and P. excavatus. According to Thomson (Skan. Col., 1859, i. 215, 3), P. rubripennis (hitherto considered a *var.* of picicornis) should be four lines long, with the elytra red, three times longer than the thorax, their striæ distinctly punctuated, especially at the base, and the basal foveæ of the thorax sparingly punctured; whilst picicornis (id., *loc. cit.* i. 215, 4) should be from four to four and a quarter lines in length, with the elytra black and shining, four times longer than the thorax, their striæ less deep and more gently punctured, and the basal foveæ of the thorax thickly punctured. These differences in length, colour and striation in the elytra appear in several specimens examined by me, and extreme examples of either variety would answer excellently to Thomson's descriptions of his two species; but unfortunately I have also seen, and even from the same localities, other individuals wherein a transposition of the above-mentioned characters takes place: *e. g.*, there are specimens with very long elytra, the striæ of which are gently punctured and not deep, but they are red instead of black, and this evidently no result of immaturity; again, there are others with black shining elytra, but short, with deeper striæ and distinctly punctured. In fact, I have seen the delicately punctured striæ and smooth interstices gradually (by a chain of examples) merge into coarser and deep punctuation, with the interstices elevated; the lurid colour tone down to deep black, and the short elytra become long. The females generally have the elytra longer in proportion and more lurid in colour than the males. I am indeed inclined to go further than expressing my belief that we do not possess two species of Patrobus with long elytra in England, and to say that I strongly suspect Thomson has elevated a mere variety into the rank of species without sufficient reason; the only character given by him at all opposed to this supposition being the difference in punctuation of the basal foveæ of the thorax. I have, however, seen certain small diversities in the degree of punctuation of these foveæ in the specimens above mentioned, but they are quite irrespective of the other characters by which they ought to have been accompanied, according to Thomson; and, if the latter has any weakness (for his work is most admirable, and exhibits an originality and keenness of discernment

seldom to be met with) it is his tendency to attach an undue importance to trifling differences in sculpture or colour.

Colymbetes sexdentatus, *Schiodte.*
Agabus sexualis, *Reiche.*
Heterocerus arenarius, *Kiesnw.*
Choleva longula, *Kelln.* (hitherto considered a *var.* of tristis).
pilicornis, Thoms.
Colon Viennense, *Herbst.*
„ serripes, *Sahlb.*
fem. *fusculum*, Er.
„ Zebei, *Kr.*
„ rufescens, *Kr.*
„ angulare, *Er.*
Hydnobius punctatus, *Sturm.*
„ spinipes, *Gyll.*, *Thoms.*
Anisotoma Triepkii, *Schm.*
„ picea, *Ill.*
„ Silesiaca, *Kr.*
? *arctica*, Th.
„ rubiginosa, *Schm.* (re-introduced).
„ scita, *Er.*
Cyrtusa pauxilla, *Schm.*
Agaricophagus conformis, *Er.*
Liodes axillaris, *Gyll.*
Agathidium piceum, *Er.*
Ptilium affine, *Er.* (addenda).
Olibrus liquidus, *Er.* (This is no doubt the insect at present known in collections as O. flavicornis, *Sturm.*)
Cerylon deplanatum, *Gyll.* ?
Telmatophilus Schönherri, *Gyll.* (*var.* Typhæ ?).
Cryptophagus umbratus, *Er.*
„ grandis, *Kr.*
„ fuscicornis, *Sturm.*
„ subdepressus, *Gyll.*
Paramecosma Abietis, *Payk.*
„ pilosulum, *Er.*
Atomaria fumata, *Er.*
„ rhenana, *Ktz.*
Lathridius assimilis, *Mannh.*
Paromalus parallelopipedus, *Herbst.*
Acritus punctum, *Aubé.*

Aphodius borealis, *Gyll.*
uliginosus, Hardy.
Cryptohypnus 4-guttatus, *Lap.*
tetragraphus, Germ.
Athoüs difformis, *Lac.*
campylöides, Newm.
Agriotes pallidulus, *Ill.*? (This is, I presume, the "4* sp——," Wat. Cat., Ent. Ann. 1863, p. 96, 86).
Cyphon nitidulus, *Thoms.*
„ fuscicornis, *Thoms.*
Telephorus figuratus, *Mann.*
„ fulvicollis, *Fab.*
nivalis, Germ.
„ femoralis, *Br.*? (*Tel.* 21* sp. ——? Wat. Cat., Ent. An. 1863, p. 97, 87?).
Dryophilus anobiöides, *Chevr.*
compressicornis, Muls.
Rhopalodontus fronticornis, *Panz.*
Hylastes angustatus, *Herbst.*
Bagoüs subcarinatus, *Schön.* (Mr. Crotch has just informed me that this ought to be considered a synonym of limosus, *Schön.*, which I have always understood to be the case).
Tropiphorus carinatus, *Mull.*
Sitonus lineëllus, *Schön.* (hitherto considered a *var.* of tibialis).
Bruchus Cisti, *Payk.* (Mr. Crotch informs me that this is to be considered a synonym of ater, *Marsh.* (villosus, *Fab.*), to which it has always been referred, and that it was erroneously ranked as a separate species in his Catalogue.)
Clythra lœviuscula, *Ratz.*
Cryptocephalus gracilis, *Fab.*
Graptodera pusilla, *Dufts.*
Helianthemi, Allard.
Aphthona cærulea, *Payk.*
Pseudacori, Marsh. (This synonym is not correct; Marsham's insect is violacea, *Ent. Heft.*)
Thyamis nigra, *Ent. Heft.*
„ brunnea, *Redt.*
lurida, v.? All.
„ lateralis, *Ill.* (26 sp——? Wat. Cat.?).
„ rutila, *Ill.*
„ canescens, *Foud.*?

Thyamis ferruginea, *Foud.*
Plectroscelis aridula, *Gyll.*
Blaps Chevrolatii, *Solier.*
Uloma culinaris, *Linn.* (mentioned in Mr. Crotch's preface as naturalized).
Tychus ibericus, *Motsch.*
dichroüs, Schmidt.
Actecharis Readingii, *Jans. MSS.*
Myrmedonia similis, *Mark.* (Mr. Crotch informs me this was erroneously inserted as British.)
Callidera nigrita, *Mann.*? (Calodera, 1 *nov. sp.*? Wat. Cat.?).
Oxypoda riparia, *Fairm.*
„ recondita, *Ktz.*
„ amœna, *Fairm.*
flavicornis, Ktz.
„ helvola, *Er.*
?*pallidula*, Sahlb. (Hitherto considered the same as annularis, *Sahlb.*)
Homalota valida, *Ktz.*
celata, Erichs.
Hypocyptus rufipes, *Ktz.*
„ seminulum, *Er.*
Tachyporus abdominalis, *Er.*
Quedius modestus, *Ktz.*?
Ocypus Saulcyi, *Reiche.*
Philonthus nitidulus, *Grav.* (Mr. Crotch informs me this species was erroneously inserted by him as British.)
„ trossulus, *Nordm.*?
Pæderus longipennis, *Er.* (Mr. Crotch informs me this was intended to be placed as a synonym of fuscipes, *Curt.*)
Stenus scrutator, *Er.*
„ sylvester, *Er.*
„ pumilio, *Er.*
„ littoralis, *Thoms.*
Trogophlœus halophilus, *Kiesenw.*

E. C. Rye.

284, King's Road, Chelsea, S.W.
October, 1863.

Proceedings of Societies.

Entomological Society.

March 7, 1864.—Frederick Smith, Esq., Member of the Council, in the chair.

Special Meeting.—A Special Meeting was held, pursuant to notice, for the purpose of electing a President in the place of Mr. Stainton, who declined to accept the office.

The Chairman appointed Messrs. Haward and Sharp to be Scrutineers. A ballot was then held, and Francis P. Pascoe, Esq., F.L.S., &c., was declared to be duly elected President for 1864.

Ordinary Meeting.—The following donations were announced, and thanks voted to the donors:—

Donations to the Library.

'Académie Royale des Sciences, des Lettres et des Beaux-Arts de Belgique: Bulletins des Séances de la Classe des Sciences, Année 1862;' 'Annuaire 1863;' presented by the Academy. 'Proceedings of the Royal Society,' No. 60; by the Society. 'Proceedings of the Natural History Society of Dublin,' Vol. iv. Part 1; by the Society. 'Proceedings of the Literary and Philosophical Society of Liverpool during the fifty-second Session, 1862-63,' No. xvii.; by the Society. 'Sitzungsberichte der Königl. bayer. Akademie der Wissenschaften zu München,' 1863, II. Heft 2 & 3; by the Academy. 'Notes on the Indian Bombycidæ,' by Capt. Thomas Hutton; by the Author. 'The Classification of Animals, based on the Principle of Cephalization; Part 2, On Fossil Insects from the Carboniferous Formation in Illinois;' by James D. Dana; by the Author. 'Chilonidarum et Crambidarum Genera et Species,' Scripsit P. C. Zeller; by the Author. 'The Intellectual Observer,' Nos. 25 and 26; by the Publishers. 'The Zoologist' for March; by the Editor. 'The Transactions of the Linnean Society of London,' Vol. xxiv. Part 2; by the Society. 'The Journal of the Society of Arts' for February; by the Society. 'The Athenæum' for February; by the Editor. 'The Reader' for February; by the Editor. 'Verhandlungen des Naturforschenden Vereines in Brünn,' Band. I. 1862; by the Society. 'Wiener Entomologische Monatschrift,' Vol. iii. Nos. 1—12; by M. Lederer.

The following additions by purchase were also announced:—'Fauna Austriaca: Die Fliegen (Diptera),' von J. Rudolph Schiner. 'Berichte über die Wissenschaftlichen Leistungen im Gebiete der Entomologie,' von Dr. A. Gerstaecker, 1853—1861; Berlin, 1855—1863.

Election of Member.

R. W. Fereday, Esq., of Oakley Station, Christ Church, Canterbury, New Zealand, was ballotted for and elected a Corresponding Member.

Exhibitions, &c.

Mr. Waterhouse exhibited two species of Aleochara hitherto unrecorded as British:—

1. A. procera, *Kraatz, Ins. Deutschl.* p. 97 = Ocalea procera, *Erichs. Gen. et Sp. Staph.* p. 61. Found at Reigate by Mr. Linnell.

2. A. fumata, *Erichs. lib. cit.* p. 166, *Kraatz, lib. cit.* p. 93. Found in Scotland by Mr. Morris Young and by Mr. Waterhouse himself.

Mr. Waterhouse also exhibited specimens of Aleochara brunneipennis, *Kraatz*, = sanguinea, *Kirby*, and called attention to the fact that that species was identical with the A. mœrens, *Thoms.*, as he had ascertained both from the description and by comparison with a specimen received from Thomson by Mr. Crotch.

Prof. Westwood exhibited the sexes of Ramphorhina Petersiana, a splendid Goliath beetle, brought from the Zambesi by the Rev. H. Rowley, the female being then for the first time exhibited; also several species of Lepidoptera from the Zambesi, amongst which was a new species of Charaxes, which considerably resembled an Argynnis, and read descriptions of this and several new species of Coleoptera.

Prof. Westwood also exhibited larvæ of Endrosis fenestrella, which had been sent to him by a correspondent, and which were accused of having made numerous holes in a carpet which had been laid down new in September or October last: on taking up the carpet, the larvæ were found on or in the interstices between the boards of the floor, but the larva-cases did not appear to be formed of particles of the carpet.

Mr. Stainton remarked that the only evidence against the Endrosis larvæ was their propinquity to the carpet; he had never hitherto detected that species in the commission of similar injury.

Mr. Bond, however, had no doubt that they would attack carpets; he himself had once had a coat destroyed by them.

Prof. Westwood said that another correspondent had called his attention to the injury done to the leather binding of books by Ptinus hololeucus, a well-known beetle, which he believed to have been imported into this country from Russia some thirty years ago in a cargo of leather, and which was now thoroughly naturalized. This also was a case of first conviction, for he had not before met with any instance of this insect doing actual harm.*

Mr. S. Stevens exhibited a collection of Coleoptera and Lepidoptera from Old Calabar.

Mr. S. Stevens also read a letter from Mr. John Young, on the subject of the swarms of small ants found in his house in Guildford Street; see 'Proceedings' for October, 1863. Mr. Young stated that he had removed the pest by the use of Dumont's Insect-destroying Powder, by puffing the powder into the crevices from which the ants issued, and laying it on the ledges, &c., on which they appeared.

Mr. Waterhouse exhibited several portions of nests of bees, wasps and hornets, in illustration of the paper mentioned below.

Papers read.

Mr. Baly read a paper entitled "A Catalogue of Cassididæ collected by Mr. A. R. Wallace in the Eastern Archipelago, with Descriptions of the New Species."

The Secretary read the first part of a paper, by Mr. Pascoe, entitled "Longicornia Malayana; or, a Descriptive Catalogue of the Species of the three Longicorn Families, Lamiidæ, Cerambycidæ and Prionidæ, collected by Mr. A. R. Wallace in the Malay Archipelago."

Mr. Waterhouse read a paper "On the formation of the Cells of Bees," in which the Author defended what may be termed the circular theory of formation, which was first promulgated by himself nearly thirty years previously.

* See 'Journal of Proceedings' for September, 1862; Zool. 8218.

A discussion ensued, in which Mr. Bates and Prof. Westwood took part: Mr. Baly mentioned some observations made by himself on the formation of the nests of certain wasps, as corroborating Mr. Waterhouse's view; and Mr. A. R. Wallace expressed his concurrence in the theory. Mr. Frederick Smith, however, was not of the same opinion, and promised to bring before the Society, at its next Meeting, certain facts which, to his mind, were conclusive against the circular theory.—*J. W. D.*

Erratum in 'Zoologist' for January, 1864.—Zool. 8897, lines 7 and 15 from bottom, for OGCOCEPHALUS read CEPHALONCUS.

"*The Boring Snail of the Bois-des-Roches.*" By the Rev. ALFRED MERLE NORMAN, M.A.

THE paragraph thus headed in the 'Zoologist' (Zool. 8932), and extracted from the 'Field,' and on which Mr. Newman requests my opinion, does not appear to contain any original observations by Mr. H. J. B. Hancock, but is a brief abstract of a long and elaborate treatise on the subject published by M. Bouchard-Chatereaux. The Memoir will be found in the 'Annales des Sciences Naturelles,' 4e serie Zoologie, vol. xvi. 1861, p. 197—218, under the title of "Observations sur les Hélices saxicaves des Boulonnais." Mr. Hancock has latinized Hélices saxicaves into "Helix saxicava." There is no such species. The boring-snail of the Bois-des-Roches is nothing more nor less than our well-known Helix hortensis.

It is not my wish on the present occasion to express any opinion upon the means by which the galleries tenanted by the Helices are excavated by the mollusks. Those who are interested in the subject, by reading M. Bouchard-Chatereaux's paper will be able to weigh the arguments for themselves and adopt or reject the chemical theory, which is so ably maintained by the author.

There can, however, scarcely be a doubt but that the perforations are the work of the snails themselves. M. Bouchard-Chatereaux, I think, clearly proves this, and the plate which he gives illustrative of the perforations presents features so peculiar that they could scarcely be produced by accident or weather. Nor is the boring of the rocks of the Bois-des-Roches a solitary instance of the phenomenon. M. Bouchard-Chatereaux quotes a statement made before the French Academy of Sciences, in 1854, that M. Constant Prévost had given a description twenty-five years before of the calcareous rocks of Monte Pelegrino, in Sicily,—crystalline rocks having the hardness of marble,—which he found traversed in all directions by

numerous channels, generally communicating with each other. In each excavation a Helix was lodged, and M. Prévost did not hesitate to attribute to the snails the work of excavating the galleries.

But the credit of first noticing excavations of this nature must be given to a countryman of our own. In 1820, the first volume of the Rev. John Hodgson's 'History of Northumberland' was published, and, at p. 193 of the second part, there will be found the following passage:—"On a sunny bank, called the Ferny-breay, on the north of the way to Wallington, and just within the Croft-gate on the east side of Whelpington, a stratum of limestone is here and there seen in gray projecting masses, the under surface of which is bored upwards with cylindrical holes, which are from a line to four inches deep, and tenanted, especially in winter, by the banded and yellow varieties of the Helix nemoralis. The Limax, while it occupies these cavities during the summer, has its fleshy longitudinal disk protruded out of the shell, and coiled nearly in a circle on the surface of the stone, the summit of its shell hanging downwards; and in this position it probably elaborates its den, in the same manner that some of the Pholades work their way into clay or wood, or, by a slow but constant process, sink and enlarge their cells in the hardest stones."

On the 19th of May, 1841, a paper was read by Dr. Buckland, before the Geological Society, "On the agency of Land Snails in corroding and making deep excavations in compact Limestone Rocks." Dr. Buckland, in this paper, first referred to the character of the excavations at the Bois-des-Roches, which he had examined during the Meeting of the Geological Society of France at Boulogne, in September, 1839. He then went on to describe perforations in the carboniferous limestone on which the Castle at Tenby stands, and assigns them as the work of the "same species of Helix as that which had formed the cavities in the limestone near Boulogne, and he found within them specimens of the dead shells as well as the living. The mode of operation by which the excavations were made, he conceived, was the same as that by which the common limpet (*P. vulgata*) corrodes a socket in calcareous rocks, and he was of opinion that the corrosion is due to the action of some acid secreted by the body of the limpet or Helix."—('Annals of Natural History,' 1842). It may be mentioned that at the time Dr. Buckland wrote this paper M. Bouchard-Chatereaux was of opinion that the mode of perforation was mechanical. It was not until a subsequent period that he adopted the chemical theory here advanced by Dr. Buckland.

In conclusion, I would call attention to certain points of resemblance

in the accounts we have of the four localities presenting these remarkable perforations: *first*, that in all the instances the perforated rocks are calcareous—a limestone; *secondly*, that the excavations are never on the upper surface of the rocks, as would be the case were they the effect of weather, but are either inwards from the edge, or upwards from the under surface of projecting ledges; *thirdly*, that such positions offer protection to the snails from the weather, which habitations on the upper surface of the rock would not; *fourthly*, that the channels are always described as of considerable depth, of unequal diameter in different parts, as tortuous, and as frequently confluent; *fifthly*, that they are tenanted by Helix hortensis, which is presumed to be the excavator.

This last statement requires some explanation: M. Bouchard-Chatereaux tells us that the boring-snail of the Bois-des-Roches is Helix hortensis: Dr. Buckland states that the Tenby snail is the same as that of the last locality, but when speaking of the Boulogne snail he calls it Helix aspersa. In this he is clearly mistaken. Perhaps some correspondent of the 'Zoologist' may have the opportunity of examining the Tenby burrows, and telling us whether or not they are occupied by the "same species of Helix as that which forms the cavities in the limestone near Boulogne," namely, H. hortensis. Mr. Hodgson speaks of the Whelpington burrower as Helix nemoralis, a title which, in the opinion of many conchologists, includes H. hortensis as a variety, and with this latitude the name may be employed by Mr. Hodgson. The name of the Sicilian snail is not given by M. Prévost.

Mr. Jeffreys, in his recently published 'British Conchology,' ascribes to Helix aspersa the boring faculty, doubtless relying on the statement of Dr. Buckland. The evidence, however, of M. Bouchard-Chatereaux must be considered the more trustworthy.

As bearing upon this subject, it may be mentioned that Mr. Jeffreys states that, according to M. Bonnafaux, the Helix aspersa has been known to perforate birds' eggs in deserted nests, in order to feed on their contents.

ALFRED MERLE NORMAN.

Sedgefield, February 20, 1864.

On the External Parasites of Fish.—May I ask the co-operation of the readers of the 'Zoologist' in enabling us to arrive at a more accurate knowledge of the parasites which are to be found upon our marine and fresh-water fish? I am engaged in the investigation of both foreign and British species, and shall feel greatly obliged for any

materials that may be placed in my hands. Fish-parasites, which are very numerous, belong to two great classes:—*internal* parasites, which attack the stomach, liver and other organs of the host, and belong to Entozoa, a section of the Annelids; and *external* parasites, which constitute the Cormostomata of Dana (the Epizoa of Owen), a remarkable and abnormal division of the Crustacea. These last parasitic Crustacea form two divisions; the one lives upon the surface of the fish, can move from place to place, anchor itself at will by means of its hook-formed, prehensile antennæ, or even occasionally leave the fish, and swim freely in the water. The species of this division are well known to fishermen as "fish-lice," and almost any cod or fresh-run salmon will afford examples of them. The other division includes sedentary parasites, having the head frequently deeply buried in the tissues of their victim, and can only be removed by careful excision. They have no power of locomotion, indeed often almost the whole of the external organs are in a rudimentary state, and the animals assume the most extraordinary and uncouth forms. These sedentary parasites should be sought for on the gills, the eyes, the roof of the mouth, the vent, the fins, and, in the case of the skates, in the nostrils. The gills are the parts chiefly affected, but among the dog-fish and sharks the vent is a favourite habitat. Little has been done as yet in Great Britain among these parasites. The only work that treats of them is Dr. Baird's 'History of British Entomostraca.' My own collection now includes nearly double the number of species there described, and for a considerable number of these I am indebted to the activity of my collector, Mr. Laughrin, of Polperro, and to the kind co-operation of Mr. Edward, of Banff. If those who have the means of examining rare fish taken on the coast would look after the parasites upon them, the result would frequently be not only the recording of the occurrence of the fish itself, but also the more important discovery of one, two or three animals new to the British Fauna. I am induced to make this appeal to the attention of ichthyologists by the record of the capture of the sword-fish at Plymouth, a host which sustains two parasites which have not hitherto been recorded in our seas. The parasitic Crustacea vary from a quarter of an inch to two inches in length. All that is necessary for their preservation is careful removal, by excision if necessary, from the body of the fish, and immersion in spirits of wine.—*Alfred Merle Norman; Sedgefield, Ferry Hill, February* 20, 1864.

Stoat and Moorhen.—Reading Mr. Harting's anecdote of the weasel (Zool. 8945) has recalled to my mind a scene which I witnessed on the 23rd of November, 1862, an account of which, I think, will be interesting to the readers of the 'Zoologist.' It was a still, sunny morning, and I was taking a quiet stroll by the side of a pond, when my attention was attracted by a moorhen rushing at a tremendous pace along the bottom of a hedge, and while I was wondering what should have been the cause of this sudden movement on the part of the moorhen I heard a second rustling in the hedge, and on looking round I caught sight of a stoat scampering along at full pace in the track of the moorhen, which latter had in the mean time stopped in a lot of sedge. I watched the stoat until he came up to the sedge, expecting every moment to see the moorhen start again, but a rustle, followed by a continued fluttering, told me that it was all up with him. I waited until the fluttering had ceased, and then walked round to the spot, where I found the moorhen dead, with its head drawn into a hole in the ground. I found on examination a wound in the head, from which the blood had been sucked,

also a wound in one thigh, and I suspect that the stoat first seized it by that part, and afterwards changed its hold to the head. It seems rather odd that the moorhen did not use its wings as a means of escape; perhaps fright may partly account for this, but I have noticed that, when disturbed, they always prefer to hide rather than take flight. I brought the moorhen home; it was a bird of the year, but full-grown.—*W. Jeffery, jun.; Ratham, Chichester, March* 5, 1864.

Otter at Pagham Harbour.—On the 2nd instant, a fine male otter was killed in Pagham Harbour, after having been shot at, I am told, as many as thirty times: it was at last wounded with a bullet, which enabled some men in the coast-guard service to knock it at head with their oars. The weight of it is 17½ lbs., and its length, including the tail, is but one inch less than four feet. It is being preserved for the Chichester Museum.—*Id.*

Badger near Melton.—A fine male specimen of the badger (*Meles vulgaris*) was captured near Melton, Norfolk, on Thursday, the 18th inst.—*T. E. Gunn; Norwich, February* 22, 1864.

Supposed Old English Rat.—I observe that, in the February number of the 'Zoologist' (Zool. 8945), Mr. Norman expresses doubts as to the identity of the rat killed near Beverley with the Old English rat, now so nearly extinct. He bases his incredulity on the supposition that, because the rat happened to have been killed in a barge on the River Hull, it must have been one of a foreign species, imported with a foreign cargo, *viâ* Hull, &c. This supposition is altogether far from the mark: *first*, then, the barge in question, on which the rat was killed, never touched at Hull on her voyage, and does not trade with that port: *secondly*, the cargo on the barge at the time of the capture was not a foreign one, but coals shipped at Wakefield, and brought from thence direct to Hull Bridge: *thirdly*, the rat itself has a very faint resemblance in some particulars to the "gaunt," large-eared, long-tailed foreign rat, which Mr. Norman correctly states is frequently met with on ship-board in the Hull Docks. I am perfectly familiar with these rats; indeed I have seen and examined dozens of them: any Hull rat-catcher could supply a considerable number of them on a very short notice: these rats are of small size, when fully grown seldom exceeding one-third to one-half the dimensions of the ordinary Norwegian rat: they are, moreover, of a very peculiar colour, *viz.* mousey, sooty, or slaty black, and of a uniform colour throughout; their fur is peculiarly soft, and devoid of the harshness caused by the longer outer hairs of the common rat; in texture it more resembles the fur of the mole or of a very young rat of the ordinary species: albinoes of this species are not unfrequently met with. The rat in question is certainly not one of this species, being larger and coarser in its fur, besides the colour being different, both in shade and uniformity. I have compared it with an undoubted specimen of the Old English rat, caught at Knowsley, and the two animals appear to be identical. Should it be more satisfactory to the Editor of the 'Zoologist' or its readers, I should be most happy to forward the specimen under discussion for Mr. Newman's opinion and decision as to its species.—*W. W. Boulton; Beverley, March* 8, 1864.

Occurrence of the Bank Vole in some numbers in Derbyshire.—Last winter I had the pleasure of recording the occurrence of six specimens of the bank vole (*Arvicola pratensis*) at Calke Abbey, Derbyshire. During the last twelve months more than thirty specimens have been caught in traps set in the gardens and pleasure-grounds of the Abbey. The traps were baited with meat, and were placed at the foot of the garden-walls and at the edges of ornamental rock-work. I am convinced that this

vole is far commoner than is generally supposed.—*H. Harpur Crewe; The Rectory, Drayton-Beauchamp, Tring, March* 12, 1864.

On the Gizzard or Stomach of Birds. By W. W. Boulton, Esq.

Since ascertaining that the bittern (*Ardea stellaris*) digested its food by the aid of a true stomach supplied with acrid solvents (Zool. 8959), instead of mechanically grinding it by means of a gizzard and foreign substances, such as stones, grit, &c., I have carefully observed the stomach of every bird that has come under my notice. The result of my investigations leads me to suppose that there are no less than three different forms or types of stomach amongst birds.

1. I find birds with a true stomach, similar in all essential parts and powers to the same organ in animals, and digesting its contents by the secretion and action of a natural solvent. Of this class are the owl, bittern, &c., birds which prey upon small animals, fish and insects.

2. Birds with a true gizzard or stomach supplied with such an arrangement of parts and powers that the food is thereby ground mechanically to the consistency required for the purposes of assimilation, and is not perceptibly acted upon or softened by a natural solvent. Of this class are the pochard, domestic fowl and small hard-billed birds, &c., birds which live upon vegetable matters, seeds, fruits, and a varied or mixed diet.

3. Birds with a stomach which appears to be compounded of the other two forms; in fact, with a stomach partly supplied with actual digestive powers (literally and strictly) and partly with grinding or triturating powers. Of this class are the goosander, smew, &c.

In all birds the œsophagus is more or less dilated at its lower end where it opens into the gizzard or stomach. This dilatation is called the "ventriculus succenturiatus," and in the case of the class of birds to which I am at present referring, it appears to serve the purposes of a digesting stomach more or less perfectly. It is supplied with a mucous membrane and glands, whose fluids possess an undoubted power of acting as solvents of the ingesta retained in this portion of the alimentary canal. Thus, a fish received into this greatly dilated ventriculus succenturiatus would have become so far softened during the period of its retention therein, that the scales would slip off on the slightest touch, and the whole tissues of the fish would have become so far altered in consistency as to be readily crushed into a pulp by the representative of a gizzard into which it enters on leaving the

ventriculus succenturiatus. I say "representative of a gizzard," because this organ is in every respect much feebler than a true gizzard in proportion to the size of the bird; indeed it appears to be rather an appendage to the ventriculus succenturiatus, in the form of a second stomach, than an independent organ. It is supplied with powerful muscles, which embrace the organ from certain fixed points, and which crush between them the contents of the organ. It is further supplied on its interior surfaces with a thickened and corrugated membrane, and small stones are also found in its cavity, which had been swallowed by the bird to assist the organ in its grinding powers. The muscles are, however, mere representatives of those immensely developed muscles which render the ordinary true gizzard so irresistible in its grinding power. The thickened and corrugated lining membrane of the organ, too, is but a feeble type of those hardened fibrous plates which, in the true gizzard, forcibly rubbed together by vast muscular contraction, act as the mill-stones on the grain in an ordinary mill. The capacity also of the organ is comparatively and relatively small, compared with the capacity of an ordinary true gizzard.

This comparative inferiority in power and capacity is due, I conceive, to the fact that it has only a secondary part to play in the process of digestion, nor has it the food to retain for so long a period as an ordinary gizzard, whose office it is to keep up a sufficient supply of softened aliment for the nutrition of the bird, and that by its own unaided powers. It is a very interesting fact, however, and this wonderful arrangement of parts, so peculiarly fitted to the habits and requirements of those birds in which we find it, is worthy of note.

In giving examples of birds occurring in each of the three classes I have spoken of, those named are selected, almost at random, from the unavoidably restricted list of birds whose stomachs I have actually examined, but which are nevertheless excellent illustrations of the peculiarities I have noted.

The question then arises, why these various arrangements of stomach and varied powers of digestion in the great family of birds? May not the explanation be—

1. That those birds in which a true stomach is found are birds feeding on animals, birds, fishes and insects, either sufficiently small to be digested *in toto*, bones and all, by the solvent powers of the organ, or birds which have the very peculiar power of rejecting the bones, hair, feathers, &c., in a mass subsequently to the removal of

the fleshy portions of the animal, bird or fish, by the solvent powers of the digestive secretion.

2. That those birds in which a true gizzard is found are birds feeding upon grain, seeds, vegetable matters, and a mixed dietary, which could never be digested by the solvent powers of a true stomach, and which positively requires the mechanical crushing, pulping process of Nature's mill, with its motive power concentrated in the enormously developed muscles, and its mill-stones on which these act, represented by the cartilaginous plates between which the food is speedily rendered fit for assimilation.

3. That those birds in which a double or compound stomach is found, possessing the solvent powers of a true stomach, together with the grinding powers of a true gizzard, are birds feeding on a comparatively bulky prey of flesh or fish, and which assimilate the bones, &c., as well as the softer portions of their victim. This is the case with the goosander, smew and diver, and most probably with all the members of these families.

W. W. Boulton.

Beverley, March 8, 1864.

Birds and Plate-Glass.—I fancy that the introduction of plate-glass into our windows must have been very fatal to the birds. Since my residence here many birds of many kinds have come to a sudden and untimely death by a flight against the glass. At first this destruction was quite distressing, but I am happy to say that each year it is becoming less. I suppose that they (the survivors) have gained experience. Plate-glass alone could have withstood the impetus with which some have met their fate, coming with a bang against the pane, like the report of a pistol. Amongst the victims I may mention a few: a sparrowhawk, two partridges (which being in season did not grieve me much), a misletoe and many common thrushes, chaffinches, two nightingales, and many other species; and a few days ago, during a severe frost, and in the dusk of the evening, seeking shelter from the cold, a golden-crested wren flew against the window, but was fortunately only stunned: I brought it in, and, before it had quite recovered, placed it in a small covered Japan basket upon a bed of rose-leaves. It never moved, and, fearing it might be dead, I carried the basket across the room some hours afterwards, and though the cover was removed in the full glare of the light the beautiful thing was not disturbed: it was asleep, and one round ball of feathers, the head and neck invisible. Upon coming into the room next morning I found it all alive and well, and gave it its liberty. Birds when asleep must fall an easy prey to their enemies; they are very deaf, and, except some (which sleep, as they say Bristolians do, with one eye open), blind to approaching danger.—*—W. C. Hewitson; Oatlands, February* 22, 1864.

Whitetailed Eagle near Wymondham.—An eagle, supposed to be a young specimen of Falco albicilla, was observed for several days in the neighbourhood of Great Melton, near Wymondham, about the middle of November last.—*T. E. Gunn; Norwich, February* 24, 1864.

Whitetailed Eagle in Savernake Forest.—During the past week a specimen of the whitetailed eagle had been observed in the neighbourhood of this place, and in vain were traps set to take it. However, on Monday, the 1st of March, Mr. Haymes, one of the Marquis of Ailesbury's gamekeepers, managed to get within shot of the bird, in the Bedwyn Brails, one of the preserves of his lordship, and brought it to the ground. The bird has been sent to Mr. Ward, of Vere Street, for preservation.—*W. H. Rowland; Hungerford, Berkshire.*

Tengmalm's Owl captured at Flamborough.—A very splendid specimen of Tengmalm's owl (*Strix Tengmalmi*) was captured at Flamborough, on the East coast of Yorkshire, on the 1st of October, 1863. I had not the opportunity of dissecting it, so cannot be certain of the sex; I believe, however, from its size, &c., that it was a mature female. It was captured in the day-time by Robert Barkley, of Flamborough, who ran it down in a field belonging to Mr. Preston, of the same place, the bird being dazzled by the light. This species is peculiarly sensitive to light, and is thereby rendered almost helpless, if disturbed in the day-time. The specimen was taken by the man who captured it to Mr. Bailey, of Flamborough, who is known to take an interest in Natural History, and from whom I obtained the particulars of the capture: he skinned and set it up himself. I have seen the bird, which is very perfect and in exquisite plumage. This owl was taken just after one of those severe gales that swept over the east coast of our island during the latter part of the year 1863.—*W. W. Boulton; Beverley, January* 21, 1864.

Notes on the Redeyed Flycatcher.—As the redeyed flycatcher (*Muscicapa olivacea*), like former stragglers from the New World, may possibly be included in our Fauna, a slight description of one shot in Canada, during the spring of 1858, may perhaps prove interesting. Though two or three thousand miles is a long wandering flight for so delicate a short-winged bird, still it is difficult to account for its appearance in any other way, as it is not likely that those trapped near Derby had been caged, though Wilson says it is a fine songster, and a reference to his work will show that many of the particulars quoted by Mr. Brown from Mr. Gosse's 'Birds of Jamaica,' respecting the habits and song of the redeyed flycatcher, are noticed by him. Take, for instance, the following passages:—"This is a numerous species. * * * It has a loud, lively and energetic song, which it continues as it hunts among the thick foliage, sometimes for an hour, with little intermission." Mr. Gosse observes, "From this time every grove, I might almost say every tree, had its bird, uttering, with incessant iteration and untiring energy, from its umbrageous concealment, Sweet-John! &c." There is here a difference in style, but nothing more. It cannot be a numerous species in Canada, for I observed none during the latter part of the summer of 1857, but shot one on the 24th of May, 1858 (Zool. 6747). Not being able to identify it at first, I remarked in my note-book, "Resembles the garden warbler and wood wren," and it was not until closely examined that I ascertained the species. But for the slightly hooked upper mandible and bristles it might readily be mistaken for a warbler, to which it is so closely allied, the tarsus being uncommonly long, measuring more than 7-tenths of an inch; the toes, too, are very elongated, and so is the bill. Neither is the plumage characteristic of the family, being brighter than usual. Altogether it is a neat-looking, not to say elegant bird: a male, I believe. Length 5¾ inches. Bill about half-an-inch long; upper mandible of a dark horn-colour, slightly decurved, hooked and notched at the point; lower mandible straight, and of a light horn-colour. Crown of the head ash-brown, with a bluish tinge. A white band over the eye; an

olive-brown band passes through it, and a dark brown one over it. Anterior part of back olive-brown, with a yellowish tinge. Posterior yellowish green. Upper tail-coverts light brown, tinged and margined with greenish yellow. Tail of a light glossy hair-brown; the feathers twelve in number, edged with yellowish green on the outer webs, and are all, except the two centre ones, broadly margined and slightly tipped with gray and yellowish white on the inner webs; the feathers, like those of Sylvia locustella, are beautifully and minutely barred with a darker shade of brown. The tail is almost even, though Wilson says it is "slightly forked," but the centre feathers are well nigh, if not quite, as long as the rest: the lateral feathers, though rounded on the outer web, are diagonally sloped or cut off on the inner web, giving the tail, when closed, a slightly forked appearance. The wing has eighteen quills of a darkish hair-brown, with black shafts. The primaries, except the two first, slightly tipped with grayish white, and they are all margined exteriorly with bright yellowish green, and with white on the inner webs. Second quill longest, the third next; and the second, third and fourth are cut out on the exterior web. The inner secondaries are of a glossy yellowish brown, with a rufous tinge; the outer secondaries like the primaries, but more broadly margined with yellowish green. The coverts like the quills. Cheek light grayish brown, with a greenish yellow tinge. Chin grayish white. Throat white. Breast white, shaded with gray and yellowish brown. Belly and vent white, the latter tinged with greenish yellow. The under tail-coverts similar, and very elongated. Sides white, shaded with greenish yellow. Under wing-coverts yellow. Tarsus and toes brown, with a bluish tinge. Claws light, curved and pointed.—*Henry Hadfield; Ventnor, Isle of Wight, March* 11, 1864.

Redwings singing in England.—This to me is something new: I have heard them chattering often with fieldfares, but I have never heard any birds sing much in flocks. Whether the bird Mr. Wharton mentions might not have been that soft, melodious bird, the wood lark, I do not know, but I agree with Mr. Newman that it was a pity the bird was not shot *in ipso facto*. It is rude to contradict such strong circumstantial evidence as that given by Mr. Matthews, who says that, except the nightingale, he does not know a more beautiful songster than the redwing; from its strong resemblance to the thrush, it ought to have a similarity of note. I shall do my best next winter to listen to the redwing; but already the redwings and fieldfares have nearly disappeared, the weather having become suddenly mild, and my present residence is near a populous town. Starlings, the most gregarious birds I know of, in all seasons, sing in flocks in their quiet, twittering, unassuming way, but that is all.—*H. W. Newman; Hillside, Cheltenham, March* 1, 1864.

Redwings singing in England.—I am quite of Mr. Newman's opinion (Zool. 8947) as to the singing of the redwing in this country. I feel quite sure that the thrush has been mistaken for it: I have had for years plenty of opportunities of hearing them had they sung. I do not call the twittering they make, when they are assembled together with fieldfares and starlings, singing. We have no end of redwings at Kingsbury every winter and spring: they are in the habit of roosting in the shrubberies of a neighbour, close to my house, and generally assemble, in fine weather, for a short time, in a double row of large elm trees bordering a lane in front of our house, and make a good deal of twittering: among them are mostly one or two resident song thrushes singing, and people seeing so many redwings might have fancied it was those birds that were singing.—*Frederick Bond; Kentish Town, March* 12, 1864.

Redwings singing in England.—As the subject does not seem to be entirely closed, perhaps I may be allowed to add my quota to the observations already published in the 'Zoologist,' regarding the singing of the redwing. Many years ago, being much engaged in procuring birds for the late Mr. T. C. Heysham, whose collection was sold in London some time since, while looking for migratory birds at the latest possible period prior to their leaving this country in spring, especially the siskin, brambling and fieldfare, I had many opportunities of meeting with large flocks of redwings, in company with the latter bird; and if the weather happened to be fine and sunny, these flocks, if alighted on the surrounding trees, seldom failed to join in what appeared to me a chorus of joy at the near approach of summer and an early return to their breeding haunts. Amongst such a large assemblage it would have been difficult to pick out the distinct song of a single individual, and trace it from beginning to end, and I never had an opportunity of hearing a single bird detached from all the rest; but, from what I could judge by listening to the whole flock, I should say Mr. Wharton's description of the song of the redwing is pretty correct, with the exception that I do not remember hearing that perpetual repetition of the same note which is so conspicuous in the song of the thrush. I could never distinctly ascertain how far the fieldfare participated in the general joy, except by hearing, at short intervals, the louder and somewhat harsh "chak, chak" they utter when flying.—*James Cooper; Museum, Warrington, March* 12, 1864.

Blackbird's Nest on the Ground.—The circumstance mentioned by Mr. Wharton (Zool. 8947) is by no means uncommon: near the ground or on the ground, at the bottom of an old hedge, on the edge of a hedge-bank, are all likely places for a blackbird to build, and also near the edge of a brook; but the curious variety of sites selected by the blackbird for its nest has puzzled me frequently. In my own shrubberies I have several times found, in the same bushy ever-green, a thrush's nest, and, within three or four feet, the nest of a blackbird, and when this was the case the thrush's nest has been invariably lower down and nearer the ground than that of its congener, the blackbird. Up to this date, although they have been numerous, I have not heard a blackbird sing this year: the thrushes, except on a dozen severe frosty days, have been in full song for three months.—*H. W. Newman; Hillside, Cheltenham, March* 3, 1864.

The Black Redstart in Cornwall.—You are aware that this species holds a more northern limit in its autumnal migration than most of the other warblers. Some are always to be observed during the winter months in the western counties: those that I have met with, in the proportion of ten out of twelve, are smoke-gray; in fact, I have considered that the black plumage is the summer livery, but I had one forwarded to me a few weeks since, killed on Marazion Green, in full black plumage. It may be a question whether many birds which undergo a change of plumage of this nature, when in a certain stage of life, do not, when very old, retain their more fully marked characteristics of plumage.—*Edward Hearle Rodd; Penzance, January* 20, 1864.

Chiffchaff wintering in Cornwall.—My garden has been honoured by an unusual visitor this winter: on New Year's Day I was surprised to see a chiffchaff actively flitting from bush to bush, and I continued to see it almost daily up to last Monday, when a severe frost set in, and I was much afraid it had perished, either from want of food or cold, but I was gratified by seeing it again yesterday in full activity. I watched it through a good binocular for nearly an hour, during which time it was frequently buffeted by other birds (house sparrows, chaffinch, dunnocks, gray wagtail,

pied wagtail, and even the little wren), who appeared to look on it as being a stranger and having no right here at this season. In one instance the chiffchaff was the aggressor, making an attack on a titlark. I remember an instance of a chiffchaff being obtained here in January, but I cannot tell in what year.—*Stephen Clogg; Looe, February* 15, 1864.

Bramblings in the Chilterns.—About the beginning of this month my brother shot three bramblings from a flock which he saw in a field close to one of the wooded slopes of the above hills. Can any of the readers of the 'Zoologist' give an instance of their having occurred in this locality before?—*Richard Tyrer; Weston Turville, Wendover, February* 18, 1864.

Pine Grosbeak at Thruxton.—On Saturday, the 30th of January, my brother killed a fine male specimen of the pine grosbeak (*Loxia enucleator*), whilst preening its feathers on the branch of a fir tree. Upon skinning the bird, I found the crop filled with small seeds, some of which I have enclosed; they appear to me to be the seeds of Pinus sylvestris. I believe this is the first recorded instance of this bird's appearance in this part of Hampshire.—*Henry Reeks.*

Hawfinch near Salisbury.—About the first week in December, 1863, a number of these birds made their appearance at Britford, a village one mile and a half to the south-east of this city. I was informed by a person resident in the village that they arrived in parties of about twenty, and at intervals of from ten days to a fortnight: he showed me five specimens that he had shot, four males and one female. Altogether I have seen not less than twenty that have been killed in that locality, and this, I fear, does not include the total number that have been shot there. I much regret having to record such wholesale slaughter. Quite three-fourths of those which came under my notice were males. I took from the crop of one which I dissected several kernels; they were chiefly from the laurel-berry; a few much smaller appeared to me to be from the yew-berry, but I could not quite satisfy myself as to the identity of these smaller kernels. I have been in the habit of seeing individual specimens of the hawfinch killed in this neighbourhood during the winter for the last few years, but never recollect them to have been so numerous as they were this season.—*Henry Blackmore; Salisbury.*

Bohemian Waxwing in the West Riding of Yorkshire.—On the 24th of February I shot a fine specimen of the waxwing (*Bombycilla garrula*) near the well-known gorge called Gordale, six miles from Skipton. It was settled upon the top of a thorn-hedge, and, although I had to go a couple of miles before obtaining a gun, it had not moved far from the spot where it was first observed. I believe this is the first time of its occurrence within the district of Craven.—*H. Roundell; Coniston Hall, Bell Rush, Yorkshire.*

Bohemian Waxwing near Liscard.—A fine old male specimen of the Bohemian waxwing was brought to me alive on the 23rd instant, by my nephew, Mr. Thomas B. Robson, whose father's gardener caught it that day in their garden at Liscard Vale, New Brighton, under a riddle baited with the berries of the common dog-rose, in the usual manner adopted by boys for catching sparrows. He previously noticed it feeding on the fallen berries, and it allowed him to approach within five yards before it took wing, when it flew to the next garden, a few yards away, but returned and was caught within an hour. On dissection I found nothing whatever in its stomach, some hours having elapsed between the time of its capture and coming into my possession. I killed it because Bechstein, in his excellent work on cage-birds, says it is a lazy,

useless, dirty, disgusting bird in captivity, when not well supplied with food eating its own excrement. No other bird was seen in company with it, but about two months since two were seen at Moreton, a village about five miles distant, one of which was shot, and is in the possession of Joseph Leyland, taxidermist, of Liverpool, and it is supposed by some that my nephew's specimen is the one that escaped the gun at Moreton.—*Nicholas Cooke; Spring View, Liscard, Cheshire, February* 26, 1864.

Cuckoo in Confinement.—On the 20th instant I observed a live specimen of the cuckoo (*Cuculus canorus*) in the possession of a person residing in this city, who informed me he had succeeded in rearing it (it being taken from a nest last year); it feeds on small pieces of raw beef, which it takes from his hands. This is the only instance I ever heard of its being kept in captivity in this country during the winter season.—*T. E. Gunn; Norwich, February* 22, 1864.

[For a similar instance, see Zool. 655.—*E. Newman.*]

Cuckoo in January.—The false alarms you received of the cuckoo appearing in January, or being heard in that month, ought, in my opinion, to be noticed by the Editor on the 1st of April, a very appropriate day for *canards* of all sorts; but the only excuse that can be made for such communications is that there are certain boys in the country who have good musical ears and voices, and thereby have deceived many others, in striking the note of the cuckoo, at from about two to four hundred yards distance, with the nearly proper key of "B flat," which key, with very little variation, is the one which all the cuckoos sing in at the time of their arrival. Towards the 28th of June, and after, the musical or singing part is altered to a coarse, hoarse, discordant scream. The Editor is quite right in demanding a sight of the bird, dead or alive.—*H. W. Newman; Hillside, Cheltenham, February* 26, 1864.

Great Spotted Woodpecker near Beverley.—This is decidedly a rare bird in our neighbourhood. I have never seen in all more than five or six specimens shot within a radius of twelve miles of Beverley. On the 1st of January a mature female specimen of the great spotted woodpecker (*Picus major*) was shot in the Burton Bushes, on Westwood, one of the common pastures adjoining the town of Beverley.—*W. W. Boulton; Beverley, March* 9, 1864.

Abundance of the Bittern in Norfolk.—As many as six specimens of the bittern, in good plumage, have been shot in Norfolk during the week.—*T. E. Gunn; Norwich, January* 16, 1864.—*In 'Corresponding Naturalists' Circular.'*

Note on the Occurrence in Great Britain of the American Wigeon and of the Red-winged Starling.—In the 'Zoologist' of this month (Zool. 8962) reference is made to the claim of the American wigeon to a place in the list of British birds, and to the specimen procured several years since in Leadenhall Market, by Mr. A. D. Bartlett. This specimen was purchased by me from Mr. Bartlett: it is a male in full plumage, and therefore there can be no mistake as to the species; and having been obtained long before the commencement of the present system of sending over wild fowl from America in the flesh, there can be no doubt of its having been killed either in the British Islands or on the Continent of Europe. I may add that I am interested in observing, in the same number of the 'Zoologist' (Zool. 8951), a notice of the recent occurrence in Sussex of another American bird, the so-called "redwinged starling," as my collection also contains the first-recorded British-killed specimen of this bird, which was obtained several years since at Barton Turf, in Norfolk.—*J. H. Gurney; March* 11, 1864.

Notes on the Ornithology of Norfolk.

By Henry Stevenson, Esq.

The reputation which this county has always maintained as being one of the richest ornithological districts in the United Kingdom, is quite unaffected by those local causes which have of late years altered the habits of many of our resident species. Not only is its bold projecting coast-line, extending from Yarmouth on the extreme eastern point to Hunstanton and Lynn on the north-west, peculiarly favourable for the advent of all migratory species, but the variety of attractions presented by the diversity of the soil and sudden transitions from one formation to another, are such, perhaps, as can be nowhere equalled in the same extent of country. On the coast itself we find a strange alternation of sand and shingly beaches, salt marsh, cultivated land, and low sandy hills, or lofty cliffs, with rich grassy summits and thick woods, in close vicinity to the sea. Besides which, to a very large proportion of our migratory visitants, the tidal channels of Breydon, Blakeney and Lynn present, at low water, from their wide extent of mud banks, an inexhaustible supply of food; and, more inland, the shallow waters and reedy margins of the "Broads," surrounded by large tracts of luxuriant marshes, form the natural resort, both in winter and summer, of many of the aquatic tribes. To the natural advantages, therefore, of the locality itself, the fact that the number of species included in the *avifauna* of Norfolk has increased rather than diminished, of late years, is mainly attributable. Messrs. Gurney and Fisher, in their "Account of the Birds found in Norfolk," published in the 'Zoologist' for 1846, give the total number of species at that time as 277; and, even omitting one or two birds, hitherto included on insufficient authority, the total number at the present time amounts to 293. It is, however, in the nesting habits of many residents, and the absence during the summer months of others, which formerly remained to breed in this county, that we really find the changes which have been effected by local causes during the last twenty or thirty years.

Civilization and cultivation go hand-in-hand, and as the necessities of our largely-increased population demand still greater exertions to supply the required food, the wild denizens of the marsh recede before the rapid inroads of the plough, drainage on all sides narrows their boundaries, and, as surely as the waving corn crops succeed the feathery reed-stems, the call of the partridge takes the place of the redshank's whistle and the drumming noise of the snipe. Salt marshes

reclaimed, no longer afford feeding-grounds for the various wild fowl; and the very repairs necessary to prevent the encroachments of the sea are a constant source of disturbance to such species as formerly bred in the vicinity of the coast. The general enclosure of commons and waste lands has likewise, in its turn, affected other classes of birds, as well as the thinning of hedge-rows and other farming operations resulting of late years from an improved system of agriculture. To the latter cause may, in some degree, be attributed the much-to-be-regretted extinction of the great bustard in Norfolk, its last abiding place in the whole kingdom. The adoption of horse-hoeing, undoubtedly, facilitated the discovery of its nests and eggs amongst the spring corn (most of them being found in fields of rye), and the high price given for the eggs, which, for the most part, were placed under hens and hatched, with the hope of rearing the young birds, caused them to be taken whenever met with. The last bustard killed in this county was a female obtained at Lexham, near Swaffham, in 1838, the remnant of a small flock of hens, which had for some years frequented that neighbourhood; but no male birds then existing, their eggs were dropped about at random during the breeding season, and thus the whole race became entirely extinct. As an accidental migrant, can it alone be included in the "Norfolk List" at the present time, specimens having occurred here, as in other counties, which may fairly be considered as migratory visitants. Drainage and cultivation, however, but share with other causes a common result; the great increase of gunners, owing to the cheapness of fire-arms, and the ready means of transit by rail to almost all parts of the county (the iron road itself traversing between Norwich and Yarmouth some of the finest snipe marshes of former days), have done much towards completing that exterminating system which years of indiscriminate egging was fast effecting by itself. Rather may we wonder that so much still remains to the sportsman and naturalist than that so many familiar forms have ceased to appear, except as temporary sojourners on their migratory course.

There is one group of birds, however, which demands a somewhat separate notice, its persecutions arising from a very different cause. No falcon, hawk, harrier or buzzard can long expect to escape the doom of its race in a strictly game-preserving district like the county of Norfolk; and scarcely can it be said that any birds of this class but the kestrel and sparrowhawk are still resident amongst us, although the nests of all three of the harriers are occasionally found in the neighbourhood of the Broads. The tawny and barn owls are both far less common than they used to be, and the shorteared owl, though a regular

autumnal migrant, has ceased almost entirely to nest in our fens, so many of its former haunts no longer existing in their normal state. The longeared owl, on the contrary, at one time scarce, has, through the great increase in our fir plantations, become a pretty numerous resident amongst us, in spite of its nests being systematically plundered. But if the Raptores have suffered at the hands of the gamekeeper (and included alike in his list of "feathered vermin" are the raven, the magpie and the carrion crow), the smaller insessorial birds, more especially the warblers that visit us in summer, are benefited greatly through the care of the game. The dense woods afford both food and shelter, and their own little nests are safe from prying eyes, since no intruding footstep is allowed to scare the sitting pheasants. This is perhaps the only class which can really be said to have benefited by recent changes, for if the marked decrease in our birds of prey has caused a corresponding increase amongst the finches, buntings and larks, the barbarous and unreasoning system of slaughter so recently adopted, by means of poisoned wheat, bid fair to effect at one time the same lamentable state of things that now exists in France. The warning, however, received from that country has roused the friends of the "little bird" amongst us, and the various appeals in its favour that have appeared in our metropolitan and provincial journals have been happily supplemented by legislative enactments tending to the preservation of the feathered tribes. "Man cannot do without the bird" as an insect-eater, and although, when undiminished in the natural way, their numbers become a serious tax upon the farmer's corn, there are and always have been legitimate and effectual means for thinning their ranks without involving in one general massacre the useful and the mischievous—the rook and the sparrow, and often, though quite unintentionally, the partridge as well.

Whitetailed Eagle. Autumn and winter migrant.*

Osprey. Spring and autumn migrant.

Greenland Falcon. Accidental.†

Peregrine Falcon. Spring and autumn migrant.

Hobby. Summer migrant, breeding here occasionally.

Redfooted Falcon. Accidental.

Merlin. Spring and autumn migrant.

* Amongst autumn and winter migrants are included most of the gulls, but although some birds of this tribe are seen on the coast nearly all the year round, they do not (with the exception of the blackheaded gull) breed here, and cannot therefore be classed as residents.

† Accidental; very rare, or such as have occurred but a few times irregularly.

Kestrel. Resident, receiving migratory additions in autumn and winter.

Goshawk. Occasional spring and autumn migrant.

Sparrowhawk. Resident, receiving migratory additions in autumn and winter.

Kite. Accidental.

Common Buzzard. Spring and autumn migrant.

Roughlegged Buzzard. Spring and autumn migrant.

Honey Buzzard. Occasional spring and autumn migrant.

Marsh Harrier. Resident, receiving migratory additions in autumn and winter.

Hen Harrier. Spring and autumn migrant, occasionally breeding here.

Montagu's Harrier. Spring and autumn migrant, occasionally breeding here.

Scops Eared Owl. Accidental.

American Mottled Owl. Accidental.

Longeared Owl. Resident, receiving migratory additions in autumn and winter.

Shorteared Owl. Spring and autumn migrant, occasionally breeding here?

Barn Owl. Resident.

Tawny Owl. Resident.

Snowy Owl. Accidental.

Little Owl. Accidental.

Tengmalm's Owl. Accidental.

Great Gray Shrike. Irregular migrant.

Redbacked Shrike. Summer migrant, breeding here.

Woodchat Shrike. Accidental?

Spotted Flycatcher. Summer migrant, breeding here.

Pied Flycatcher. Spring and autumn migrant, occasionally breeding here.

Common Dipper. Accidental.

Missel Thrush. Resident, receiving migratory additions in autumn and winter.

Fieldfare. Winter migrant.

Song Thrush. Resident, receiving migratory additions in autumn and winter.

Redwing. Winter migrant.

Blackbird. Resident, receiving migratory additions in autumn and winter.

Ring Ouzel. Spring and autumn migrant, occasionally breeding here.

Golden Oriole. Accidental.

Hedgesparrow. Resident.

Redbreast. Resident.

Bluethroated Warbler. Accidental.

Redstart. Summer migrant, breeding here.

Black Redstart. Accidental.

Stonechat. Summer migrant, breeding here.

Whinchat. Summer migrant, breeding here.

Wheatear. Summer migrant, breeding here.

Grasshopper Warbler. Summer migrant, breeding here.

Sedge Warbler. Summer migrant, breeding here.

Savi's Warbler. Accidental.

Reed Warbler. Summer migrant, breeding here.

Nightingale. Summer migrant, breeding here.

Blackcap Warbler. Summer migrant, breeding here.

Garden Warbler. Summer migrant, breeding here.

Common Whitethroat. Summer migrant, breeding here.

Lesser Whitethroat. Summer migrant, breeding here.

Wood Warbler. Summer migrant, breeding here.

Willow Warbler. Summer migrant, breeding here.

Chiffchaff. Summer migrant, breeding here.

Dartford Warbler. Accidental.

Goldencrested Regulus. Resident, receiving migratory additions in autumn and winter.

Firecrested Regulus. Accidental.

Great Tit. Resident, receiving migratory additions in autumn and winter.

Blue Tit. Resident.

Cole Tit. Resident.

Marsh Tit. Resident, receiving migratory additions in autumn and winter.

Longtailed Tit. Resident.

Bearded Tit. Resident.

Bohemian Waxwing. Occasional winter migrant.

Pied Wagtail. Resident, receiving migratory additions in autumn and winter.

Gray Wagtail. Winter migrant.

Grayheaded Wagtail. Accidental.

Ray's Wagtail. Summer migrant, breeding here.

Tree Pipit. Summer migrant, breeding here.

Meadow Pipit. Resident, receiving migratory additions in autumn and winter.

Rock Pipit. Winter migrant.

Richard's Pipit. Accidental.

Shore Lark. Accidental.

Sky Lark. Resident, receiving migratory additions in autumn and winter.

Wood Lark. Summer migrant, breeding here.

Lapland Bunting. Accidental.

Snow Bunting. Autumn and winter migrant.

Common Bunting. Resident, receiving migratory additions in autumn and winter?

Blackheaded Bunting. Resident.

Yellow Bunting. Resident, receiving migratory additions in autumn and winter.

Cirl Bunting. Accidental.

Ortolan Bunting. Accidental.

Chaffinch. Resident, receiving migratory additions in autumn and winter.

Brambling. Autumn and winter migrant.

Tree Sparrow. Resident.

House Sparrow. Resident.

Greenfinch. Resident.

Hawfinch. Autumn and winter migrant, occasionally breeding here.

Goldfinch. Resident, receiving migratory additions in autumn and winter.

Siskin. Autumn and winter migrant.

Common Linnet. Resident, receiving migratory additions in autumn and winter.

Mealy Redpole. Autumn and winter migrant.

Lesser Redpole. Resident, receiving migratory additions in autumn and winter.

Twite. Autumn and winter migrant.

Bullfinch. Resident, receiving migratory additions in autumn and winter.

Pine Grosbeak. Accidental migrant?

Common Crossbill. Occasional winter migrant.

Parrot Crossbill. Accidental.

Whitewinged Crossbill. Accidental.

Redwinged Starling. Accidental.

American Meadow Starling. Accidental.

Common Starling. Resident.

Rosecoloured Pastor. Occasional spring and autumn migrant.

Raven. Resident, receiving migratory additions in autumn and winter.

Carrion Crow. Resident, receiving migratory additions in autumn and winter.

Hooded Crow. Autumn and winter migrant.

Rook. Resident.

Jackdaw. Resident.

Magpie. Resident, receiving migratory additions in autumn and winter.

Jay. Resident, receiving migratory additions in autumn and winter.

Nutcracker. Accidental.

Great Black Woodpecker. Accidental.

Green Woodpecker. Resident, receiving migratory additions in autumn and winter?

Great Spotted Woodpecker. Resident, receiving migratory additions in autumn and winter.

Lesser Spotted Woodpecker. Resident, receiving migratory additions in autumn and winter?

Wryneck. Summer migrant, breeding here.

Common Creeper. Resident.

Wren. Resident.

Hoopoe. Spring and autumn migrant.

Nuthatch. Resident.

Cuckoo. Summer migrant, breeding here.

Roller. Accidental.

Bee-eater. Accidental.

Kingfisher. Resident, receiving migratory additions in autumn and winter.

Swallow. Summer migrant, breeding here.

House Martin. Summer migrant, breeding here.

Sand Martin. Summer migrant, breeding here.

Common Swift. Summer migrant, breeding here.

Alpine Swift. Accidental.

Nightjar. Summer migrant, breeding here.

Ring Dove. Resident, receiving migratory additions in autumn and winter.

Stock Dove. Resident.

Turtle Dove. Summer migrant, breeding here.

Common Pheasant. Resident.
Black Grouse. Resident.
Sand Grouse. Accidental.
Common Partridge. Resident.
Redlegged Partridge. Resident, receiving migratory additions in autumn and winter.
Common Quail. Summer migrant, breeding here.
Great Bustard. Accidental.
Little Bustard. Accidental.
Great Plover. Summer migrant, breeding here.
Collared Pratincole. Accidental.
Golden Plover. Spring and autumn migrant.
Common Dotterell. Spring and autumn migrant.
Ring Dotterell. Resident, receiving migratory additions in autumn and winter.
Kentish Plover. Occasional spring and autumn migrant.
Gray Plover. Spring and autumn migrant.
Peewit. Resident, receiving migratory additions in autumn and winter.
Turnstone. Spring and autumn migrant.
Sanderling. Spring and autumn migrant.
Oystercatcher. Resident, receiving migratory additions in autumn and winter.
Common Crane. Accidental.
Common Heron. Resident.
Purple Heron. Accidental.
Great White Heron. Accidental.
Little Egret. Accidental.
Squacco Heron. Accidental.
Little Bittern. Accidental.
Common Bittern. Autumn and winter migrant.
Night Heron. Accidental.
White Stork. Occasional spring and autumn migrant.
White Spoonbill. Occasional spring and autumn migrant.
Glossy Ibis. Accidental.
Common Curlew. Spring and autumn migrant.
Whimbrel. Spring and autumn migrant.
Spotted Redshank. Spring and autumn migrant.
Common Redshank. Resident, receiving migratory additions in autumn and winter.
Green Sandpiper. Spring and autnmn migrant.
Wood Sandpiper. Spring and autumn migrant.

Common Sandpiper. Spring and autumn migrant.
Greenshank. Spring and autumn migrant.
Avocet. Accidental.
Blackwinged Stilt. Accidental.
Blacktailed Godwit. Occasional spring and autumn migrant.
Bartailed Godwit. Spring and autumn migrant.
Ruff. Spring and autumn migrant, occasionally breeding here.
Woodcock. Spring and autumn migrant, occasionally breeding here.
Great Snipe. Spring and autumn migrant.
Common Snipe. Resident, receiving migratory additions in autumn and winter.
Jack Snipe. Spring and autumn migrant.
Sabine's Snipe. Accidental.
Brown's Snipe. Accidental.
Curlew Sandpiper. Occasional spring and autumn migrant.
Knot. Spring and autumn migrant.
Buffbreasted Sandpiper. Accidental.
Broadbilled Sandpiper. Accidental.
Little Stint. Spring and autumn migrant.
Temminck's Stint. Occasional spring and autumn migrant.
Pectoral Sandpiper. Accidental.
Dunlin. Spring and autumn migrant.
Purple Sandpiper. Spring and autumn migrant.
Landrail. Summer migrant, breeding here.
Spotted Crake. Summer migrant, breeding here.
Little Crake. Accidental.
Baillon's Crake. Accidental.
Water Rail. Resident, receiving migratory additions in autumn and winter.
Moorhen. Resident.
Coot. Resident.
Gray Phalarope. Occasional autumn and winter migrant.
Rednecked Phalarope. Occasional autumn and winter migrant.
Graylegged Goose. Accidental.
Bean Goose. Autumn and winter migrant.
Pinkfooted Goose. Occasional autumn and winter migrant.
Whitefronted Goose. Winter migrant.
Bernicle Goose. Winter migrant.
Brent Goose. Winter migrant.
Redbreasted Goose. Accidental.
Egyptian Goose. Accidental.

Canada Goose. Accidental.
Mute Swan. Resident.
Hooper. Winter migrant.
Bewick's Swan. Occasional winter migrant.
Polish Swan. Accidental.
Sheldrake. Resident, receiving migratory additions in autumn and winter.
Gadwall. Autumn and winter migrant.
Shoveller. Resident, receiving migratory additions in autumn and winter.
Pintail. Autumn and winter migrant.
Wild Duck. Resident, receiving migratory additions in autumn and winter.
Garganey. Summer migrant, breeding here.
Teal. Resident, receiving migratory additions in autumn and winter.
Wigeon. Autumn and winter migrant.
Eider Duck. Accidental.
Stellar's Western Duck. Accidental.
King Duck. Accidental.
Velvet Scoter. Occasional autumn and winter migrant.
Common Scoter. Autumn and winter migrant.
Redcrested Whistling Duck. Accidental.
Pochard. Autumn and winter migrant.
Ferruginous Duck. Occasional autumn and winter migrant.
Scaup Duck. Autumn and winter migrant.
Tufted Duck. Autumn and winter migrant.
Longtailed Duck. Autumn and winter migrant.
Harlequin Duck. Accidental.
Goldeneye. Autumn and winter migrant.
Buffelheaded Duck. Accidental.
Smew. Autumn and winter migrant.
Hooded Merganser. Accidental.
Redbreasted Merganser. Autumn and winter migrant.
Goosander. Autumn and winter migrant.
Great Crested Grebe. Resident, receiving migratory additions in autumn and winter?
Rednecked Grebe. Spring and autumn migrant.
Sclavonian Grebe. Spring and autumn migrant.
Eared Grebe. Spring and autumn migrant.
Little Grebe. Resident, receiving migratory additions in autumn and winter.

Great Northern Diver. Autumn and winter migrant.
Blackthroated Diver. Autumn and winter migrant.
Redthroated Diver. Autumn and winter migrant.
Common Guillemot. Spring and autumn migrant.
Ringed Guillemot. Accidental.
Little Auk. Autumn and winter migrant.
Puffin. Occasional autumn and winter migrant.
Razorbill. Spring and autumn migrant.
Cormorant. Occasional spring and autumn migrant.
Shag. Accidental.
Gannet. Occasional spring and autumn migrant.
Caspian Tern. Accidental.
Sandwich Tern. Occasional spring and autumn migrant.
Roseate Tern. Accidental.
Common Tern. Spring and autumn migrant, breeding here.
Gullbilled Tern. Accidental.
Arctic Tern. Spring and autumn migrant.
Whiskered Tern. Accidental.
Lesser Tern. Spring and autumn migrant, breeding here.
Black Tern. Spring and autumn migrant, occasionally breeding here.
Whitewinged Black Tern. Accidental.
Little Gull. Occasional spring and autumn migrant.
Blackheaded Gull. Resident, receiving migratory additions in autumn and winter.
Kittiwake Gull. Autumn and winter migrant.
Ivory Gull. Accidental.
Common Gull. Autumn and winter migrant.
Iceland Gull. Accidental.
Lesser Blackbacked Gull. Autumn and winter migrant.
Herring Gull. Autumn and winter migrant.
Great Blackbacked Gull. Autumn and winter migrant.
Glaucous Gull. Occasional autumn and winter migrant.
Common Skua. Occasional autumn and winter migrant.
Pomarine Skua. Occasional autumn and winter migrant.
Richardson's Skua. Occasional autumn and winter migrant.
Buffon's Skua. Occasional autumn and winter migrant.
Fulmar Petrel. Occasional autumn and winter migrant.
Capped Petrel. Accidental.
Manx Shearwater. Occasional autumn and winter migrant.
Great Shearwater. Accidental.

Dusky Petrel. Accidental.
Wilson's Petrel. Accidental.
Forktailed Petrel. Accidental.
Storm Petrel. Occasional autumn and winter migrant.

HENRY STEVENSON.*

Notes on 'Stanton Grange; or, at a Private Tutor's.' †
By JOHN RANSON, Esq.

THE Rev. J. C. Atkinson, M.A., author of 'Birds' Nests and Eggs,' &c., has just published another volume with the above title: it is, I am sorry to say, disfigured with various slang expressions, such as "lumbering thickhead," "considerable lubber," "blurted out," "auld scrap," &c. The title gives no idea of the contents of the book; indeed, the second title is calculated to mislead, for the book does not contain a single expression about the advantages or disadvantages of a private tutor. The plot of the book, such as it is, is very badly managed, and the episode of "Peter the Assassin" adds nothing to its interest. Notwithstanding all this, the facts in Natural History, which are interwoven into the narrative, are told with great power, and they alone redeem the book from being dull, for nothing on Natural History, if it comes from Mr. Atkinson's pen, can be dull.

The perusal of this little book has recalled to my memory many little facts and pleasant adventures, some of which I here present under the title of notes.

Birds laying to Death. When I was a boy there was a tradition abroad among juvenile bird-nesters that a "cuddy" (a Yorkshire name for the hedgesparrow) had laid herself to death. I once took eighteen eggs from a hedgesparrow's nest, by one at a time, always leaving a nest-egg: how many the bird would have laid I do not know, for some other nester pulled the nest out. In 1854 two young gentlemen who were under my care, robbed a magpie's nest in some firs at the bottom of my garden: they got out of the nest, the first time, five eggs, seven the second, and five the third time, when I forbad them plundering it any more, and the old birds eventually got away with six young ones. In 'Stanton Grange' (p. 7) the fact

* Reprinted from White's 'History and Directory of Norfolk.'

† 'Stanton Grange; or, at a Private Tutor's.' By the Rev. J. C. Atkinson, M.A. London: Sampson Low.

of twenty-seven eggs having been taken from the nest of a wryneck is mentioned.

Water Ouzel's Nest. I never but once found a water ouzel's nest, and that was in 1854, upon the banks of the little River Seven, which runs through Rosedale, North Yorkshire. I was fishing in a very retired part of the river when an ouzel popped out, within three yards of me. I spent considerable time in looking for the nest, and was at last rewarded by finding it: it was under a projecting slab of stone, which hung a foot over the nest, and there was scarce room to pass my hand between it and the stone: the nest contained eggs, which felt as if hard set, for I did not disturb it.

Loistering. At page 26, spearing eels by the light of a fire is mentioned. Some years ago I was very innocently drawn into an unlawful taking of trout near Harrowgate. Two men got into the Beck, each with a tin, like a bread-tin, containing three candles each; the trout were attracted by the light, and when they met the quick eyes of the two men a push was made at them with a fine steel comb fixed at the end of a pole, about three feet long. In this way, in a remarkably short time, above three hundred fine trout were captured. One of the keepers was present, and got his share and a few over.

Rats. In spring, when the farm-yards are generally cleared, the rats migrate to the fields, and making their holes in banks, breed there. I can bear witness to the destruction they cause in a field. One of my neighbours had a bean-field that was bounded by a brook, the banks of which they soon colonized, and as soon as the beans were set they commenced plundering them; they stripped the stems of the pods, extracted the beans and left the pods, and in this way bushels were destroyed.

Bite of the Adder. In my early days I was acquainted with a viper-catcher, who always carried a flask of Florence oil with him as a remedy: it was used to rub the wound, and was also taken internally. He used to tell me of a brother adder-killer who lost the use of an arm from the bite of one.

Red Field Mouse. During the autumn of 1861 I planted a pint of Mazagan beans, on a sheltered border, for an early crop. Before they appeared above ground something removed them all: my gardener blamed the blackbirds. Some time after I was removing a pit of wurzel, when out jumped a red field mouse, who fell a victim under the spade; in a minute after out jumped another, which escaped. When the whole of the earth and straw were removed from off the wurzel, there lay my beans piled up in a nice heap, close

by a compact nesting-place made of wicks. The distance of the store from the place where they were planted was forty-nine yards. (See page 113.)

Hedgehogs and Arsenic. I was never partial to trying experiments on animals, but I have frequently known arsenic to be given to hedgehogs, without any serious results. (See page 221.)

Robin. In 1863 a robin built a nest among currant-bushes: when the first brood flew, the old birds cleaned out and repaired the nest, and reared another brood in it. (See page 225).

Mobbing an Owl. If an owl chance to stray away in the day-time, he is sure to be the centre of attraction to all the little birds about, who buffet him well, peck at him, and give him what my countymen call "a good calling." I have twice been witness of an owl-mobbing. French sportsmen (?) often get a tame or stuffed owl, which they put up in some conspicuous place, as a lure for the small birds, who are thus drawn within gun-reach of the hidden sportsmen. (See page 227.)

Carrion Crow. This bird is becoming very scarce in some localities. The farmers' wives on the Yorkshire Wolds and Moors are well acquainted with the fact of the carrion crow being a wader for ducks' eggs. The rook will also destroy the eggs of pheasants and partridges.

Eggs of the Tree Sparrow. I have never been able to see any great variety, either in the shape or colour, of the tree sparrow's eggs; but those of the house sparrow are subject to great variety, both in shape and colour. The tree sparrow is quite common here (Linton-on-Ouse), and should any readers of the 'Zoologist' want specimens I will send them some for the postage.

JOHN RANSON.

York, March, 1864.

Correction of an Error.—There is an important error in the bottom line of page 8964 of the 'Zoologist,' which I will thank you to correct. We are all of us liable to mistakes, and I may have made such a stupid blunder as to write "Falco islandicus" for "Falco candicans." The latter name stands, however, in the rough copy of my note (now before me), and so it should do in the place I have quoted from the 'Zoologist.' If I was the culprit, I can only say I am very sorry for it.—*Alfred Newton; Magdalene College, Cambridge, March* 5, 1864.

Rare Birds near York.—The following rare birds have occurred near here and have been sent to me for preservation:—Three bitterns: one shot at Wassent, near Borsdey; another at Londesborough, near Market Weighton; and a third at or near Church Lintern. A goshawk, shot at Oswald Birth. Two goosanders: one at Sutton-on-Derwent; the other at Newby Park, or near there; both fine old males. A female specimen of Barrow's goldeneye, shot at the mouth of the Derwent: I am not aware

that this bird has before been noticed as being killed in England: I found them very plentiful in Ireland, about Newtown, when there, in 1844, with Mr. H. Melville.—*David Graham; Market Street, York, February* 13, 1864. [I feel very doubtful as to the names, but have done my best for them.—*E. N.*]

The Common Kite.—It may be interesting to the readers of the 'Zoologist' to know that the common kite (*Milvus regalis*) has not become quite extinct. On the 20th of February I saw a splendid skin of this species, sent to a taxidermist to be preserved, which was shot in Wiltshire, near Longleat. It is more than twenty years since I have seen a living bird, and only two skins during that period: they have become exceedingly rare in England. In Morris's 'History of British Birds,' I find one was seen in Hornsey Wood, in 1833, and another, in 1844, near Barnsley. When I was a boy, living in Hampshire, near Romsey, a pair of birds had a nest in a very high oak tree, standing in a wood, not far from our dwelling. This nest was occupied two years in succession, after which I saw no more of the birds. There is reason to fear that the keepers destroyed both old and young. Many of our British birds are becoming very rare, and even our summer visitants do not appear in such great numbers as they did some thirty years ago. Can any reader of the 'Zoologist' give a reason for their diminished numbers?—*J. J. Fox; Devizes, March* 1, 1864.

Osprey, Kite and Little Bustard in Devonshire.—A fine female specimen of the osprey was shot at Slapton Ley, where it had been seen fishing for roach and perch for several days previously. I have also received a male specimen of the kite, which was shot at in the cliffs adjoining the sea, and was taken wounded the following morning. Since this a female specimen of the little bustard has been sent me by Lieut. Pearce, who shot it about a fortnight since on the high open lands adjoining the sea-coast adjacent to the Start Lighthouse.—*Henry Nicholls, jun.; Kingsbridge, March* 21, 1864.

The Osprey in North Wales.—A fine osprey was shot last week in the adjoining parish of Llandrillo, by one of the gamekeepers of Croggen, the seat of the Earl of Dudley; it was of large size, and had been seen haunting the neighbouring Berwyn Mountains for some few weeks past, and occasionally visiting the outlying farms all around here; and about the time of the severe snow-storm which we had in the early part of this month, it was seen on the lands of Ty Cerrig, closely adjoining the Church of Llandderfel.—*William Pamplin; North Wales Central Botanic Gardens, Llandderfel, Merionethshire, March* 26, 1864.

Anecdotes of Hawks.—In the 'Zoologist' (Zool. 8875) is recorded the singular capture of a hawk in pursuit of a small bird. A similar instance came under my notice a short time ago: whilst my uncle was fishing in the River Avon at Stratford-sub-Castle, in Wiltshire, early in November, he observed a hawk pursuing a bird; in a few moments, either from having been struck by the hawk or from fear, the bird, which was a thrush, fell within a few feet of the spot where he was standing: the hawk, unwilling to lose his victim, came headlong after it, and the person who was with my uncle struck it with his fishing-rod, and in this manner disabled it sufficiently to make an easy capture of it: on examination the hawk proved to be a male kestrel, and is now in my possession. Another instance of the boldness of this species occurred in December last: whilst my brother, Dr. H. P. Blackmore, was driving along the turnpike-road near Wilton, about three miles to the west of Salisbury, he noticed a sparrow busily engaged in the road looking for food; his attention was soon after attracted to a hawk, which he saw flying towards the road: with that

instinct, innate to its species, the hawk quickly descried its victim, and with the swiftness of lightning swept down on the unfortunate sparrow, and bore it off in triumph, almost within reach of my brother's driving-whip: this incident happened in the after part of the day, just as the light was beginning to wane, but my brother quite satisfied himself that the hawk was a kestrel, and from its size he thought it must have been a female.—*Henry Blackmore; Salisbury, March*, 1864.

On the Redwing singing in England.—With reference to the observation appended to my note on the redwing singing in England (Zool. 8946), I beg again most positively to assert that on many occasions, and under the circumstances already recorded, which must have rendered any mistake impossible, I have heard the redwing in full song in Oxfordshire. After more than twenty years' experience as an ornithologist, it can scarcely be thought necessary for me to ask the opinion of any person as to the difference between a redwing and a song thrush. Any one conversant with the habits of these birds will know that they do not usually associate together, and least of all are they likely to do so at the time when the redwings are assembling for their vernal migration. Moreover, the food of the two species is essentially different; that of the redwing consisting of berries and hedge-fruit, while the song thrush subsists chiefly on snails, worms and other small animals. Although I cannot take upon myself to say that either species restricts itself exclusively to its own proper food, yet this difference must act, in a great measure, as a bar to their association.—*A. Matthews; Gumley, Market Harborough, March* 19, 1864.

Redwing singing in England.—The Rev. A. Matthews, in speaking of the song of the redwing, says, in the 'Zoologist' (Zool. 8946), that it was very little inferior to that of the song thrush, and adduced what appeared to him unmistakeable evidence of being so, from having secreted himself in a wood and watched them; nay, more, on one occasion shot one in the act. *Query:* may not this identical bird have been a specimen of our native song thrush, and may not others of this species have congregated with the redwings, and so have been mistaken by Mr. Matthews? The redwings do, however, sing or chatter not very unlike starlings, which assemble in large flocks in the autumn, and keep up a kind of jargon (to me very agreeable) just before going to roost. I have for fifty years observed the character and habits of the redwing, and could never discover any song approaching the song of the thrush, either in quality or quantity; and Bechstein says, "The song of the male bird is as inharmonious as that of the fieldfare. These birds," he continues, "make a great noise when they are collected in large flights upon the alders in March and April; but their warbling hardly deserves the name of song." This, I confess, is my experience, and I do not believe I am mistaken.—*J. J. Fox; Devizes, March* 7, 1864.

[This communication very closely corresponds with the passage in my own history of the redwing, which first originated the discussion. I am quite willing to admit that negative evidence cannot be fairly weighed against positive evidence like that of Mr. Matthews; but it is a little remarkable that Mr. Doubleday (whose very decided opinion I have not printed), Mr. Yarrell, Mr. Bond, Col. Newman, Mr. Fox, Mr. Bechstein (to say nothing of myself), all of whom have made this a special object of inquiry, should have never detected a redwing in the act of singing: it certainly tends to show that the singing is very exceptional and not the normal habit of the bird, as in the case of the song thrush.—*Edward Newman.*]

Black Redstart at Eastbourne.—A fine specimen of the black redstart (*Sylvia tithys*) was caught here by a bird-catcher on the 9th of November, 1863; a splendid adult

male was also procured at Birling Gap, on the 16th of December: both birds I examined in the flesh.—*John Dutton; Eastbourne, March* 19, 1864.

Wheatears in March.—It would appear that some wheatears do remain with us here in North Wales through the winter months, for I noticed a pair of them in the neighbourhood of Bala about the middle of this present March.—*William Pamplin.*

Wheatear near Eastbourne in March.—A fine specimen of the wheatear was shot by a friend of mine, while we were out rabbit-shooting, on Wednesday last, the 16th of March. Is not this unusually early?—*John Dutton; Eastbourne, March* 19, 1864.

The Query respecting the Robin.—Probably a few birds of most of the native species may migrate, but the habits of the robin are very easily discovered. Mr. Blake-Knox (Zool. 8947) is of my opinion entirely as to the libel on the robins killing their parent birds. In England the main body of these birds forsake their winter haunts, and go further into the secluded parts of the country, and probably the males may keep closer together in winter than the females, although they never appear in flocks, like the chaffinches. But there is one great difference between the English and the Irish robin, as Mr. Blake-Knox avers, "Neither does the robin, from choice, seek man's habitation, either in winter or summer." This is quite contrary to the habits of our English bird, as I have often, in severe weather, admitted robins into my house, from their apparent voluntary wish to enter. Robins will also enter churches in England in winter, and stay a month or six weeks quite contented, provided they have water given them. It must be remembered that the winters in Ireland are much milder than in England. The robin is greatly venerated, even by boys, in England. Mr. Reeks's observation of the scarcity of the robin does not hold good here: the separation of the sexes I have not noticed at all.—*H. W. Newman; Hillside, Cheltenham.*

Notes on the Robin.—Touching the habits of the robin, I quite agree with Mr. Ranson (Zool. 8843) that it is a mistake, notwithstanding the great weight of Macgillivray, to imagine that it retires from the vicinity of man for the purpose of nidification. Last year I found five or six nests, none of which was above one hundred and fifty yards from dwelling-houses: three of these were on the open ground among grass. In my neighbourhood the robin is abundant; I have seen five together this winter. I do not coincide with Capt. Hadfield (Zool. 8878) when he insinuates that the supposed comparative scarcity of the species might be the consequence of the want of "green lanes, mossy banks, hedge-rows and ivy-grown walls wherein to build their nests." In the East Riding of Yorkshire, and in a great part of the West Riding, green lanes and luxuriant hedge-rows are distinctive features that we are proud of; and in the North-West I can testify that walls, crags and trees, thickly clad with ivy, are not uncommon: walls here, it is true, divide the fields instead of green fences, but they cannot be considered unfavourable to a bird that is partially a wall-builder. I suppose our county is considered "the North" in the Isle of Wight. Again, I cannot concur with the gallant writer when he assumes that three pairs would rear thirty-six young ones in a season. My own opinion is that the robin, bearing in mind the many dangers the eggs and young, in common with those of most other birds, are exposed to, will not on an average rear more than four at a brood.—*G. Robert Lofthouse; Wakefield, February* 20, 1864.

Migration of the Goldencrested Wren.—That the goldencrested wren arrives on this coast about the beginning of October, in large numbers, as stated by Mr. Norman (Zool. 8950), I have no doubt. Living on the east coast of Lincolnshire, nearly

opposite Spurn Point, I have for several years closely watched the arrival and departure from this neighbourhood of our migratory birds. I find, on referring to my note-book, that on the 12th of October, 1863, I observed large numbers of the golden-crested wren on the few scattered hedge-rows and bushes in the open marsh country near the Humber; many on the reeds in the drains; and at a lonely farmstead, close to the Humber, quantities of these active little fellows were busily searching up and down on the fold-yard fences, in the old sheds and on the stacks. In all these localities I have never seen a single specimen at any other time during the year. A day or two afterwards they had all disappeared.—*John Cordeaux; Great Coates, Ulceby, Lincolnshire, April* 4, 1864.

Tree Sparrow near Eastbourne.—Four specimens of this moorland sparrow were brought to me on the 8th of January last, shot near here: they are not uncommon during the winter, and congregate in small flocks.—*John Dutton.*

Further Capture of Hawfinches near Beverley.—Since my last communication (Zool. 8884) relative to the occurrence and dissection of the hawfinch (*Fringilla coccothraustes*), I have had the opportunity of examining five more specimens of this singular bird. Two were shot by Mr. Eaton, of Beverley, in the "Pits" on Westwood, a common adjoining the town; one on Friday, December 11, 1863, and the other on the following Monday. These "Pits" are of ancient date, and are now thickly studded over with large hawthorn bushes, mixed up with the sloe and other brushwood. The birds were taken to Mr. R. Richardson, of Beverley, for preservation, at whose house I saw and dissected both specimens. The first proved to be a young male of the year, and the second an old male, in splendid plumage. The contents of the gizzard in both specimens I found to be precisely the same, consisting of the kernels of the sloe or bullace, mixed up with small fragments of the fruit-stone: the organ in each was quite full of this food, which was in various stages of trituration. On the 8th instant three other specimens of the hawfinch were brought to Mr. Richardson for preservation: they had been shot by Mr. Smelt, of Beverley, in the same Pits whence the other specimens were obtained. I dissected all three specimens: The first was a mature male; the gizzard was full of the kernels of the sloe, more or less broken and mixed up with fragments of the fruit-stone: the second was a young female, and the third a young male, whose gizzards contained an exactly similar mass of food to that found in the gizzard of the other bird. Thus far, in every specimen of the hawfinch I have dissected, the food has proved to be the kernel of the sloe or bullace, and this alone. In no instance had the bird swallowed the outer flesh of the fruit; and in every case the only triturating aids taken with the food were small fragments of the fruit-stone.—*W. W. Boulton; Beverley, January* 13, 1864.

Contents of Crop and Gizzard of Hawfinch.—I feel much obliged to Mr. Tyrer (Zool. 8951) for communicating the results of his dissection of a hawfinch. It is only by a careful series of dissections and observations, and a comparison of notes amongst students of Nature in various localities, that the certainty and uniformity of any habit, &c., amongst the lower animals can be correctly ascertained. I trust Mr. Tyrer will excuse my offering one or two suggestions that have occurred to me since reading his communication. First, then, Mr. Tyrer remarks that on dissection his bird's crop "proved to be empty, but his gizzard was quite full of the kernels of plums or damsons (not sloes)," &c. The hawfinch in question is stated to have been shot "at the close of last month," and, as Mr. Tyrer's communication is dated "January 13, 1864," it must have occurred at the end of December, 1863; at which

period how or where could the bird have found a supply of plums or damsons? In consequence of their value these fruits are usually gathered before they are fully ripe, so that comparatively few are lost by dropping from the trees, and these few would, in the intervening lapse of time, have become so trodden into the soil, or covered with compost of various kinds, that the stones would be hard to find. Now the wild plum, bullace, or "sloe," as we here term it, is very late in ripening, and when fully ripe and fallen is less liable to be lost than the garden-plum, besides which the fruit-stone will often be found adhering to the stem long after the fleshy portion has been removed. Moreover, the hawfinch is a wild, shy bird, and frequents woods, plantations and coppices, rather than gardens, and consequently meets with the wild fruit more naturally and readily than with the cultivated. May not the kernels found in the gizzard of Mr. Tyrer's specimen be, after all, those of the bullace or sloe? Mr. Tyrer goes on to say that, in addition to these kernels, he found "a quantity of flint-grit; not a single piece of the broken fruit-stone." Did Mr. Tyrer submit this apparently flint-grit to the powers of a lens or magnifying-glass? Trusting to my naked eye, I once thought that the kernels in the gizzard of a hawfinch I dissected were mixed up with a quantity of flint-grit; but, on carefully examining these semi-transparent particles with a magnifying-glass, they proved to be, without exception, minutely broken portions of the fruit-stone. I cannot help thinking that if Mr. Tyrer thus tests the apparently flinty grit found in the gizzard of his hawfinch, he will be induced to reconsider his first decision as to its nature. I do not wish it to be supposed for one moment that I consider it unlikely or even unnatural that a hawfinch should have swallowed grit with its food. The hawfinch is a bird with a true gizzard, and therefore must swallow foreign substances to aid the organ in crushing its contents. These aids play as important a part in the digestive process of birds as the teeth do in that of animals, and are just as necessary to complete and perfect assimilation. Nature most wonderfully accommodates herself to circumstances, and although I could never find that caged hawfinches swallowed the grit offered them, I have no doubt that were they compelled to live on the buds of trees or softer food than we have found them selecting in a state of nature, they would eagerly substitute grit for the broken fruit-stone. I still think, however, it will be found, as a rule, that birds living on either the flesh or kernel of stone-fruit will prefer the stone of the fruit on which they have fed, either whole or broken, according to the part selected for food, rather than any other hard substance, as an aid to the digestive function. In reply to Mr. Tyrer's inquiry as to the nature of the soil about Beverley, it is rich loam and clay on chalk and gravel.—*W. W. Boulton; Beverley, March* 10, 1864.

Hawfinches near Eastbourne.—Several hawfinches have been killed here within a few days. One in my possession met his death by striking against the lantern of the lighthouse called "Bell Tont," near Beachy Head, in December last.—*John Dutton; Eastbourne, March* 20, 1864.

Note on the Yellowhammer's Nest.—On the 8th of May, 1862, I found the nest of a yellowhammer (*Emberiza citrinella*) at Kingsbury, in a tall, thin hedge, and nearly six feet from the ground; it contained two eggs. In this hedge also, a few yards off, I found, on the same day, another nest placed even higher up, but, as it contained no eggs, the species is hardly certain, though the nest apparently differed in no way from the other.—*Charles B. Wharton; Willesden Green.*

Food of the Rook.—One word in answer to Col. Newman and Capt. C. J. Cox, who write in the 'Zoologist' (Zool. 8951, 8952) on the food of rooks. I did not mean

to make any attack upon, or to give a bad name to, the rooks, of which we have a great number in this neighbourhood; and I am quite sure, from experience, that they do much more good than harm, though, on account of their omnivorous propensities, they undoubtedly do mischief at times, and get blamed for more than they really do. That it was a rook, as mentioned by me (Zool. 8885), that was feeding on the young rabbit, I am perfectly certain, as I got quite close, within about half a gun-shot, and could distinctly see the rough white skin round the base of his beak: had I entertained any doubt on the subject, I could easily have shot him, as I had a gun in my hand at the time. Were further evidence necessary, the fact of his joining a flock of rooks in the next field, some of whom till frightened by me were in the same field, and close by the rabbit-eater, I think conclusive, as I do not believe that crows ever associate so intimately with rooks. I certainly considered both the rabbit and the sand-eel very unusual food for rooks, and made a note of what I had seen when I returned home, from which I copied.—*Cecil Smith; Lydiard House, near Taunton, March* 14, 1864.

[I never doubted Mr. Smith's bird was a rook: I always conclude that no one would venture an opinion on such a subject who did not know a rook from a crow.—*E. Newman.*]

Food of the Rook.—Col. Newman mentions, in the 'Zoologist' (Zool. 8952), the fact of rooks eating eggs as an extraordinary circumstance, only to be accounted for by the great scarcity of water. I have several times seen a number of rooks plundering a duck's nest by the side of a pond, and short work they made of the eggs: my attention was drawn by a number of rooks (upwards of twenty) cawing and fighting for the eggs, which were laid amongst rushes close to the water's edge. I suppose the nests were discovered by some of the birds going to the pond to drink. Some years ago I saw three rooks (not carrion crows) attack a missel thrush's nest, and, in spite of the indignant clamour of the owners, carry off the eggs to a neighbouring rookery. That rooks will eat carrion freely I have seen many proofs, and have used it as a bait when wishing to shoot some of them, and once killed six at one shot, feeding on a piece of dead calf.—*Joseph H. Ellis; Leicester, March* 19, 1864.

Abundance of the Kingfisher in Lincolnshire.—The kingfisher has been unusually plentiful in this neighbourhood this winter, more particularly, however, in the months of October and November. When out shooting, I have repeatedly seen these beautiful birds, and in many drains and places where I have never in previous seasons noticed them. A few pairs remain here during the summer, but few compared with the number that have visited us this winter.—*John Cordeaux; Great Coates, Ulceby, Lincolnshire, April* 4, 1864.

Arrival of the Wryneck.—I had a wryneck sent me from Sidlesham on the 19th instant: this is about a fortnight before the usual time of its appearance here.—*W. Jeffrey, jun.; Ratham, Chichester, March* 22, 1864.

Arrival of Cuckoos, Nightingales and Swallows.—All I can say in reference to the very numerous records I have received of such events prior to the middle of March, is that I cannot print them unless their authenticity is vouched for by some ornithologist with whom I am personally acquainted. Without denying the possibility of such occurrences, I must decline the responsibility of publishing them.—*Edward Newman.*

The Willow Grouse and Red Grouse.—I have just been reading Mr. Reeks's communication (Zool. 8955), and shall here offer a few remarks in reply to that gentleman. I certainly have not seen Mr. Wheelwright's letters in the 'Field,' for I do not

see that paper, but have recently read his very interesting work on Lapland. The conclusions, however, of Mr. Wheelwright I cannot by any means agree to. It is unnecessary here to repeat the reasons I before gave, in the 'Zoologist' (Zool. 8868), when discussing the subject of identity of the two birds; but there are points of distinction in their habits, quoted by Mr. Reeks, which require a few remarks. Mr. Reeks asks whether any one has seen the red grouse perch on a tree: I never did, nor was I aware that the willow grouse perched; indeed I never saw the bird in the neighbourhood of trees. If the bird really does perch in trees, the fact goes strongly against my views. The nesting of the willow grouse in the forest I know nothing of: as I have stated, I never saw the bird in anything that could be called a forest, but only on the elevated fjelds, with occasional thickets of willow, birch and juniper, which correspond with our upland moors. Mr. Reeks then asks "whether any one has ever known the red grouse frequent, even accidentally, small birch, willow or fir forests, lying remote from moors?" In reply to this, I have repeatedly, on the Yorkshire Moors, both sprung and shot this bird from low thickets of birch, willow and bracken, lying on the low sheltered parts of the moor, where such vegetation frequently occurs, especially where a stream runs. I may here mention, with regard to the partiality of the willow grouse to forests, if such really be a fact, that on our moors, the ling and heather is much more frequent, taller and more robust, than on the Norwegian fjelds, and that, for lack of this necessary cover, the willow grouse may select coppices and forests of birch and willow. I have spent days together in forests of fir, birch and pine, but I certainly never came across willow grouse in such situations. Mr. Wheelwright certainly errs in saying that the willow grouse is never seen on the open moors and fjelds, for I have seen them in such situations on the Doure, quite as frequently as amongst the thickets of willow and juniper. Then, again, the red grouse may be partial to dry situations, but it by no means avoids wet and swampy places, a fact that most shooters are aware of; indeed it is a notorious fact, that during the heat of the day such places are far more likely to yield a bag than the drier parts of the moor. Touching the matter of the eggs, as a means of clearing up this dispute, I must acknowledge I am but little versed in the subject, and merely throw out the hint for those learned in this department, for them to make use of or not, and have now, I think, said all I know of the matter, and must leave the question to those far more competent than myself for settlement.—*George Norman; Hull, March* 1, 1864.

The Red Grouse and Willow Grouse.—In the editorial note (Zool. 8955) appended to the communication of Mr. Reeks upon the grouse question, it seems to me that scarcely sufficient value is accorded to the observations of Mr. Wheelwright; for, although there may be nothing in them that is likely to settle the question, yet the comparative difference of the habits of two closely allied species may be of some value; certainly, according to my experience, of more value than a comparison of their eggs, so much contended for by the Rev. A. C. Smith,—that is, if we are to judge by the eggs of other closely allied species. I may mention a case that came under my own observation: about twenty-five years since, while exploring the upper marshes of the Solway, my attention was attracted to a large colony of terns hovering over a particular portion of the marsh, at some distance; on reaching the place, I found it to be their breeding-ground, and upon examination I found a great many nests, or, I should more properly say, a great many deposits of eggs, for they make no nest, merely selecting a depression in the turf: upon examining these eggs, I found them to differ,

both as to ground-colour, disposition of markings, and even in shape, in the same nest: while making these observations, I heard a difference in the voices of the host of birds overhead; by paying a little more attention, I found that two or three outsiders had a short crisp note; one of these I brought down; it was a roseate tern. I next select others from the main body of the host, whose notes were somewhat more prolonged, but still harsh and clear; on shooting two or three of these I found them to be arctic terns: the more prolonged and nasal cry of the majority of the birds, I found when shot to proceed from the common terns, for I shot two or three of each species here enumerated to satisfy myself, and, to judge by the excitement displayed by all at my presence, I am persuaded they—that is, each species—had deposits of eggs laying round me, yet I doubt if the most skilful oologist could have successfully separated the eggs of any particular species from the others. Many years afterwards I found a small colony of arctic terns upon a bare rock in the Sound of Harris, in the outer Hebrides; the eggs presented the same variety as those above mentioned. These variations may not exist in the eggs of those grouse, but, should they closely resemble each other, it could not be admitted as a positive test of the identity of species. The best way of testing the matter would be to have the Norway grouse introduced into Scotland: a few generations (of grouse I mean) would settle the question.—*James Cooper; Museum, Warrington, March*, 1864.

Bittern near Beverley.—On the 19th of February last a very fine old male specimen of the bittern was shot on Hornsea Mere, a lake of considerable extent, about twelve miles from Beverley, and between one and two miles from the sea. Another, probably the female, had been shot on the same water a short time previously. The male bird is in my collection; I had it in the flesh and dissected it. The stomach contained two young pike, one seven and the other eight inches long: both fish had been swallowed (as I believe is always the case in predacious birds that swallow their prey whole) with the head directed downwards, and apparently about the same time, for both fish were nearly equally acted upon by the digestive solvents of the stomach: the skulls of these fish were both perfectly denuded of flesh and integument, and the bones themselves separated one from another: the skin and flesh of the shoulder was quite pulpy; that of the back, sides and belly so far softened as to slip off easily on being touched with the finger; but that of the caudal third, and the tail itself, was scarcely acted on at all, and retained the consistency and appearance of the fish when fresh. The intestine measured 8 feet 4 inches in length from pylorus to anus. The bird was altogether larger than the female specimen I recorded in the 'Zoologist' (Zool. 8961), and which was shot on the 4th of January, on the River Hull. I have preserved the lower jaw of one of the pike taken from the bird's stomach, also the stomach itself and the intestine, in case any of the readers of the 'Zoologist' might like to examine them further.—*W. W. Boulton; Beverley, March* 9, 1864.

Bittern at Eastbourne.—Three specimens of the bittern have been shot in our marshes during December and January; one, on the 15th of January, a great beauty, which I saw and examined.—*John Dutton; Eastbourne, March* 19, 1864.

Ruddy Shieldrake, Spotted Sandpiper and Bittern near Epworth.—In the last week of January a fine specimen of the ruddy shieldrake was taken in Capt. Healey's decoy, near Ashby; and single specimens of the spotted sandpiper and bittern have been shot here within the last few days.—*Samuel Hudson; February* 18, 1864.

Pintail, Longtailed and Scaup Duck at Eastbourne.—On the 27th of February a friend of mine shot a beautiful male and female of the pintail on the Crumble Pond:

the female was alive when I saw it. A beautiful female of the longtailed duck was killed with a stone by a farmer, while it was swimming on a small pond near Polegate, in January last: what could have brought this rare visitant to the said pond I cannot imagine. Scaup ducks have been unusually plentiful.—*John Dutton.*

Variety of the Common Wild Duck.—I have just examined, in the flesh, a variety of the common wild duck (*Anas boschas*), a female, killed in the Humber, near Ferril Sluice. The whole of the under parts are pale buff, on the neck and upper part of the breast slightly streaked with pale brown; sides of the head pale buff; upper part of the head and neck pale brown, streaked down the centre of each feather with darker brown; back, scapularies and upper tail-coverts pale slate-colour, each feather broadly marked down the centre and margined with pale chestnut; tail light sandy colour, the middle feathers slightly darker down the centre. The wings have the primaries pale gray, the outer webs darker; secondaries pale slate-colour on the inner webs; the outer webs dark gray; tips white. Tertiaries uniform pale slate-colour; greater wing-coverts pale slate-colour, barred across near the tips with white; tips pale slate-colour; upper wing-coverts pale slate-colour, slightly tinged with brown. The entire plumage of this duck is remarkable for its subdued pale tint; there is a complete absence of the speculum, or beauty-spot, on the wings. The bird was in fine condition, and very fat.—*John Cordeaux; Great Coates, Ulceby, Lincolnshire, March* 26, 1864.

Ferruginous Duck in Radnorshire.—I send you a short account of the ferruginous duck (*Fuligula nyroca* of Selby's 'British Ornithology' and Jenyns' 'British Vertebrata'). Specimens of this bird appear to be rare even in the eastern counties of England, and I have never seen or heard of another specimen having been found so far to the westward as this county (Radnorshire). This specimen, which is either an adult female or the young of the first year, appeared first on a pond of mine in the winter of 1859, and remained on the pond till February, or, I think, March of the following year 1860. It did not appear to be wild, and I was able to examine it with a pocket telescope on the water: now and then, if approached very near, it took flight, but only to settle again at a short distance on the pond, which is a small one. The white bar on the wing was very distinctly visible in flight. I would not have it molested, as I do not allow any birds to be destroyed. I did not see it on the pond later than, I think, March, 1860.—*Harford J. Jones Brydges; Boultibrooke, February* 22, 1864.

Tufted Duck near Salisbury.—I purchased, in the flesh, a short time ago, a good male specimen of the tufted duck (*Anas fuligula*); it was shot on the River Avon, a few miles to the north of this city, on the 4th of February, 1864. About the same date last year, I obtained a female, which was shot on the same river, near Breamore, about nine miles to the south-east of Salisbury. These are the only specimens of this species that have come under my notice in this neighbourhood.—*Henry Blackmore; Salisbury.*

Smew near Eastbourne.—A beautiful adult male specimen of the smew (*Mergus albellus*) was shot, about a month since, at Cuckmere Haven. It is in my collection. —*John Dutton; Eastbourne, March* 20, 1864.

Dusky or Sclavonian Grebe near Selby, Yorkshire.—On the 20th of February a female specimen of the dusky or Sclavonian grebe (*Podiceps cornutus*) was killed on the River Ouse, near Selby, by a bargeman. It was sent to me in the flesh, and I dissected it. The gizzard contained vegetable matters far advanced in maceration,

the remains of a few water-beetles, and a considerable mass of feathers plucked from the bird's own breast.—*W. W. Boulton; Beverley, March* 1, 1864.

Sclavonian or Dusky Grebe near Salisbury.—An excellent female specimen of the Sclavonian grebe (*Podiceps cornutus*) was brought to me, in the flesh, last month; it was shot in this immediate neighbourhood on the 19th of January, 1864. I never recollect seeing a more beautiful vermilion-red colour than the irides were when first it came into my possession: the bird was in very good condition, and well shot for preserving. I cannot learn that this species has been previously met with in this neighbourhood.—*Henry Blackmore; Salisbury.*

Eared Grebe on the Humber, near Hull.—On the 20th of February a female specimen of the eared grebe (*Podiceps auritus*) was sent to Mr. R. Richardson, of Beverley, for preservation; it was in the flesh, and I dissected it, proving it to be an immature female. It had been shot on the Humber, near to Hull, and was offered for sale at a fish and game shop in Hull.—*W. W. Boulton; Beverley, March*, 1864.

Gargany Teal at Flamborough.—The other day I received a very good male specimen of this charming little duck from Mr. Bailey, of Flamborough, on the east coast of Yorkshire: it was in the flesh, and had been shot, on the 19th of March, by Mr. Robert Barkley, of Flamborough, near to that place. I have never before seen one of these ducks in the flesh, although I have no less than three other specimens, one of which was shot on our own River Hull, some years ago. In the Lincolnshire decoys this duck is not unfrequently taken, and a stray specimen occasionally finds its way to the Hull Market with other ducks; nevertheless, I have not before seen a specimen in the flesh that had been shot in the East Riding.—*Id.*

[These beautiful little ducks have been unusually abundant in Leadenhall Market, the price varying according to the apparent eagerness of the buyer: two shillings each for very perfect specimens is the highest price I have heard asked. There is no longer any possibility of ascertaining the country of birds offered for sale in our markets; formerly the locality could be traced without much difficulty.—*Edward Newman.*]

Redthroated Diver near Beverley.—On the 3rd of March a particularly fine immature specimen of the redthroated diver (*Colymbus septentrionalis*) was shot on the River Hull, by George Verity, of Beverley, near to Wilfholme, about seven miles above Beverley. The bird was brought to me in the flesh, and on dissection proved to be a female.—*W. W. Boulton; Beverley, April* 2, 1864.

Bernicle Goose at Bempton, near Flamborough.—On the 4th of March a very beautiful old male of the bernicle goose (*Anser leucopsis*) was shot at Bempton, near Flamborough. It was sent to me, in the flesh, together with the above details of its capture. I dissected the bird, and found an immensely developed gizzard, and a very lengthened intestine. Both gizzard and bowel were full of vegetable matters; the gizzard also contained fine sand mingled with the vegetable food. The length of the intestine from pylorus to anus was nine feet.—*Id.*

Egyptian Goose and Great Gray Shrike in Somersetshire.—I have to record the appearance of two rare birds in this county, namely, the Egyptian goose, two very fine specimens of which I saw, in the flesh, at Mr. Turles, bird-stuffer, at Taunton, on the 24th of March; one had been shot on the River Parret, near Bridgewater, and the other near Glastonbury, a few days before; both birds had been recently killed, and were in very fine plumage: and one example of the great gray shrike, shot near Wiveliscombe on the 31st of March.—*Cecil Smith; Lydiard House, April* 10, 1864.

Note on the occurrence of the Egyptian Goose near Glastonbury.—On the 23rd of March I was shown a specimen of the Egyptian goose (*Anser ægyptiacus*), which had been shot the day before on Turf Moor, near Glastonbury, Somersetshire. It had been seen flying in the neighbourhood for several days. The elegant form of the bird, the minute and delicate pencilling of the plumage, the colours of the wings, and, more especially, the chesnut patch on the breast, readily determined the species. In Yarrell's 'British Birds' it is stated of this bird that "four were shot on the Severn, near Bridgewater, in February, 1840." This appears to have been near the mouth of the Bridgewater river, the Parret, which is but ten or twelve miles from the place where the present bird was shot.—*Thomas Clark; Halesleigh, April* 12, 1864.

Wild-fowl in the London Waters. By Henry Hussey, Esq.

Four years ago (Zool. 6922) I sent some notes to the 'Zoologist,' hoping to get from its correspondents some information on a subject which is a puzzle to me, *viz.* the frequent appearance of wild-fowl in the London waters. I was not successful. Mr. Crewe's letter (Zool. 7049) does not appear to me to go far in clearing up the difficulty. That a few passing wild-fowl, several years ago, occasionally pitched and remained a few days in the Regent's Park Lake, quiet and secluded as a great part of that water then was, I can well believe. Colonel Hawker, in the ninth edition of his 'Intructions to Young Sportsmen,' published in 1844 (p. 508), states that he had, in a previous winter, observed at least thirty wild fowl, wigeon, tufted ducks and dun birds, in the Regent's Park water. But that any, or at all events the great majority, of the birds I have seen, often very tame, are wild bred, I cannot believe, except on better evidence than I have been able to obtain. The male unpinioned wigeon Mr. Crewe mentions, I often noticed during two or three successive years, and have always supposed that he was the father of some of the numerous hybrid wigeons I have often seen, but only in the Regent's Park waters, and there only occasionally and at considerable intervals: the keepers of this park tell me that the hybrids only visit these waters now and then. However this wigeon was first introduced into the Regent's Park, I cannot assume, without further evidence, that he was a wild-bred bird who had voluntarily taken up his residence in London, with a duck for his wife. The eleven pochards I saw in the Serpentine in January and March, 1862 (Zool. 7939), two of the park-keepers told me, were all bred in one of the shrubberies on the Serpentine, the produce, no doubt, of the pinioned pair I had seen a few years before. They appeared to me to be mature birds, not birds of the year, and

mostly males. They only stayed while the floating ice prevented the boats from plying; as soon as the water ceased to be quiet every bird disappeared. They visited the Serpentine again in the following March, when the water was also quiet. It appears therefore that these birds, although bred in the Kensington Gardens, do not make the Serpentine their usual haunt, but only visit it at rare intervals. Frequently as I walk the whole length of the Serpentine, carefully examining its waters with a glass, these pochards could not have escaped me had they been in the habit of coming here in the day-time.

I have never seen any party of diving ducks on the Serpentine from that time (early in 1862) until the 5th of January last, on which day I saw a party of about twenty diving ducks: I counted nineteen. The water was then also quiet, partially covered with ice, which did not bear, and no boats: so dark was the day and distant the birds that I could not be quite sure as to the species, but believe they were pochards, with a few tufted ducks among them.

From the accompanying notes, it will be seen that the number of the species, as well as of the birds, which frequent the London waters has increased since 1860, although those waters have certainly not become more quiet. All the birds mentioned in the following list I have seen myself.

1860.

April.—St. James's Park Canal: two male gadwalls.

November.—St. James's Park Canal: two male gadwalls. Regent's Park: two hybrid wigeons, male and female.

December.—Regent's Park: one male and two female hybrid wigeons. St. James's Park Canal: a ferruginous duck.

1861.

January.—Round Pond, Kensington Gardens: a female pochard, quite tame. Regent's Park Lake: one male and two female hybrid wigeons, and four teal, three male and one female (these four birds were quite tame); there was skating on the lake.

February.—St. James's Park Canal: two male gadwalls and one ferruginous duck.

March.—Regent's Park Lake: two male hybrid wigeons and one female.

April.—Round Pond, Kensington Gardens: one male and one female pochard, and a female ferruginous duck. St. James's Park Canal: one male ferruginous duck, one female pochard and one male gadwall.

May.—Regent's Park Lake: one male hybrid wigeon.

October.—Round Pond: a pair of ferruginous ducks (male and female) and a female pochard.

December.—St. James's Park Canal: a pair of gadwalls (male and female), a pair of pochards (male and female) and a male tufted duck.

1862.

January.—Serpentine: eleven pochards.

March.—Serpentine: about ten or twelve pochards.

May.—Regent's Park Lake: a male hybrid wigeon and a male gadwall. St. James's Park Canal: a male gadwall.

October.—Round Pond: a pair of gadwalls (male and female), a pair of pochards (male and female), and a male tufted duck. St. James's Park Canal: three male gadwalls, one male ferruginous duck, one female pochard and one female wigeon.

November.—Round Pond: nine diving ducks, *viz.*, one male tufted duck, two pairs of pochards (male and female), two ferruginous ducks and two other ducks (pochards, I believe).

December.—Round Pond: four diving ducks (all pochards, I believe). St. James's Park Canal: a pair of wigeons (male and female).

1863.

January.—St. James's Park Canal: two male wigeons, a male and female gadwall, and a female pochard.

February.—Regent's Park Lake: a pair of hybrid wigeons.

May.—St. James's Park Canal: three gadwalls and a ferruginous duck.

October.—Serpentine: a male gadwall.

December.—Regent's Park Lake: a male hybrid wigeon. Serpentine: two male gadwalls, a male teal (quite tame), and two male wigeons and one female. Round Pond: a male gadwall.

1864.

January 5th.—Serpentine: about twenty diving ducks (pochards and tufted ducks, I believe), a male gadwall and a male teal.

January.—Serpentine: five wigeons, two male pochards, a male teal, a male gadwall and a male goldeneye. Round Pond: one male and two female wigeons, and one male gadwall. St. James's Park Canal: three male and one female wigeon, and a male gadwall.

February.—Serpentine: seven wigeons, one male goldeneye and one male teal.

March.—Round Pond: a male gadwall. Serpentine: a male gadwall.

April.—Serpentine: a male teal. Round Pond: a male pochard.

From this list, and the former one in the 'Zoologist' (Zool. 6922), it will be seen that the London waters have been visited by wild-fowl of no less than eight species, without reckoning the hybrids, namely, gadwall, wigeon, teal, shoveller, pochard, tufted duck, ferruginous duck and goldeneye. My theory that these birds were bred in the Zoological Gardens or the Regent's Park, and that they were only waiting in town until their migrating time arrived, is not, I am afraid, a sound one, and will not bear investigation. Very many, I think most, of these birds are old birds, males chiefly. They are too numerous to have escaped from the Zoological Gardens, and the facilities for breeding in the other London waters are very small indeed, unless in Her Majesty's garden and water at Buckingham Palace, the birds meet with an asylum and the quiet they require. Perhaps some of the correspondents of the 'Zoologist' may know whether or not this is so, and, if it is, be kind enough to insert such information in the 'Zoologist.' If the birds always find a place of refuge in Buckingham Palace Gardens, most of the difficulties as to their appearance in the parks vanish.

Besides the birds I have mentioned as frequenting the Serpentine, a coot, with perfect wings, haunted that water for about five weeks, in January and February. I never but once before saw a coot in the Serpentine, and that was on the 11th of February, 1863, on which day, and in the same water, I also saw a little grebe (dabchick), in its clove-brown winter plumage. On the 11th of this month I saw a little grebe in the Round Pond, Kensington Gardens; it kept well out in the middle of the pond, but, by means of a glass, I could distinguish its size, shape and action, and satisfy myself that it was not a young duck, of which indeed there was not one in the pond. It seems to me very extraordinary that a bird whose powers of flight are supposed to be very small, should make its appearance in a pond without an atom of cover in or near it, and surrounded by many miles of brick and mortar. On Christmas Day I saw a kingfisher flying over the Serpentine in Kensington Gardens. In December last four mute swans, with perfect wings, visited the Round Pond: they did not stay long, but I had the pleasure of seeing them on the wing twice before they went to the Serpentine; they stayed but a short time at the latter water, and when I saw the last of them, on the 21st of January, they were on the wing, rising in the air, as if for a long flight: they flew perfectly well, rising from the water without the preliminary flapping along the surface described by the late Mr. St. John in the case of *wild* swans. Where did these birds come from? and how happened

it that they were so fortunate as to escape being crippled in their youth, in the usual manner?

As I am always absent from town during the summer months, I cannot say what birds visit its waters during that period.

HENRY HUSSEY.

7, Hyde Park Square,
April 12, 1864.

What is the usual time for Frogs to cast their Spawn?—I have some years seen it as early as the middle of January, in sheltered spots: this having been a very mild early winter I was induced to watch some of their early spawning places, to see if the weather had any influence on the spawning, and on the 26th of December last I was successful in finding some deposited. I had passed the same spot on the 23rd, when there was not any spawn there: I should think, from the appearance of the spawn, it must have been cast on the 25th. This, I think, must be very unusual. I have been on the look-out for a great many years, and have never seen any before the middle of January until the above-named occurrence. All the spawn has been frozen, and I shall be anxious to see if the frost has any bad effect on it.—*Stephen Clogg; Looe, Cornwall, February* 15, 1864.

Engineering under Difficulties.—In a small glass-covered room, serving the threefold purpose of a lounge, a green-house and a nursery for larvæ, stands a table, on which are a Camellia plant and a Hydrangea: scattered over the surface of the table are seeds of the vegetable marrow, each about half an inch long and of considerable weight. On entering the green-house one morning, I observed two of the seeds suspended some twelve or fourteen inches from the table: on examination I at once perceived (what I had frequently read of and much desired to see) that this was the work of a spider. During the previous night a web had been formed attached to the Camellia on one side and to the Hydrangea on the other: the shape of one of the plants was such that the necessary moorings for extending and steadying the lower portion of the web, apparently, could not be carried out. To obviate the difficulty, two cables had been taken down to the table, each attached to a seed, and then shortened up, raising the seeds to within four or five inches of the lower edge of the web and twelve or fourteen from the table: this proportioning of the distance would be about the best for avoiding too much swing and yet effect the purpose. The web and seeds remained undisturbed for several weeks, and the little engineer's labours were rewarded, as I saw, during that time, several fierce struggles, always ending in favour of the spider, except when a honey-bee occasionally became entangled: the former then wisely kept aloof until the bee had broken away: the following morning always found the rent in the web repaired.—*George Gascoyne; April*, 1864.

The Fossil Human Eyes.—In the Free Museum of Liverpool I have seen the eyes which were presented by Capt. Heron, of the ship "Mystery," on the 2nd of May, 1859: they are the eyes described in the communication headed "Curious preservation of Human Eyes," by Mr. Peter Inchbald, in the 'Zoologist' for 1860 (Zool. 7273).

They are the horny portion of the eye of the cuttle-fish, which are preserved in the cemetery near Arica in Peru; and were described from specimens brought from the same situation by Mr. Hennah, in my 'Specilegia Zoologica.' The crystaline lens of the human eye are of quite a different shape: they are more like the globular crystaline lens of the fish. But there can be no doubt of their being the crystaline lens of the eyes of the Loligo, if any one will take the trouble to compare them with the crystaline lens in the eyes of the recent specimens of that family. See the figures of the eyes of the cuttle-fish, after Cuvier, in Jones's 'General Outline of the Animal Kingdom,' fig. 275, at p. 590. These eyes were worn as ornaments by the Peruvians, and Mr. Stutchbury informs me that the natives of the Sandwich Islands sold them to the Russians as pearls.—*J. E. Gray; British Museum.*

Addendum to Mr. Hellins' Paper (Zool. 8985).—The date of my paper in the last number of the 'Zoologist' should have been February 20th, the only portion of it dating March 7th being the postscript to the note on Cidaria russata and C. immanata, from line 7 to line 17, page 8989. The larvæ of C. russata, mentioned in my note, are now spinning, having attained a length of 1½ inch; but within the last week I have captured some just ¾ inch in length, which will not be full fed for two or three weeks. Meanwhile the largest larva of C. immanata which I have is barely ½ inch long, and some of the eggs, which are evidently not dried up, remain yet unhatched.—*J. Hellins; April* 11, 1864.

Larvæ of Sphinx Ligustri and Liparis auriflua.—I can most fully corroborate the remarks of my friend Mr. Gascoyne (Zool. 8968), in contradiction of the theory broached by another of your correspondents (Zool. 8906), that the larva of Sphinx Ligustri, when young, descends to the ground during the day for the purpose of concealment. I have taken numbers of the larvæ, both in the newly-hatched and every succeeding stage, and I have had as many more from the egg. I always found them in the natural state high up on the twigs and branches (generally when small on the under side of a leaf), and in confinement I never observed them descend. With regard to your correspondent's remarks (Zool. 8969) on the hybernation of Liparis auriflua, and his astonishment thereat, I am as much astonished at his astonishment. The larva of L. auriflua *always* hatches in the autumn and hybernates, and so does L. chrysorrhœa.—*H. Harpur Crewe; The Rectory, Drayton-Beauchamp, Tring, March* 12, 1864.

The name "Puss Moth" and English Names in general.—The aspect of Dicranura vinula, in that stage of its growth referred to by Mr. Beauchamp (Zool. 8971), may certainly have given rise to its name of "puss" moth. It does not, however, appear to me to present at that time the strongest resemblance to the feline race. Strange to say, it resembles those individuals at two other periods of its existence. The young larva, up to the time of its second ecdysis, is exactly like a cat in miniature, when it is in a state of repose; and then the moth, when viewed from beneath, as when it is at rest upon the lid of a gauze-covered box, reminds one strongly of the head of a white cat. With regard to English names, the question has several times been put to me, "Is not a reformed English nomenclature possible?" I fear not. In attempting to carry out such a revision, it would be found impossible to determine, in many cases, which name really was the oldest applied to the insect. Besides, many would argue, that if we attempted to form such a vernacular nomenclature, the older name ought to

be discarded, in not a few instances, in favour of one more appropriate to the species. It is singular what errors have crept in already amongst the English names: thus, I feel quite convinced that the name "Admiral," applied to two species of our Diurni, is a corruption of the name "Admirable," found in the oldest works; given, doubtless, on account of the rare beauty of these insects, *ergo admirari debet.* I hope, therefore, that the use of these uncertain names will be avoided by entomologists as far as possible: most of them must now be convinced of the utility, not to say the necessity, of a standard Latin nomenclature, capable of a world-wide use.—*John R. S. Clifford; 21, Robert Terrace, Chelsea, March* 31, 1864.

Results of Pupa-digging.—In this county neither larvæ nor pupæ were at all plentiful during the autumnal part of last year; therefore we cannot reasonably expect to find Lepidoptera otherwise than rare in this neighbourhood at the approaching season. I commenced pupa-digging in September last, and continued the pursuit upon every available day until Christmas. Having kept a journal of each day's proceedings, I find I have enjoyed upwards of fifty days' vigorous hunting, and have taken 2300 pupæ, which I consider to be a much smaller number than I have usually taken in former years, in proportion to the time so occupied. They consist of the following:—

Noctuina	2009
Geometrina	138
Smerinthus Populi	21
„ Tiliæ	88
Bombycina	17
Cocoons of Sesia apiformis	31

The number of Geometrina, in proportion to the Noctuina, is certainly very small. Pupa-digging, I think, must be, to those who have a thorough relish for Entomology, a very exciting enjoyment, at least I have ever found it to be so. I think little of distance to a likely spot, having scores of times walked from six to nine miles out early in a morning, and set to work digging, and continued doing so almost as long as daylight lasted, never sitting down, or eating or drinking, until I was upon the road home again. This is perhaps more enthusiastic than wise, but my object has usually been to make the most of the time. My principle endeavours lately have been made to obtain Xylomiges conspicillaris, and I hope to be enabled ere long to announce that I have been successful.—*Abraham Edmunds; The Tything, Worcester.*

[I believe the tendency of Mr. Greene's admirable 'Insect Hunter's Companion' will be to render pupa-digging universal among Lepidopterists: the work is indispensable to the collector. To those, however, who do not possess the virtue of patience pupa-digging will often prove a wearisome pursuit.—*Edward Newman.*]

Cells of Bees: Hexahedral Forms very general in Natural Objects.—In the most interesting discussion that has taken place at the Entomological Society between Mr. Waterhouse and Mr. Smith, a very simple difference not hitherto expressed certainly exists. Mr. Waterhouse evidently believes that hexahedral forms in Nature come direct from the great Workmaster, without thought or contrivance on the part of the individual agents; Mr. Smith, on the contrary, attributes the result to the skill, reflection, contrivance, instinct,—call it by what name you will,—of the individual bee who labours in their production, though doubtless he would equally attribute this skill, or whatever it may be called, to the same Fountain-head. Now I can fully agree with the view I have assigned to Mr. Waterhouse, but not at all with that which is,

I believe, held by Mr. Smith. I do not for a moment deny that an animal may reflect, and act on reflection; that it is capable of receiving instruction, and of acquiring a variety of accomplishments, if so they may be called. A monkey will learn to dance, smoke, stand on its head, fire a gun and imitate exactly a hundred other human actions, but all this is the result of laborious and long-continued teaching. The bee, on the contrary, without any teaching, without any meditation, begins to make its beautiful and symmetrical cell the hour it is born: it is as much an irresistible act, and the architect is as much an irresponsible agent, as the hen that covers her egg with a calcareous shell before extrusion, and produces it of the best possible form for the purpose for which it is intended. The egg and the cell are worthy of all admiration, but neither the brain of the hen nor that of the bee have laboured in their construction. This granted, the question of lateral pressure is of very secondary importance; it is a question that has only been imported into the controversy as accessory or supplementary, and forms no part of the simple inquiry, whether the hexahedral form of cell is due to the sagacity of the bee. Mr. Spence, in controverting the views expressed in Darwin's 'Zoonomia,' says, "The single fact, depending on the assertions of such accurate observers as Réaumur and Swammerdam, that a bee, as soon after it is disclosed from the pupa as its body is dried and its wings expanded, and before it is possible it should have received any instruction, betakes itself to the collecting of honey or the fabrication of a cell, which operation it performs as adroitly as the most hoary inhabitant of the hive," &c. Now this is a fact not open to question; Mr. Smith would admit the premises without hesitation; but if I understand him right, he would deny the truth of Mr. Spence's definition of instinct,—"those unknown faculties implanted by the Creator, by which, independent of instruction, observation or experience, and without a knowledge of the end in view, they are impelled to the performance of certain actions tending to the well-being of the individual and the preservation of the species." Such, for instance, is the construction of a cell, and such is the covering of an egg with a calcareous shell; in neither case is the act optional, it is compulsory. I purposely select extreme cases, but the practical naturalist will readily supply intermediate ones which will fuse them into a single principle: that instinct, taking it as defined by Mr. Spence, "compels animals to provide for the well being and continuance of their race." Mr. Spence, in continuation of the subject, gives a multitude of most interesting exceptions to the ordinary modes of working adopted by bees, and, after dwelling on each instance fully and fairly, he rejects all idea of any higher or other cause than compulsory instinct: he says, "No degree of reason that we can, with any share of probability attribute to bees could be competent to the performance of labours so complicated, which, if the result be considered, would involve the most extensive and varied knowledge on the part of the agents." Deviations from what we should be inclined to call a normal or regular course are equally abundant throughout the vegetable and the animal world; take, for instance, the honeysuckle: in a dwarf hedge, it, shows no inclination to climb, but expands its blossoms within a yard of the ground, all that it seeks for them is exposure to the sun: move a plant of honeysuckle from that dwarf hedge into a dense coppice, where the hazel stems attain a height of twenty feet, and it will alter its character entirely: like a little snake it will twine round and round the stems, ascend to the very summit, and, surmounting the topmost foliage of the hazel, will expand its blossoms in the summer sun: the bees that were compelled by Huber to build their combs horizontally, instead of vertically, exhibited no higher

degree either of instinct or reason than the honeysuckle; and thus will every plant accommodate itself to altered circumstances quite as readily as a bee: both act without tuition and without reflection; they do so because they have no choice. Then let us consider what is called erroneously the hexagonal form of a cell: the word does not in any way convey the meaning intended, which is that a transverse section of the beautifull cell formed by the bee presents a hexagonal outline, the cell itself being a hexahedral prism. There is in Nature a decided tendency to adopt this form, and it appears to me the result of crowding, not of design. The cells of Microgaster alvearius, cut through transversely, exhibit exactly the same type of structure, as indeed the name implies, and yet I believe even Mr. Smith would not contend that this result was produced by contrivance and reasoning powers on the part of the eyeless, footless, I might almost add shapeless, maggots, which are the sole architects. Again, I have found the eggs of a Pentatoma assuming an exactly similar form; in fact, so similar are these that many an entomologist has believed them the work of a Hymenopteron. Again, the eggs, which constitute the roe of a female herring, are always compressed when approaching maturity, into hexahedral prisms, a section of which would exhibit the constantly recurring hexagonal outline. Again, the lenses in the eyes of insects; surely no one will attribute any design or management on the part of the insect, in the structure of these constantly recurring hexagons. Again, the form of basaltic columns at Staffa and Fairhead are mere repetitions of bees' cells on a larger scale; the outline of a section is exactly similar. Again, in bubbles of soap and water, the outline of each bubble, when it impinges on others, is flattened; while, untouched by others, it is spherical. Now, in all these instances, and each instance is the type of a thousand others, there is no more evidence of individual design than in the formation of my hand. Design there certainly is, but design on the part of the great Workmaster—design to which the bee or the basalt yields alike unreasoning obedience.—*Edward Newman.*

Addendum to the Paper "On some New or Rare British Coleoptera" (Zool. 8998). By G. R. Crotch, Esq.

The reprint of Mr. Rye's article in the 'Zoologist' (Zool. 9002), renders it almost necessary for me to justify myself, if possible, from the charge of wilfully ignoring the Stephensian names in favour of Teutonic ones. An investigation of Mr. Waterhouse's Catalogue (exclusive of the Staphylinidæ) gives seventy-two species as Marshamian; of these I have rejected five, three as not being recognisable with certainty, and two from different views of synonymy: seventy-two species are also recorded as Stephensian; of these I have rejected seven,—five I consider insufficiently characterised, and two depend on the view taken of Linnean and Fabrician types: I have, however, inadvertently appended later authors' names to six species described by Stephens. It is, however, to the Staphylinidæ that Mr. Rye's remarks, as I suppose, principally refer, though it was, I should hope, sufficiently obvious that I had used the Erichsonian names throughout,

and had rejected Sahlbergian and other names, as well as Stephensian ones. An analysis of the group shows that Mr. Waterhouse cites fourteen as described by Marsham; of these I recognize six: fifty-six are referred to Stephens; of these I have retained five. Here there would appear to be some ground for the accusation brought against me; but let us examine what is the evidence brought forward, on the strength of which we are to overthrow fifty-six names that have been in constant use for twenty years. In twenty-two of these cases Mr. Waterhouse acknowledges that the examples in the collection do not agree with the description; following, therefore, the example of Mr. Wollaston in the Atomariæ, and that of entomologists generally, these names would be rejected. In six cases, further investigation has shown that older names take the precedence of even the Stephensian ones. There remain, therefore, only twenty-eight names, having any claim to be restored, and many of these certainly appear to me very doubtful. But the same analysis forces upon us the difficult fact, that in no less than nineteen cases, does Mr. Waterhouse cite the avowedly prior Stephensian names as synonyms to the Erichsonian ones! What, then, is to be our guide?

Mr. Rye, to illustrate his position, has chosen an instance, the Homalota vicina of Stephens, which he states to be at once recognisable from the description in the 'Illustrations' and the 'Manual,' and quotes the latter *verbatim*. Admitting that this quotation sufficiently characterizes the insect, he has, I believe, since become aware that the 'Manual' was published in 1839, or the same year as the first part of Erichson's 'Genera et Species,' in which case I suppose few, even in this country, would accord priority to the 'Manual.' The 'Illustrations' were indeed published in 1832, but not only is the salient point of the diagnosis omitted, but the insect is said to be found in "Boleti, Norfolk and Suffolk," and neither locality being quoted in the 'Manual,' and the habitat being most unlikely, if not impossible.

Upon such slender grounds as these, which are not even detailed for them, are we to expect the continental workers to overthrow the name "umbonata," thoroughly characterized and universally adopted twenty years ago?

Of the genus Stenus, indeed, a careful investigation has been published in the 'Transactions,' by Messrs. Waterhouse and Janson, and report says that Mr. Rye is about to describe that group; we shall then probably have a detailed statement of his views upon their synonymy.

G. R. Crotch.

[I have handed this addendum to Mr. Rye, in order that he may notice it in his reply, which reply, together with a postscript, written with especial reference to this addendum, now immediately follow, and with them the correspondence ceases: Mr. Rye having had the first hearing is entitled to the last.—*Edward Newman.*]

"*On some New or Rare British Coleoptera.*" By E. C. Rye, Esq.

I HASTEN to avail myself of Mr. Newman's permission to reply to Mr. Crotch's remarks upon my paper in the 'Annual' for the current year. It was certainly not my duty to apply to Mr. Crotch for information; he could only expect to establish as British the numerous species brought forward by him by publishing evidence of their specific identity and occurrence in England, and I cannot avoid remarking that a paper containing such information, and also stating precisely in what cabinets specimens of the respective species exist (or, if possible, could be seen) would have been of much more real service to Coleopterists than the publication of a Catalogue so soon after one has been supplied to us.

The existence hitherto, as reputed varieties, of some of the species in Mr. Crotch's 'Catalogue' was of course known to me, and I added to some of them a note to that effect, but it is surely incumbent upon him, and not upon me, to make some statement of the reason for reproducing them as separate species. There are four insects of this description particularly mentioned in Mr. Crotch's remarks, and of one of these, Choleva longula, *Kelln.*, I should like to have some information, both as to identity and locality, although aware of its being included as British in Murray's 'Monograph,' and of its generally reputed specific value. I should also like to know why a query is put after Philonthus trossulus, *Nordm.*; if Mr. Crotch were not sure about his insect, why did he bring it forward?

If I had passed over the records of Liodes axillaris, *Gyll.*, Paromalus parallelopipedus, *Herbst*, and Cerylon deplanatum, *Gyll.* (Zool. 8301), it would not have been surprising, since their names occur at random in a mere list of captures, with no heading to call attention to their being new to Britain; and surely the loose and undecided remarks on the latter insect are not enough to substantiate its specific identity. These were included by me in the main body of Mr. Crotch's additions, partly on account of want of space, and partly in the hope of obtaining a more detailed account.

I admit the mistake of placing Ptilium affine, *Er.*, in two places, not a very large error, considering the numerous alterations and additions to be made at the eleventh hour, and at the same time wish to mention two others, *viz.*, the omission of the common Aleochara lanuginosa, *Grav.*, in Mr. Crotch's 'Catalogue,' and of Stenus Rogeri, *Ktz.*, in my list of his additions. Information as to the latter would be acceptable.

Heterocerus arenarius, *Kies.*, Agabus sexualis, *Reiche*, and Ocypus Saulcyi, *Reiche*, may have been described from British specimens, but it would have been very little more trouble to Mr. Crotch (whose acquaintance with entomological literature is notoriously great), to have informed others, who, like myself, have no such opportunities as he, *where* and *when* these insects were taken, and whether they are worthy of the rank of species.

It is possible that I may have given Mr. Crotch an Atomaria to which the name fumata, *Er.*, had been provisionally applied, and yet that the insect brought forward in his 'Catalogue' should not be identical with Erichson's species. *I* certainly have never ventured to publish it as such, but Mr. Crotch has less scruples apparently, as he brings it forward on the authority "at least of a species bearing that name," to use his own words: surely he should have satisfied himself it *was* right, before publication.

The existence of certain species in the collections of Dr. Power or others was no evidence that they represented Mr. Crotch's species, until he published a statement to that effect.

Tychus ibericus, *Mot.*, Homalota celata, *Er.*, and Stenus pumilio, *Er.*, are recorded in the 'Annual' for 1855, it is true; but so are other species not now recognized. Has Mr. Crotch seen the specimens referred to in the notices of these insects, and satisfied himself as to their correct determination? I have some of the identical specimens of T. ibericus, *Mot.*, recorded in the 'Annual;' they were named by Motschulsky himself, and sent to me by Mr. Wollaston—nevertheless they are only light-coloured examples of the common T. niger, *Payk.*

As to classification, I expressly stated that freedom of opinion was open to all, and I do not see how the simple use of the word "foreign" implies an intention to stigmatize. Mr. Crotch's arrangement does not differ very much from that of Dr. Schaum's 'Berlin Catalogue,' the most conspicuous difference between them being that the former places the Brachelytra at the end. I have always understood that the placing the Staphylinidæ at the end of the Coleoptera was in con-

nection with the circular and quinarian theory, which has long ago exploded.

I am quite ready to join in any expression of admiration and respect for the entomological merits of Mr. Wollaston, but I emphatically repudiate the insinuated assumption of authority by me; even if I did not do so, some latitude should be allowed by Mr. Crotch, who has not hesitated to change and reconstruct our list of Coleoptera, so recently, and with so much labour, prepared by one who is, to say the very least, much more experienced than himself.

As regards Ptilium saxonicum, *Gillm.*, and P. discoideum, *Gillm.*, I would remark that as I do not profess to know the Trichopterygidæ, I have, in preparing articles for the 'Annuals,' applied to the Rev. A. Matthews for any additions or corrections to be made therein; and as that gentleman has neither informed me of his opinion that these species ought to be omitted, or published any withdrawal of them, I certainly imagined they ought to be considered British.

The accounts given by Mr. Crotch for the species mentioned in his remarks are (with a few exceptions) scarcely satisfactory; the evidence of specific identity, and, in some cases, the localities, being not explicit enough.

I have seen one of Mr. Crotch's specimens of Cryptocephalus Wasastjernæ, *Gyll.*, and certainly agree with him in referring it to that species; nevertheless the thorax is not rugose at all, being most delicately scratched as with a needle.

Blaps Chevrolatii, *Sol.*, is synonymous with B. mucronata, *Latr.*, but I included it in the list of additions, since, in the 'Catalogue,' it was brought forward as separate.

I have seen one of Mr. Crotch's specimens of Stenus littoralis, *Thoms.*, and find it not to differ from my small examples of S. crassiventris, *Thoms.* (nigritulus, *Erichs.*). From Thomson's description, S. littoralis should, besides being smaller than S. crassiventris, have the legs pitchy, the elytra more closely, and the abdomen more thickly and strongly punctured. These differences I have as yet failed to see in any British specimen.

It will, I am sure, give much satisfaction to British Coleopterists, and to none more than myself, if the more extended notices promised by Mr. Crotch, enable them to retain with security all the species brought forward by him; but there will be nothing surprising if some of them should not stand, as the great energy shown by him in getting together so large a number must itself occasionally have hurried the work a little too much.

The somewhat reckless suppression of Stephensian names remains, however, as yet unjustified.

E. C. Rye.

284, King's Road, Chelsea, S.W.
April 7, 1864.

Postscript.—It seems to me that the only correct way of attacking such of the Kirbyan and Stephensian species as are desired to be repudiated would be to mention them, individually by name, and to give in detail the reasons for rejecting each of them. This could only be done by some one who is a thorough master of all procurable evidence, and who has a perfect knowledge of the insects themselves as species, and of the very specimens referred to in the descriptions, however old or in bad condition they may be. Of course any defender of them would require similar qualifications; and, taking even the Homalotas alone into consideration, Mr. Crotch will, I hope, pardon me for saying that neither is he, nor am I, competent to argue either way. I must say I consider the matter of priority set at rest, as far as it can be, by the statements of Mr. Waterhouse.

Admitting, for the moment, Mr. Crotch's sweeping and general statements, it appears by his own admission that throughout the Coleoptera he has passed over no less than seventy-seven names which we claim for British authors (of which six seem to be "inadvertently" deposed, though inadvertence in such a matter is scarcely pardonable). Mr. Crotch selects the Brachelytra as containing the most of these; and, allowing (for the sake of argument only) his deductions, there remain twenty-three, which, as he says, have any claim to be restored, and whereof many appear to him to be very doubtful. I again ask, Has Mr. Crotch himself endeavoured to sift all attainable evidence, even about these twenty-three only? Has he examined the *insects*, the types themselves, or is he conscious that an examination by him would in many cases be useless?

I am well aware that no one is better qualified than he for working out expeditiously and correctly any matters of reference, questions of date, or generally knotty points of entomological literature; still in this case such capabilities are not called into use, and I think myself justified in saying I believe he has *not* sifted the evidence afforded by the specimens in the Kirbyan and Stephensian Collections (especially the former), and that he has therefore only a theoretical opinion in the matter.

The very instance he gives of Mr. Waterhouse citing nineteen

avowedly prior Stephensian names as synonyms to Erichsonian ones, is to my mind pretty conclusive evidence that in all others he adopted there were sufficient reasons for his doing so.

I merely selected Homalota vicina at random; any other species would doubtless have done as well.

It is true I was not (nor, I believe, was Mr. Crotch) aware that Erichson's work was published in two parts, or that the first portion, containing Homalota, came out in the same year as the 'Manual' of Stephens, which contains an avowedly sufficient description of the species in question; but, by Mr. Crotch's showing, the 'Illustrations' were published seven years before, and they contain a much more ample account than the 'Manual.' The "salient point of the diagnosis omitted" is absolutely nothing but a sexual difference, and surely a species ought not to be re-named because a subsequent observer supplements such a character to a description. In how many Erichsonian species do we see "mas latet" at the end? and yet the name stands, though others have afterwards found and described the male. It is a mistake to look in Stephens' Collection for Kirby's types; the Kirbyan species, of which this is one, were simply published by Stephens in the body of his work, the characters being of Kirby's own writing. I have examined Kirby's type, which is so ticketed and numbered that no error can arise; it is positively the H. vicina of the 'Manual,' and the umbonata of Erichson; and, being a female, I do not see how he *could* have described the male character from it, there being but that one. It must be remembered that insects now common, were, in the early days of working at Brachelytra, considered very rare. The expression "found in Boleti" is doubtless of Stephens' adding, being indeed in different type to the description; and this is borne out by the specimens representing vicina in Stephens' own collection, which are common fungus species. It is manifestly absurd to look in Stephens' Collection for Kirby's types, simply because Kirby's description was published in Stephens' book: this remark will apply also to divers other Kirbyan names, in other genera, which are proposed to be sunk.

As far as regards H. vicina, I have known it named as H. triangulum, *malgré* both Stephens and Erichson.

I myself informed Mr. Crotch that I was about to attempt short descriptions of the British Steni, and indeed he has kindly given me a list of localities of rare species, and also some remarks upon synonymy; but he knows I do not intend to enter into any statement of my views on the latter point, as my intention is to enable beginners to name

their captures, and not to disgust them with the "disagreement of doctors" as to the vexed question of priority.

Mr. Crotch has also given me information on various points connected with the matters in question between us, from which it is quite clear to me that he represents in his 'Catalogue' the views of others, rather than his own convictions (founded on personal examination) as to the existence, specific or British, of divers insects therein enumerated.

E. C. Rye.

Coleoptera at Stockwell.—I have for some time been at some pains in compiling a list of the beetles that have occurred in our house, garden and field here. This list I give below in a tabulated form. The result, showing a total number of 460 species indigenous to us, is more favourable than I had expected, and is an unanswerable proof of the productiveness of the London district. Among my captures are a great many rarities, including some which neither I, nor any of my friends, have found elsewhere near London. Among the rarest I may mention Bembidium 5-striatum, Euthia plicata, Anommatus 12-striatus, Megapenthes lugens, Ischnodes sanguinicollis, Xylophilus populneus, Eryx atra, Barynotus obscurus, Opilus mollis and Euplectus Kunzei. It will be seen by the table below that the Brachelytra have, as might be expected, a grand majority; this is in some measure due to the existence of several hot-beds, on which the Philonthi, Xantholini and other similar genera swarm. Of the first-named genus I include in my list no less than twenty-five species, *viz.*:—

Philonthus	splendens	Philonthus	marginatus	Philonthus	varians
„	intermedius	„	sordidus	„	debilis
„	laminatus	„	fimetarius	„	ventralis
„	carbonarius	„	cephalotes	„	discoideus
„	punctiventris	„	ebeninus	„	Thermarum
„	æneus	„	sanguinolentus	„	nigritulus
„	politus	„	2-pustulatus	„	villosulus
„	varius	„	longicornis	„	procerulus
„	albipes				

The Geodephaga are not inadequately represented, although they are mostly common species. The few species of Hydradephaga were ingloriously captured in a cow-tub. I have not worked much with the net, and therefore the Eupoda have but few representatives, but I anticipate doubling their number during the present season. I now subjoin the list referred to, premising, for the sake of statistical exactitude, that the collecting-ground covers an area of about three acres:—

Geodephaga	53	Heteromera	15
Hydradephaga	6	Rhyncophora	53
Brachelytra	166	Malacodermi	18
Necrophaga	70	Longicornes	4
Lamellicornes	22	Eupoda	16
Sternoxi	10	Pseudotrimera	27

—*H. Montague; Stockwell, April* 12, 1864.

Notes on the Economy of certain Micro-Lepidoptera.

By Mr. Charles Healy.

1. *Larva of Adela Degeerella.*—This larva is reported to feed on the Anemone nemorosa (wood anemone); whether it does so at any period of its larval state I am unable to say, but in March, 1861, I found several of the larvæ, being the first, I believe, ever discovered in this country, and in the following May bred two of the perfect insects, both females. These larvæ were found amongst the fallen leaves at the base of birch-bushes, and fed on the decayed leaves until the following April, when I offered them the buds of beech and hazel, which they appeared very partial to, each larva attacking a bud at its base, and eating out the interior. As I believe nothing at present is known as to the economy of the very young larva, I am inclined to think that a careful examination, at the end of June and the beginning of July, of the plants and bushes, particularly beech, in the locality frequented by the imago, might lead to its detection. Possibly the larva in its earlier stages of existence, like that of Incurvaria muscalella, mines its food, blotching the leaf, and afterwards cuts out a small case and descends to the ground: any blotched leaves found in the metropolis of the imago containing minute larvæ should be collected, and the result carefully noted, as we have several interesting observations to make on the habits and economy of this larva before its history can be considered as thoroughly mastered. The following fact came under my own notice:—Three of the full-fed larvæ that I had placed on some mould in a jar, a day or so afterwards suddenly disappeared: feeling convinced they could not have escaped from the jar, I gently turned over the mould, and found one larva just under the surface, another about the centre, whilst the third larva I found had penetrated to the bottom of the jar. Can this be its usual habit?

2. *Economy and Moulting of the Larva of Incurvaria muscalella.*—It sometimes happens when looking for one larva that we find another equally, if not more, acceptable to us than that for which we were searching. Just such an occurrence, on the 7th of June, 1863, revealed to me the inner life and economy of the very young larva of this species; for whilst engaged searching a hedge, consisting of sloe and whitethorn, I became aware of the presence of numbers of small blotches in the leaves, each blotch containing a minute larva: feeling interested as to what they would eventually prove to be the larvæ of,

I brought home some half-dozen for attentive observation and study. On the 8th I noticed that each larva had cut out an *entire* case of the upper and under cuticle of the blotch in which it had been feeding: this is sometimes done so adroitly that the whole of the mined portion of the leaf is appropriated by the larva in the construction of its first case. The blotches, as far as I have yet observed, are always near the edge of the leaf. On the 10th I took the following description of the larva:—Body white; head shining dark brown; back of the second and third segments brown; no appearance of a dorsal vessel. On the 16th it commenced enlarging its case; it then merely cut off sufficient of the leaf to act as a cover for *one side* only, and not, as on the 8th, cutting out an entire case. On the 17th, the larva's body was dirty white; back of the three first segments dark brown, the first segment having a few bristles projecting from its sides; dorsal vessel darkish. On the 19th it made a further enlargement of its case: I must here observe that every addition to the case is a trifle larger, and overlaps that previously made. I was much interested in watching the method adopted by the larva in making additions to its case: having chosen a part of the leaf suitable for its purpose, the larva fastens a silken cord to the leaf and its case, so as to keep the latter in its position; then stretching out its body, it gnaws through the leaf, a short distance beyond where the silken cord is fastened; after cutting the leaf for a short distance it fastens another silken cord to the leaf, and so on alternately fastening cords and cutting the leaf until the required addition to its case is completed. Not the least interesting feature in the habits of the larva is the change of taste evinced by it for oak, in preference to the sloe and whitethorn, on which it feeds at the earliest stage of its existence; this predilection it evinces in a marked manner, feeding with evident relish on the green leaves, and appropriating portions of its favourite food in constructing its case. I have only as yet observed one moult, the covering of the head being thrown off from the front, the skin retiring down the larva's body, and is then finally ejected from the case.

3. *The Larva of Solenobia inconspicuella carnivorous.*— I have ascertained for a fact that this larva has a slightly carnivorous taste, for on placing a dead Musca domestica into a jar along with several of these larvæ, on looking at the fly, after an interval of four days, I observed that its legs, wings and eyes were entirely consumed, and the larvæ were then engaged feeding on the abdomen, a portion of which had been eaten. The female of this species, like that of Talæporia pseudobombycella, Psyche roboricolella, &c., lays its eggs inside its

case, and covers them with *down*, which is used by the young larvæ in constructing their first cases.

4. *As to the Moulting of the Larvæ of the Genus Lithocolletis.*—At page 125 of the ninth volume of the 'Entomologist's Weekly Intelligencer,' there is an article, written by Mr. Scott, entitled "Curiosity," in which that gentleman asks the following question, "Do the larvæ of Lithocolletis moult as other larvæ with which we are acquainted do? if so, what becomes of the cast-off skins?" Now, from close inspection of the mines of the following species, namely, Lithocolletis pomifoliella, L. corylella, L. spinicolella, L. Faginella, L. carpinicolella, L. tenella, L. sylvella, L. Emberizæpennella, L. Schreberella, L. trifasciella, L. Massaniella, and various oak-feeders, I can answer that they do moult, not only once, but twice: a careful search amongst the "frass" in the larva's mine will disclose the presence of two cast-off skins concealed therein.

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Life-Histories of Sawflies. Translated from the Dutch of M. Snellen van Vollenhoven, by J. W. MAY, Esq.

(Continued from page 8792).

ATHALIA SPINARUM, *F.*

Fabr. Syst. Piez. p. 26, f. 21. *Panzer, Fauna Germ.* 59, f. 18. Athalia centifoliæ, *Hartig, Blatt-und Holzwespen*, p. 284, No. 1. *Lepel., Monogr.* p. 24, No. 71. *Menzel, Ueber den Afterraupen-frass der Weissrübenblattwespe* (no date or publisher's name). *J. Curtis, Farm Insects*, p. 37 *et seq.*

Athalia rufo-flava, capite cum antennis, excepto ore, mesothoracis dorso, tibiarum tarsorumque apicibus nigris.

The first four of the above authors have confined themselves to the description, and, in the case of Panzer, to the representation of the imago; the two following have, in addition, given some account of the damage done by the larva to the turnip crop. Now although the history of this sawfly may be said to be sufficiently investigated and made known, especially since the appearance of Curtis's book, we could not pass over this insect in a description of our native Tenthredonidæ, *first*, because we propose, if possible, to take in hand all the

indigenous species of the family; and, *secondly*, because Menzel's *brochure* and the work of Curtis are as yet very little known.*

Mr. Menzel states that in 1842 and 1853 this sawfly proved very destructive in the Swiss Canton of Zurich; in the first-named year its effects were confined to the immediate neighbourhood of the town of Zurich, but in September of the latter year the insect had extended its ravages throughout the canton. M. Cornelius, writing from Elberfeld at the end of October, 1858, stated that the larva of this sawfly was to be met with in immense numbers on the turnip-plant, not only in the neighbourhood of his place of residence, but also in the Moselle district, and, as he supposed, had extended its ravages through the whole of Rhenish Prussia. He adds, that four years previously the injury caused by the insect had been noticed, although to a much less extent.

We have taken the following respecting the ravages of Athalia spinarum in our own country, from the 'Journal of Agriculture' of Dr. J. Wttewaall.

Before the year 1854 the larva does not appear to have caused any such damage to the turnip crop as to have been considered worthy of notice in the public papers or any scientific publication; its ravages were first observed by my friend Wttewaall himself on his own summer turnips. It was also stated by M. Havelaar, of Ellekom, that as early as 1833 the injury caused by this insect to his turnip crops had attracted his attention, and that in the above-mentioned year, 1854, his whole crop of that vegetable was destroyed by Athalia spinarum. He had at the same time observed that the larva always, or so long as possible, eats holes in the leaves, so that it very rarely feeds with its body sidewise, only doing so when all the substance of the leaf between the veins has been consumed; for this reason he calls in question the accuracy of the figure given by Nordlinger at page 409 of 'Die Kleine Feinde der Landwirthschaft.'

In the following year, 1855, the larva was more widely spread, and appeared in the turnip-fields in increased numbers, so that notices were received from various parts of the country respecting the injury it was causing. The editor of the 'Landbouw Courant' ('Journal of Agriculture') was informed that its ravages had been observed on the

* The above observation is of course applied, in the original, to Dutch readers; but as most English naturalists may be supposed to be acquainted with the 'Farm Insects' of Curtis, I have, with the permission of the author, omitted that part of the present paper in which he recapitulates the main facts contained in Mr. Curtis's book respecting the ravages caused by this sawfly in Great Britain.—*J. W. M.*

summer crop at Heelsum, on the autumn crop at Voorst and Heerde, also at Dedemsvaart and in North Brabant in the neighbourhood of Moergestel, Bois le Duc and Langstraat.

In 1857 the larva was again observed to cause considerable injury in the country about Ellekom, Heelsum, Dodewaart, Hattem, Deventer and Voorst. Dr. Wttewaall wrote in October of that year, "We think that Athalia spinarum will appear in great numbers next year, and, unless kept down by the wet weather, be the cause of great loss."

Nevertheless it appears that 1858 passed over without the usual turnip harvest having suffered much, so that the weather must have exercised some influence on the larva of our sawfly.

I am also unacquainted with any record of its ravages in 1859.

If the names of the villages and towns mentioned in these returns are noted, it will be seen that the western part of our country appears to have been hitherto free from these attacks, and we thus come to the conclusion that it is most improbable that the fly should ever have flown over in great numbers from this country to England. We will now pass on to a description of the different states in which this insect is found; in other words, of its metamorphoses.

The egg is laid in a leaf of a turnip plant (*Sinapis arvensis* or *Raphanus Raphanistrum*) in an incision made by the saw of the female in the epidermis of the leaf. It is oval, white and subtransparent, and is always deposited near the margin of the leaf. At *a a*, fig. 1, pl. 9, is represented the position of two eggs on a turnip-leaf. In five days, or perhaps in a shorter time, if the weather is very favourable for their development, the young larvæ make their appearance; should the weather be very damp and cold, they are longer before they are hatched. On their first emerging from the egg the little larvæ are colourless and nearly transparent, with the exception of two little spots on the head; however, they very soon assume a pale green colour. A short time afterwards they begin to feed, eating several little holes in the leaf. Six or seven days afterwards they change their skin for the first time, when most of them are black or a very deep green. According to Curtis ('Farm Insects,' p. 48) they moult four times.

After the third moult they have acquired the size of fig. 2. The appearance of the larva is then as follows:—The head is narrower than the body, shining, black and beset with a few very short stiff hairs; the eyes are placed in circular rings; beneath the eyes are two palpiform organs composed of six very short joints. The body is

cylindrical, and consists of twelve segments, each of these being sub-divided into several folds. It is quite bare, having no pubescence on any part. The upper surface, as far as the spiracles, is black or deep blackish green; then follows on either side a longitudinal slate-coloured stripe; then a row of black, mostly double, oblong spots; the legs, together with the ventral surface, are all slate-colour. There are twenty-two legs; namely, three pairs of horny thoracic legs, black marbled with gray, seven pairs of gray abdominal legs, and a pair of anal prolegs, so that the fourth segment only is destitute of organs of progression.

Many of my larvæ after their last moult assumed a much paler dull gray tint, as represented at fig. 4 of our plate. The head is black, and the gray near the head somewhat darker than on the middle of the back. These larvæ were a little smaller than the black ones.

On comparing our figure with that of Curtis, in plate B of 'Farm Insects,' a considerable difference will be perceived. His larvæ are more or less brown on the dorsal surface and yellowish on the sides; however, we can assure our readers that our drawings were made from life, and we must therefore suppose that Mr. Curtis, usually so accurate, or at all events the artist who coloured his plates, has been mistaken in this instance, for in the description the colour of the back is given as slate or gray, and that of the sides is called a pale line.

These larvæ repose somewhat curled up on the upper surface of the leaves, and, in contrast with the habits of some other sawfly larvæ, appear to luxuriate in the hottest sunshine. They mostly eat holes in the leaves, feeding, however, sometimes along the margins, to which they generally keep themselves attached by the six thoracic legs. When feeding they slightly elevate the abdomen.

According to the views of Mr. Wttewaall, there must be three generations of this insect in the year in this country; the first living as larvæ in May and June on the wild radish and wild mustard; the second in July and August, subsisting on the summer turnip crop; and the third in September and October on the autumn crop. Nevertheless it is most probable that very many individuals of the second and third generations will be found on wild plants of the rape family.

When full grown the larva descends to the ground, and, burrowing one or two inches below the surface, makes a little oval cocoon of grains of earth, as represented at plate 9, fig. 5; this it lines with a white satiny material, so that the walls inside are quite smooth and shining. In this receptacle it changes to a white pupa (fig. 6). The

pupa gradually acquires a gray tint, and the eyes become black; at last all the colours of the imago begin to make their appearance.

The first brood, and, if a third is to follow, the second require but a short time, two or three weeks being sufficient, to pass from the larval through the pupa state, and to appear as the perfect insect, but the last brood remains shut up in the pupa-case all through the winter, at least up to the end of March, sometimes till April or even into May. With me Athalia spinarum once made its appearance on or just before the 29th of March, and on another occasion not until the 26th of May: I am quite unable to account for this difference.

This insect and Athalia Rosæ, *L.*, are the only representatives occurring in this country of the genus Athalia, which appears, moreover, to be not very rich in species; its characteristics are as follows:—Sawflies having antennæ of from ten to eleven joints, becoming somewhat thicker towards the end; anterior wings with two marginal and four submarginal cells; the recurrent nervures joining the second and third submarginal; the anterior portion of the anal cell obliquely divided; the posterior wings with two middle cells.

The perfect insect may be described as follows:—The female is generally 8 centimetres long, expanding to 17 centimetres; the male usually not more than 6 centimetres, and is, more especially as regards the abdomen, much more attenuated. The general colour of the body is a clear orange or deep yellow. The head, seen from above, is broad quadrangular, the angles rounded, viewed from the front more triangular, black with a gray silky pubescence, more especially above and below the trophi. The antennæ have ten joints in the male and eleven in the female, and are more or less clavate; that is to say, they become broader towards the end. They are black on the upper surface, the last joint (and in the female the first also) being likewise of that colour, the middle ones being pale gray or even white; in the male the first two joints of the antennæ are mostly white or yellow on the under surface and at the sides. The last two joints have evidently proceeded from the division of the normal terminal joint (it must be remembered that the large family of Tenthredo, *Klug*, of which Athalia of Leach is really but a section, has nine joints in the antennæ). The parts of the mouth are white or very pale yellow. The upper lip (fig. 8 *a*) is broadly quadrate, the anterior angles truncate; the mandibles or upper jaws are triangular, having at the end, which is curved, a chestnut-brown hook, and below this on the inner side a rounded tooth (fig. 8 *b*); the lower jaws or maxillæ consist of two lobes (fig. 8 *c*) and have each a long six-jointed palpus, the first joint small, the others

of equal length, and the fifth joining the fourth in an oblique direction; lastly, the lower lip (fig. 8 *d*) is oval, and has three fleshy lobes, and two hairy four-jointed palpi. The eyes are black, oval and prominent; the ocelli are disposed in a triangle. The thorax is yellow on the under surface, red and black on the upper; the prothorax, the diamond-shaped central lobe of the mesothorax, the scutellum and a spot behind it on the metathorax are red.

The abdomen is in the female somewhat thick, cylindrical in the male, of an orange-yellow colour, the first segment being generally more or less black. The valves of the sheath in the female are also black at the tip. The saw and ovipositor are of a clear ochre-brown, rather elongated, somewhat curved, and transversely plicated (fig. 9). The legs are not very long; coxæ yellow; the anterior pair generally have some black spots at the base; femora moderately expanded, pale orange; tibiæ yellow, black at the ends, with a silky pubescence; tarsi rather long, white, with a black termination to each joint; the first four have rather large pulvilli on the under surface, the two last have sharp black claws.

The wings are pretty large, yellow at the base, translucent and iridescent at the tip. The whole anterior margin as far as the stigma is black; the stigma itself is also black, but gray at the end.

I have observed but few varieties; some examples have the antennæ entirely black. Two individuals, which, if I remember rightly, came from green larvæ, had large black spots on the middle of the breast.

It is remarkable that a species of Athalia occurs in Japan, which exactly agrees with the insect found in Europe, excepting only that the wings are smoke-coloured; there are some examples of this species or local variety in the Museum of Natural History at Leyden, collected during the voyage of Mr. Von Siebold. Why Fabricius should have given this species the name spinarum, and Panzer should have called it Centifoliæ, I cannot imagine; perhaps the first-named author may have found it on the blossom of the hawthorn and the latter have observed it on a garden rose; at all events it appears from what has been said above, that it has no connection with hawthorn or Rosaceæ. A very nearly allied species is named Rosæ, *L.*, probably through confusion with Hylotoma Rosæ, *F.*, the larvæ of which live on rose plants. It may be that Panzer, merely to indicate the relationship of the two species, has taken the name of Centifoliæ for that species which he thought was unnamed at the time he described it.

On the Sagacity exhibited by certain Bees and Ants. By FREDERICK SMITH, Esq., late President of the Entomological Society of London.

IN the number of the 'Zoologist' for May (Zool. 9055) Mr. Newman published some opinions and observations upon the cells of bees, and also indicated certain opinions as being held by myself upon that subject. My views as to the definition of instinct, in certain species of insects, is suggested in the same paper. I claim space for a few observations upon both subjects.

It will be admitted by every one, I imagine, that various quadrupeds readily acquire a variety of accomplishments, all being the result of teaching; and I readily admit the opinion that wasps, bees and other insects are at their birth, or, more correctly to express myself, on arriving at their perfect condition, gifted with all the skill necessary to accomplish the requirements of their particular economy.

In the paper alluded to above, I find what I conceive to be an oversight on the part of the author: I allude to the following:—"The bee, on the contrary, without any teaching, without any meditation, begins to make its beautiful and symmetrical cell the hour it is born." This passage, in my opinion, is calculated to inculcate what I believe to be an error. From inquiry I have ascertained that hive-bees, after leaving the cell for the first time, are some days in the hive before they take any part in the labours of the community. I can speak from observation as to wasps, having frequently reared them in my own apartment, and watched them through every phase of their labours: individuals of the species Vespa rufa, on emerging from their brood-cell, frequently have the faintest possible trace of the gay ornamentation that is known to characterise that species, and such individuals certainly remain some days in the vespiary before taking part in its labours. I do not for a moment suppose that during the time passed in the hive, before taking part in its labours, the wasp or bee acquires any additional skill through observation or teaching; I merely record the result of my own observation and experience for the purpose of correcting what I think is calculated to mislead.

To proceed: it is stated that the wasp or bee, in constructing its hexagonal cell "is as much an irresponsible agent as the hen that covers her egg with a calcareous shell before extrusion, and produces it of the best possible form for the purpose for which it is intended;" also that the building of the cells is an "irresistible act;" neither the

brain of the bee or that of the hen having laboured in their construction.

My own observation of the habits of insects and the knowledge I have acquired from that of other naturalists, have irresistibly led me to the adoption of very opposite opinions. If those I have quoted above hold good as regards the wasp and bee, they must equally apply to all the recorded economies of the insect world. I will mention two or three instances of what I call insect sagacity, exhibiting skill, reflection, contrivance, &c.—in fact, a number of those qualifications which are usually summed up in the one debateable sense called *instinct.*

A little swarm of Trigonæ are on the wing; they are in search of some hollow tree or other suitable cavity adapted for their hive; a tree with a large hollow in the trunk is found; this hollow is some inches in diameter, as well as in length. Such a house is not adapted to their purpose; it requires, in fact, the front of the domicile built, and of course a doorway constructed: had this swarm flown twenty yards further a tree with a suitable hollow and also a suitable entrance would have been found. Although the tree selected is not ready for their purposes it matters little, the bees can by contrivance make it so; accordingly they collect a quantity of moist clay and build up the wall, leaving a suitable opening for their entrance and exit. Will it be argued that this is parallel to the formation of the calcareous covering of the egg in the body of the hen? Is no amount of intelligence exhibited in all this contrivance, and in the choice of a material so admirably adapted for the purpose required?

Let us now look in another direction. There is an army of the travelling ant on the march: onward they go, over hill and level plain, and down into the deep ravine; but they halt suddenly, a narrow stream intercepts their progress: they do not turn aside, such is not their wont, the difficulty must be surmounted. A low bush grows close to the margin of the stream; one of its branches overhangs the water; an ant is seen ascending the bush and traversing the overhanging branch to its furthest extremity: having reached this, it seizes the twig with its jaws, and suspends itself by them over the stream; another ant follows, and attaching itself to the legs of the first, hangs down likewise; this example is followed by others, until a chain of ants hangs over the stream; this is wafted to and fro until the ant at the extremity touches and clings to some twig or blade of grass on the opposite side: a suspension bridge is thus formed, and over this the whole army passes. Should no bush be found suitable for their pur-

poses, what has been observed of their resources under such circumstances? Sometimes, if the stream is somewhat rapid, they form a floating chain, which, moving to and fro on the surface of the water, at length touches the opposite bank. I may record another contrivance adopted when a pond of still water interrupts their march: in such a case they have been observed to cluster together in masses, forming balls of ants, and in this condition they float on the water, and are wafted to the opposite shore. The late Mr. Foxcroft saw a number of these ant-balls floating across a pond, one of which he secured and placed in my hands; it proved to be the rare species Anomma Burmeisteri. Do these expedients on the part of the ants exhibit no ray of intelligence? Are they nothing more than the irresistible actions of irresponsible agents?

One further illustration, and I leave it to others to show that all the instances advanced prove nothing in support of my own opinion. There is a burrow in that gate-post, constructed with infinite labour last summer by Osmia aurulenta; it now contains a few males and four females, all matured, and each is gifted with the power capable in every respect of performing every act necessary for the attainment of the ultimate purpose of her economy. One of the females issues from the burrow; like her parent before her, she excavates a burrow in the gate-post; this is the work of days of almost unremitted labour. A second bee takes flight, and, at some little distance, alights upon a sunny bank of compact fine sand; such a bank is admirably adapted to her purposes; she at once commences to excavate; her task is light in comparison with that of her sister's that we left labouring at the gate-post, and in half the time occupied by the first, the second has completed her task.

Let us now attend to the third bee that is on the wing: passing the sunny bank, she makes her way, at length alighting on the thatch of an out-house; the thatch is composed of straw, twigs and reeds; amongst the latter is one the tube of which is exactly adapted for the nest-burrow of a bee; the Osmia observes this, and at once selects it for that purpose.

The fourth bee is buzzing about some tufts of grass, flying here and there apparently without any very settled purpose, but she alights on a stem of grass, at the foot of which lies a snail-shell; now the whorl of this shell is very different in construction to the straight tube in the post, sand-bank or reed; not only is it spiral, but also much narrower at one end than at the other; it is much too wide, in fact, to answer the purpose of the bee without alteration, or some mode of adaptation,

but by availing herself of either of these expedients it will suit her purpose admirably; and "so thinks the bee." The bee does avail herself of this spiral tube of the shell, placing or building her cells longitudinally, so long as the width of the whorl is suitable to such a position; but, when it becomes too wide, she constructs one or two transversely.

Are these actions, so plainly exhibiting reflection, contrivance and skill, nothing more than the irresistible acts of an irresponsible agent? The author of the paper before alluded to speaks of the brain of the bee; surely no action in which the bee can possibly be engaged during the whole course of its existence can claim a greater exercise of its function.

I will, in the next place, make one or two observations on the assumption that I should deny the truth of Mr. Spence's definition of instinct: "Those unknown faculties implanted by the Creator, by which, independent of instruction, observation or experience, and without a knowledge of the end in view, they are impelled to perform certain actions tending to the well-being of the individual and the preservation of the species." I at once admit that I do differ in opinion, very materially, in my definition of the instinct of insects; in fact, it appears to me that the definition contains a contradiction of what it is clearly intended to enforce. The faculties are in the first place described as being unknown, and in the next line they are defined as "possessing no knowledge of the end in view." It is, however, to this latter definition I demur; in fact, I believe that of all impossibilities, perhaps none is greater than to draw a line between what is commonly called instinct and reason. Are we not really speaking of the same sense in both cases? Are not the faculties implanted in the ant, the bee and the wasp, modifications of reason?

I have no intention here to contest the principle upon which the hexagonal cells of bees and wasps are produced, but I freely admit that the cocoons of Microgaster alvearius are produced without any reasoning power being exercised by the apodal grubs; I am perfectly aware of the fact of their being the result of crowding: any single grub removed from the mass would undoubtedly have spun a cylindrical cocoon. The elastic eggs of Pentatoma become hexagonal in shape through the operation of the same principle; in fact, all cylindrical tubes and hollow spheres, if elastic and submitted to an uniform degree of pressure on all sides, will in consequence assume the hexagonal shape.

The basaltic columns are probably hexagonal through the operation

of an opposite force. If an unshapen mass of clay were before me, and I by scraping or cutting removed externally all superfluous portions, I should produce an hexagonal body by another process. If, on the other hand, I were to use the clay, trowel in hand, I could build an hexagonal tube by another mode of operation: the single hand and the single wasp are alike capable of such construction; and this, I contend, is the mode of operation adopted by a number of individuals in the nests of many species of wasps.

FREDERICK SMITH.

New Locality for Claviger foveolatus.—This peculiar insect appears to be not uncommon in the neighbourhood of Weymouth, where I discovered it on the 10th of April, in the nests of Formica flava, beneath stones on the Chesil Bank; and again, under the same circumstances, in the Valley of Friar Wooton, a place where the annual Dorsetshire Steeple-chases are held.—*G. F. Mathews; H.M.S. Warrior, May* 4, 1864.

Beetles in a Boat-house.—On Monday, the 14th of March, I accompanied my friend Mr. Thomas Nash, exhibitioner of Balliol, for a row on the floods, which, as all Oxonians know, covered the low-land for miles round at that time. My friend's ostensible object was fern-collecting—my own, entomologizing. The Editor of the 'Zoologist,' being a *savant* in both pursuits, may wonder why we should choose such a method: probably our inclination for a row was the real explanation. The row in question, however, proved no joke, and had it not been for the powerful arm and experienced boatmanship of my friend, these lines would probably never have been penned. By strenuous efforts, our boat was driven into a boat-house while we rested from our exertions. The result of this movement was the capture of a great number of beetles, which had evidently been driven from the land to shelter in the boat-house. Many small Staphs (Aleocharidæ, &c.), were everywhere to be found: unfortunately those which escaped the voracity of their own kind, and were transmitted to my friend Mr. T. Blackburn, from whom I received the names, were but a very limited number, and all the smallest things seemed to have disappeared. This I must, I am afraid, attribute to my own mismanagement. The survivors were as follows:—Aphodius fimetarius, A. prodromus, Agriotes lineatus, Pterostichus cupreus, P. strenuus, Pæderus littoralis, Xantholinus punctulatus, Lathrobium elongatum, Tachyporus Hypnorum, Stenus brunnipes? S. ater? besides some Bembidia, not yet named.—*E. M. Geldart; Rose Hill, Bowdon, March* 23, 1864.

Scent of Cicindela campestris.—Mr. Norman states (Zool. 8997), in answer to an inquiry of Mr. Archer, that he has never observed the scent of roses emitted by Cicindela campestris in this country, although he has in Germany. I have never noticed this scent when capturing specimens, but when killing them by means of boiling water have perceived a strong, though momentary, perfume, more resembling verbena than roses, in my opinion.—*William Ingall; 4, Albany Road, Camberwell, April* 7, 1864.

Proceedings of Societies.

Entomological Society.

April 4, 1864.—F. P. Pascoe, Esq., President, in the chair.

Mr. Pascoe thanked the Society for electing him to fill the Presidential Chair; and nominated as Vice-Presidents Mr. Stainton, Mr. A. R. Wallace and the Rev. Hamlet Clark.

Additions to the Library.

The following donations were announced, and thanks voted to the donors:—'Sitzungsberichte der Königl. bayer. Akademie der Wissenschaften zu München,' 1863, II. Heft 4; presented by the Academy. 'The Zoologist' for April; by the Editor. 'The Classification of Animals based on the Principle of Cephalization. No. III. Classification of Herbivores;' 'Note on the Position of Amphibians among the Classes of Vertebrates;' by the Author, James D. Dana. 'Stettiner Entomologische Zeitung,' 1864, Nos. 1—3; by the Society. 'Exotic Butterflies,' Part 50; by W. W. Saunders, Esq. 'The Natural History of the Tineina,' Vol. viii., containing Gracilaria, Part i., and Ornix, Part i.; by H. T. Stainton, Esq. 'The Intellectual Observer,' No. 27; by the Publishers. 'The Reader' for March; by the Editor. 'The Journal of the Society of Arts' for March; by the Society.

The following additions by purchase were also announced:—Grenier, A., 'Catalogue des Coléoptères de France.' De Marseul, S. A., 'Catalogue des Coléoptères d'Europe et du Bassin de la Méditerranée en Afrique et en Asie,' deuxième edition.

Election of Member.

P. H. Harper, Esq., of 30, Cambridge Street, Hyde Park Gardens, was balloted for and elected a Member of the Society.

Exhibitions, &c.

Mr. Frederick Smith—after remarking that his attention had been called to a note appended by the Editor of the 'Zoologist' (Zool. 8975) to an extract from his Address to the Society on the 25th of January last, the passage extracted being that relating to the luminosity of Fulgora, and the note being in the following words, "I believe the Honduras fire-fly with intermittent light is an Elater; if so, the Fulgora question remains *in statu quo*,"—said that he had since had supplied the further evidence of another eye-witness of the luminosity of the lanthorn-fly. Mr. James Smith, of 23, Wilton Row, Queen's Road, Dalston, made the following statement:—

"The Fulgora candelaria is found most plentifully between the months of May and August; it is occasionally seen in the winter, but these, I think, are hybernated specimens; it is then not luminous, and very much faded. In the summer it has a pale blue or green light at the end of the snout, which may be considerably augmented by a gentle pressure of the insect; it is brightest in the female. It is common throughout all China, and called the 'Star of Eve,' 'Eye of Confucius,' 'Spark-fly'; and the same insect is called, in the winter, the 'Flying Elephant,' perhaps in reference to its long proboscis. When the insect is settled the light is more luminous than when it is flying, and when the male and female have mated it is wholly extinguished. The

male, I believe, does not survive many hours, as I never caught one in the summer which was not luminous. They fly in swarms, and I have repeatedly taken two or three species in the same swarm. They are most plentiful in gardens, though they are found everywhere. The Chinese ladies catch them and imprison them in a fine gauze net, and wear them in their hair."

Mr. W. F. Evans said that Sir John Barrow's experience was in favour of the luminosity of Fulgora.

Mr. Newman remarked that his note on Mr. F. Smith's former statement was confined to that part which referred to the Honduras fire-fly, *i.e.* to Fulgora laternaria, not F. candelaria. Nothing that had been adduced that evening had any bearing upon the luminosity of F. laternaria.

Mr. Bates said that Fulgora laternaria was pretty common on the Upper Amazons; he had been aware of Madame Merian's statement, and had observed the insect closely; but he had never found it luminous, and, what was stronger than the negative evidence of any single observer, there was no rumour or idea existing amongst the natives to the effect that it was luminous. The natives were well acquainted with the insect, which was the subject of fables current amongst them; for instance, a tale was told of one of these insects having emerged from the forest and attacked a boat's crew of nine persons, eight of whom were killed by the poisonous creature, and the pilot only escaped by jumping into the river. But though the fly was thus reputed to be venomous, there was no story current of its being luminous. Mr. Bates himself was of opinion that Fulgora laternaria was not luminous, and (strange as it might seem) that the Honduras correspondent on whose statement Mr. F. Smith relied had attributed to the Fulgora what, in fact, was the luminosity of a Pyrophorus.

Mr. Newman (on behalf of Mr. Butler, who was present as a visitor) exhibited a number of insects embedded in amber and gum-animè differing from those of which an account was given by Hope in the first and second volumes of the Society's 'Transactions.' The amber was from the Baltic, the gum-animè (which, by the bye, was a resin, not a gum) from the East Indies; one of the amber-insects was peculiar from having enclosed with it a globule of air and a globule of water.

The President exhibited several new Australian Longicornia, presented to him by Mr. F. G. Waterhouse, of Adelaide, some of which were taken by that gentleman during the recent exploring expedition under Stuart; among the more interesting was a new genus, in some respects connecting those remarkable and isolated forms Bimia and Hesthesis. Also a considerable number of new species from Gawler, near Adelaide, part of a large collection for which he was indebted to Mrs. Kruesler and Mr. Odewahn; one of these had the appearance of a Malacoderm, for which, at the first glance, it might very readily be taken. It might, in fact, be regarded as another case of "mimetic resemblance"; but if so, there was this peculiarity about it, that the stronger insect was here imitating the weaker, which seemed not quite consistent with the theory that the imitated form was copied with a view to the protection of the imitating.

Mr. A. R. Wallace said that the case was quite consistent with the theory of mimetic resemblances, and that that theory did not depend upon the relative strength or weakness of the imitated or imitating forms; an insect might be very weak in structure, and yet be a proper subject for mimicry; many insects of weak structure were extremely abundant, were, in fact, dominant species; such species no doubt possessed some protection against their enemies with which we were unacquainted,

and of which other species of stronger structure were deprived; and having that protection, whatever it might be, they were on that account fit and likely subjects for imitation. So far from conflicting with the theory, he felt no surprise whatever at finding a structurally-stronger insect mimicking a Malacoderm.

The President also exhibited diagrams of the under surface of the abdomen of the females of Obrium cantharinum and other Longicornia, showing the presence of large lumps or tufts of hair on particular segments; he was anxious to ascertain whether such a structure was invariably present in the female; he had reason to believe that in some Australian genera (Penthea and Symphyletes) it was not invariably present, but further observation was required. If it should prove that it was not invariably present in the female, this would furnish another instance of "dimorphism," by which he (Mr. Pascoe) meant a case where there was an addition to or alteration of a part or organ; the term, in his opinion, ought to be confined to such a phenomenon, and was not applicable to simple variation, such, *e.g.*, as variation in colour.

Mr. A. R. Wallace exhibited specimens of Papilio Memnon, P. Pammon, P. Theseus, P. Ormenus, P. Erectheus and P. Tydeus, for the purpose of illustrating his views on "polymorphism." Mr. Wallace remarked that *he* did not apply the term "dimorphism" to simple variation; on the contrary, he regarded "polymorphism," of which "dimorphism" was but the first and least complicated stage, as a totally different phenomenon from "variation," and one which required a separate name. Under the common term "variety" many distinct phenomena were confounded; he proposed to confine that term to those cases in which there was indefiniteness and irregularity in the variation. "Variation," then, was an indefinite and inconstant phenomenon, the instances of which passed from one to the other by irregular, often by insensible, gradations; "polymorphism," on the other hand, consisted in the existence of several distinct forms of the same insect which do not graduate into each other. Thus, in Papilio Memnon, the male was in each locality constant; it had rounded hind wings, and was always nearly black, with a few ashy rays; the female, however, existed under two distinct forms; the first had the wings shaped like those of the male, but had a very different colouration, being more or less olive-coloured, and often banded on the hind wings with whitish yellow, and with marginal black spots; the second form of female differed remarkably from the first, the hind wings being produced into a large spatulate tail, and marked with white patches radiating from the base. Both these forms exhibited varieties in the same locality, but there were no connecting links between them. The males paired with both forms of female, and in each case the resulting brood assumed the distinct forms above described. This was a case of dimorphism. Papilio Pammon was a parallel case; there was a form of female resembling the male, and there was a second aberrant form of female, *viz.* the form which had been called P. Polytes: he believed that P. Romulus would prove to be a third form of the female of P. Pammon, though of this he had not evidence at present; but the male of P. Romulus had never been found, whilst the females occurred along with P. Pammon in every collection from India: if that were so, then P. Pammon would exhibit an instance of trimorphism. P. Ormenus was certainly trimorphic, for three distinct forms of female were found, all differing greatly from the male; and Mr. Wallace had reason to believe that to some males of Papilio as many as four distinct wives must be assigned. These forms had hitherto been classed as varieties, but the physiological differences presented by them were striking.

Mr. Wallace further distinguished between a "variety" and a "local form" or

"race," denoting by the latter term a form which kept distinct from the parent stock and propagated itself independently: such a form was not a "variety" by reason of its constancy and the absence of intermediate links, and could not be considered a "species" by reason of the comparative unimportance of the characters in which it differed from the type-form. The subject of Mr. Wallace's remarks had been treated by him at length in a paper recently read before the Linnean Society: he further illustrated the phenomenon of polymorphism by the following hypothetical case:—Imagine the discovery of an island inhabited by white men, and black (negro), red (Indian), and yellow (Chinese) women, and in which the union of these variously-coloured parents produces children which always resemble one or other of the four above-mentioned forms, no intermediate forms ever occurring; the boys are always white, whilst the girls are black, red or yellow, but without any necessary connexion with the colour of the mother, so that a black girl may be the offspring of a white father and of either a black, red or yellow mother. Such a phenomenon would certainly be an extraordinary one, but it was exactly parallel to what took place with the exhibited species of Papilio.

Gen. Sir John Hearsey remarked that so long ago as 1831 he had captured Papilio Pammon and P. Polytes *in copulâ*, had killed the pair *in situ*, and so sent them to Prof. Westwood; in which position they were to be seen at Oxford to this day.

Mr. Waterhouse enquired whether there was any evidence of the fertility of the abnormal females, since on theoretical grounds it might almost be expected that they would be unproductive.

Mr. Wallace replied that he believed one of the abnormal females then exhibited could be seen to be full of eggs.

Prof. Westwood exhibited a butterfly recently received at the Oxford Museum from M. Snellen van Vollenhoven; the specimen was from Ceram, and it appeared to him to differ from Papilio Peranthus only in its large size and to some extent in its colouring; he found no structural difference whatever, and he begged to exhibit it as P. Peranthus, *var.*; it seemed to him to be precisely one of Mr. Wallace's "local forms," but Mr. Wallace informed him that *he* should describe it as a new species.

Mr. A. R. Wallace said that if structural difference was necessary to constitute a species, two-thirds, or probably nine-tenths, of the existing species must be abolished; the difference between a local form and a species was one of degree only, and in his opinion the butterfly exhibited possessed characters sufficient to entitle it to specific rank.

Prof. Westwood read a description of a gigantic Heteropteryx, the type of which was preserved in spirits in the Oxford Museum; it was named H. Hopei. Also a description of a new species of leaf-insect, one of the distinguishing characters of which was that the abdomen had no rounded lobes; this was described under the name of Phyllium Feejeeanum.

Mr. S. Stevens exhibited a box of insects recently received from Mr. Diggles, of Moreton Bay, Queensland; they consisted principally of Lepidoptera, with a few Orthoptera, admirably preserved.

Mr. Sharp exhibited a single specimen of a beetle new to this country, the Stenus Kiesenwetteri, which he had captured at Wimbledon. The species appeared to be a rare one, but had occurred in Spain and in Bavaria.

Capt. Cox sent for exhibition some photographs of insects, the execution of which excited the admiration of all; they were very nearly, but rather under, the natural size.

The Secretary mentioned that the name of Sosxetra, proposed by Mr. F. Walker for a new genus of Hymenoptera (Chalcididæ), Trans. Ent. Soc. Ser. 3, vol. i. p. 370, must, according to the ordinary rules of nomenclature, be sunk, since the same author had, at p. 84 of the same volume, described a new genus of Lepidoptera under the same name.

Mr. Frederick Smith said that in stating the contents of the late Mr. Curtis's British Collection, in his Address to the Society at the last Anniversary Meeting, he had made a serious mistake. See 'Journal of Proceedings' for 1863, p. 198. The actual number of specimens was as follows:—Coleoptera, 9405; Lepidoptera, 7200; Hymenoptera, 7715; Diptera, 5878; Neuroptera, 1165; Hemiptera, 1673; Homoptera, 244 specimens.

The Rev. Hamlet Clark communicated extracts from a letter recently received from Mr. John Gray, who was collecting insects at the Cape de Verdes. The letter was partly written from the Island St. Nicholas, under date 22nd of February, 1864, and partly from Porto Grande, St. Vincent, 29th of February, 1864. Eight days had been spent in St. Nicholas, but as regarded Entomology the expedition was a failure; it was the mid-winter of that country, and more beetles could have been got out of any turnip-field on any Christmas-day in England than he had been able to procure there from the whole of the vegetation put together. Nevertheless a few nice beetles were captured—a handsome Dytiscus, a large tropical Gyrinus (Dineutes?), and eight or ten species of Harpalidæ, taken high up on the mountains (Nebria, &c.). Altogether, however, a list could not be made of more than twenty species, of which about five were Heteromera, several species of which were in profusion under every stone. There were no signs anywhere of abundant insect-life; nothing was seen upon the walls of the houses, nothing upon the flowers, nothing anywhere except the Heteromera under stones. A few fine spiders had been obtained, and carefully preserved in spirits.

Mr. Douglas C. Timins, under date of Cannes, March 29, 1864, communicated the following notes of his entomological observations made during the winter months in the Departement des Alpes Maritimes:—

"During the early part of November Papilio Podalirius and Gonepteryx Cleopatra appeared, though in small numbers. Cynthia Cardui and Vanessa Atalanta were extremely abundant, and continued on the wing throughout the winter. Orthoptera were very numerous in November and December: amongst them I noticed Acridium lineola, Gryllis maculata, G. azurea, G. Italica, G. cærulescens, &c., Mantis religiosa and others. Cicindelidæ were very abundant (the common C. campestris and C. hybrida, as well as several other species). In the beginning of December I took a great many specimens of Polyommatus Bœticus and the allied P. Telicanus: both these species fly round the tops of bushes, very much after the manner of the Theclas, between which genus and Polyommatus they form in habits, as well as in appearance, a connecting link. P. Unionalis appeared in fir-plantations and Lycæna Phlœas abounded everywhere, as did Lasiommata Ægeria, L. Megæra, L. Mæra, Argynnis Lathonia and Macroglossa Stellatarum. The larvæ of Papilio Machaon and P. Podalirius continued feeding until the middle of December, and this was also the case with numerous other species which in England assume the pupa state some three months earlier. During January few species of Lepidoptera were seen; Pieris Daplidice, however, appeared, and also *fresh* specimens of Colias Edusa and C. Myrmidone, and *battered* ones of Vanessa Io, V. Atalanta, V. Antiopa, V. Cardui and V. Urticæ. Examining moss appears to be of little or no use in this locality; probably the

Coleoptera rarely hybernate in so mild a climate, and yet few were taken on the wing or crawling about, except Carabus monilis and Chrysomela Populi, and some of the genus Aphodius. This neighbourhood seems poor in Dytiscidæ, for I met with few, and these only the commonest species. In February the weather was extremely bad, and the only Lepidoptera which appeared were Lasiommata Ægeria, L. Mæra and Colias Edusa; early in March Papilio Podalirius reappeared and Gonepteryx Rhamni and G. Cleopatra also. During this month Colias Edusa, C. Myrmidone, Pieris Daplidice (very common), Anthocharis Belia, Vanessa C-album, V. L-album, Pontia Brassicæ and P. Chariclea, Thais Rumina, Thecla Rubi (very common), Polyommatus Alcon (?) and Saturnia Carpini appeared; also Vanessa Io and the other common Vanessidæ. Several species of Cicindelidæ occur now (March 24th) in the rocks, but I have not yet been able to identify them all; and of Libellulæ, Æshna grandis, Libellula forcipata, L. depressa, &c. A good many species of Hemiptera occurred in December and January, but I have been obliged to reserve their nomenclature for some future time, as I can obtain here no books on that order. Among the larvæ found in December were Deilephila Euphorbiæ, D. Galii and Acherontia Atropos. The pine woods have been full of the larvæ of one of the processionary moths, living in society under white silky nets, and proceeding in lines or chains, sometimes thirty feet long (each larva is hardly an inch and a half in length), to bury themselves preparatory to assuming the pupa state: on reaching a suitable place for this purpose, the chain of larvæ disperses, and each one proceeds to bury himself, usually, however, near his comrades, so that when one pupa was found by digging, more were certain to be obtained within a few inches of the same place."

Paper read.

Mr. Frederick Smith read a paper "On the construction of Hexagonal Cells of Bees and Wasps." This was illustrated by the exhibition of a collection of nests, among which were those of Icaria guttatipennis, Nectarina Lecheguana, Tatua morio, Polistes tepidus, P. Tasmaniensis, Vespa vulgaris, Apis mellifica, &c.: among the most remarkable was a nest of Polistes Tasmaniensis, in which a single central cell had been prolonged and carried to a considerable distance above the level of the surrounding cells; this prolongation was alleged to be hexagonal, and much use was made of this in the course of Mr. Smith's argument. Mr. Bates, however, took issue with Mr. Smith on the hexagonality of this part, and declared it to be, in his opinion, as nearly circular-cylindrical as possible. In contradistinction to the "circular theory" expounded by Mr. Waterhouse at the previous Meeting, Mr. Smith's might be termed the "hexagonal theory," but it will give a better idea of the main argument, if we denote his view of the construction of the cells as the "intentional theory." The hexagonal form of cell was described as "the ground plan laid down by the Great Architect," and the bees were the builders who carried out his designs: it was argued that both bees and wasps began instinctively and with a primary intention to construct hexagonal cells; and so strong was the "hexagonal principle" guiding them in their operations, that one wasp, Apoica pallida, not only built hexagonal cells, but occasionally formed the entire comb of a hexagonal shape. Reference was also made to the artificial bases or foundations for cells used by the German bee-keepers, such foundations being hexagonal; and from this it was argued that these hexagonal ground-plans must be exactly such plans as bees were accustomed to erect their cells upon, or at all events that the fact of bees at once accepting the plan furnished them was strongly in

favour of the supposition that bees when left to their own resources construct a precisely similar basement. In fine, Mr. Smith could not regard bees and wasps as creatures that would instinctively construct circular-cylindrical cells, but whose labours always eventuated in the production of hexagonal ones; on the contrary, he regarded them as creatures that would instinctively construct hexagonal cells, and the hexagons actually produced were only the carrying into effect the original intention of the builders.

Mr. Marshall (who was present as a visitor) asked Mr. Smith whether he thought a hexagonal foundation would be laid in a case where it was not in contemplation to form other cells in immediate juxta-position? or would a cell be hexagonal if there were no other cells adjoining to force it into that form? In his opinion, the hexagonal shape was due to the fact that there were other, as it were, competing cells around, and to the pressure of such competing cells on that whose form they thus determined: this also accounted for the fact that the exterior cells were circular. Competition and pressure were the causes of the hexagonal shape of the cell.

Mr. Newman enquired to what extent Mr. Smith would carry his principle of intention? Would he apply it equally to the case of the larva-cells of Microgaster alvearius? Was it applicable to the aggregation of lenses in the eyes of insects? or could it afford any explanation of the hexagonal form of pillars of basalt?

Mr. Waterhouse thought he had, in his paper, anticipated and answered most, if not all, of Mr. Smith's objections to the circular theory; he admitted, however, that the nest of Polistes Tasmaniensis presented a difficulty, but thought an isolated instance of unnatural formation was insufficient to overthrow the theory; he admitted also Mr. Smith's greater practical acquaintance with the nests of bees and wasps; but he considered the vice of Mr. Smith's paper to be that it overlooked or did not give sufficient attention to the circular marginal cells: according to the "intentional theory," the marginal cells ought to be as exactly hexagonal as the rest, but this was not the case; it was upon observations of the marginal cells that the "circular theory" was grounded, and for their form, as well as for the hexagonal form of the surrounded cells, the circular theory accounted, whereas the intentional theory of Mr. Smith applied to the central cells only, and left the other case entirely unexplained. At any rate the two theories were before the Society, and he hoped the two papers would be published together, so that Members, caring naught for either theory as such, might impartially draw their conclusions for themselves.

New Part of the 'Transactions.'

A new Part of the 'Transactions,' Series 3, Vol. i. Part 9, being the concluding part of the volume, and the first published during the present year, was on the table.

May 2, 1864.—F. P. Pascoe, Esq., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—'Mémoires de la Société de Physique et d'Histoire Naturelle de Genève,' Vol. xvi. Parts 1 and 2; Vol. xvii. Part 1; presented by the Society. 'Proceedings of the

Royal Society,' Vol. xiii. No. 61; by the Society. 'Journal of the Proceedings of the Linnean Society,' Vol. vii. No. 28; by the Society. 'Notes on Sphærularia Bombi,' by John Lubbock, Esq., F.R.S., Pres. Ethn. Soc.; by the Author. 'Sitzungsberichte der Königl. bayer. Akademie der Wissenschaften zu München,' 1863, II. Heft iv.; by the Academy.' 'The Journal of Entomology,' No. 8; by the Proprietors. 'The Journal of the Society of Arts' for April; by the Society. 'The Reader' for April; by the Editor. 'The Zoologist' for May; by the Editor. 'Stettiner Entomologische Zeitung,' 1864, Nos. 4—6; by the Society. 'Descriptions of New Genera and Species of Phytophaga,' by J. S. Baly; by the Author.

Exhibitions, &c.

Mr. Dunning (on behalf of Mr. R. S. Scholfield, who was present as a visitor) exhibited a specimen of Hydrilla palustris, captured by Mr. Scholfield in Quy Fen, Cambridgeshire; the specimen was a male, and was disturbed from grass on the afternoon of the 29th of May, 1862. This Noctua was introduced into the British List on the authority of an example in the possession of Mr. Allis, taken some years ago near York; but the species was not included (or rather was given as a "Reputed British Species") in Mr. Doubleday's 'Synonymic List of British Lepidoptera' (ed. 1859).

Captain Cox exhibited various coloured drawings of Lepidopterous larvæ; and the original of his "larva-index" or "larva-dictionary," the plan of which was described by him at a recent Meeting of the Society. (See 'Journal of Proceedings' for 1863, p. 186.)

Captain Cox also exhibited a number of Lepidopterous larvæ which had taken possession and were consuming the contents of a large bin of bran; in the previous year he had found Aglossa pinguinalis extremely abundant in his stables and outhouses, and hence thought it probable that the larvæ were of that species; it was, however, remarkable that the larvæ of so fat and greasy a moth should be nourished on so dry a substance as bran. Mr. Dunning thought the larvæ were more probably those of Pyralis farinalis; and Mr. Newman suggested Ilithyia sociella.

Prof. Westwood exhibited nine species of Charaxes (three of which were unique specimens) from the Zambesi, whence they had been sent by the Rev. H. Rowley; each specimen was placed in a separate envelope, a considerable number might thus be placed in a box, and the whole had travelled in this manner without sustaining material injury.

Mr. A. R. Wallace exhibited various species of Papilio, Eronia and Pieris, with the intention of showing the effect of locality in producing change of form in insects. Numerous species inhabiting the island of Celebes were produced, and in each case in juxta-position therewith was its nearest ally from the adjoining islands. The Celebes insects, in every instance exhibited, had the costa of the anterior wings much more strongly arched than was the case with their congeners with which they were compared. Mr. Wallace remarked that changes in colour which were due to locality had been frequently noticed, but of instances of a change of form only few had been recorded; Mr. Bates, however, had mentioned some as having come under his observation in South America. In the Eastern Archipelago, he (Mr. W.) had found that the butterflies inhabiting the islands which formed the eastern half were generally larger than those in the western half; and, especially in the Papilionidæ, that Celebes and Amboyna produced the largest specimens. Some species which in India were found with a large tail appended to their hind wings, possessed only a small tail in the

Indian Islands, which ceased altogether or was reduced to a mere tooth in the islands of the Pacific; of this Papilio Agamemnon was an example. The island of Celebes was as nearly as might be the centre of the Eastern Archipelago, and the butterflies of that island, especially the Papiliones, possessed the peculiarity in the form of their wings to which he had invited attention; sixteen or seventeen species of Papilio were found in Celebes, and, with a single exception to be afterwards noticed, all were distinguished from their allies in the other islands by having the upper wings strongly arched, in lieu of a gentle and gradual curve, or, if he might so term it, a flat bend. The same distinction existed also in many Pieridæ and in a few Nymphalidæ, but he had not observed it in other groups of butterflies. Mr. Wallace had a theoretical explanation to offer of this phenomenon; he conceived that the insects had become modified in form by the external circumstances to which they had been subjected, and that this modification was to be accounted for by some physical or organic change which had occurred in Celebes, but not in the now adjacent isles. Rapidity of flight was generally supposed to be the consequence or a property of the falcate form of wing; he (Mr. W.) was inclined to think that the falcate form gave greater facility in twisting or turning about; if that were so, the Celebes form of butterfly-wing would give the insect this additional facility, and thus enable it more easily to escape from its enemies. If, then, the Celebes insects were supposed to have been formerly subject to great persecution, those with the arched form of wing would have the best chance of escaping, the less favoured forms would be gradually killed off, those that survived would owe their existence to the form of their wings, their offspring would resemble and some few would exceed them in the possession of the advantageous shape, and the specimens with the best developed wings being naturally selected in each succeeding generation would lead to the gradual and regular increase of the peculiarity. But then it might be asked, How is it that only a few of the butterflies have the peculiarity in question? The answer was, that different insects preserve their existence by different means; one may escape by means of its power of flight, the habits of a second may enable it to avoid its foe, a third may owe safety to its colour, whilst a fourth may be positively distasteful to animals which prey upon insects. Thus the Danaidæ, though slow of flight, were very abundant and were the subjects of mimicry or imitation by other species; in all probability they owed their immunity from destruction to the strong and unpleasant odour which they indubitably possessed. It was manifest that where another means of escape already existed, the principle of selection would not be brought into play; the peculiar form of wing would not be wanted, and therefore would not be acquired. The obscure Satyridæ were doubtless protected by their colour; the majority of the Nymphalidæ had already sufficient power of flight, and those of that group which had acquired the arched form of wing were precisely the species which possessed only about the same power of flight as a Papilio. The single Celebesean Papilio which had not assumed the arcuate form of wing was one belonging to the Polydorus group, a group which was itself imitated by other Papiliones, and which therefore was doubtless provided with some special defence, though the nature of it was unknown to us.

Prof. Westwood, after remarking upon the pleasure he always derived from Mr. Wallace's speculations, whether he agreed with them or not, said that he was unable to follow Mr. Wallace in tracing the phenomenon to the causes assigned by him; arched wings were not necessarily, or even generally, accompanied by the greatest rapidity of flight; and if the original form of the butterfly must be varied, if

one species must imitate another, he (Prof. Westwood) thought it far more probable that the variation would consist in getting stronger muscles to their bodies, as in the species of Charaxes he had that evening exhibited, rather than in a minute change in the curve of the wing.

Captain Cox thought that the swiftest fliers had the straightest wings, as, *e.g.*, the Sphinges, where the costa was scarcely arched at all.

Mr. Newman also was unable to connect an arcuate wing with rapidity of flight, and instanced the straight costæ of the swift-flying Diptera.

Mr. F. Smith referred to some of the swiftest Hymenoptera, which had pointed wings, but with perfectly straight costæ.

Mr. Baly said that the arched form of wing might be advantageous in giving a greater power of twisting and turning about, rather than in giving greater rapidity of flight; and this, he thought, was what Mr. Wallace had suggested.

The President observed that the theory seemed to be based upon the supposition of a gigantic persecution to which the butterflies had been subject; but was there any evidence of the existence of such persecution? had Mr. Wallace ever seen the insects actually pursued by birds or other enemies? It seemed to him that persecution, to the extent to which it now occurred, was altogether inadequate to account for the magnitude of the result attributed to it.

Mr. Bates said that he had frequently observed in South America that the paths were strewn with the wings of butterflies; and in this country it was not an uncommon sight to see the Pontiæ pursued by birds, and sometimes escaping by means of their tortuous or "dodging" flight.

Captain Cox had recently seen forty or fifty specimens of Brephos notha destroyed by tom-tits in a single morning.

Mr. F. Smith remarked that, on the persecution principle, great change must be impending in the shape of wing of the butterflies of the London district.

Prof. Westwood asked whether Mr. Wallace had observed the twisting or "dodging" flight to be conspicuous in the butterflies which have largely-developed wing-tails? or whether the tails contributed to or affected the flight in any, and, if any, in what manner?

Mr. Wallace replied that he had not observed that the wing-tails had any influence upon the flight of the insect; he did not think they affected the rapidity, or that they acted as a rudder, and he was at a loss to assign any use to those appendages. With respect to the other points which had been touched upon, there was in some cases an increase of muscular power as well as an increase of curvature of the wings, but the wing of a butterfly was far more liable to variation than the body of the insect; that organ was therefore more accessible to the operation of the principle of selection, and a modification of its form was consequently more readily produced. Most of the instances of swift-fliers with straight wings which had been adduced (as *e.g.* the Sphinges) were insects with the strongest bodies and the greatest muscular power; moreover, he did not maintain that any insect with arched wings would have a more rapid flight than any other with straight wings; all that he had argued was, that, as between two closely allied species, the one which had the wings most arched would have the flight most rapid; for instance, he should expect a Sphinx with arched wings to fly more rapidly than a Sphinx with straight wings. But in truth, though he had referred to the supposed concomitancy of falcate wings and a rapid flight, his own notion was (as had been correctly stated by Mr. Baly) that the arched form was

chiefly useful in giving greater power of turning or twisting. As to the enquiry whether he had seen the butterflies actually pursued, he admitted that he had not to any great extent; he offered his explanation as a theoretical one; but he thought it could scarcely be doubted that butterflies were subject to the attacks of numerous depredators.

Paper read.

The Secretary read a paper, "On the Reversion and Restoration of the Silkworm," by Captain Thomas Hutton, F.G.S., of Mussooree, N.W. India.

The author attributed the enormous loss of silkworms by "muscardine" and other diseases, and the consequent diminution of the crop of silk, to the combined effects of bad and scanty food, want of sufficient light and ventilation, too high a temperature, and constant interbreeding for centuries of a debilitated stock. He asserted that there was no such thing now in existence as a perfectly healthy domesticated stock of silkworms; and moreover, that it was useless to seek for healthy seed, for whether in Europe, Persia, India or China, the worms were all equally degenerated, or, if there were a difference at all, it was in favour of the European race. He had for several years been experimenting upon Bombyx Mori, with a view, if possible, to reclaim the worms, to restore to them a healthy constitution, and to induce them to *revert* from their present artificial and moribund condition to one of vigour and permanent health. The occasional occurrence in a brood of one or more dark gray or blackish-brindled worms—the "vers tigrés" or "vers zébrés" of the French—contrasting strongly with the pale sickly hue of the majority, must have been noticed by all who have had experience in rearing silkworms; such occurrences have been always spoken of as indicating variety arising from domestication. The author had endeavoured, by a series of experiments, to ascertain the cause of this phenomenon, his conviction being, either that the species had at some time or other been crossed by another of different colours, and that Nature, as sooner or later she always would do, was making an effort to separate them, or that the original colour of the worm had been dark, and an effort was being made to *revert* from a sickly condition to the original healthy starting-point. He accordingly picked out all the dark-coloured worms and reared them separately, allowing the moths to couple only *inter se*, and the same with the white worms. In the following spring the one batch of eggs produced nearly all dark brindled worms, whilst the other batch produced white worms, sparingly interspersed with an occasional dark one; these latter were removed into the dark batch, which was also weeded of its pale worms. In the third year the worms were still darker than before, and were always larger and more vigorous than the pale ones, giving larger and better-stuffed cocoons. Just as the eggs of the third year had been collected, a violent gale of wind upset the whole, but in the spring of 1862 the author recommenced *de novo*, and went over the same ground again. The few dark worms picked out escaped disease altogether, though reared in the same manner, in the same room, in the same temperature, on the same quality of food as, and in close contiguity with the others. In due time they spun cocoons, and produced moths, which, coupling *inter se*, deposited a fair stock of eggs, with which the experiments were continued in 1863. The eggs began to hatch on the 16th of March, and no sign of disease was apparent until the moths came forth, when many still showed defects in the malformation and dark spotting of the wings. As compared, however, with the previous year there was decided improvement; still there were too many white worms in the brood, but there was no symptoms of disease, the worms attained a larger size by a quarter of an inch

and produced larger cocoons, and the moths laid good-sized eggs, great numbers of which adhered firmly to the paper upon which they were deposited, and many of the male moths displayed unusual vigour in flying in search of the females. But still more extraordinary was the fact that some of the eggs of Bombyx Mori of the spring crop of 1863 began to *hatch again for a second crop* on the 7th of August; these were all of the dark stock. The hatching continued throughout August, and occasionally even to the 23rd of September, when, through fear that the supply of leaves might fail, the eggs were removed to a temperature below 70° Fahr., in order to check the hatching. The worms which were then hatched throve and spun good cocoons, superior in size to those of the spring crop; in due time the moths appeared and were fully twice as large as those of the spring, depositing large well-formed eggs. In the beginning of December, to the author's dismay, more worms were hatched from the spring batch, and they continued to come forth at the rate of forty or fifty daily in a temperature of 53° Fahr., until, there being no more leaves upon the trees, the remaining eggs were placed in the open air at night, in order that the hoar frost might put a stop to further hatching. The whole of these worms were of the dark kind, and no white ones appeared amongst them as in the spring. This circumstance, so unusual with Bombyx Mori, the author attributed entirely to an accession of health and strength in the black worms; he regarded the occasional occurrence of the dark form in domestication as an attempted return on the part of Nature to the original colours and characteristics of the species, and considered the whiteness of the generality of the worms as a positive indication and proof of the destruction of the original constitution; in fact, the dark worms were the original and natural worms. This conclusion was further supported by arguments deduced from the strong similarity in the disposition and arrangement of the markings to those of the existing wild races in India, and by analogy to the general fading in domestic stocks of the original colour, to give place to piebald and finally to white. The author had long entertained the idea that the production of white cocoons (except in those cases where the white was permanent and constant in all climates) was a strong sign of degeneracy, the white cocoons being more abundant where the temperature was high than in more temperate climes; the whiteness of the worms and the white cocoons were both indications of failing constitution, evidencing the existence of a higher temperature and more artificial treatment than was conducive to the health of the insect. The author proceeded to argue that the good quality of the silk produced was no proof of the general health of the insect; it was the quantity, rather than the quality, of the silk that was affected by the present maladies; too great fineness of the silk was, in fact, an indication of too high a temperature, and of the consequent degeneracy of the worm. After considering at some length the question "What species of mulberry-tree is best adapted for the nourishment of the silkworm and for the production of good silk?" the author concluded by recommending the sericulturist to separate his dark worms from his general stock, to set them apart for breeding from, and to annually weed out all the pale-coloured worms; in the course of three or four years he would be able to cast aside his present sickly stock, and would have a stock far healthier than had ever before been seen in Europe.—*J. W. D.*

Monkeys in Africa.—The most attractive of all the native inhabitants are the troops of monkeys which we saw disporting themselves among the wood on the opposite side of the gorge. These creatures, which are of the same species as those of the Rock of Gibraltar, descend in the morning and evening to drink at the Chiffa; and, at the approach of wheels, they may be seen scrambling promiscuously up the mountain side, mothers carrying their young, some on their back, others in their arms, and frequently turning, rushing up a tree, and, after a hasty glance at the passing traveller, chattering and grinning as monkeys know how. Now and then a fellow older and bolder than the rest will remain ensconced among the branches of a chesnut-tree, and take a very close survey of the intruders.—'*The Great Sahara,*' *by H. B. Tristram*, p. 38.

Harp Seal in Shetland.—Several harp seals are now to be seen in the deep sheltered Voe at Baltasound. This species can scarcely be considered very rare here, but it is said only to occur in bad weather, and certainly the present visit forms no exception to the rule, the wind having for some days been blowing heavily from N.E., accompanied by sleet and snow.—*Henry L. Saxby; Baltasound, Shetland, March* 14, 1864.

The Grampus in the River Parret, Somersetshire.—On the 21st of March ten of these huge creatures came up the Parret to within five miles of Bridgwater, following the course of the river, or three miles in a straight line; they then returned about four miles down the river, or to about half a mile below the village of Combwich, when they were all captured by means of harpoons and spears. Two of them were brought up to Bridgwater and exhibited: these I saw; one of them was twenty-three feet three inches long, measured in a straight line, and sixteen feet round at the largest part; the other was very much smaller, being but thirteen feet long. Of the other eight, one is said to have been rather longer than the larger of the two which were brought to the town, but not thicker; another, still smaller than the smaller of these, being but eleven or twelve feet long; the rest are described as varying in length from eighteen to twenty-one feet. They agreed well with the figure and description in Bell's 'British Quadrupeds,' except that the fins did not appear to me quite so large in proportion to the whole body as the description gives them.—*Thomas Clark; Halesleigh, April* 12, 1864.

The White Camel of the Sahara.—The most peculiar appendage of the Touareg is his magnificent "mahari," or white dromedary, as indissolubly associated with these people as the horse is with the sons of Ishmael. This graceful creature, which may generally be seen kneeling in the souk of any M'zab city, with its fawn-coloured head and neck towering above the camels round, bears the same relation to them that the thorough-bred racer does to the cart-horse. Its small head, its very fine coat, its great length of limb and depth of chest, all bespeak the highest "breeding." I never saw any ordinary camel (or djimel) which approached within eighteen inches the stature of a mahari; but the most distinctive development is in the depth and width of chest, while the hump is comparatively small. The Saharans maintain the mahari to be distinct species; but it is not necessary to be an acceptor of Mr. Darwin's theory, in order to believe that this noble creature is simply the development of the camel by a long course of artificial selection in a very dry, hot climate, where speed, and not the power of bearing burdens, is the one object aimed at. The Touareg is as careful in the selection of his breeding mahari as the Arab is in that of his horse. All intermixture with the common camel is carefully avoided; and as the pedigrees are handed

down, many a dromedary can boast a genealogy far longer than the descendants of the Darley Arabian. The training of these white dromedaries, as the French term them, is among the "noble mysteries" of the desert; and certainly the mahari, so far as my own observation goes, is rendered obedient to the word of command, and lies down, turns, rises, quickens or slackens its pace, as no other camel is taught, at the voice of its rider. It is also guided by a bridle,—a single thong of leather attached to a ring inserted in its nostril when very young, and by which its rider directs it, dexterously flinging the rein over its head, and drawing it to either side at pleasure, a mode of guidance never adopted with the ordinary camel. But the most singular part of the dromedary's equipment is the saddle, placed, not on the hump or back, but on the neck and shoulders. It is prevented from slipping from its position by two girths; one just behind the fore legs, the other round the neck. The saddle itself is in shape like a chair, a wooden frame with a high back, covered with leather, and a curious high peak in front, narrow at the base, round which the rider crosses his legs, with a wide and flat top, on which he can lean his body and round which his pouches are slung. To an inexperienced rider, no motion can be more trying than that of the dromedary saddle. The only relief to be obtained from the uneven movement of the creature's shoulders, as it trots, is by resting the body against the peak; and, unless it be lifted at each step, a violent blow on the chest or stomach is the inevitable consequence. The ordinary pace of the mahari is a swinging trot; and this it will keep up from sunset to sunrise, without intermission, accomplishing with ease eighty miles in a day. Fabulous tales are recounted of dromedaries which have run 250 miles without a halt, and repeated the same distance the following day; but the endurance of even a Touareg could scarcely have sat out such a stage. To protect themselves from the exhaustion of the motion, the Touareg, before mounting, tie a very thick and tight bandage of leather round the stomach and loins. The mahari is fed principally upon dates instead of barley, which can rarely be procured in the desert, and, with a small supply of this fruit, added to the dry coarse herbs of the country, will undergo the severest fatigues.—'*The Great Sahara,*' *by H. B. Tristram*, p. 537.

Ornithological Notes from Shetland. By Henry L. Saxby, M.D.

Fieldfares and Redwings.—Not satisfied with having, as usual, "come in like a lion," March is going out like a bear. Yet, notwithstanding the prevalence of frost, snow and heavy winds, during the last few weeks, some of our regular spring visitors have already arrived. On the 2nd a steady breeze from S.W. brought a large flock of fieldfares; they remained until the 11th, when they left with nearly a gale from W.S.W. These birds, like the redwings, are not by any means common with us, and both species seem partial to travelling by night.

Oystercatchers.—On the 18th of March, came the oystercatchers, as usual punctual almost to a day. Oddly enough this species is only a summer visitor to Shetland, although it remains in Orkney

throughout the whole year; the distance between the two groups of islands being considerably less than a hundred miles, it is scarcely probable that this migration can be entirely due to the influence of climate. It is not very often that birds are observed in the act of arriving from their winter quarters, but I am quite convinced that I have upon several occasions seen oystercatchers making their first appearance in the spring. Not one is to be found in winter, but shortly after the middle of March their loud echoing cry is sure to be heard—not a very musical one, it is true, although at the close of a long and dreary winter it is welcome as the voice of a long lost friend. They mostly arrive soon after mid-day, not in large flocks, but in small parties of half a dozen, or even less, keeping rather low, and making straight for their old haunts: there, if not much disturbed, they remain in a state of comparative inactivity for a day or two, displaying but little of their customary eagerness in their search for food, and often permitting a very near approach.

Lesser Blackbacked Gull.—Another of our summer visitors, but one which is not expected within the next few weeks, is the lesser black-backed gull, which, although it breeds here in countless numbers, entirely deserts us soon after the young birds are strong upon the wing. This species also remains in Orkney throughout the year.

Lapwings.—Some thirty years ago lapwings were very uncommon in Unst, and also, I believe, in most other parts of Shetland. Now, however, there are whole colonies of them in various parts. They left as usual, in autumn, but the first flock returned to Baltasound on the 21st of March.

Wild Swans.—On the same day (March 21st) the first hoopers were seen, and they will probably continue to arrive at intervals until about the middle of April. As a rule, the flocks which come at this season are much smaller than those which pass southwards in autumn, but nevertheless, in April, 1858, I saw as many as fifty-two fly over this house. I have observed that on their return they often fly nearer to the ground, sometimes within easy stone's throw. This is most likely, because in spring the greater number arrive late in the evening, or very early in the morning, when there is but little stirring below, whereas in autumn they most frequently pass over in broad daylight, when the people are gathering in their harvest. This difference as to time seems to imply a certain definite range in their migrations. During their flight they utter a soft and rather melancholy cry, resembling the words "Who, who, who," repeated many times in succession: on a calm spring evening about twilight, or, as the Shet-

landers say, "in the dim," these sounds have a strange, one might almost say solemn, effect. The flight is performed with great swiftness, although, to all appearance, rather laboriously; indeed the poor birds seem to be always ready to remain for a night upon the lochs, or sometimes upon the quiet sheltered voes. Strange stories are often told of the supposed perfect order of their flight, and of the regular system of relief which is said to be observed among the leaders. My own experience is small, but, as far as I have been able to ascertain, the flock really does occasionally assume the precise form of a wedge, but far more frequently it has the appearance of a long irregular line. I never saw any other than a white, and therefore adult, bird taking the lead. Every now and then, sometimes twice or thrice in a minute, another passes to the front and becomes the leader, but this seems to be more a matter of fancy than of obedience to any fixed plan.

Snow Buntings.—It would be difficult to imagine a scene more suggestive of famine and desolation than that presented by the hills above the Loch of Watley after a heavy fall of snow; nevertheless, when I had occasion to cross them one day early in the month, there, true to their name, were the hardy little snow buntings flitting from stone to stone, and twittering as merrily as though they were in the midst of plenty. The hard weather which accompanied that same fall of snow was severely felt by birds of many kinds. Wild ducks, golden-eyes, tufted ducks and pochards, all left the inland water and appeared upon the voe: the previous snow had long since driven the golden plovers to seek their food upon the shore, below high-water mark.

Snipes.—Snipes, too, suffered considerably. On the 13th of March I saw about a dozen crowding round a small spring in front of the house. I know one well-authenticated instance in which seventeen out of a party thus assembled were killed at one shot. In Morris's 'Birds' an almost similar case is recorded. During a frost, snipe may constantly be found feeding in abundance along shore, and it is therefore difficult to account for the fact that at such a time individuals are to be met with in a half-starved condition a few hundred yards inland, when a visit to the shore would enable them amply to supply their wants. Thus it is that one person upon the shore may shoot snipe in excellent condition, while another, a little inland, may upon that very day meet with none that are worth powder and shot. In hard weather I have several times seen snipe close under the windows, tapping the frozen ground with their bills in the vain endeavour to find a soft spot where the snow has been swept away. One greatly excited my compassion by its miserable appearance, and I endeavoured to tempt it

with some small strips carefully cut from the breast of a glaucous gull which I happened to be skinning at the time: these so much resembled earthworms that I confidently placed them in the bird's way, but, although it evidently perceived them, it never even attempted to take one in its bill. I have since asked myself whether a snipe ever does take food from a hard surface. A hooded crow, which afterwards appeared upon the scene, was not so particular. Very early one terrible morning in winter I found a dead snipe upon the ledge outside the kitchen-window: the poor bird was crouched up almost into the form of a ball, and was in such sad condition that when I took it up it seemed to weigh little more than a stuffed skin.

Sky Larks.—Upon the 3rd of March the song of the sky lark commenced, and it has since regularly accompanied almost every gleam of sunshine. Very few of these birds remain during the winter.

Gulls.—Iceland and glaucous gulls have left, but they are very irregular in their migrations: I have seen the former in May, and the latter even as late as June. Iceland gulls are comparatively rare, but a severe winter is sure to bring large numbers of glaucous gulls to feed upon the dead ponies. I have only seen one ivory gull this winter.

Ravens.—Ravens are very busy with their nests in the high sea-cliffs, and will soon begin to lay. In Shetland I have never seen the eggs earlier than the 22nd of March. Ravens arrive in great numbers about the middle of October, and remain until the commencement of the breeding season. As many as forty may sometimes be seen together upon the hill-side, but they are then very shy and difficult to approach. Very little damage is done by them at this time of the year, but a few weeks hence, when the young birds begin to require a large supply of food, the parents are sure to visit the farms and commit serious depredations: no uncovered egg will then be safe, and ducks, hens, lambs and foals, will be mercilessly slaughtered. Even full-grown ponies will not be secure if they exhibit any signs of weakness. The first attack is always made upon one eye, and then, as the tortured animal endeavours to alleviate the agony by rubbing the wound upon the ground, the other eye is pierced, and the cruel bird flies off, only to return when its victim is dead. A pony struggling to extricate itself from a peat bog is almost certain to be destroyed by ravens if it remains long unaided.

Blackbirds, Redwings, Bramblings and Chaffinches.—Before Dr. Edmondston began to plant shrubs about his house, many insessorial birds which now visit us regularly were almost unknown in this island. We now look with confidence for the blackbird, the redwing, the

brambling and the chaffinch. The latter is the most regular in its visits, as well as the most numerous, but neither of the four species just mentioned remain to breed: several chaffinches, both male and female, have been here all the winter.

Yellowhammer and Robin.—To-day (31st of March) a great rarity appeared in the shape of a yellowhammer, and some weeks ago a still greater rarity honoured us with a visit—it was nothing less than a robin redbreast! When a Shetlander talks of the robin he almost invariably means the wren, a bird which is almost common in some parts of these islands.

Carrion Crows.—A few carrion crows have lately arrived; it is very long since I last saw one.

Whitetailed and Golden Eagles.—On the 14th of March, word was sent to me that whitetailed eagles were returning to a nest in the island of Yell, where they have been in the habit of breeding for many years. I know an eyrie in Fetlar, and a few others in various parts. About ten years ago I saw a nest at Lund, in this island, but it is now deserted. A pair of these birds now breed undisturbed in the high cliffs at Noss, the only man who was able to climb to the nest having been killed in his last attempt to reach it. Golden eagles are still said to breed in Foula, but there is reason to doubt the report.

Upon the voes there are still plenty of cormorants, shags, great northern divers, black guillemots and many of the commoner species of gull. There are also a few scaups and longtailed ducks, and some flocks of redbreasted mergansers. One of the latter, shot a few days ago, had a very peculiar appearance, in consequence of the iris being of two distinct colours, an outer ring of crimson and an inner one of reddish brown. Upon the shore the most remarkable birds are purple sandpipers and a few redshanks. Greenshanks occasionally occur, but none have been seen this winter. Flocks of ringed plovers are breaking up, and many of the birds are already returning to their breeding-grounds. Rock pipits are abundant everywhere along the coast: their song commenced on the 29th of March.

Water Rails.—During the winter, water rails were to be seen in many parts of these islands. Upon the whole they may be considered rather scarce here, but they have been more frequently met with this year than previously. As soon as the frost sets in they visit enclosed grounds, sometimes venturing into corn yards, and even to our very doors; but I never found corn in their stomachs, even in the most severe weather. One couple invariably takes possession of an angle of a rough wall near a small spring, and where a thick row of willows

affords them some concealment even in winter. A few others are to be seen in the garden, where it is probable they will soon become acquainted with cats and merlins, which seem to be especially fond of preying upon such poor wanderers as seek shelter therein. How the two just mentioned manage to escape is a mystery, but I fancy they display even more than usual caution. Sometimes I have crept behind the wall and watched them through the crevices; but no matter how cautiously I approach, they always hear me, and are never in sight when I take my first peep. After awhile, however, one slowly glides from among the tangled herbage at the foot of the hedge which skirts the wall, stands to listen, and then, if satisfied, walks rapidly about the grass, nodding with every step, and constantly picking at something upon the ground; occasionally it catches sight of some article of food several feet distant, and runs headlong to seize it. When I raise myself so as to see above the wall, although there is a pretty fair screen of twigs above, I am instantly perceived, and the watchful bird stands for some seconds with its neck at full stretch and its tail elevated; then, as if convinced that the apparition is not to be trusted, it makes off for shelter with all speed. The bird which, from its smaller and more slender make, and also from its more subdued colouring, appears to be the female, is much the more shy of the two, never coming out until some minutes after its companion. Once when both were out, and within a fathom of me, I tried the effect of suddenly rising to my feet. Instantly the astonished birds scampered off to shelter, and in an almost incredibly short space of time one darted through a chink on my side of the wall. It stopped abruptly on perceiving me, and then, instead of retreating, took wing, and with heavy flight dropped towards the mouth of a drain about forty yards distant, and in the twinkling of an eye was out of sight.

HENRY L. SAXBY.

Baltasound, Shetland, March 31, 1864.

Some Particulars of Birds obtained in the Neighbourhood of Eastbourne, Sussex. By JOHN DUTTON, Esq.

THIS rich and beautiful region is as celebrated for objects of Natural History as it is for the salubrity of its climate, its noble cliffs and breezy downs, which teem with the feathered race. That magnificent headland Beachy Head, 588 feet high, the crest of which is visible far out at sea when the last expiring beams of day linger on

its summit, tinting it with a rosy hue when the sun has sunk to rest below the horizon. How many a wistful eye has looked upon it from the deck of the "outward bound,"—

> "When slow the ship her foaming track
> Against the wind was cleaving,
> Her fluttering pendant looking back
> To that dear land 't was leaving."

The young cadet, who has just torn himself from the embrace of his widowed mother, has gazed upon it with a full heart as it gradually faded away in the gray of evening; and then when returning home, after a lapse of twenty or thirty eventful years, the master of wealth and honours, the well-remembered outline of the cliff has met his eyes in bold relief against the brightening sky at sunrise,—

> "While homeward bound with fav'ring gale
> The gallant ship up channel steered,
> And scudding under easy sail
> The mighty headland first appeared."

That magnificent headland has seen the lordly eagle wing his way on more than one occasion, "on pinions that never flutter:" one occurred as recently as 1859.

This cliff, a few years since, was celebrated as the breeding-place of multitudes of the cliff-birds; but from a very extensive "land slip" that occurred some years since, it is no longer the great resort that it was at that time. However, a good many of the guillemots, razor bills and herring gulls breed there now. I will give a few of the birds, some of which breed here, and are either in my own collection or in that of others.

Whitetailed Eagle. One in my own collection was shot at Birling Gap, near the Lighthouse, on the 17th of December, 1859, by a coast-guardsman. Captain Knox, in his charming 'Ornithological Rambles in Sussex,' also mentions one shot at Pevensey in 1851, which Mr. A. Vidler stuffed for Mr. Ellman, of Lewes.

Peregrine Falcon. A pair always breed near Beachy Head, and did so last year. On Monday, May 18th, 1863, I had a peregrine falcon brought me from a nest containing two others, taken on the previous Saturday, near the Lighthouse here.

Hobby. Several were killed here in 1861. It is a rare bird in this district.

Merlin. Occasionally met with near the cliffs.

Kestrel. The common hovering hawk that is so frequently seen about. It breeds in numbers on the cliffs.

Buzzard. One was shot at Ampton Place, the (then) seat of the Duke of Devonshire, in 1859, which I saw.

Honey Buzzard. A very fine one was shot on the 18th of September, 1862, by Mr. Gorringe, jun., of Birling Farm, on an apple tree in his garden, and which I preserved for him.

Marsh Harrier. Occasionally on the downs and marshes. A magnificent one was in the collection of Mr. A. Vidler, a year or two since, shot by him in 1858.

Hen Harrier. A fine female in my collection. Another shot last spring, which I saw.

Montagu's Harrier. One in Mr. Vidler's collection, shot here a few years since.

Longeared Owl. Not infrequent. One shot at the cemetery here a month or two since. I have seen several.

Shorteared Owl. Constantly to be met with on the preserved rabbit-grounds and marshes during the woodcock season.

Barn Owl. I should say as frequent in Sussex as any place in England. I have had the adults, young and eggs, frequently offered me.

Great Gray Shrike. A very fine male in my collection, shot at Jevington on the 19th of November, 1861, by a farmer in the neighbourhood. Another was seen in company with it.

Redbacked Shrike. Common in hedgerows.

Pied Flycatcher. One was shot by Mr. A. Vidler at Pevensey, about two years since, which I have.

Pallas' Sand Grouse. One was killed by striking against the telegraph wires at Boxhill, in the fall of last year. A flock was seen in the road by Mr. Vidler on the day before.

Ring Ouzel. Great numbers come every year to our gorse-covered hills in the autumn. I have seen hundreds.

Black Redstart. A magnificent male was shot at Birling Gap by Mr. Gorringe, in December last. Another also I handled, caught by a birdcatcher.

Wheatear. I have made a great many inquiries about the wheatears coming, as they used to do, to these our celebrated Sussex downs; but alas! what a falling off is there. A shepherd told me that about forty years ago as many as eighty dozen were taken, with one set of traps, in one day. Alas! this is not the case now. The shepherds speak

of their becoming less numerous every year. Where there were hundreds of dozens taken formerly, there are only a few dozens taken now. They are chiefly taken in snares of a very simple description. They breed in the cliffs, &c. For several years one has built at Pevensey in an old six-pounder cannon.

Dartford Warbler. Scarcely ever have I been out for a day's rabbit shooting on our preserved furze-land without seeing one or more. They are not at all uncommon here. They must breed here. There is no mistaking him with his long tail, so much like the long-tailed tit.

Rock Pipit. Common on our cliffs. Breeds.

Wood Lark. Numbers were here in the severe winter of 1859—60, associating with the sky larks. I have several of them.

Snow Bunting. A few occur most winters, but mostly when there is plenty of snow. A splendid one in my collection.

Brambling. Vast numbers occurred in the severe winter of 1859—60. Several in my own collection.

Tree Sparrow. Several were shot at the cemetery this spring, and brought to me. They occur every winter.

Hawfinch. Most winters. One was killed by striking against the Lighthouse a short time since, which I have.

Chough. An old shepherd says, "Them there redlegged crows was common at Beachy Head and 'Bell Tout' (the name of the Lighthouse) about forty years ago." They are now extinct.

Raven. A pair always build in the cliffs between Beachy Head and the Lighthouse. I have the young brought me most years. They generally fly down on the beach and are caught.

Hooded Crow. Very abundant on our marshes and sea-shore from October till April.

Hoopoe. Must have been very common a few years since, as in many of the old houses and inns you see them stuffed; very few, however, have occurred lately.

Nightjar. Very common at its proper season.

Rock Dove. Large flocks sometimes occur.

Redlegged Partridge. Supposed to breed here. Often shot.

Quail. Not uncommon. Breeds occasionally. Two in my own collection shot here.

Stone Curlew. One in my collection. Breeds occasionally on the hills and fallows.

Golden Plover. Large flocks appear in the winter.

Dotterell. Occasionally. Supposed to breed.

Ringed Plover. Very common. Breeds.

Turnstone. Occasionally, Cuckmere Haven.

Oystercatcher. Not uncommon.

Crane. One was shot in a chalk-pit at Westham, about ten years since. It was purchased for the collection of Mr. Ellman, of Lewes, for £5. It formerly belonged to a neighbour of mine.

Heron. Very common in the marshes.

Bittern. Almost every winter. Three were shot here during last winter, two of which I saw.

Spoonbill. Occasionally. An immature one was shot at Pevensey about two months since.

Whimbrel. Common in April and May.

Redshank. Spring and autumn. Cuckmere Haven.

Spotted Redshank. Pevensey. (Mr. Vidler's collection).

Greenshank. Autumn. Cuckmere Haven. I have seen seven or eight in a day there. Several in my collection.

Avocet. One in Mr. Vidler's collection, obtained at Pevensey a few years ago.

Blacktailed Godwit. Cuckmere Haven and Pevensey. Rare.

Bartailed Godwit. Pevensey and Cuckmere Haven. Several in my collection.

Curlew Sandpiper. Not uncommon at Cuckmere Haven in the autumn.

Little Stint. Several in my collection. A man once brought five or six for sale, which he had shot at Cuckmere Haven.

Temminck's Stint. Cuckmere Haven. My brother shot one there about two years since.

Spotted Crake. One in my collection shot at Pevensey. Not infrequent in Pevensey Marshes. Mr. Vidler has shot numbers.

Little Crake. One was caught alive at Gravitt's Pond in March, 1862. It is in my house at present, and belongs to a Mr. Bates here.

Whitefronted Goose. In Mr. Vidler's collection: shot by him at Pevensey.

Bernicle Goose. In Mr. Vidler's collection: shot by him at Pevensey.

Brent Goose. Frequent in the winter, or in the spring on their return from the mud-flats of Hampshire.

Egyptian Goose. A very fine specimen of this rare goose was shot on the 4th of December, 1862, by a farmer residing at Watling Hill, and purchased by me for my collection. It is in perfect plumage,

and appears never to have been in captivity; and what tends to confirm me in this opinion is the presence of an old and perfectly healed gun-shot wound in the foot, and the unsoiled state of its plumage.

Hooper. Occasionally in severe winters. One, shot at Pevensey, in the collection of Mr. G. A. Jeffrey, of this place.

Pintail Duck. Occasionally in the winter. A beautiful couple, male and female, were shot by Mr. J. Austen, of this place, at the Crumbles, on the 27th of February, 1864.

Garganey. Occasionally in hard winters. Some in Mr. Vidler's collection.

Velvet Scoter. A very fine specimen in my collection, taken alive on the 14th of April, 1863.

Common Scoter ("Black Duck"). Perhaps as common as anywhere in England. Very shy.

Longtailed Duck. A splendid female was killed by a stone on a pond near Polegate, on the 27th of February, 1864. I examined it in the flesh.

Scaup Duck. Very common in the winter. I saw a great many last winter.

Tufted Duck. One in my collection, obtained here.

Goldeneye. Several in Mr. Vidler's collection. Very much rarer than formerly.

Smew. An immature specimen in my collection, shot here.

Sclavonian Grebe. In Mr. Vidler's collection.

Redthroated Diver. Exceedingly common. Hundreds may be seen "off at sea" during the sprat season.

Guillemot. Exceedingly common in the Channel during April and May. Shooting them is quite as much a business as puffin-shooting at Freshwater, Isle of Wight. I went out on the sea with my brother on the 20th of April last, and we killed twenty-three. A few breed at Beachy Head.

Ringed Guillemot. I shot one off Beachy Head about two years since. A fine specimen was brought me on the 18th of April last, shot on the same day.

Razorbill. Rather common. Breeds.

Gannet. A few are always to be met with during our herring and sprat seasons. I counted about twenty off Beachy Head in October, 1862. One in my collection, shot by a fisherman.

Arctic Tern. Notwithstanding that such eminent authorities as Mr. Gould, Mr. Edward Newman, Mr. H. Stevenson and others think differently, I still am of opinion that the tern that breeds on our

"Crumbles" is the arctic tern, and not the common. I have collected a great many of the eggs, and find, by comparison with those in the British Museum, that the "arctic tern" is here the "common tern." Captain Knox, in his 'Ornithological Rambles in Sussex,' says:—"The arctic tern is decidedly more numerous on Pevensey Shingle, during May and June, than the common tern. In fact this bird is here (Eastbourne) the 'common tern,' and would appear to be more generally distributed throughout the British Islands than any of its congeners." Such also is my opinion.

Lesser Tern. Not infrequent in Pevensey Bay during the summer and autumn. I do not think it breeds on the "Crumbles."

Little Gull. A perfect beauty was shot here on the 6th of December, 1860. It was purchased by Mr. Pratt, of Brighton.

Ross's Roseate Gull. One was shot by Mr. Albert Vidler, of Pevensey, in 1852. It was purchased by Mr. J. B. Ellman, of Lewes. I believe only two specimens have occurred in England.

Kittiwake. Exceedingly common in the winter. During the sprat season you may shoot any quantity. I shot, last December, twenty in an hour from one of the sprat-boats.

Common Gull ("Winter Gull.") Large flocks are constantly to be seen, during the winter months, on our downs and fallows, searching for worms, &c. I have seen hundreds this winter. I do not say they are all common gulls.

Lesser Blackbacked Gull. A few breed at Beachy Head and Newhaven. I have frequently seen them when off shooting at sea.

Herring Gull. Numbers breed between Beachy Head and "Bell Tout" Lighthouse.

Great Blackbacked Gull. Provincial "Parson Gull." I have seen upwards of a hundred at one time on the sands off Beachy Head during the winter months. Common here.

Pomarine Skua. Perhaps more common than supposed to be, from its resemblance to a young herring gull. Two in my collection. One shot by me in October, 1862, off Beachy Head.

Richardson's Skua. One in my collection, a splendid adult, shot on the 6th of June, 1860, at Langney Fort, by a man named Ward.

Manx Shearwater. One was shot about two years since off Beachy Head, which came into my possession.

Forktailed Petrel. One in Mr. Vidler's collection at Pevensey.

Storm Petrel. Not very uncommon. John Ward shot three specimens "off at sea" on the 18th of June, 1860, which I saw and

handled. They were purchased by Mr. Vidler. There were several more seen at the same time.

JOHN DUTTON.

Norfolk Ornithology.—I am quite sure that when you inserted in last month's 'Zoologist' (Zool. 9025) a reprint of my paper on the Ornithology of Norfolk, from the new edition of White's Gazetteer for this county, you had no intention of doing anything which would place me in a false position; but the fact of the appearance of that paper, slightly altered in style of arrangement, and with my name attached, would naturally lead to the impression that I had forwarded it myself as a communication to the 'Zoologist.' It is this impression that I am particularly desirous of correcting, inasmuch as the work for which this paper was written by request is not yet published, and Mr. White would have had a very fair ground of complaint against me had I forestalled that portion of his publication, by contributing it entire to another journal. Mr. White very kindly supplied me with copies of my paper for private distribution as soon as that part of the Gazetteer had passed through the press, and one of these I forwarded to you, knowing your interest in such local "lists,' and thinking you might be inclined to notice the fact of its publication by way of review. You will, I am sure, readily give insertion to this explanation, which is, I think, desirable under the circumstances, both as regards Mr. White and myself.—*H. Stevenson.*

[I regret this mistake, but I am so much in the habit of regarding all communications sent to the 'Zoologist' as intended for publication, that I arranged Mr. Stevenson's for press as a matter of course. Mr. Stevenson neither requested publication nor accompanied the paper by a veto.—*Edward Newman.*]

Rare appearance and scarcity of the Kite and other Birds.—In answer to Mr. Fox's remarks on the scarcity of the kite (Zool. 9039), it is to be hoped that the bird seen by him on the way to be stuffed was not the last of the species in Wiltshire. Many years ago, when on a long visit to a relation who lived within a very few miles of Whittlebury Forest, Northamptonshire, my eyes were very frequently gratified by a view of this noble hawk sailing majestically through the air in beautiful circles, without seeming to move a feather for minutes together, and now and then dropping gently down to the earth on his prey, a mouse or small bird frequently. The kite is the bird named by Butler, in his 'Hudibras,' as the "verriest long-winged hawk that flies." No doubt the gun of the gamekeeper and the rat-trap, judiciously covered with earth or weeds and baited with a mouse or a bird in open fields, are the causes why we now seldom see the kite in all game-preserving countries; but I regret his disappearance, as he is a much more harmless enemy to game of all sorts than many of his congeners not half his size. With respect to the scarcity of other birds, there are many causes, which have lately been mentioned in the 'Zoologist,' to account for it, such as the increase of population, the clever manner in which the birdcatchers entrap most of the singing birds of all sorts, the great mania for the collection of birds' eggs, and, last though not least, the increased number of juvenile sportsmen with pistols and fowling-pieces (many boys take excellent aim with the catapult and destroy an immense number of birds); in fact, the increased number of traps and engines for the purpose of killing birds and game of all sorts. The only bird which seems, in my knowledge, to have increased in number is the common house sparrow. That great bird, the bustard, or wild turkey, used to be plentiful in Norfolk; they were often run down by

greyhounds; these birds are now only a matter of history in the East of England. From the same causes assigned to account for the scarcity of the kite, magpies and carrion crows are greatly reduced in numbers, both in England and Scotland.—*H. W. Newman; Hillside, Cheltenham.*

Montagu's Harrier at Eastbourne.—A fine female specimen of Montagu's harrier was trapped on Monday, April 15, 1861, at Pevensey Levels, and came into the possession of Mr. Albert Vidlow, of South Street, Eastbourne. It had already killed three young hares, and it was caught in a trap baited with one of them.—*John Dutton.*

Great Gray Shrike near Norwich.—Two specimens of the great gray shrike were seen in this neighbourhood on the 2nd of April last, one of which was caught in a trap-cage by a young man: it was kept alive till within a few days since, when it died.—*T. E. Gunn; Norwich, May* 6, 1864.

Redwing singing in England.—Since my former communication was written I have read the notes on the singing of the redwing published in the April number of the 'Zoologist' (Zool. 9021). Any communication from Mr. Bond is sure to meet with the respect which his well-known science as an ornithologist must always command; but in answer to his observations I beg to say that it was no twittering of the redwing to which I have many times listened with much pleasure, but a full and continued song, poured forth with open bill and largely-distended throat, and that in more than one instance the bird in the act of singing was within three or four yards of my head. Without pretending to compare my own experience or ornithological knowledge with that of Mr. Bond, to whose opinion in any doubtful matter I would most readily defer, I may venture to say that I am as fully competent to judge of the difference between a redwing and a song thrush as any naturalist can possibly be. It is not in garden shrubberies or in trees by the road-side that I should ever expect to hear the redwing sing; such places abound here, those in my own garden are unusually extensive, and redwings are not uncommon; but the deep solitude of the great woods in Oxfordshire, where much of my leisure time was formerly spent, offers a much more suitable locality; and I have no doubt that any one who would take the trouble of seeking them in their favourite haunts in such places, at a similar period of the year, and under the circumstances detailed in my former note, would be amply repaid by hearing the redwing in full song. My story is now told, its truth and accuracy in every particular I most positively affirm, and I think I know enough of Mr. Bond to feel sure that he at least will believe that I have heard the redwing, not twittering, but in full song. If Colonel Newman will refer to my first note (Zool. 8946) he will see that I did not speak of any resemblance between the song of the redwing and that of the nightingale, I merely compared them on the score of excellence; but that, as he expected, I did point out its general similarity to the song of the thrush, asserting the superiority of the former in richness of tone. The observations of Mr. Cooper tend in the main to corroborate my own statement. I will now only add that I do not intend to allude again to this subject, unless specially invited to do so.—*A. Matthews; April* 2, 1864.

[Received in ample time for insertion in the May number, but after the pages touching the redwing were printed, and it would have occasioned inconvenience to the reader had I placed it elsewhere. I see no occasion to alter my last editorial note on the subject: it is perfectly evident that all the interlocutors seek to establish the truth, indeed I never can believe any true naturalist could entertain for a single moment any other design.—*Edward Newman.*]

Longeared Owl at Stratford St. Anthony, Wiltshire.—On the 6th of May a good specimen of the longeared owl (*Strix otus*) was killed by a shepherd at Stratford St. Anthony, Wiltshire: he observed the bird sitting in an elder bush, and looking quite foolish (no doubt from being disturbed at mid-day), so he knocked it down with his crook. I believe this is by no means an uncommon bird about Salisbury, but I have never met with it at Stratford before. A few days ago I asked a keeper who is employed on the Wilton estate of the Earl of Pembroke, if he had seen any rare birds about lately: he told me there was a longeared owl's nest in a tree hard by; it contained only one young one, as he had killed two of the same brood a day or two before, and intended killing this one as soon as he could get the old birds. He took me to the tree to show me the two young ones that he had killed, but they were gone, so I climbed the tree to look at the one that was alive: when I came to look into the nest, I found the young one still alive and grown to a good size, also the bones, and part of the flesh and feathers of the two young owls that were killed by the keeper and laid at the bottom of the tree; the flesh appeared to be in good part eaten from the bones. I supposed by this that the old bird had fed her living young one on its unfortunate relations.—*Anthony S. Bradby; Moundsmere, Hants.*

Fieldfare near Andover on the 18th of May.—Yesterday I killed a fieldfare: it was a solitary bird, and proved on dissection to be a female; the ovary contained six eggs. It seems to me rather extraordinary that a bird of this species should be here in such a May as the present, with the thermometer at 100° in the sun. The stomach was filled with Coleoptera of the genus Elater, and apparently of two species: I little expected to find such food.—*Henry Reeks; Manor House, Thruxton, May* 19, 1864.

Fieldfares in Yorkshire in May.—I do not know whether it is a common occurrence in this part of England to have these birds so late, never having lived so far north before, but this afternoon I saw in the fields near here a flock of from one hundred to a hundred and fifty. I examined them attentively for some time with my landscape-glass: they were moderately tame, and let me approach within fifty or sixty yards.—*R. Tyrer, Keighley, Yorkshire, May* 1, 1864.

[I think this is not unusual.—*E. N.*]

Singular Nest of a Song Thrush.—In the month of March last a pair of song thrushes built their nest on the top of a straw bee-hive which stood on a covered stand in my kitchen-garden. The hive was tenanted by the usual complement of bees, which perhaps was the reason that the thrushes forsook their nest after the female bird had laid three eggs.—*J. H. Gurney; Catton, Norwich, May*, 1864.

Song Thrush nesting on the Ground.—This spring I found a nest of the song thrush built quite on the ground: the nest was placed at the bottom of a dead hedge that divides two water-meadows: there was a small stream of water running close beside the nest. The eggs were broken, and to all appearance sucked by a rat, at least I thought so, as rats are very numerous there.—*Anthony S. Bradby; Moundsmere, Hants.*

Redwings singing in England.—Many communications have lately appeared on this subject in the 'Zoologist.' Perhaps a few notes on my humble experience may tend to clear the matter. For years I have noticed the redwings congregating in vast quantities during mild weather in the spring and previous to their journey to the north. On such occasions I have seen them in thousands, scattered about the ground and covering the trees and bushes, especially towards the evening, and have been

induced to approach them quite closely, in order to listen to the furious babel of chattering which was being rehearsed. Certainly I never on these occasions heard anything from them that I should call singing, the noise far more resembling the chattering of the starling than anything else I can compare it with.—*George Norman; Hull, May* 4, 1864.

Redwing singing in England.—On the 8th of March, 1864, in the immediate neighbourhood of Alton, I shot a redwing in the act of singing. There was a flock of redwings in a neighbouring field; the bird in question was, however, alone in a hawthorn-tree. Its song resembled that of the nightingale with a large admixture of the notes of the thrush.—*C. E. Stewart; Ackender House Academy, Alton, Hants, April* 9, 1864.

[Please send the bird for inspection.—*Edward Newman.*]

Redwing singing in England.—From all that I have heard on both sides of this question, I cannot help thinking that the solution of the difficulty depends entirely upon the definition of the word "singing." What constitutes a "song"? The Rev. A. Matthews is as positive that he has heard a redwing sing as Mr. Doubleday and the other gentlemen named in the editorial note are certain that this bird does not sing in England; and yet I have little doubt but that each of them has heard exactly the same note, the only difference being that Mr. Matthews calls it a "song," and his opponents say, "You cannot call this a song, it is merely a clear and loud prolonged twittering, and very different from the real song of the redwing, which the bird only gives forth in the breeding season, during the months it is absent from England." I could cite numerous instances in which I have approached very close to redwings, and, with a good glass, watched them with open bills and distended throats, uttering the peculiar note to which I have alluded, and which, I believe is the same to which Mr. Matthews refers. I think it is best expressed by the word "twittering." But I need not occupy your space further than to say that I have never heard a redwing utter any other sound than this prolonged and really musical twittering, except the call-note, which is harsh, and not unlike that of the fieldfare. The conclusion, therefore, at which I arrive is this: if it be granted that this peculiar twittering or warbling (call it what you will) is worthy to be called a song, and moreover that this is the *only* song which the redwing has, then, assuredly, the redwing *does* sing in England. But if, on the other hand, it be said, "We cannot allow that this twittering is a song, and besides this, the bird has another and a different note, which is as much a song as that of the thrush, but is uttered only in the breeding season," then we must conclude that the redwing does *not* sing in England.—*J. Edmund Harting; Kingsbury, Middlesex, May* 11, 1864.

Food and Song of the Redwing.—I should not have said anything more about this bird had not the Rev. Mr. Matthews stated that its food is essentially different from that of the thrush: as far as my observations go, the food of the two birds, with the exception of the snail, is precisely similar; the thrush certainly feeds upon fruit and berries as much as the redwing. At the bottom of my garden stand two large red-flowered thorns, and in the autumn they are generally covered with haws, of which the birds seem particularly fond, preferring them to those of the ordinary white-flowered thorns growing close by. The song thrushes invariably come to the two red-flowered thorns in the autumn to feed upon the haws, in company with missel thrushes, redwings and blackbirds, and they never leave them till all the haws are gone. Last autumn I was standing with a friend in the garden, and we counted more than

twenty song thrushes on the two thorns at one time. There is a large increase in the number of these birds in the autumn, caused by the arrival of foreigners, which come in small flocks a few days before the redwings, for which species they are often mistaken. After the haws are gone the thrushes feed upon the berries of a large yew, and now they are devouring the berries of the ivy which covers a large pollard elm growing close to the yew. When fruit and berries are not to be had, the whole of the thrushes feed upon insects, and the song thrush destroys large numbers of snails, and is, I believe, the only British bird which feeds upon them. I perfectly agree with all Mr. Fox has said with regard to the song of the redwing. When assembled in large flocks previous to their departure from this country, they will sit on trees warbling and chattering for hours at a time, but I never heard a solitary redwing attempt to sing, and I believe all the supposed redwings said to have been heard singing singly on the tops of trees were song thrushes.—*Henry Doubleday; Epping, May* 11, 1864.

Curious place for a Blackbird's Nest.—In a thick thorn hedge near Stratford St. Anthony I found an old magpie's nest that had been inhabited by magpies in 1862: on looking into the nest I was rather surprised to find it tenanted by blackbirds; they had built their nest so as to exactly fit into the cup-shaped nest of the magpie. I tried to take both nests together, but on cutting away some of the branches that the magpie's nest was built among, the whole gave way together, probably owing to the magpie's nest having been built so long as to nearly crumble to pieces on the spot.—*Anthony S. Bradby; Moundsmere, Hants.*

A White Blackbird.—A friend residing at Mildenhall, Suffolk, informed me that a white specimen of the above bird has lately been shot in that neighbourhood by a gamekeeper, for whom it was preserved.—*T. E. Gunn; April* 18, 1864.

Ring Ouzel nesting in Yorkshire.—Crossing the moor a few miles north of Keighley this afternoon, I came upon the nest of the ring ouzel, putting the bird off: the nest was built on the ground, in a shallow hole, under a bunch of ling. As I see some difference of opinion is expressed in 'Birdsnesting' about the formation of the nest and the colour of the eggs, I will describe them, to the best of my ability. The nest consisted, first of a layer of the decayed leaves of the ling, damp and muddy as they came from the ground; this was covered above the level of the ground with roots and tufts of grass, pieces of dead ling, and various other rough materials, and the whole lined with coarse grass to the depth of about two inches at the bottom, and gradually becoming thinner to the top: in this nest the bird had clearly used an equivalent for mud, though as clearly had not plastered her nest with it, but had constructed of it the first layer. Of this I am certain, as I brought the nest entirely away from the ground. It contained four eggs: as they were not sitting, I suppose the old bird was about laying again; they are not in the least like those of the blackbird, and if I had not known their origin I should have taken two for those of the missel thrush, as they are remarkably like them, being of a very light green, and blotched with brownish red and light purple: the other two are of a deeper green, so that the blotches, though quite as large, are not so distinct; the eggs are rather larger than a common blackbird's.—*R. Tyrer; Keighley, Yorkshire, May* 1, 1864.

Black Redstart.—I have just seen your description of the black redstart (the male) in 'Young England.' I observe that you have not described the female. I have frequently met with it, and it is very like the female of the common redstart in plumage. We have usually met with the black redstart here in December, January and February. In a severe winter, some years since, I shotone (a female) in April;

but this is unusual. I found amongst my papers a note that "They are tame, taking short flights, and then settling on ledges of the cliffs or on the beach, jerking their tails, like the common redstart, when they settle. I have observed them feeding on small dipterous insects, which are abundant about the heaps of sea-weed. In their habits they seem somewhat to resemble the stonechat, but have the familiar manner of the robin." This I have written as I found it from a rough note, and have not attempted to put it into shape. It is just what struck me when I was in the habit of watching them; but I have not been near their haunts of late, and it is now some years since I have seen one. I do not doubt that they are to be met with, however, in the very same spot where we used to see them year after year, this being one of their characteristics.—*W. R. Hall Jordan; Teignmouth, April* 30, 1864.

Black Redstart at Alton.—Among the rare feathered visitors to this district I have to record the black redstart, which I shot on the 23rd of March. A naturalist here has informed me that during a period of nearly thirty years he knows only of one more specimen of this bird having been found. I first observed it sitting on a hop-pole in a field adjoining the town. The general colour of the bird I obtained is smoke-gray.—*W. C. Saunders; Alton, Hants, April* 21, 1864.

Arrival of the Willow Wren and Swallow.—On the 23rd of March a friend shot a willow wren, and on the previous day a gentleman living in this place observed another bird of the same species in his garden. Whilst out walking on Saturday, the 2nd of April, with a friend, I had the good fortune to notice along with him a solitary specimen of the swallow.—*Id.*

Wheatears in March.—Mr. Pamplin seems to infer (Zool. 9041), because he saw wheatears in the middle of March at Bala, North Wales, that they remain there throughout the winter; but I think you will agree with me that this conclusion is a wrong one. Wheatears are usually the first of our summer migrants to appear, and it is by no means uncommon to see them here by the middle of March. I shot one this year on the 19th of March, and have seen them as early as the 16th of that month; but I should not conclude, therefore, that these birds had wintered here.—*J. Edmund Harting; Kingsbury, Middlesex, May* 11, 1864.

Early Appearance of the Wheatear.—Two instances are recorded in the 'Zoologist' (Zool. 9041) of the appearance of the wheatear in March. On the 29th of March, 1863, I saw one, a male; and on the 12th of last March I saw two, male and female. Mr. Morris, in his work on 'British Birds,' says, at page 173, vol. iii.:—"Sir William Jardine says, that they arrive in Scotland the first week in March." I have repeatedly watched for their appearance in that month in different localities, and never until March, 1863, have I seen wheatears before the middle of April. This year they were seen near Edinburgh about the same time, and their appearance was considered unusually early. The whinchat was also seen about the same time, which most certainly is an early arrival for that bird.—*J. A. Harvie Brown; Dunipace House, May* 6, 1864.

Eggs of Grasshopper Warbler.—I have again been fortunate in obtaining eggs of the grasshopper warbler. On the 21st of May a friend brought me five nice specimens, which a lad had taken from the nest two days previous in Hethel Wood, a short distance from this city: he described the nest as composed of rye-grass, lined inside with the finer material of same; it was placed at the foot of an old stump, hidden by a tuft of grass; the nest contained six eggs, slightly sat upon; one of these he unfortunately broke. A nest of five eggs was taken in the same locality four years since.

Owing to the wary habits of this species its nest is difficult to find, therefore I have no doubt it is thought to be more rare than it really is.—*T. E. Gunn; Norwich, May* 23, 1864.

The Reed Warbler nesting in Gardens.—This very pretty little warbler I had only associated years ago with what I then thought its only haunts, such as reed-beds in fens, marsh-ditches and river-banks—in short, wherever reeds were to be found; but the last few years I have become more intimately acquainted with it in quite another aspect, namely, so near London as Hampstead, where I have a garden, far away from water in any shape, and bordered on two sides by a high road, yet here for some years it has not failed to appear about the middle of May, much later than the arrival of our common warblers, and for the last three years a pair have bred in the garden, the first year in a Corcorus, the nest, as in reeds, being firmly attached to three stems; the last two seasons in a lilac in the same manner. The lilac is close to my hall-door, and neither the noise of children or dogs disturbed them in their labours, and the male sang cheerily through the day, invariably accompanying the female in her search for materials for the nest, but never, that we could see, assisting her in actually carrying such matters, or in constructing the nest itself. They were so far from exhibiting any shyness in their habits, that they rambled over the standard roses, and were constant visitors to the balcony of a Venetian window which was full of plants, and near which some of us were usually sitting. These nests were fastened and held together by any little bits of twine and thread or hair that they could pick up in the vicinity of the house. Mr. Bond suggested the other day that we might have two species of bird at present under this name, but the eggs were exactly similar to those taken from reeds, and at Bath, where the River Avon is bordered by gardens, I have formerly found their nests in shrubs near the water; but I confess I was much astonished to find this bird *entirely* away from water, and so near London. I may add that last summer I found four pairs of this bird here breeding in gardens under similar circumstances. The young, I observed, were very much fed on Aphides taken from a sycamore, the adjoining tree to that containing the nest. As soon as the eggs were hatched, the male nearly discontinued his song, gave up his idle life, and devoted himself to his parental duties.—*Robert Mitford; Hampstead, April* 12, 1864.

Rock Pipit in Norfolk.—On the 7th of March a pair of rock pipits (*Anthus petrosus*) were killed on the river's bank, near St. Martin's Gates, Norwich, a most unusual locality, since the very few birds of this species obtained in Norfolk have been killed on Breydon Wall, near Yarmouth. It is most probable that a few regularly visit our coast in spring and autumn, though unnoticed by the gunners, from their general resemblance to the meadow pipit (*Anthus pratensis*); but, with the exception of one other specimen, these are the only examples of this species that have come under my notice in the hands of our bird-stuffers.—*H. Stevenson; Norwich, April* 27, 1864.

Snow Bunting in Summer Plumage near Penzance.—We have the snow-flake pretty regularly every autumn and winter on our open downs, but I do not remember ever having seen one so late in the spring with the slightest symptom of the black summer plumage until last month, when I was shown a specimen pretty far advanced in summer plumage, which had been shot somewhere between this and the Land's End.—*Edward Hearle Rodd; Penzance, May* 9, 1864.

Brambling in the Chilterns.—Your correspondent Mr. Tyrer (Zool. 9023), in noticing the occurrence of a flock of bramblings at Weston-Turville, asks whether these

birds have been previously observed in this neighbourhood. It may be some satisfaction to him to hear that I have for some years past known the parish of Drayton-Beauchamp well, which lies at the foot of the Chilterns, about four miles from Weston-Turville, and I never remember a winter passing without some large flocks of bramblings frequenting the stubbles and stack-yards in the parish.—*H. Harpur Crewe; The Rectory, Drayton-Beauchamp, Tring, April* 13, 1864.

Habits of the Hawfinch.—As Mr. Boulton has kindly made several remarks upon the habits of this bird (Zool. 9042), and has also endeavoured to set me right in various points of my former communication, I will endeavour to explain them more fully. Firstly, as to the contents of the gizzard being the kernels of plums or damsons, and not sloes, I was led to this opinion, and still keep it, by the size of kernels, most of them being only slightly broken: they were far too large for those of the sloe, and the bullace is not very common with us in the south: plum and damson orchards abound everywhere; there is scarcely a cottage without a dozen or more of these trees, and though last year there was not an abundant crop, yet they are generally very plentiful, and once, in our own orchard, rather than be at the expense and trouble of getting them, we let them fall from the trees as food for our pigs. The hawfinch does not, however, limit its meals to the kernels of stone fruit, for my brother, who is now at Weston, has lately caught another with a horsehair noose in our garden. It was in the habit of coming every morning to feed on the seeds of the Portugal laurel: when feeding on these seeds it would naturally take some grit into its gizzard. It soon became quite reconciled to its captivity, and would suffer itself to be fed without any signs of fear. I may nevertheless have been in error as to the triturating substance in the gizzard of the specimen I examined, as I did not apply any lens: it looked far too fine for broken plum-stone, but as Mr. Boulton says that the bird crushes them so fine, it may have been so in this case. I am much obliged to Mr. Boulton for this suggestion, and will not fail to apply it next time I have the pleasure of examining this bird.—*R. Tyrer; Keighley, Yorkshire, May* 21, 1864.

Crossbills in Bedfordshire.—On Monday, the 11th of April, three crossbills were brought to me, killed near Aspley. They formerly were frequently met with about here, but are now of very rare occurrence. I imagine they are not often found in any part of England so late in the spring as April.—*C. Hervey Smith; Aspley Guise, Bedfordshire, April* 15, 1864.

Hooded Crows at Brighton.—On the 29th of February I was surprised by seeing a quantity of hooded crows on the cliffs beyond Brighton, near Rottingdean. I counted twelve feeding voraciously, with jackdaws and rooks, in a wheat-field, and passed quite close without disturbing them.—*C. J. Maurice; East Court Cottage, East Grinstead, March* 16, 1864.

Food of the Rook.—About ten days ago I saw a pair of rooks eagerly tearing to pieces and devouring a dead lamb. They were standing upon the carcass, and while tearing it with their beaks pushed vigorously against it with their feet. When I approached to within some ten paces or so, so intent were they on their meal that they only hopped off to a short distance, each carrying a piece in his or her beak, and not seeming at all ashamed of their "weakness" for "high" meat. I have repeatedly seen rooks, as well as carrion crows, engaged in a like manner, and never knew that it was not generally known. The gamekeepers round this quarter are in the habit of setting traps baited with eggs for magpies, and they repeatedly find rooks taken prisoners instead. I have known also of an instance of a rook being caught by the

wing in a trap baited with a piece of a rabbit: no doubt in attempting to escape from the falling "flag" it had stretched out its wing, and thus been made prisoner.—*John A. Harvie Brown; Dunipace, May* 6, 1864.

Habits of the Creeper.—Having been informed that a pair of creepers (*Certhia familiaris*) had built a nest behind the matting that lines the inside of my boat-house, I repaired thither on Tuesday, May 10th, for the joint purpose of fishing and embracing an opportunity of watching the nesting habits of this most interesting little bird. My sister-in-law, who had been sitting there sketching on a previous day, had remarked the fearless confidence it displayed, being apparently completely unembarrassed by her presence, and as it continued to visit and revisit the nest, running in all directions over the matting, she proceeded leisurely to transmit to paper a characteristic portraiture of both bird and nest. I suspect that there may have originally existed a small perforation in the texture of the outstretched matting which induced the bird to make selection of this spot, and which she had personally enlarged to suit her purpose; at all events there was the hole, the edges of which were neatly chipped so as to form a perfect oval, and just large enough to admit with ease the entrance and exit of the bird. From three to four inches below the entrance, between the matting and the outer wooden wall, the nest containing seven eggs was constructed. Anxious to add a couple of eggs to my collection, I had come provided with a piece of wire, with which I successfully extracted them, but think it possible that during the process I might have cracked a third. Be this as it may, as I lay reclining at length, alternately watching the fluctuations of my float and the evolutions of the smoke from my pipe, as it curled gracefully upward on the still air of a bright sunlit afternoon, the little creature presently appeared slyly coursing over the surface of the rough bark around one of the oak-tree posts, which, rising from the deep water, forms one of the main supports of the boat-house roof. I was curious to observe whether the little agile tenant would become aware that its sanctuary had been invaded, and consequently how she would under the circumstances proceed to act. Watching me with furtive restlessness as she sped up and down the surface of a rafter, she now took to the matting, over which she travelled with the utmost dexterity with a series of short side-long jumps (very much as a skater would make a leap, both his feet leaving the ice at the same moment), but clinging on at each hop to the perpendicular wall with a tenacity that produced an audible crackle of the matting, and with an agility most beautiful to witness. Arrived at the entrance she seemed to be at once aware that her nest had been tampered with, and accordingly made several circuits of the hole, in evident doubt and hesitation, ere she finally disappeared within its dark recess. Keeping my eyes fixed upon the spot, great was my surprise at seeing her presently emerge with an egg impaled upon her bill. She flew directly towards me, when, flurried at discovering my presence, she let the egg drop, and it fell through the open floor and smashed upon one of the seats of the boat underneath. It at once occurred to me that this must have been the cracked egg, which the little creature had immediately discovered and with provident sanitary precaution had thus taken instant measures to effect its removal. She is now sitting hard upon the remaining four eggs, with my best wishes for the welfare of herself and family.—*Arthur W. Crichton; Purchase, Ditchling, Sussex, May* 18, 1864.

Hoopoe in Suffolk.—A magnificent male specimen of the hoopoe was shot at Wortley, Suffolk, on the 20th of April last. Another specimen, also a male, was taken at Lowestoft two or three days previous to the above.—*T. E. Gunn; Norwich.*

Immense Flight of Swallows.—Three immense flocks of swallows passed over the island of Portsea on the night and morning of the 10th and 11th of May, going east or north-east. My attention was first directed to them by the noise they made in passing: the night was dark and cloudy, so that the first and second divisions could not be seen; but the noise of the first division was heard a few minutes after eleven, and continued until twelve o'clock, when all was still till thirty minutes past twelve, when the second division was heard passing over, their noise continuing to be heard until twenty minutes after one, when it ceased. The morning broke beautifully clear, and at half-past three the third and last division was seen passing; they were making no noise and flying steadily over. Do birds of passage make a noise at night for the purpose of keeping themselves together? If not, why, in this instance, did it cease at daylight? These observations can be authenticated by two gentlemen who were with me the whole of the night, taking ten minutes' observations on the pressure of gas, at one of the public lamps in the Landport district.—*Henry Moncreaff; Southsea, May* 26, 1864.

Extraordinary Flight of Swallows.—The following letter appeared in the 'Exeter and Plymouth Gazette' of the 14th of May, and as it is unusual to see swallows migrating in such extraordinary numbers as therein described, and especially in a southerly direction at this time of the year, I have, as it is a short communication, copied it *verbatim*:—

"*To the Editor of the 'Plymouth and Exeter Gazette.'*

"Sir,—Perhaps the following circumstance may be interesting to some of your readers. On Saturday evening last, whilst standing with a friend in my garden, between the hours of seven and eight, we observed a large flight of birds approaching, which proved to be *swallows*. I should say the flight extended over a space of nearly a mile in length, by one-third of a mile in breadth, and that they were many thousands in number. The course they took was from north to south.

"I am, yours truly,

"Instow, May 12th, 1864." "E. T. Fernandez.

I wrote to Mr. Fernandez, and requested him to be good enough to furnish me with any further particulars on the subject, and also to allow me to make use of the above, and received in reply an answer, the substance of which is as follows:—The birds were the common swallow (*Hirundo rustica*, Linn.), and flew in rather a scattered manner, but evenly so, over the space they occupied, all taking the same course from *north* to *south*: they were from two to three gun-shots high, and appeared to be in rather a fatigued condition: one alighted on a telegraph wire, and did not leave until nearly all the rest had passed. It is well known that these birds congregate in large flocks in the autumn before leaving us, but on arriving in spring they are generally seen in pairs. I should like to know if any of the readers of the 'Zoologist' have ever observed a similar migration at this time of the year.—*G. F. Mathews; H.M.S. Warrior, Plymouth, May* 21, 1864.

Arrival of Swallows, Martins and Sand Martins at Blackheath.—At 5.15 P.M. on Friday, the 8th of April, I saw one swallow fly over St. Germain's Place, Blackheath: its flight was due east, weak and weary. On Thursday afternoon, the 21st of April, I saw a pair of swallows and four sand martins flying about the round pond in Blackheath Park. In the afternoon of Tuesday, the 26th of April, I saw a house martin

flying over the same pond: it signalized its arrival by pitching right and left into the sand martins located here since the 21st of April.—*Matthew Hutchinson; Woodlands Road, Blackheath, S.E.; April* 27, 1864.

Pigeon laying three Eggs.—I have this day observed a curious fact, or rather freak of Nature. I found that a pair of my fancy pigeons were sitting upon three eggs. That the female bird had laid all three, and at the same time, or, more correctly speaking, in the same nest, and for the one incubation, there can be no doubt; *first*, because the pair of birds in question were in a pen or aviary apart from all other pigeons; *secondly*, because they had only been therein a sufficient space of time to admit of their going to nest *once;* and, *thirdly*, because I made a note of the day on which the first egg was laid, as I am in the habit of doing with all my fancy birds. These three eggs were all perfect in form and size, and the exact counterpart of each other. I removed the three eggs from the nest to-day, and broke them to examine the contents: only one egg contained an embryo. The first egg would be laid ten days ago. The pair of birds were a male "dragon" and female half-bred bird: they were used as "feeders." I have kept pigeons fifteen years, and never before observed an undoubted instance of any individual or variety producing more than two eggs at a time.—*W. W. Boulton; Beverley, April* 26, 1864.

Late Breeding of the Ring Dove.—Last year I took two late nests of the ring dove, each containing two perfectly fresh eggs: the first of these I took on the 16th of September, and the second on the 30th of the same month. I have before taken their eggs as late as the 16th, but they were always pretty far on in the process of hatching. I never before got any so late as the 30th.—*John A. Harvie Brown, Dunipace, Falkirk.*

The Red Grouse and Willow Grouse.—I am glad to find that the long-pending suit of "Red Grouse *versus* Willow Grouse" is again before the Divorce Court, and I trust the jury of ornithologists who try these intricate cases will not suffer it to be shelved again till they have come to a verdict, on sufficient evidence; and either join them together as one species, or separate them for ever as distinct. But I should not again have intruded my own opinion on the question had not my name been mentioned, and my recommendation of a close comparison of their respective eggs been called in question by your last correspondent on the subject (Zool. 9045). I am still, however, of opinion that a careful comparison of a sufficient series of eggs of the two (so-called) species would not be wholly without value in helping us towards a decision. Unquestionably in some families the eggs of certain species bear a very close resemblance to each other (and in such cases it would be manifestly most unsafe to rely too much upon the egg alone, as if it were an unfailing mark of distinction); but this is not invariably, neither is it generally, the case; and a practised oologist will, for the most part, name the species from a close inspection of the egg. Moreover, even in those cases where the eggs of allied species most nearly resemble one another, a very careful and painstaking scrutiny of a sufficient series of eggs will sometimes result in enabling us to distinguish between two species, where at first sight the task seemed hopeless, and the resemblance of the eggs exact: but then we must not be content with a superficial, hasty survey; the examination must be close, and deliberate, and minute, and that not of one or two specimens only, but of a sufficient series,

"Nocturnâ versate manu, versate diurnâ."

After such an examination I have more than once been surprised at the result, and at

the difference which a careful observation enabled me to perceive in two sets of eggs which before seemed perfectly identical in size, form and colour. This has been especially observable in the eggs of some of the ducks, at first sight apparently indistinguishable from one another. I am far from saying that this is the invariable result, or that, with all our pains and accuracy, the eggs of closely-allied species can *always* be distinguished; but I do say that in investigating a doubtful species the evidence of the well-authenticated egg is *generally* of no slight value towards either corroborating or disproving our opinion. And therefore, I repeat once more, let a sufficient series of the egg of the willow grouse be carefully compared with those of the red grouse, and the result of the comparison will, in my judgment, go a long way as evidence conducing to a verdict.—*Alfred Charles Smith; Yatesbury Rectory, Calne, June* 11, 1864.

Partridge alighting on a Tree.—Mr. Stevenson asks (Zool. 8846) whether it was a specimen of the redlegged or of the common partridge which I saw alight on a tree. I can confidently affirm that it was no other than the common partridge, as I had a very close view of it, both when it flew up and while it sat on the tree. The redlegged partridge is a rare bird here, and I have never heard of its capture since 1860, in Stirlingshire: one was killed in the season of that year on the grounds belonging to Lord Dunmore.—*J. A. Harvie Brown.*

Note on a Gray Hen killed by a Sparrowhawk.—About three weeks since a female sparrowhawk, a bird of last year, was shot in the New Forest in the act of devouring an adult gray hen, which it had apparently just captured. Both birds have been preserved by Mr. Wright, bird-stuffer, of Lymington, and I saw them at his house this day. This is, I think, a remarkable instance of the courage and power of the female sparrowhawk.—*J. H. Gurney; May* 26, 1864.

Skeleton of the Moa.—I have this morning been assisting in unpacking and arranging the bones of a nearly complete skeleton of the Dinornis robusta, the great New Zealand extinct moa; but it cannot have been long extinct, for the leg-bones of this bird have the periosteum as perfect and shining as it is on the corresponding bones of some ostrich skeletons which I mounted about thirty years ago. This bird has several ribs on one side still attached to the dorsal vertebræ, *in situ*, as when the bird was living; the inner right toe has every bone *in situ*, with its cartilages, and the external corrugated skin of the toe just as when alive; a patch of skin nearly a foot square still adheres to the lower part of the back on the pelvic bones, covered with stumps of feathers still sticking out of the skin; some of the toe-bones show signs of decay, but the bones are not fossilized. I think some of your readers may be interested with this slight notice; I cannot give a more scientific report, because I think it probable that Dr. Gibson, of York, whose brother has sent us this prize through him, may wish to send some account of the skeleton to some of our scientific periodicals, and I have no right or wish to interfere with his just claims. The pelvic bones are complete, some of the cervical vertebræ are wanting, the caudal are complete.—*Thomas Allis; Osbaldwick, York.* [More on this subject hereafter.—*Edward Newman.*]

Eggs of the Thickknee Plover.—In the early part of this month, in company with my friend Mr. N. F. Dobrée, I visited an extensive warren called Tollington Moor, near Market Weighton, for the purpose of obtaining a few eggs of the snipe: only one nest with four eggs was found, but we were rewarded by finding two nests of the thickknee plover, each containing one egg freshly laid. The birds were seen and recognised in both cases.—*George Norman; Hull, May* 4, 1864.

Gray Plover on the Lincolnshire Coast.—The gray plover is now very plentiful on the coast. These birds, I notice, visit us in much larger numbers during the spring than on their return south in the autumn. A large flock, which I noticed through a good glass to day (May 10th) was composed of birds in every state of plumage, from the full summer dress, the under parts deep black, bordered with white, to others with their breast mottled with white, and some showing as yet little change from the usual winter garb, except a slightly darker plumage. The gray plover and the whimbrel are the last to leave our coast in the spring. I have seen them on the Humber flats, in considerable numbers, as late as the 27th of May.—*John Cordeaux; Great Cotes, Ulceby, Lincolnshire.*

Note on the Whimbrel on the Lincolnshire Coast.—Amongst the many waders which for a time frequent the wide mud flats bordering the Humber at this season, on their passage northward, the whimbrel is this year unusually plentiful. On the 6th of May I counted in one flock alone upwards of eighty of these birds, and the same morning saw several smaller flocks in the neighbourhood feeding on the mud flats and in the grass marshes; indeed they appear to be of much more frequent occurrence on this coast than formerly. During the last year or two I have noticed a very considerable increase in the numbers which visit us, both during the spring and autumn. I was talking the other day to an old gunner who has been nearly all his life a wild fowl shooter on this coast; he told me that he never remembered in any previous season anything like the number of whimbrel we have had this year, and had not before known them to congregate in such large flocks.—*Id.*

On the Breeding of the Green Sandpiper (Helodromas ochropus).—Ornithologists are aware of the very different positions often chosen for their nests by birds of the same species. Thus eagles may be found sometimes building their eyries upon trees, at others on cliffs, and again sometimes absolutely upon the flat ground. The same may be said of some species of falcons and of some herons. Certain crows also and the stock dove (*Columba œnas*) exhibit a like disparity of habit. Even among the members of the Gallinaceous order a similar diversity is occasionally, though rarely, to be observed. I have been told, on authority I cannot question, of a common pheasant (*Phasianus colchicus*) and of a capercally (*Tetrao urogallus*) each choosing a nest in a tree wherein to lay its eggs. Instances of the common wild duck (*Anas boschas*) breeding in hollow stumps of trees are very frequent; and with the ducks of the genus Aix this seems to be the normal mode of nidification. But, excepting in the last case, this peculiarity in the selection of a site for the nest seems to result from the particular fancy (or instinct, it may be) of the individual; and in that exceptional case the general habits of the birds are so essentially arboreal that we need not wonder at the fact of their using trees for their nurseries as well as for their usual places of lodging. The only instances parallel to the one I am going to adduce are, so far as I can call to mind, those of the goldeneye (*Clangula glaucion*), the goosander (*Mergus serrator*), and the smew (*Mergus albellus*). Each of these three birds departs from the manner of nidification which obtains among its brethren, just as I shall show that the green sandpiper (*Helodromas ochropus* *) does. Though I do not pretend to lay before you

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* The osteology of the Tringa ochropus, *Linn.*, presents such a marked deviation from that of the other Totani which I have examined, that I do not hesitate in this case to follow Dr. Kaup in considering it the type of a distinct genus.

any novel facts this evening, yet it will be, I think, admitted that hitherto we have had in England but little positive information on the mode of breeding of the green sandpiper; such as it is, however, I will proceed to notice it. First, I must say that I think the story of the nest of this bird "by the side of a clay-pit" in Norfolk, as told in Mr. Yarrell's 'British Birds' (vol. ii. p. 529) and in Mr. Lubbock's 'Fauna of Norfolk' (p. 75), can hardly be relied on—not, of course, that there is the slightest reason to doubt the implicit good faith of Sir Thomas Beevor, on whose authority it appears to rest. Next there is the statement contributed to the last edition of Mr. Hewitson's 'Eggs of British Birds' (ed. 3. vol. ii. p. 334*) by Mr. Tristram, to the effect that he found the species breeding near sluggish streams or mountain tarns between Bodö and Quickjock in Lapland. Now this particular district has since been visited by three other excellent observers, to no one of whom did the green sandpiper reveal itself. I therefore hope I may be pardoned for suggesting the possibility of a mistake in my friend's assertion. In the 'Naumannia' for 1851 (vol. i. part 2, p. 50), Herr Pässler mentions that he had, through his friend the Oberförster Wiese, obtained an egg of Totanus glareola, with the remark that this species of sandpiper always "nests upon a tree;" but in the same periodical for 1852 (vol. ii. part 1, p. 95) he states that Baron von Homeyer had informed him that the egg in question was not that of T. glareola, but of T. ochropus, and adds that during his stay at Haff he had seen many nesting-places of this latter species; they were on the borders of "Elsenbrüche,"—*quære*, swamps of the service-tree (*Pyrus domestica*)?—in the middle of the forest, where the trees stand upon hillocks. In the 'Journal für Ornithologie' for 1855 (vol. iii. p. 514), the above-mentioned Herr Wiese, writing on the Ornithology of Pomerania, especially in the district of Cöslin, says that he had first heard from an old sportsman, who knew the peculiarities of all the forest animals, that the Totanus ochropus nested in old thrushes' nests, which information, he remarks, "I naturally did not believe;" but he states that some years after, in 1845, he obtained from the same man four fine eggs of a bird of this species, which for many years had been wont to nestle in an old beech tree. Still doubtful on the subject, the following spring he himself found a nest of the bird on a pine which had a fork about five-and-twenty or thirty feet high. "Joyfully," he says, "I climbed the tree, and found in that fork four eggs on a simple bed of old moss." He goes on to say that in the spring of 1853 he again obtained four eggs of the same species; and in the spring of 1854 (the year he was writing) he found a nest placed in the old nest of a song thrush, out of which the shed buds of the beech had not so much as been removed. There were four eggs, which were hard sat upon on the 25th of May. In the 'Naumannia' for 1856 (vol. vi. p. 34), in an account of an excursion in Western Pomerania ("Vorpommern"), Dr. Altum states that Totanus ochropus returns annually to its old nesting-places, these being misseltoe thrushes' nests, whose remains were still to be seen, often some hundred yards distant from the nearest pool, and their height fifteen feet or more from the ground. The same journal for 1857 contains a valuable series of observations on the birds of the same district by Herr W. Hintz, in which the author says (vol. vii. part 1, p. 14) that on the 6th of May, 1855, he found three eggs of this bird on an "Else" (*quære*, Pyrus domestica?) in an old dove's nest, as he thinks, though he states it might have been that of a jay. Formerly, he proceeds to remark, he had only observed this sandpiper to use old nests of Turdus musicus, excepting once, when he found some young ones, only a few days old, hard by a river-bank on a layer of pine-needles on an "Else"-stub. Soon after the publication of this last piece of intelligence, appeared that part of Herr Bädeker's

'Eier der Europäischen Vögel,' wherein (fol. xxx. No. 5) Helodromus ochropus was treated of, and a concise summary of the foregoing accounts was given. This was remarked upon by the writer of an article in the 'Ibis' for 1859 (vol. i. p. 405), and thus the curious facts which I have above detailed were made generally known, for the first time I believe, to English readers. In 1860 a short recapitulation of them was also published by my friend Dr. Baldamus, in the continuation of Naumann's celebrated 'Vögel Deutschlands' (vol. xiii. p. 241). Towards the close of the same year also that excellent observer who veils his name under the signature of "An Old Bushman" contributed a series of articles to the 'Field' newspaper, in which he described his own experience of the green sandpiper's way of nesting in Sweden. The Natural-History editor of that paper, not knowing what had been already written, exhibited some signs of scepticism on the subject, whereupon his correspondent reiterated his statement, saying ('Field,' No. 411, November 10, 1860, p. 393), that "there is no doubt about the matter," and adding that he "never took the nest on the ground." I have now only to read to you a portion of a letter, dated November 27, 1861, which I received from my friend Pastor Theobald, of Copenhagen. He says as follows:—"The nidification of Totanus ochropus is so remarkable that I do not fear to trouble you with the history the Forester Hintz" (whom I have mentioned above) "has given me. He writes,—'This year I succeeded in finding the nest of Totanus ochropus. On the 9th of May I took four eggs of this bird; they were found in an old nest of Turdus musicus, and seemed to have been incubated about three days. The very same day there were brought to me four other eggs of this bird, also found in a thrush's nest. * * * The 10th of May there was shown to me a nest, thirty feet high, on an old birch, the bird having chosen an old decayed nest of a squirrel. This nest was the highest I have ever seen. Three young ones had just been hatched; in the fourth egg the bird was about to break the shell. One jumped down and concealed itself on the edge of a water-pool. The 11th of May a nest with four fresh eggs was found, but they did not come into my hands; this was in an old pigeon's nest on a Pinus rubra, and full of dry pine-leaves. The 20th of May two eggs, almost burst by the young, were found in an old thrush's nest, the two missing birds having most likely already left the nest. The 22nd of May four young ones, apparently but a few hours old, were found in the old nest of a Lanius collurio, in a juniper three feet high. The 24th of May four young ones were found in the hole of a Populus tremula thrown down by the wind. The year before Muscicapa luctuosa had its nest in the trunk as it lay on the ground; this year Totanus ochropus had chosen the same opening. When I approached the trunk, the young ones, perhaps four-and-twenty hours old, jumped away and hid themselves in the grass among the branches. All these nests were near the water,—two on the edge of a rivulet, the others on wet morasses, the distance from the water being at most six feet.'" I have the pleasure of exhibiting to you a small series of a score of the eggs of this bird, as well as three nests. The latter were sent me by Mr. H. W. Wheelwright, and were obtained by him this year in Sweden. They are so ragged and dilapidated that, as is often the case with ancient ruins, it is not easy to say of what race the builders were. From one of them, five-and-twenty feet up in a fir tree, the mother was killed on the 28th of May, and I produce her skin. Three of the sets of eggs belonged to these nests; a fourth set was the contents of Forester Hintz's nest of the 9th of May, 1861, mentioned in his interesting letter. This I owe to Mr. Theobald and some other friends

in Copenhagen. The remaining four eggs are odd ones obtained by Mr. Wolley and myself from Dr. Kjærbölling.—*Alfred Newton.**

Bartram's and the Purple Sandpiper in Sussex.—I purchased at a sale of birds belonging to the late Mr. Wille, of Lewes, on Monday, April 18th, a beautiful specimen of Bartram's sandpiper, shot at Newhaven some time between 1836 and 1840. I also bought a specimen of the purple sandpiper, which the label states to have been stuffed by Swaysland, and shot at Pevensey Bay, in December, 1838. Mr. Wille was exceedingly particular about the authenticity of his birds, some of which fetched high prices.—*John Dutton; Eastbourne.*

Curlew Sandpiper and Dunlin on the Lincolnshire Coast.—The curlew sandpiper is not a common visitant on this coast: during the last week in April I saw several of them on the flats, and managed to approach, under cover of a bank, within a few yards of one which was feeding in a shallow pool on the shore: I had a very distinct view of its curved bill: when flying the white upper tail-coverts were very conspicuous. It is a slightly taller and more slender bird in appearance than the dunlin. I have noticed several on the flats this spring feeding in company with the dunlin. The dunlins are now (May 6th) in full summer plumage: a few probably remain and breed in the neighbourhood, as I have seen a few of these birds on the coast all through the summer months.—*John Cordeaux; Great Cotes, Ulceby.*

Reeve killed near Grangemouth.—I ought to have mentioned long ago the occurrence of a somewhat rare bird in this locality. On the 10th of September, 1862, while down at the coast shooting between Grangemouth and Kincardine, my friend Mr. J. R. Cook killed a very fine specimen of the reeve, which I have now in my collection. It is of very rare occurrence hereabouts.—*John A. Harvie Brown.*

Spotted Crake in Norfolk.—Five or six good specimens of the spotted crake have been taken in this locality during the course of this week.—*T. E. Gunn; Norwich, April* 8, 1864.

Little Crake in Cambridgeshire.—It is with much pleasure I embrace this opportunity of recording the occurrence of the little crake in Cambridgeshire, a male of this species having been taken alive on the 26th of March, by a labouring man in Chesterton Fen, about two miles north-east of Cambridge: it is said to have been seen frequenting this place some time prior to its capture: the man who caught it states that he kept it alive for a few days, and that its actions were most graceful. I will now describe its exact measurements, &c., which I took a few hours after its death. From tip of tail to tip of beak the extreme length was 8¼ inches, and from tip to tip of extended wings 12½ inches. Irides brick-red, with a slight tinge of orange-yellow. Mandibles cuneated. Beak of a beautiful soft dark apple-green, slightly yellowish near the tip; extreme tip greenish horn-colour. Claws lightish horn-colour; under portions of feet of a dirty slaty hue. Owing to its having been kept in confinement a day or two after its capture, the bird was in very poor condition. Heart particularly elongated and slender; testes large and prominent; stomach quite round and compressed, the internal cavity large and quite destitute of food, containing only some small particles of flint gravel, such as is found in fenny water. I have presented its sternum to the Oxford Museum: the bird itself is now in the possession of Mr. W. C.

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* From the 'Proceedings of the Zoological Society of London,' December 8, 1863: communicated by the author.

Horsfall. The previously recorded instances of the occurrence of the little crake in Britain are as follows:—The first specimen occurred in Yorkshire, on the banks of the Yore, on the 6th of May, 1807; a second, in the same year, at Adwick, near Manchester; the third, near Ashburton, Devon, in 1809; the fourth was killed in Norfolk in May, 1812; the fifth, near Chelsea, also in 1812; and in March, 1826, a female specimen was caught at Barnwell, near Cambridge. I cannot refrain from mentioning the singularly interesting fact that the first example and the last in this county occurred in the same month and at near the same spot, the boundaries of Barnwell and Chesterton joining at the piece of fenny ground in which these captures occurred, and both specimens were caught, not shot. The nidification of this species commences at the end of May. Meyer says the little crake has a very great peculiarity that belongs solely to itself,—that is, its curiosity. If a person carefully approaches the spot where a bird is known to be, it may be seen to come to the edge of the swamp and utter its piping call-note, as it were in astonishment at what it sees.—*S. P. Saville; High Street, King's Lynn, May* 11, 1864.

Early Breeding of the Woodcock.—I send you a note of the early breeding of the woodcock, at least what I consider early, as in this part the weather has been very cold with frost. The nest was found on the 13th of April in Methven Wood, containing four eggs, very much darker than any eggs I have seen of the woodcock, the larger end quite dark brown; they were close upon hatching, and, as it requires seventeen days' incubation, some of the eggs must have been laid at the latter end of March. Last year I saw a nest, containing four eggs, on the 6th of July.—*T. Brunton; Methven Castle, Perth, April* 18, 1864.

Gray Lag Geese in Norfolk.—On the 5th of March I purchased in our fish-market a fine specimen of that now scarce bird, the true Anser ferus, or gray goose, and on the 12th of the same month another, both having been killed out of a small flock on Ludham Broad. On dissecting these birds I found them both males, and evidently adult, but in neither case was there any indication of the white front observable in many birds of this species, and the under parts of the breast presented only the faintest indication of the cross bars, which in some specimens are almost as marked as in the laughing goose (*Anser albifrons*). The first bird, which weighed 7½ lbs., measured 55 inches from tip to tip of wings; length from tip of beak to end of tail 33 inches; wing from carpal joint to end of second quill 18 inches; beak from base along the upper surface to the nail 3 inches; tarsus 3½ inches; middle toe and claw 4 inches; inner toe 3⅛ inches; outer toe 3¾ inches; hind toe and claw 1⅛ inch. Feet livid-pink; claws slate-colour; beak pink flesh-colour, nearly purple (dead bird) round the edge of the mandibles; nail white; eyelids white all round; eyerials red-hazel, very dark. The second specimen differed only in being about one inch longer from beak to tail, and the same in extent of wings. In both cases the stomachs were filled with short wiry coarse grass, having a brackish smell.—*H. Stevenson; Norwich, April* 27, 1864.

The Flamingo.—Not far from this is a small salt lake, which I had visited for a few days during the previous spring, and which abounds in birds of every variety. Conspicuous among them is the flamingo. On approaching the lake, a long white line could be seen stretching right across it, looking somewhat, by its slightly undulatory motion, like the foam of a line of breakers on a reef. But the alarm is given, the white line becomes animated, rises and expands,—first of a snowy white, then, as the birds simultaneously turn, unfolding thousands of black wings, it appears a dark,

speckled, confused mass; then, as they wheel from the spectator, the soft pink colours of their backs and wing-coverts absorb all other hues, and, screaming with outstretched necks, they fly off, an animated, rosy cloud. It is the most gorgeous sight on which the naturalist's eyes can feast. The flamingos are most difficult of approach; and it is only by a chance flock crossing overhead that a shot can be obtained. But, though the flamingos have gone on the first alarm, myriads of birds remain; ducks are swimming literally *en masse;* clouds of the pretty white-winged black tern are playing overhead, and making feints almost within reach; while the beautiful blackwinged stilt, the tamest of waders, daintily lifts his long pink legs as he gracefully stalks through the shallows, or more hurriedly leaves the nests which are most profusely scattered round us, unprotected and unconcealed amid the mud and grass. The opposite side of the lake is bordered by a mass of tall reeds, into the recesses of which the water hens and purple gallinules are hurrying, and from whose thickets resounds the harsh note of the great sedge warbler or thrush nightingale, mingled with the gentler strains of many lesser aquatic warblers. On all sides of us the collared pratincole is exercising its arts, like the lapwing, to lure us from the eggs which lie scattered on the hard dried mud, dropped by threes into any chance camel's footmark; and groups of little Kentish plovers are running rapidly by the water's edge.—*Tristram's* '*Great Sahara*,' p. 62.

Shoveller near Beverley.—On the 15th of April a male of this species, in full adult plumage, was shot by Mr. Kemp, gamekeeper, of Skerne, near Driffield, on the River Hull, near to a place called Brigham. The bird was alone. I had it in the flesh, and on dissection found, as I had anticipated, the gizzard was modified and beautifully adapted to the bird's peculiar habits and food. The organ was relatively small in proportion to the size of the bird and to the gizzard in other species of this great family. I attribute this relative inferiority in the dimensions of the organ to the modification of its parts, powers and functions. Most of the ducks feed more or less upon grain, grasses, seeds and vegetable matters generally, and in consequence the muscular walls of their gizzards are immensely developed, in order to render the organ capable of pulping its contents by mechanical force; but in this species I found the muscular walls of the gizzard comparatively thin and feeble in their development. The ventriculus succenturiatus was considerably dilated and proportionally larger and more highly developed than in those specimens of the other ducks I have had the opportunity of examining, and indeed the whole organ approximated more closely to the compound stomach of the mergansers, &c., than that of any bird I have dissected. The form and arrangement of parts in the organ itself bespeak the natural food of the bird, *viz.* insects, which are searched for, captured, and separated from water, weed and mud by the deeply fringed or pectinated bill. When received into the stomach the food is digested partly by the action of natural solvents, and partly by mechanical grinding force. The bill itself is a very beautiful provision of Nature for finding and securing the bird's necessary food. I believe it to be endowed with exquisite powers of sensibility, and imagine that by means of this sensibility the bird finds its prey, rather than by means of the senses of smell and sight, which appear to be only secondary auxiliaries in detecting the food. The broadly expanded convexity of the lower third of the bill is dotted over with minute depressions, which I believe correspond to an equal number of nervous filaments of sensation, brought at these points very near to the surface, as in the snipe and other birds which hunt for their prey in like manner. The unusual breadth of the bill affords space for a greater number of nervous filaments,

and is brought in contact with a greater surface of water and mud whilst feeding, so that the bird hunts its ground more rapidly than it could were the bill formed on any other plan. Again, how beautiful is the arrangement of that fringe or ciliated border which is spread around the outer and lower margin of the upper mandible, directed downwards along two-thirds of its extent, and inwards along the remaining third! By this arrangement nothing can be lost; every mouthful of water and mud being perfectly filtered, and the solid contents and inhabitants being thus retained or rejected subject to the will or instinct of the bird. The unusual length of the bill enables the bird to search a greater depth as well as expanse of mud in pursuit of its living prey. The stomach of the bird I dissected was nearly empty, and contained chiefly minute gravel and vegetable matters, most probably swallowed *with* the food, rather than *as* food, although it is not improbable that this duck may resort to the softer and less highly organized forms of vegetable life when its more natural sustenance is scarce. The shoveller is a rare duck in this neighbourhood. I possess the only pair that have been shot near Beverley to my knowledge or recollection.—*W. W. Boulton; Beverley, April* 21, 1864.

Crested Grebe in the Humber.—Mr. Boulton will, I trust, pardon me for putting him on his guard when purchasing specimens in the Hull Market. Dealers in game here are by no means particular in giving a wrong history of any bird they may have for sale, and will frequently palm off a specimen as "British killed," if not closely questioned. The specimen of the horned grebe alluded to by Mr. Boulton as having been killed in our river may certainly be British, although I have never heard of the bird being seen on the Humber. According to my opinion, it is far more likely to have come with the large importations of birds we have lately received from Holland, Norway, &c. Only last week I examined a large number of ruffs and redshanks from Rotterdam, which would probably all have been described as home-killed had the dealer suspected I examined them as a naturalist. During the winter months the importation of game from Norway has been of a sadly miscellaneous character: as an instance I give a list of Norwegian birds offered as articles of food in one dealer's shop: capercaillie, black cock, hazel hen (*Tetrao bonasia*), willow grouse, longtailed and pintailed ducks, redthroated diver, Eider duck, cormorant, gannet, guillemot, and a host of others rather too strong in flavour to be palatable, I should imagine.—*George Norman; Hull, May* 4, 1864.

Doubts as to the Occurrence of the Ruddy Shieldrake and Spotted Sandpiper at Epworth.—In Mr. Hudson's communication (Zool. 9046) these two birds are recorded as having occurred at Epworth, and the record has induced several communications expressing doubts. It has always been my endeavour to avoid the offence which is frequently given quite unintentionally by the mode in which such doubts have been expressed, and I will therefore, instead of printing the communications I have received on this subject, invite Mr. Hudson to give us further information on the two birds mentioned, first offering a few words on the species in question. The ruddy shieldrake (*Anas rutila* of Pallas) is one of the very rarest of our occasional visitors, and a specimen of the common shieldrake (*Anas tadorna* of Linneus) may possibly have been mistaken for it. The spotted sandpiper (*Totanus macularius* of Temminck) is an American bird, and has never been obtained in Great Britain at all, the figure in Mr. Yarrell's work having been drawn from a skin which has been proved to be North American, and is now in the possession of Mr. Gurney. That two such birds should have occurred at the same spot, and within a month of each other is very remarkable.—*Edward Newman.*

Barrow's Goldeneye.—In printing Mr. Graham's communication (Zool. 9039) the locality where this bird was formerly obtained should be Iceland, not Ireland: there was not a single name of place or bird legibly written; I guessed at them as well as I could; but I must express a wish that correspondents would exercise a little more care in their MS.—*Edward Newman.*

Puffin in Sussex.—A very beautiful specimen of the puffin has just been brought to me, shot off our town this morning: it is a very rare bird in this part of the channel; I never previously obtained one during my residence here.—*J. Dutton; Eastbourne, April* 20, 1864.

Ringed Guillemot off Eastbourne.—Yesterday I had brought me for inspection a beautiful specimen of the ringed guillemot, shot off this town on the morning of that day. It was in company with common guillemots, of which birds there are great numbers off our coast at the present time.—*Id.; April* 19, 1864.

Remarks on the Exhibition of a Natural Mummy of Alca impennis.—For the last twenty-one years, since the appearance of the part of Mr. Yarrell's 'History of British Birds' containing his account of Alca impennis, wherein was cited Mr. Audubon's statement that that species bred on an island in the neighbourhood of Newfoundland, the attention of ornithologists in this country has been more or less directed to that colony, in the hope of obtaining thence specimens of this rare and curious bird. Mr. John Wolley, with his usual sagacity, applying the knowledge he had culled from his extensive researches among the works of our older naturalists, not only soon made out the truth of Willughby's supposition, "Penguin *nautis nostratibus dicta, quæ* Goifugel *Hoieri esse videtur*" (Ornithologia, Lond. 1676, p. 242), but found that the name was still persistent among those who were yet engaged in the cod-fishery in the Newfoundland seas. Among his various memoranda I find one, apparently written about the year 1850, to this effect:—"In Newfoundland, Funk or Penguin Isle is 170 miles north of St. John's, and about thirty-six miles north-east by east from Cape Freels, the north headland of Bonavista Bay. There are also Penguin Isles two or three miles from shore; Penguin Islands, too, in the middle of the south coast of Newfoundland." This note was evidently written after making a careful examination of the map; and I well remember, in February, 1856, going over a chart of the North Atlantic with him, in which he had previously marked the various places known as "Penguin Island," "Bird Rock," and the like. To the best of my recollection, he also told me, either at the same or some former period, that in the course of his reading he had come across various notices of "penguins," contained in the narratives of ancient voyages to that part of the world. All this time, however, I had not been altogether idle in the way of collecting (or at least seeking for) information on the subject. In the summer of 1853, as I have elsewhere stated,* a boatman at Torquay, then about seventy years of age, and by name William Stabb, told my brother Edward and myself that in former days he used to follow the Newfoundland cod-fishery, and that he had seen penguins off that coast. He added that they used to resort by hundreds to some islands there to breed, but were destroyed for their feathers, being driven up in a corner by people in boats. This practice, however, must have nearly or altogether ceased in his time; for he stated that he had never seen but two or three birds himself, and never a dead one. I mention these facts merely to show that Mr. Wolley's

* 'Zoology of Ancient Europe,' London and Cambridge, 1862, p. 30.

determination to work out the history of the gare-fowl or northern penguin was formed prior to his acquaintance with Professor Steenstrup's valuable discoveries, and to their publication in the elaborate and excellent article (Vidensk. Meddelelser, 1855, pp. 33—116) on this bird, to which it always gives me so much pleasure to refer. When Mr. Wolley, later (in 1856), became aware of what that illustrious naturalist had ascertained, he was more than ever bent upon prosecuting his researches; and, acting upon the information I received from him, I at once set about doing what I could to further them.* Believing at the time that no example of the bird's skeleton existed in any of the European museums, and having great confidence in the trustworthiness of Herr Stuvitz's statement, as given by Professor Steenstrup (*loc. cit.*), that there were still many of its bones to be found on Funk Island, I began to address letters of inquiry respecting them to almost every one I could hear of in Newfoundland who seemed likely to be able to give assistance. I need not here go into details. For a long time I could get no response from any of those to whom I wrote; some of my epistles were returned to me through the dead-letter office; and occasionally I almost despaired of calling attention to the subject in that colony. At last I had the great pleasure of receiving from the clergyman of the Island of Fogo, the Rev. Reginald M. Johnson, a reply which, in the most obliging terms, promised me his valuable help in the matter. Still the chances of procuring specimens of bones that would really be serviceable towards determining the osteology of Alca impennis were not good. Though when Stuvitz, in 1841, visited Funk Island the bones were in quantities (*i Mængde*), many causes during the time that had since elapsed might have scattered or destroyed them. The locality, as I have before shown, was a distant one, and, like all resorts of the gare-fowl as far as I know them, not easy of access. Stuvitz stated there were but two landing-places, and these only to be attained by a hazardous leap (*kun ved et voveligt Spring*). These latter particulars were confirmed by Mr. Johnson; and in the last letter which I had from that gentleman (only a few weeks ago) he told me he had come to the gallant determination to make the expedition himself, as without him he was sure all endeavours to obtain the bones would fail. Meanwhile the Bishop of Newfoundland, in the course of one of his visitations, had been shown by Mr. Johnson my letters, enclosing sketches of the principal bones and other papers relating to the subject, and most kindly volunteered to give me all the aid in the matter which his high position afforded. When the Members of this Society know the result, I think they will congratulate me on my good fortune in having excited his lordship's interest. After several other friendly letters, I had three days ago the great pleasure of receiving one in which the Bishop informed me his success had surpassed anything I could have anticipated; for his lordship had done no less than secure me what may be not inaptly called the "mummy" of an Alca impennis, which, having come into my hands yesterday, I have now the honour of exhibiting to the Society. It appears that the Colonial Government have recently conceded to a Mr. Glindon the privilege of removing the soil from Funk Island; for this soil, being highly charged with organic matter, is consequently valuable as manure when imported to Boston and other places in North America. The Bishop, through Mr. N. R. Vail, a gentleman of the United States, well informed on scientific subjects, and therefore aware of the interesting nature of the research, made application to the lessee of Funk Island, who ordered his men

* Cf. 'The Ibis,' 1861, p. 397.

employed there to use their best endeavours to obtain for me the bones of the penguin. They appear to have done their work very effectually; for I hear that they "brought away many puncheons of bones and other remains"—of course not all necessarily "penguins"— which I believe are now on their way to New England, where they will doubtless be readily bought up by the farmers, though I trust some may be rescued from ignoble uses by the American naturalists. This mummy, however, the Bishop tells me, was "found four feet below the surface, and under two feet of ice." I need scarcely point out to the Society what an advantage it is to have obtained so many bones undeniably belonging to one individual bird. Though the skeleton is not perfect, it is plain that we have here at least one side of the entire vertebral column. The extremities of the limbs are altogether wanting on either side; and though this is greatly to be regretted, it is some consolation to think that a knowledge of what these parts are like in Alca impennis may be, with a little trouble, supplied from almost every one of the sixty-three or sixty-four stuffed skins at present known to exist.* I do not, however, mean to prolong these remarks by making any observations on the osteological structure of this bird. That I have reason to hope may be fully described by a far more able pen; for it is my intention to place the specimen I now exhibit in the hands of Professor Owen, trusting that he will make it the subject of one of those monographs which have so materially enriched our series of 'Transactions.' I have but to say in conclusion that, so far as I know, my "mummy" is, with one exception, the only approach to a complete skeleton existing in Europe. That exception is the specimen, nearly perfect, in the Osteological Gallery of the Museum of the Jardin des Plantes at Paris; for the remains of the two gare-fowls killed on Eldey in 1844, which were sent to Copenhagen, and are still preserved in the Physiological Museum of the University there, have been dissected with a view to show the different systems of organs; they are therefore even less available to determine the general osteology of the bird than are the various loose bones which, through Stuvitz's labours, exist in the Museums at Christiana and Copenhagen, that of our Royal College of Surgeons, and in my own collection.—*Alfred Newton.*†

Ornithological Notes from Shetland. By Henry L. Saxby, M.D

(Continued from p. 9096.)

Raven.—Ravens having hatched have now become very bold and mischievous. I procured fresh eggs from Burrafirth on the 16th of

* Mr. Blyth, just six and twenty years ago, exhibited to this Society some bones which had been left in a preserved skin of this bird (P. Z. S. 1837, p. 122; and 'Ibis,' 1861, p. 396, *note*). Within the last year, Mr. John Hancock extracted from his own beautiful specimen, and from the very ancient and interesting example in the Newcastle Museum, *every bone* they contained, without doing the slightest damage to the skins, as might be seen at the late Meeting of the British Association (Cat. of Exhibition, Nos. 180, 185).

† From the 'Proceedings of the Zoological Society of London,' November 10, 1863: communicated by the author.

April, and upon that day half-fledged young were also taken from the same range of cliffs. A well-marked instance of the attachment of this bird to its nest occurred about the end of last month in the Island of Uyea, where a pair have long been in the habit of building in the almost perpendicular cliff of a lonely "geo," or deep rocky inlet of the sea. A party of boys, finding that the nest was beyond their reach, threw stones into it from above, laying it in ruins, and breaking the three eggs which it contained, but, strange to say, without causing the birds to desert the spot; for in less than a fortnight afterwards, not only was the nest repaired, but it even contained a fresh set of eggs. As a rule, destruction of the eggs does not act as a sufficient warning, but if the young are taken or destroyed another situation is nearly sure to be selected by the old birds the following spring. The usual number of eggs is five, but sometimes six may be found: I have often observed that after four have been laid, every additional one is paler in colour and longer in form. With this exception, eggs from the same nest bear considerable resemblance to each other in colour and size, but those from different nests vary greatly in both respects. It is said, and apparently with some truth, that those eggs which are of the short roundish form are laid by young birds; some which were taken last year are very little larger than those of the carrion crow. In these islands ravens breed in the highest and most inaccessible of the sea-cliffs, and perhaps, in nine cases out of ten, the rock immediately above the nest overhangs, while, for many feet below, it is too smooth to afford foot-hold even to the most experienced cragsman; therefore it is comparatively seldom that the nests are robbed. About ten days ago some whales were driven ashore at Uyea Sound, and of course the ravens have not overlooked the attraction offered by the still exposed carcases. Shortly after sunset at least fifty ravens and about double that number of hooded crows retire from the feast and fly heavily across to the neighbouring island of Uyea, where they roost all night. At any other time of the year this would excite but little surprise, but in the breeding season such proceedings are certainly rather unaccountable. At daylight this company of gourmands may again be seen hard at work upon the whales, and throughout the day many more ravens, probably those which have young ones to feed, are constantly adding to the crowd, most of them remaining only for a short time, but carrying away quantities of the flesh. The number of crows undergoes but a slight increase. Although the breeze coming up from the beach now carries with it rather more of a Thames flavour than is agreeable, it nevertheless also conveys the assurance that as long as the annoyance continues,

young lambs and weakly foals will have less to dread from their merciless foes, the ravens.

Lesser Blackbacked Gull.—Most of our summer visitors have now arrived. Lesser blackbacked gulls appeared on the 8th of April (wind S.E.), and are now revisiting their nesting-places, where there are already many nearly-completed nests of the herring gull.

Wheatear.—On the 14th of April a stiff breeze from S.E. brought the first few wheatears, and the song of these welcome birds has since been almost constantly heard. The greater number appear first upon the hills, but they very soon descend to the low grounds, preferring such as are stony and irregular, and intersected by those loosely built stone walls in which they so love to conceal their nests. Comparatively few wheatears breed among the hills.

Arctic Tern.—The first arctic tern was seen on the 23rd of April (wind S.S.E.), but that was early, and there are very few here yet.

Redwing.—The only other arrival that I observed was that of a small party of redwings, which appeared, with a S.W. wind, on the morning of the 13th of April. They left during the following night.

Blackheaded Gull.—Blackheaded gulls remain with us all the year: they are now in full plumage, and pairs are to be met with upon most of the small lochs near the sea.

Whitetailed Eagle.—Whitetailed eagles are sitting. The nest in Yell contained the first egg on the 20th of April. A pair of these birds visited the island of Balta three days ago, and committed some havoc among the lambs. Their foot-prints were very distinct in the sand upon which a partly-devoured ewe was lying.

Longtailed Duck.—A considerable number of longtailed ducks (*Anas glacialis*) still remain, although many pairs were flying northwards on the 22nd of April. I have seen a few as late as the last week of May, but they were, without exception, immature birds. The old ones nearly all pair before leaving, but young ones continue in flocks or small parties as long as they remain here. The cry is still constantly to be heard, particularly in fine clear weather, when it is easily distinguishable at the distance of a mile or more; even upon a fine moonlight night, whether the birds are flying overhead or sitting quietly upon the water, whole flocks may be heard uttering their well-known "cal-calloo," both old and young joining in chorus, in which the more clear and musical tones of the former are distinctly to be recognized. Every listener has some pleasing association connected with the cry, and to me it irresistibly calls to mind the voice of a child who is still too young to speak. Authors seem to have come to the

conclusion that both sexes have the same note, yet it is curious that, although I have for many years been constant in my endeavours to settle the question to my own satisfaction, I have never yet heard the female utter a sound of any kind. In the winter of 1862-3, this species was very scarce at Baltasound; the inhabitants accounted for this by the fact that during that season the unusual abundance of small fish attracted large flocks of shags, whose presence alarmed the longtailed ducks: the latter most certainly dislike the company of other species.

Lapwing.—Lapwings were making their nests early in April, but the first eggs that I heard of were found on the 12th. I have some curious specimens in my collection; some of a pale reddish stone-colour, with faint bluish gray marks, and one of a very pale cream-colour, with a well-marked zone of small black dots.

Ringed Plover.—The first ringed plover's eggs were found on the 26th of April, but most of the birds had paired and returned to their breeding-places some weeks previously. I have seen fresh eggs as late as the first week of July. The favourite breeding-ground in this neighbourhood is situated about half-a-mile inland, at the foot of a range of steep hills, and with a large extent of cultivated land lying between it and the sea. The nests are invariably found in the bare gravelly patches which so frequently occur among the stunted grass and heather, a preference being shown to the vicinity of water, even though the quantity be barely sufficient to glisten in the sunshine. A perfect nest consists of a saucer-shaped hollow scraped in the ground and lined with small stones, which are sometimes so thickly piled around the sides that the eggs are found standing almost perpendicularly upon their small ends. Like the oystercatcher, the ringed plover will frequently make more nests than it requires for use, and three or four may sometimes be found within a few yards of a sitting bird. Occasionally the presence of a large stone or a root at the bottom of one of these hollows shows sufficient cause for abandonment, but it often happens that these extra nests are carefully lined and finished. The cavity of a perfect nest measures from four inches and a half to five inches across, according to its depth, the deepest being, of course, also the widest. The most remarkable variety of the egg that I have seen is of a yellowish colour, with a few large blotches of dark brown, and is so similar in appearance to the second figure of the quail's egg in the second edition of Mr. Hewitson's work on the 'Eggs of British Birds,' that almost every person to whom I have shown it has been struck by the resemblance. The only other egg which the nest contained was of the ordinary form and colour.

House Sparrow.—House sparrows returned to their nesting-places about the 10th of April: their attention is now about equally divided between nest-building and the destruction of young gooseberries. For the last six years a pair of sparrows has bred regularly in one particular crevice in a cottage-wall; the plumage of the female is remarkably pale and faded in appearance, but this peculiarity seems not to be transmitted to any of the young birds.

Osprey.—On the 28th of April I saw an osprey standing upon a small hillock, devouring something, probably a fish, which it held down with its feet. I tried to get within shot, and should have succeeded if an impudent hooded crow had not scared it by endeavouring to snatch a share of the meal. The osprey frequently removed to the distance of about a hundred yards, carrying its food in its claws, and at length when the last morsel was finished, away sailed the graceful bird, wheeling in circles and gradually ascending to a great height, and all this with scarcely a perceptible movement of the wings.

Kittiwake and Guillemot.—Kittiwakes and guillemots returned to Burrafirth, their main breeding station, about Candlemas, keeping almost entirely to the water for several weeks, and then taking up their quarters in the cliffs. The kittiwakes are unusually numerous this season. A few small flocks remain with us all through the winter. The young birds do not breed during their first year, and are known in Unst as "yield kittiwakes."

Kestrel.—On the 13th of April hoopers were last seen, and on the 15th I observed several kestrels. A few pairs of the latter breed in the sea-cliffs, and there is reason to believe that, with very few exceptions, both old and young leave us in winter.

Cormorant and Shag.—Cormorants returned to their breeding-places a few days ago, but shags were already building at that time.

Redbreasted Merganser.—Redbreasted mergansers are still in flocks; this is nothing unusual, for they are late breeders.

Water Rail.—No water rails are now to be seen.

Snow Bunting.—Snow buntings are returning northwards. At this season large flocks come from the south, and after resting for a few days continue their journey, taking with them the few which have remained with us all the winter.

Starling.—Although there are still some small flocks of starlings about, many pairs are busy with their nests. Last year there was quite a colony of these birds among some large stones upon the shore, a few yards above high-water mark: the nests were easily discovered, but most of them were far beyond arm's reach.

Hooded Crow.—The hooded crow is a late breeder, that is, late compared with the raven, the only other species of crow indigenous to these islands. It paired early in the month, but no nests have yet been found. Although the raven displays such cunning in the selection of a site for its nest, the hooded crow, on the contrary, seems to take no small pains so to place its nest that it shall be easily accessible to man. I am by no means a good climber, and yet I never saw more than one of these nests which was beyond my reach. In this island, where we have no *tree* larger than rhubarb, except in Dr. Edmondston's garden, sticks and even twigs are scarce, therefore birds are compelled to select such materials as the climate affords for nest-building purposes. Mr. Hewitson has long since recorded the fact of Shetland eagles and crows substituting sea-weed for sticks. The most singular looking nest which has yet come under my notice was that of a hooded crow. The upper part was, as usual, composed of large sea-weed stalks, lined with wool, feathers, hair and moss, but this was placed upon a substantial foundation of the bones of ponies and sheep, collected in such quantity that the mass measured nearly a yard across, and, in one part, a foot in depth; many of the bones were of so large a size that it was difficult to imagine how they had been conveyed by the birds. But the peculiarity did not end here. In my walks along shore I had at various times collected a number of quills of geese and great blackbacked gulls, depositing them for safety in a crevice of a rock; but the hoard having been discovered by the crows, it was unceremoniously appropriated by them, and long afterwards the quills were to be seen sticking like so many skewers around the brim of the nest, crossed and interwoven in a manner well calculated to afford great strength, although they certainly caused a very odd appearance. I know of one other instance in which bones entered into the composition of the nest, but they were only used in very small quantity.

Purple Sandpiper.—Purple sandpipers are still to be met with in considerable numbers, not only upon the rocks by the sea-side, but also in moist spots upon the tops of hills several hundred feet above the level of the sea. They are found in the latter situation chiefly in spring and autumn, probably because at those seasons food is more abundant inland. Returning homewards rather late one evening, across a piece of wet gravelly ground, I heard a low grating noise, and after some little search discovered that it proceeded from a purple sandpiper, which was standing near with its bill partly open, and apparently making great efforts to swallow something. I then shot

the bird, and found in its mouth a small roundish stone, partly covered with a minute vegetable substance, which also grew in great abundance upon every stone beneath the slowly trickling water. A large quantity of the same substance was present in the stomach and œsophagus, and more of it was thickly entangled in the double row of papillæ upon the palate. I afterwards shot two more of the same species, which were similarly engaged. This certainly looks very much as if the papillæ, assisted by those at the base of the tongue, acted together as a kind of rasp. The familiarity of these birds often enables me to approach them within the distance of a few feet, and sometimes in the dusk of the evening I have succeeded in creeping up even closer than usual; at such times I have heard another very peculiar sound, resembling the loud, regular ticking of a watch. At first it seemed likely that it proceeded from the bursting of a succession of air-bubbles as they ascended from the hidden inhabitant of one of the pools of water near at hand, but afterwards, hearing it when the bird was standing upon a piece of dry ground, some distance inland, my opinion was altered. The purple sandpiper is an excellent swimmer. I once saw one upon some stones near the edge of the Loch of Cliff, and upon my approach it flew for several yards, and then quietly alighted in deep water. Upon another occasion I saw one of a small party wade into a deep pool of salt water, and deliberately swim across to the opposite side, a distance of about five feet. Occasionally when sailing close inshore I have come suddenly upon a small flock, several individuals of which were swimming actively about the base of the rock upon which their companions were busily searching for food. I never saw one dive except when it was wounded. Purple sandpipers seldom appear here in anything like a large flock, but are usually found in small parties of perhaps a dozen or thereabouts, either by themselves or in company with other birds of similar habits, such as turnstones, ringed plovers, dunlins or oystercatchers. In fine weather they mostly frequent such rocks as can supply them with small shell-fish. They are less active at high water, when their feeding-places are covered, and at that time they loiter about the rocks, as though waiting for the tide to fall. Their habit of keeping to the seaward side of the rocks often renders it difficult for a person upon the land to discover them. This species shows such little fear of man, that it is usually difficult to alarm them, provokingly so sometimes when one wishes to obtain a shot, and the bird, refusing to rise, stands quietly with its head on one side, as though it were highly amused at such an amount of "clucking" and gesticulation on the part of the

would-be-murderer. As to the question of this species breeding here, I have yet some remarks to make, but must beg to reserve them until the approaching summer affords further opportunities for investigation.

HENRY L. SAXBY.

Baltasound, Shetland, April 30, 1864.

Lepidogaster bimaculatus in an Aquarium.

By W. R. HUGHES, Esq., F.L.S.

THIS beautiful little creature, which is one of the smallest and most interesting of British fishes, offers many important points of attraction both to the zoölogist and the marine naturalist. As a tenant of the tank it is unrivalled, especially to those who give the preference to animals of a roving rather than a sedentary habit, such as the anemones, corals and higher forms of radiate life. Its symmetrical form, its lively colour, its peculiar motion, and the readiness with which it accommodates itself to its new home, specially commend it to the attention of the aquarian naturalist. Our present efficient state of the aquarium is certainly matter for gratulation, when we read the following quaint passage in 'Yarrell.' "Colonel Montagu obtained the Lepidogaster bimaculatus, by deep dredging, at Torcross, adhering to stones and old shells, and kept some specimens alive for a day or two in a glass of sea-water!" Perhaps, as I am quoting from that eminent ichthyologist it may be as well to state that he classes the sucking fishes under the Cyclopteridæ, or third family of the sub-brachial Malacopterygii, assigning as the characteristics of the genus that "the body is smooth, without scales; dorsal and anal fins opposite and near the tail; pectoral fins large, descending to the inferior surface of the body, and, by an extension of the membrane, surrounding an oval disk; ventral fins united by a membrane, which extends circularly under the belly, forming a second concave disk."

The external appearance of the little sucking fish is, as Mr. Gosse remarks, somewhat tadpole-shaped, but a tadpole conveys but a faint idea of the graceful body of my pet. It does not exceed two inches in length; the colour is a delicate pink, slightly speckled; but this is subject to great change, dependent, perhaps, on the passions of the fish; occasionally it may appear yellowish white, while at other times it assumes a rich carnation hue. The specific title owes its origin to

two oval spots of a dark purplish colour on the ventral sides of the fish, and which, at first sight, might lead the observer to imagine that the little fellow had received an injury. No words can describe the singular beauty of its eyes; they are perfectly gemmeous, and appear like living opals set in burnished gold. Every visitor who for the first time sees the little sucking fish is sure to be attracted by these remarkable organs, and viewed through a good lens they are indeed a pretty object. Unquestionably they are the most beautiful feature of this beautiful little animal. They have the remarkable power which some other fishes and a few of the reptiles possess, *viz.*, that of separate vision; one eye, perhaps, looking directly in front, while the other is directed to the tail, or it may be stationary, or rolling round in the most grotesque manner. By and bye the motions may be reversed, or they may act in unison. This may be explained by the fact that the optic nerve simply crosses, without any commissural communication, as is the case with man and the higher animals. The eyes being on opposite sides of the body, each eye only receives impressions of objects situated on its own side; its nerve fibres therefore pass directly across to the opposite side of the brain, without receiving, as it otherwise would, the nerve fibres originating from that side of the opposite eye.

Another curious feature of the genus is the singular power of attaching themselves and firmly adhering to stones and old shells. The inner surface appears usually to be the part selected, and in the neighbourhood of the hinge they lie coiled up safely at anchor at the bottom of the sea. This power of adhesion continues so pertinaciously that they are easily secured by the dredge, through the meshes of which it would otherwise be perfectly possible for them to escape. In the living state they are exceedingly difficult to detach, without danger of injury, from any substance to which they adhere, and after death the power of attachment continues for a short time.

My first personal introduction to the species was in the month of July last, in the study of Mr. Gosse, at Torquay, who had several specimens in a large shallow pan, some three or four inches deep. There were no other animals in this aquarium, and the stones and shells in it were profusely covered with rich confervoid growth. The sight of my friend's pets fired my enthusiasm, and, in company with my brother-in-law, we dredged most industriously, sometimes for a whole day, but without success. In vain did our guide and factotum of the genus "salt" endeavour to appease our anxiety by promising that he would take us to a place "where we could ketch three hundred

o' them 'ere fish." Why he fixed this modestly definite number I cannot presume to say. His promises were as pie-crusts—made to be broken. So at length we changed our *cicerone*, and presently our patience was rewarded, but not until very many heavings of the dredge had been overhauled. Only seven specimens were eventually taken, and these were secured in the vicinity of the Ore Stone, one of the most celebrated dredging grounds in the district. I am therefore disposed to think that, in the neighbourhood of Torbay at least, the little sucking fish is somewhat of a *rara avis*. Of these, although the greatest attention was paid to them in the extempore aquarium—usually a pie dish—which one is compelled to make shift with at a watering place, only five reached the Midland Metropolis, and these were carried the greater part of the journey in my hand in a gallipot, with a bit of muslin for a cover. Occasionally fresh sea water was added, as the motion of the train caused waste, or as the temperature became affected by the heat of a July sun. At home I experienced further losses: two were mercilessly mauled by a voracious "daisy" anemone, and the third died of causes unknown,—at least, the *post mortem* disclosed no more satisfactory evidence than that my pet had expired from the effects of a surfeit. I shrewdly suspect that a kind though injudicious friend over fed it with bread. The remaining two survived partly through the winter. To these I am indebted for the observations recorded in this paper. One was an adult, the other about two-thirds grown.

In a very few days after I brought them home they became perfectly domiciliated. I placed them in a large glass pan, about seven inches high, with a sandy bottom extending to about half the depth, in which were several untenanted bivalve shells—as Cardium and Pecten for instance—some placed with the concave side upwards, some *vice versâ*, and some arranged at an angle on bits of stone, so as to form a sort of cave. They speedily attached themselves to these by means of their suckers, sometimes remaining for days in one shell without leaving it, but they would frequently turn round in the shell, with a smooth, gliding motion, as the sucker passed over its surface. This was particularly noticeable when anyone went to the aquarium in which they were imprisoned; the caudal portion of the body assuming a curved shape, and gently undulating in the most graceful manner, the tail itself frequently moving, and the pectoral fins never seeming at rest.

Mr. Gosse, with his wonderfully accurate observation, beautifully describes this phenomenon at page 110 of the second edition of his 'Aquarium.'

"When put into a vessel of water (no easy matter without injuring it, as it adheres so firmly to its hold), it immediately clings to the side of its new habitation or to the first solid substance with which it comes into contact. Here it will probably remain for a considerable time unmoved, or now and then shift its position a few inches, or take a wayward start, and wriggle along with an awkward sort of agility to some other part of the aquarium, to which it sticks fast in a moment, as before. During the night it is much more restless, but, so far as I am aware, it has no power of hovering in the water, or swimming deliberately to and fro, as other fishes do, its locomotive powers consisting only of the ability to shift from one stationary position to another.

"As it thus has no power of pursuing prey I conjecture that its subsistence is derived from those microscopic organisms which are scattered abundantly through the water, and which furnish support to multitudes of other creatures more strictly immoveable. In the case of these, which are for the most part invertebrate, strongly ciliated surfaces are provided, which produce constant and forcible currents, and thus the floating atoms in the surrounding fluid are carried along to the orifice of the digestive canal. Our little sucking fish has no external apparatus of cilia that I am cognisant of, but a similar effect is produced in another way. I have noticed that while this little fish remains stationary, being fast moored by its breast anchor, it maintains a constant and regular fanning with its filmy pectoral fins. This habit seemed to me at first useless and unaccountable, but, on consideration, I have little doubt that its purpose is to produce a more free and rapid change of the surrounding water, and that it is one of those compensatory actions that we frequently meet with in physiology, and that are so interesting."

It is worthy of notice that each of my pets usually retained his own particular shell, and if he occasionally took a gliding turn round the sides of the aquarium, he generally came back to his old home. But their rambles were of unfrequent occurrence, and their locomotion evidently a matter of labour. The reason of this is patent: the Lepidogaster bimaculatus has no swimming bladder, consequently he swims about, with apparent difficulty, by means of his fins and tail. When tired or disposed to return to his habitation, he ceases all motion, and drops to the bottom by his own specific gravity. I have said that my favourites soon became domiciliated. I think that at the end of a fortnight they knew me so well that they would follow me with their beautiful little eyes to whichever side of the aquarium I happened to stand, and sometimes they would leave their shells and come over

and adhere to the side of the glass, pouting their little mouths even out of the water for a portion of food.

My wife agreed with me in opinion, that for some weeks at least there existed a personal attachment between me and my little friends, for they rarely came up to anyone else. It may be accounted for by the circumstance that I always fed them myself.

They subsequently got tamer, and always rose to the surface, if they happened to be hungry, whenever anyone went to the aquarium. This habit nearly lost them their lives on more than one occasion. A favourite cat of ours was often in the habit, when no one was in the room, of sitting and watching for them to rise to the surface; but I cured her of her propensity for live fishing by summarily dipping her head in the sea-water, to her great disgust, when she attempted to "wash her face," as is the custom with cats.

They were fed once or twice a week with one or two small portions of mussel, oyster or raw fish, about the size of half a pea, and the diet was generally varied. They took their food in the most peculiar snatching manner,—as quickly as the chameleon catches an insect,—darting at it, and, if they missed their mark, returning again and again, until they succeeded.

In the same aquarium were a few specimens of the British corals C. Smithii and B. regia, and it was remarkable that on feeding days, when the corals happened to be first served, on account of my pets being out of sight, their instinct soon taught them to understand that their turn was coming, and they immediately appeared all expectancy, "wagging their tails" for a morsel. I am informed that they are mischievous little fellows if there happen to be Serpulæ or other tube worms in the aquarium, bobbing at their branchiæ with indefatigable perseverance, but they are generally careful to keep out of the way of the Actiniæ.

To any of the readers of the 'Zoologist' who are aquarian naturalists, and who may be fortunate enough to secure specimens of the Lepidogaster, I most certainly recommend that they follow Mr. Gosse's plan, and keep a separate aquarium for them. The rapacious blennies and gobies are of course always on the alert for them, the inquisitive crustaceans are always poking at them, and (if they come in their way) the omnivorous anemones are ever ready to engulph them.

The water of my aquarium was changed sometimes—not of necessity, but because I happened to have some fresh sea-water in stock, and the little fellows appeared to appreciate a change now and then. It

was never syringed, but the surface occasionally agitated by means of a stick, in order to prevent a film of dust accumulating.

At page 181 of his 'Tenby,' Mr. Gosse gives some very interesting particulars respecting the reproduction of the Lepidogaster. He says: "It is the habit of this tiny fish to lay its eggs in the interior of old shells of bivalves that lie on the bottom; and it would appear that it is one of those species which exercise a parental care over their offspring, watching the eggs until the young are hatched. We can scarcely call it incubation; but the little animal coils itself up among its spawn, adhering by the sucking disk of its belly to the interior of the shell, and continuing there with remarkable pertinacity. I have kept my specimen now for seven days, during the whole of which time I do not believe it has left the old cockle shell even for a moment, night or day, though it frequently shifts its position a little, now and then shuffling half round. Yet its quarters seem none of the most comfortable, since it finds room to sit only by coiling its tail on either side by its body.

"The embryos have continued to be matured from day to day. On the first introduction of the nest from the depths of the sea to the light and warmth of a vase in my window, they came out numerously and rapidly, but after the first day the births were much less frequent. Now, however, on the seventh day of captivity, there is again an impulse to the process, and the remaining eggs are hatching fast.

"The eggs are interesting objects beneath a lens. At first it seems as if each contained only two black specks in a globule of pellucid greenish jelly; but, on closer attention, we perceive through the perfectly transparent egg-shell the form of the little embryo fish. It is coiled up in a circle, the centre of which is occupied by the head, and this, which is by far the largest portion of the animal, consists almost entirely of the two staring eyes. As soon as the young escapes, it swims along by a wriggling motion, usually seeking the surface of the water and that side of the glass which is next the light."

Alas! I never had an opportunity of observing the development of the young of the sucking fish, for my two remaining specimens succumbed under the influence of the cold, frosty nights in January. One morning, on going to the aquarium, I found them both rigid and nearly dead, although placed in the warmest room in the house. The temperature of the water was about 36°. I tried removal to a smaller vessel, full of fresh sea-water, in a position nearer to the fire, but this failed to revive them. Vertebrate life, as a rule, cannot sustain the extremes of temperature to the extent that invertebrate life

can, for no other animals in my aquaria died during the winter. Several, however, seemed much pinched with the cold, but the warmth of a sunny day or two soon brought them round again. Once Peachia hastata came out of his burrow, but returned after a few hours.

My friend Mr. Bracey, our house surgeon, and I dissected one of the sucking fishes, and the following are the notes made on the occasion.

The most remarkable part of its anatomy was the sucker. This formed a disk, composed of the union of the pectoral and ventral fins, situated on the under surface of the body near the gills. The disk was composed of two cartilaginous plates, nearly circular in form, placed one in front of the other and a little inclined towards each other. The anterior one was rather the larger, and had connected with its sides a kind of fringe, formed of a similar material, folded into a series of rays. The posterior plate had a smaller fringe, so placed as to form a continuation of the first; thus the edges of the disk were capable of adaptation to any irregular surface, and would remain in contact with it when the plates were elevated, as the disk became concave. This movement of the disk, upon which its action as a sucker depended, was effected by muscles attached to the edges of the plates where they were in contact with one another, and springing from part of the vertebral chain. These muscles were very distinct, and appeared to be largely developed. The two spots on the surface next attracted attention, and here a large deposit of pigment was found in the tegumentary structure. The alimentary organs could not well be made out, owing to the decomposition, but the intestinal canal appeared to be very simple. The mouth was large, and furnished with teeth.

W. R. Hughes.

The General Hospital, Birmingham,
May 16, 1864.

On the Abundance of Spring Wasps.—From various parts of the country I have received accounts of the unusual abundance of wasps this spring. Appended to this information are various opinions: one correspondent congratulates me with the assurance that I shall have no reason to complain of the scarcity of wasps this year; another friend tells me that fruit-growers and others have paid boys a penny, and, in some cases, twopence, a dozen for collecting these spring wasps. On turning back to the seventh volume of this great magazine of zoological facts (Zool. 2614), I find a very excellent communication upon the "Seasonable Abundance or Scarcity of the Common Wasp," by the Rev. W. T. Bree, whose experience on the numbers of spring wasps is summed up in these words:—"An abundant flight of spring wasps is no sure

earnest of a correspondent summer flight, but rather the contrary. I mean that if wasps are abundant in the spring they are scarce in the summer, and, *vice versâ*, if they are scarce in the spring they are abundant in the summer." The communication concludes with a hope that some reader will, if possible, throw a light upon the "above fact." At Zool. 2678 I have endeavoured to account for the circumstances narrated by Mr. Bree. In order to support Mr. Bree's conclusions, wasps should be comparatively scarce during the coming summer and autumn, and such I am inclined to expect will prove to be the case, for reasons which I will proceed to detail. All those who, like myself, take annual holidays in autumn will remember the wet, soaking wet, autumn of last year. I spent a week in Dorsetshire, visiting Pool and Swanage: to say that it rained every day would scarcely convey a correct idea of the weather I experienced; it, in fact, rained every night also, more or less. I was told by the residents that it was the wettest season that had occurred in that part of the country for many years. During the few brief intervals of sunshine that occurred, I rambled over Purbeck Hills, which are strewed over with slabs of the Purbeck stone; under these, when in search of Coleoptera, I found considerable numbers of female wasps; all were in a semi-torpid state, having apparently taken refuge for the purpose of hybernation. The pairing season had been most unpropitious to the Vespidæ, and I am inclined to believe that when this is the case a large majority of the females never copulate with the other sex; and if this be a fact we can readily understand that, in cold, ungenial seasons, the females will retire to their hybernaculi at a much earlier period than in fine warm sunny autumnal weather. Bearing these considerations in mind, I look forward to the coming autumn with a degree of curiosity, anxious to ascertain by facts in how great or less a degree they will accord with results which are anticipated in the above remarks, because I think we may fairly conclude that, if the majority of spring wasps deposit unfertilized eggs, we cannot look forward to the appearance of large swarms of wasps in the autumn.—*Frederick Smith.*

Proceedings of Societies.

Entomological Society.

June 6, 1864.—H. T. Stainton, Esq., V.P., in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—'The Journal of the Royal Agricultural Society of England,' Vol. xxv. Part 1; presented by the Society. 'Verhandlungen der Kaiserlich-Königlichen Zoologisch-botanischen Gesellschaft in Wien,' Band xiii.; by the Society. 'Monographie der Oestriden,' von Friedrich Brauer; by the Author. 'The Transactions of the Entomological Society of New South Wales,' Vol. i. Part 2; by the Society. 'Histoire Naturelle des Araignées (Aranéides)' par Eugène Simon; by the Author. 'Sitzungsberichte der Naturwissenschaftlichen Gesellschaft Isis zu Dresden,' Jahrgang, 1863; by Herr L. W. Schaufuss. 'The Zoologist' for June; by the Editor. 'The Intellectual Observer,' Nos. xxviii. and xxix.; by the Publishers. 'The Journal of the Society of Arts' for May; by the Society. 'The Athenæum' for April and May; by the Editor. 'The Reader' for April; by the Editor. 'The Entomologist's Monthly

Magazine,' No. 1; by the Editors. 'The Entomologist,' Vol. ii. Nos. 1 and 2; by the Editor.

Election of Member.

Edward Revett Sheppard, Esq., of Rutland Lodge, Lee Park, Lee, was ballotted for and elected a Member of the Society.

Exhibitions, &c.

The Secretary exhibited some leaves of the sugar-cane from Mauritius, with numerous specimens upon them of an insect (a species of Coccus) which had lately committed great ravages among the plantations of that colony: they had been sent to him by Mr. James Morris, the representative in this country of the Mauritian Chamber of Agriculture. Mr. Morris (who was present as a visitor) said that the insects had attacked the young leaves as soon as they came out, both in Mauritius and Réunion; they had never been noticed before, and were supposed to have been introduced into the islands from France or Belgium. The sugar-growers were very anxious to hear of some remedy; the employment of children to pick the insects off and destroy them had been suggested, and the use of sulphur, which had been successfully applied for the vine-disease, had also been recommended. They had formerly suffered considerably in Mauritius from the borer insect (*Diatura Sacchari*), and in some quarters the injury was still continued; but at his (Mr. Morris's) suggestion, some of the planters dipped the heads of the canes, before planting, in a weak solution of carbolic acid very much diluted in water, and it was found that the canes grew vigorously and were not attacked by the borer.

Prof. Westwood remarked that the use of sulphur for the vine-disease had certainly produced a most beneficial result; the application of carbolic acid, which had proved successful with the borer, ought to be tried as a preventative of the attacks of the Coccus; the young plants might be washed with the solution, but to get rid of the insects when once they had settled upon the plants he apprehended that a manual application would be required.

Mr. Bates asked whether there was any destroyer of Cocci which could be readily imported. It would be difficult to organize an immigration of Coccophagi (Chalcididæ).

Mr. F. Smith exhibited some singularly elaborate and beautifully coloured drawings of Lepidoptera belonging to Mr. W. S. Atkinson, of Calcutta, and executed by Indian artists; among them were the sexes of Epicopeia Polydora, exhibiting peculiar variation in the form of the hind wings, and the rare Calinaga Buddha, *Moore*.

Mr. F. Smith also exhibited a British female specimen of a Bombus which was unknown to him; it was captured by his son on Deal Sands; the head resembled that of B. hortorum, whilst the rest of the insect was like B. Lapponicus; he had as yet been unable to determine the species.

Mr. F. Smith also exhibited a series of six wasps' nests of most singular construction, belonging to Mr. Stone, of Brighthampton; each was built in a cubical wooden box, and all were of different and fantastic shapes, one being an imitation of a stalactite cave, whilst another not inaptly represented Stonehenge. The whole of the series had been executed by the same colony of Vespa germanica, without a queen, in thirty-eight days of September and October, 1862; No. 1 of the series was completed in two days, No. 2 in four days, No. 3 in seven days, No. 4 in fifteen days, No. 5 in five days,

and No. 6 in five days. He had only that day received the nests, with a letter from Mr. Stone, of which the following was an extract:—"Of these nests I may remark that the extraordinary thing is that one set of wasps should have executed the entire series, and also the very short space of time in which some of the specimens were completed. The fifth and sixth of the series are certainly very extraordinary productions. In the roof of these examples the arrangement of the cones is beautifully shown." Mr. Smith hoped before the next Meeting to obtain information from Mr. Stone as to the means employed to compel or induce the wasps to make these abnormal constructions.

Mr. F. Smith read the following further extract from Mr. Stone's letter:—

"The present season bids fair to be a more favourable one for our favourite Order than any one since the disastrous year 1860. I think I never saw the commoner species of Bombi so plentiful. Wasps, too, are in great force, and they commenced their labours at an earlier period than I ever knew them do before. I took out of a chamber I had formed the year before, and attached to a peg I had then inserted, a small nest of Vespa germanica so early as the 23rd of April last, and up to the present time I have removed from chambers I formed this spring fifteen nests of various species and of various sizes. I have one of V. germanica at work in a window of the house: from this nest I am in daily expectation of seeing young wasps emerge.

"Two years ago I brought home two nests of V. sylvestris, which produced a vast number of young females in the autumn of that year. Last year none of the females of this species were observed here, but this year they abound. This goes to confirm the opinion you have expressed, and in which I agree, that female wasps occasionally remain more than one winter in a torpid state, after leaving the nest in which they were bred."

The Secretary read the following, which had been communicated by a gentleman residing near Chichester:—

"If you have no statistics of the occasional visitations of wasps in unusual numbers, perhaps the following notes may interest the enquirers into such matters. I have been a wasp-destroyer for many years, and to that end have paid for all queen wasps taken in the months of April and May, and destroy all nests found during the year. The queens appear when the gooseberry blooms and the hawthorn hedges begin to be green. In some years large numbers have been obtained, and, if my accounts are at all a true test, there have been very few queens in some seasons, and in others not enough to repay an idle boy for the trouble of collecting them. As the breed of wasps is said to be dependent in some measure on the weather in the previous autumn and winter, I have appended a few weather remarks in connection with the wasp reports.

1836. Previous autumn wet, early spring wet, yet 123 dozens of queens were collected.

1837 and 1838. Scarcely any wasps, only 3 dozens of queens in 1838.

1839. Much wet in the previous autumn, but spring rather dry: 287 dozens of queens.

1840. Much wet in the previous autumn, the spring rather dry: 73 dozens of queens.

1841. Cold and severe January, and about an average quantity of rain in the spring, but queen wasps abounded to a very great extent: 586 dozens of queens collected. No account of nests afterwards.

"No report of wasps taken for some years, but it is supposed that they were scarce here, or the boys would have been anxious to earn their pence.

1852 and 1853. Very wet, consequently against the breed of such insects. No queens paid for.

1854. The four months, July to October, in 1853, very wet, but the spring of 1854 dry. No queens recorded as paid for, but the nests of wasps were very early, very strong and remarkably abundant: nearly 100 nests were destroyed within a few hundred yards of the homestead. The year 1854 was one of the driest on record, and it was also remarkable for the almost total destruction of hops by blight. Were the wasps sent to destroy or stay that evil? They are great enemies to all insect life. In this year I was attracted by the wasps collecting on the stems of some stunted silver-firs where the bark had been rubbed off in former years: on examination I observed that these spots were inhabited by some specimens of the Aphis tribe, large and rather light coloured: they exuded very large drops of their fæces, and this was the attraction to the wasps, who became gorged or drunk with it, so as to prevent them from getting out of the way of the foot which crushed a dozen at once. What species of Aphis was it likely to be?

1855. The spring of this year also very dry, but no wasps are recorded as paid for.

The years 1856 and 1857 were moderate as to rain, and 1858 was a very dry year. In 1857 there were 144 dozens of queens and in 1858 94 dozens paid for.

No record of 1859, but 1860 was a year of wet and gloom: no queens and no nests.

In 1861 no queens collected, and only 21 dozens in 1862.

In 1863 no queens collected and very few nests to be found; there were some very strong nests, but all known ones were destroyed.

Yet now, on the 20th of May, there have been brought in above 250 dozens. Where do they come from after such a season of their scarcity as 1863?

"My house is not very far distant from long tracts of wood, on the edge of the southern slopes of the South Downs."—W. L. W.

Mr. F. Smith enquired what was the object of destroying all the queens? Surely such immense visitations of wasps did not occur without there being some important function which the insects were sent to perform.

Mr. Tegetmeier mentioned a novel instance of intelligence and prevision in the honey-bee. When a tenantless hive with empty combs is left in an accessible situation, it frequently happens that bees will visit it and clear out the refuse, and that a swarm will then take possession of it; but it has not been previously recorded that the bees will secrete wax in a tenantless hive for the purpose of repairing the injured combs and of fastening them more securely to the roof and sides. Being desirous of stocking a moveable frame hive with a swarm that was expected to come off early in May, Mr. Tegetmeier secured an empty comb in each frame and placed the hive alongside the stock from which the swarm was expected to issue. The bees from that stock immediately visited the empty hive, and carried out fragments of loose comb; on raising the hive after it had been thus visited for a few days, he observed newly-secreted scales of wax on the floor-board; and on careful examination he found that a considerable quantity of new white wax had been secreted, and used for the purpose of

securely attaching the combs to the wooden frames. The difference between new and old wax was so great as to preclude the possibility of one being mistaken for the other; and hence Mr. Tegetmeier could only conclude that the bees, with the intention of taking possession of the empty hive, had assembled in it in considerable numbers and clustered together to secrete wax, which they had then employed to strengthen the attachments of the combs, so as to enable them to bear the weight of the honey, bee-bread and brood, with which the cells would be filled shortly after a swarm should take possession of the hive.

Mr. Tegetmeier also said that about two years ago he had brought under the notice of the Society the fact that bees in the perfect state were in the habit of eating pollen or bee-bread, which was previously supposed to be collected solely as food for the larvæ; during the present year he had obtained indubitable proof of the consumption of pollen by the bees themselves, having captured several in the very act of eating it on the alighting-boards or entrances to the hives. Microscopical examination showed that in each instance the stomach was filled with pollen-grains; and Mr. Tegetmeier thought there was no good ground for suspecting that the pollen thus eaten was afterwards disgorged with the honey in the stomach as food for the larvæ.

Mr. M'Lachlan exhibited a case-bearing larva which had been found by Mr. Douglas at Box Hill, apparently feeding on wild thyme. Prof. Westwood was of opinion that it was a larva of the Coleopterous genus Clythra.

Mr. Bates read the following extract from a letter recently received by him from Mr. Roland Trimen, of Cape Town:—

"I have just noticed a very remarkable instance of close imitation of a flower by a spider. Leptoneura Clytus, a handsome Satyrus, is very abundant here just now. Flowers are rather scarce at this season, and a tall straggling plant with yellow composite flowers attracts these butterflies, with many other insects. As I approached a plant upon which were several Clytus, I observed that two specimens did not fly off with the others, and found that each was in the clutches of a bright yellow spider. I removed one of these butterflies, and as the spider shrunk up its limbs on the flower, which it equals in size, it was scarcely distinguishable, so exactly similar was it in colour. But it was after this that it assumed its astonishing likeness to the flower. Recovering from its alarm (I suppose), it slowly moved to the side of the flower, and, holding on to the stalk by its two hindmost pairs of legs, extended the two front pairs upwards and laterally. In this position it was scarcely possible to believe that it was not a flower seen in profile, the rounded abdomen representing the central mass of florets, and the extended legs the ray-florets, while, to complete the illusion, the front femora, appressed to the thorax, have each a longitudinal red stripe which represents the ferruginous stripe on the sepals of the flower! As the other spider also assumed the same attitude when robbed of his butterfly, and as both retained it for a considerable time (I left them so), I conclude that it is their ordinary mode of waiting for their prey. I enclose the flower, and shall be glad to hear its name."

Mr. Bates added that the flower was the Senecio pubigerus of Linnæus, a very common road-side weed in dry ground, &c., about Cape Town, and the spider belonged to the genus Salticus; he considered this case of mimetic resemblance peculiarly valuable, since the purpose or object of the imitation was so plainly manifest.

Major Parry sent for exhibition a male specimen (*var.* minor) of Odontolabis

Stevensii, the left antenna of which was trifid from the third joint, having three distinct clavæ, whilst the right antenna was bifid from the extremity of the basal joint; one of the latter limbs appeared to have been fractured, and in consequence the right antenna did not exhibit two perfect clavæ. Major Parry communicated the following note:—

"I beg to submit to the Meeting a brief account of an extraordinary and interesting case of monstrosity produced in the antennæ of Odontolabis Stevensii, one of the Lucanoid Coleoptera, the right antenna being furcate from the apex of the basal joint, whilst the left one exhibits a bifurcate process, issuing from the third joint, that is to say, the former being abnormal from the basal and the latter from the third joint; the left antenna, moreover, possesses three distinct clavæ, the right one being in this respect in its normal state, exhibiting, however, the partial development of a second one. In regard to the malformation of the right antenna as exhibited in the present instance, an exactly similar case was remarked by M. Buquet in another Coleopterous insect belonging to the Buprestidæ (Julodis Clovei, from Abyssinia), and notified by that gentleman in the Ann. Soc. Ent. Fr., accompanied by a figure (Ser. 2, vol. i. pl. iv. [iii.], fig. 1). It is in vain, I think, to suggest any cause for such an extraordinary freak of nature, and I must therefore content myself with merely recording the fact."

Mr. Stainton exhibited the pupa of Anchinia verrucella, one of the Tineina, which in its angular form, and mode of suspension from its tail and by means of girths round the body, resembled the pupa of a Pieris.

Dr. Alexander Wallace exhibited specimens, sent him by M. Guerin-Meneville, of the silk produced by Bombyx Cynthia fed upon the Ailanthus; the specimens included silk carded from the cocoon, spun silk, woven silk, and a skein of Ailanthine spun from the cocoon in one continuous thread. Dr. Wallace said that he was engaged in a series of experiments with a view to the introduction into this country of the cultivation of the wild silk-worms, from which it was hoped that the deficiency of the supply of the silk of Bombyx Mori might be made up; he had planted a railway-embankment near Colchester with the Ailanthus, which was found to be very hardy, and he had preserved larvæ of B. Cynthia through a temperature of 32° Fahr.

Prof. Westwood expressed a fear that an out-door colony of silk-worms would not succeed in this country so well as M. Guerin-Meneville's; the existence of small birds, which were practically extinct in France, would make a great difference in the result of the experiment.

Mr. Newman remarked, with reference to the alleged deficiency of silk, that there was no dearth of that article, that the English and French markets were overstocked, and that silk which five or six years ago was worth thirty shillings a pound was now not worth more than twenty-two shillings a pound.

Prof. Westwood said that, however that might be, the quantity of silk produced in France was diminished by one-third; and Dr. Wallace added that in many parts of France the mulberry was being destroyed, and the vine planted in its stead.

Prof. Westwood exhibited some extremely minute Acarideous insects, which he had received from Mr. Chapman, of Glasgow, who had observed them in vast numbers infesting the unopened buds of black currant trees, which they entirely destroyed by withering up the embryo blooms. These creatures, almost invisible to the naked eye, were of an elongated oval form, with an oval head and two pairs of short legs porrected in front of the body, the penultimate joint of each emitting a long bristle; the

extremity of the body was obtuse, and also emitted two bristles, and the body itself was marked with very numerous transverse rows of minute dark dots. These creatures were also found dead in vast numbers on the inner surface of the sheathing-leaves of the dried-up buds. On one of the diseased buds were also found several specimens of a full-grown Acarus belonging to the genus Nothrus, and evidently forming a new species distinct from any figured by Koch. The genus, or rather subgenus, Nothrus forms part of the group Oribata, but Prof. Westwood was inclined to believe that the minute creatures were not the young of the Nothrus, but of some species of Tetranychus, some of the species of which are found upon trees, spinning extensive webs, as is the case with T. telarius. The only other recorded instance of a four-legged state of individuals among the Acaridæ occurred in the closely allied form figured by Dugès in the 'Annales des Sciences Naturelles,' 2nd series, vol. ii. pl. II. A, under the name of the "Acarien du galle de Tilleul," found in galls on the leaves of the lime-tree, which, from the structure of its palpi, mandibles and legs, M. Dugès was inclined to refer to the neighbourhood of Tetranychus. In every other recorded immature state of Acaridæ the animals possessed six legs. The question of the introduction of such great numbers of these minute creatures within the closely-packed leaves of the currant buds was difficult of explanation, but Mr. Stainton suggested that the eggs had been introduced into the immature buds in the previous autumn.

Prof. Westwood also exhibited a remarkable new species of butterfly from East India, which, although presenting all the general appearance of a species of the Brazilian genus Brassolis in its robust body and wings and in the coloration of the latter, belongs to the Lycænidæ, having the veins of the fore wings arranged as in Amblypodia Timoleon. The following are its characters:—

Genus Liphyra, *Westw.*

Corpus breve, crassum. Caput mediocre, oculis magnis. Palpi minuti, obliqui, suprà vix visibiles, articulo ultimo ovali, apice acuto. Antennæ rectæ, dimidio apicali sensim clavatæ. Pedes valde abbreviati, crassi, omnes sex æquales, perfecti, tibiis omnibus ecalcaratis; tarsorum unguibus integris, nec bifidis, pseudonychiis conicis, pulvillo subbilobato. Alæ magnæ, obtusæ, ecaudatæ; anticarum vena postcostali 4-ramosa, ramis duobus ante apicem cellulæ discoidalis, alterisque duobus æquidistantibus inter cellulam et apicem, cellula clausa; posticarum margine costali angulato, cellula in angulum acutum terminata.

Liphyra Brassolis, *Westw.*

L. fusca; alis anticis nigris, plaga magna hastata interno-basali, maculaque subquadrata parva discoidali fulvis; alis posticis fulvis, limbo maculisque quatuor parvis disci nigris.

Expans. alar. unc. 3¼.

Habitat Assam (Jenkins), Singapore (Horsley).

In Museo Hopeiano Oxoniæ.

Paper read.

Mr. Francis Walker communicated a paper entitled "Descriptions of undescribed Chalcidites." The whole of the species belonged to the genus Smicra, were discovered by Mr. Bates in the Amazon country, and are now in the collection of the British Museum.—*J. W. D.*

The Crocodile.—Mr. Smith's observation from Herodotus is worth notice,—the smallness of the egg compared with the size of the crocodile. Herodotus also makes another curious observation—and a true one: he says the crocodile is the "only *wild beast* which has no tongue," and therefore, as the saying is, this hideous animal may be called "unique."—*H. W. Newman; Hillside, Cheltenham, February* 27, 1864.

A Five-spined Stickleback in Britain.—Are you aware of the occurrence, in Britain, of a stickleback with five spines? I recently took a hundred and forty of these little fishes for examination, from a trout stream near Warrington. About one-half of them were the three-spined smooth-tailed stickleback, the other half consisting chiefly of the ten-spined S. pungitius, *L.*, with three or four of the four-spined G. spinulosus, and one nondescript species with five spines. In this specimen, which is about 1½ inch long, the spines are long and slender, the second one being the longest; the forehead and the lower jaw apparently form a more obtuse angle than in the allied species G. spinulosus, thus giving the head a truncate appearance. I presented this, with the four-spined ones, to Mr. Cooper, for the Museum, and he placed them in spirits. Is it not strange that the species which Yarrell describes as the commonest (G. trachurus) should not be found about here?—*John Peers; Warrington, May* 9, 1864.

[This information is highly interesting, and it seems a favourable opportunity for expressing my opinion that our British species of Gasterosteus are at present very imperfectly understood. I am only acquainted with three species: (1) G. aculeatus; common everywhere, and embracing Yarrell's G. trachurus, G. semiarmatus and G. leiurus, which I find it impossible to separate; (2) G. lævis of Cuvier = G. pungitius of Yarrell; and, lastly (3), G. spinachia, a very well known marine species, and a great favorite in our aquariums.—*Edward Newman*].

Angel-fish and Pilot-fish at Penzance.—On the 7th inst., in Mount's Bay, I took an angel-fish (or monk; not the angler, sometimes also called angel) nearly four feet long over all, and two feet nine inches across the wings. Whilst lying in the boat the fish extruded naturally twelve young ones, all alive, perfect in shape, and about nine inches long. After it was landed it added nine more to its family, but this time under the influence of the knife. I caught a similar fish about this time last year, from which I took thirteen young ones. On the 8th inst. I had brought to me a pilot-fish of unusually dark colour, the transverse bands almost black, and the ground colour a silvery gray, having a perfectly smooth tongue, and on the vomer a rough, rasp-like bone, but no tooth. In the sacred cause of Science I ate that pilot-fish: I found it something like a dry mackerel. This morning I captured a P. corrugatus, and about ten days ago I took a Galathea strigosa; both of them my second specimens here.—*Thomas Cornish; Penzance, June* 11, 1864.

Pilot-fish and Large Mackerel at Penzance.—A pilot-fish, not so large as the one I noted two or three days ago, has just followed one of our mackerel boats into the harbour here, where it was caught in a bucket. It was very dark in colour, but more blue than the one I had. I have just measured a mackerel having the following dimensions:—Length, from eye to fork, 14¾ inches; length over all, 17¾ inches. Girth, round the shoulder at the origin of the pectorals, 8¼ inches; greatest girth, over the dorsal, precisely where its hinder end touches the back when laid flat, 9¾ inches. Weight, 2 lbs. 4 oz.—*Id.; June* 14, 1864.

Rock-boring Snails; Correspondence between the late Dr. Buckland and the late Mr. William Baker. Communicated by the late Thomas Clark, of Bridgwater.

[It is my mournful duty to record the death of Thomas Clark, whose love of Natural History and zeal for the promotion of the Science were only equalled by his amiable qualities as a man, and the unwearying readiness and kindness with which he communicated his varied knowledge, even to the end of his long and useful life. It will be seen that so lately as the 16th of May he was still pursuing the interesting inquiry which forms the subject of this memoir. He was taken ill shortly after this excursion, and breathed his last on the 29th,—in peace with all men. In Thomas Clark I have lost a true friend: one of that cherished few who know not how to change.—*Edward Newman*].

The notices which have recently appeared in the 'Zoologist' (Zool. 8932 and 9012), of perforations in stone made apparently by some species of snail, have reminded me that this subject had the attention of the late William Baker, of Bridgwater, more than twenty years ago, as well as of the late Professor Buckland and some others. I well remember William Baker telling me of his observing the perforated stone on Cannington Park, an isolated hill of mountain limestone, about four miles north-west of Bridgwater, and his decided opinion that the perforations were the work of the snails. I have been obliged by one of his daughters with his correspondence on the subject, with permission to make use of extracts from the various letters. I have made free use of this permission, and I send with this note the extracts I have made, hoping they may be of sufficient interest to appear in the 'Zoologist.'

The snail to which the perforations are attributed, principally at least, is the common large snail, Helix aspersa of Turton's 'Manual,' or H. hortensis of his 'Conchological Dictionary.' William Baker, in these extracts, has given both these names to the same species; he does not by H. hortensis mean the hortensis of Lister, Montagu and others. From the interesting paper in the 'Zoologist' (Zool. 9012), on the "Boring Snail of the Bois des Roches," by the Rev. Alfred Merle Norman, M.A., it appears that M. Bouchard-Chatereaux, in his treatise on the subject, tells us that the snail in question is Helix hortensis. Is it not probable that by this name he also means the H. aspersa of Turton's 'Manual'? If so, Professor Buckland is no doubt

correct in saying that the snail which perforates the limestone at Tenby is the same as that of the Bois des Roches. It appears that twenty or thirty years ago, before the appearance of Turton's 'Manual,' and when his 'Dictionary' was in much request, the common large snail was called hortensis as frequently at least as aspersa.

William Baker to Prof. Buckland.

Bridgwater, Oct. 6, 1841.

In looking over the report of the proceedings at the Devonport meetings in the 'Athenæum,' I observed your notice of garden snails perforating limestone. I several years ago found numerous perforations in the under sides of naked rock on the upper part of Cannington Park, and many of the perforations were occupied by the common snail (Helix aspersa or hortensis). I have since found similar perforations and their tenants in the jew stone of the lias at Wedmore and other places. I trouble you with a few pieces of the Cannington Park stone, showing marks of very recent operations of the snail, and some of more remote, as evidenced by the covering of lichens on the latter. When I showed some specimens to our dear old friend Mr. Anstice, he was much interested, and we have made use of the discovery to illustrate the borings of the Pholadæ, nearly in the same way that the subject was treated by you and others at Devonport.

Prof. Buckland to William Baker.

Oxford, Oct. 27, 1841.

Pray accept my best thanks for * * * and also for your specimen of snail holes from Cannington Park, and the confirmation your observations afford of the power these animals possess of making holes on the limestone rocks they habitually and for a long series of years frequent. I have as yet only seen these holes on the compact limestone of the mountain and transition formations.

Prof. Buckland to William Baker.

Oxford, April 8, 1842.

Your discoveries of abundant snail-holes is very interesting and confirmative. You will oblige me by a note detailing your observations more at length, which I may read to the Geological Society, where there are still many sceptics, who will not believe it because they have

so long overlooked it. Can you on your visit take a strong wedge or lever and good hammer, and get for the Museum at Oxford and the Geological Society a couple of large demonstrative specimens? Are the holes equally numerous on all sides of the hill, or on what aspect do they more abound? Are the apertures always so much inclined downwards that rain water will never lodge in them? Do they seem to have been made by more than one species of snail, and what species? I found them in Cumberland made by small wood snails.

William Baker to Prof. Buckland.

May 14, 1842.

I have now procured [from Cannington Park] some large and good specimens of the perforated limestone. The most illustrative specimen shows weather-worn indentations and holes distinct from those made by snails. It weighs more than ½ cwt. Shall I reduce it by chipping off the least interesting parts? The effects of the weather are seen on the upper surface and sides of the stones, and the operations of the snails are from the sides and under parts, commencing near the surface of the ground. The holes are unlike those of Pholadæ and the boring Mytilidæ; they are pretty large at the entrances, enlarging and often branching within in very irregular courses and dimensions; their direction is generally upwards, and they sometimes pass quite through to the top of the stone in smaller perforations; several holes sometimes run one into the other, and form capacious chambers, sufficient for the habitation of many snails. The outer parts of the holes are often lined with minute lichens, but within they show more and more freshness towards the further extremities, where there is generally evidence of very recent operation. These perforations are found on all parts of the hill, but more abundantly in blocks partly concealed by small bushes and herbage. They are in blocks which stand out from the turf, and in those which have been buried by earth washed over them by rains. There are none to be found in places which are not now accessible to snails, or which have not been so recently. Almost all the holes contain either living snails or shells. The only species which I have found in them are Helix aspersa and nemoralis. The former are the most abundant; indeed, I believe the perforations are made chiefly by this species. On lifting up some large flat blocks that snails could pass freely under, and which afforded them a snug shelter, I found large accumulations, many hundreds of shells and living snails. The under surface of these blocks had large

and deep indentations, produced by the blended operations of multitudes during many generations.

Prof. Buckland to William Baker.

Oxford, May 29, 1842.

Your last kind and welcome letter arrived as I was starting for London, and demands my best thanks for your successful exertions in the field of Cannington Park, which I shall be tempted to revisit, I hope in your company, the next time I am at Bridgwater. I shall be obliged if you will have the kindness to forward by railroad luggage train to London, on Friday night, the specimens you have kindly collected, * * * addressed to me at Geological Society, Somerset House, London, where I shall be on Wednesday. * * * I want to take the limestones to the meeting of the British Association at Manchester, to continue the discussion of this subject, which began at Plymouth last year, and you will oblige me by allowing me to lay before the meeting your last letter to me upon this subject. With respect to the size of the stones,—the larger they are the better, and I am especially desirous to have the evidences you mention of the different effect of weathering and snail drilling. Also I shall value a slab having its under surface marked with indentations from the complex action of multitudes during many generations.

William Baker to Prof. Buckland.

Bridgwater, May 31, 1842.

I have sent off by this evening's train, addressed as requested in your favour of the 29th, two baskets of specimens; one containing red sandstone, the other perforated limestone from Cannington Park. * * * I did not bring from the hill one of the slabs having extensive indentations on the under surface, but will procure one in two or three days, which shall be forwarded to you at your request. You will see on the large perforated specimen that many of the snail-holes in the upper part have been worn into by the action of the atmosphere.

Prof. Buckland to William Baker.

Oxford, June 10, [1842].

Pray accept my best thanks for your baskets, which arrived last Wednesday at the Geological Society, London. Your snails are capital workmen, and their boring apparatus is the acid that you may

detect in their slime by making a snail travel over paper tinted by lithmus.

Prof. Buckland to William Baker.

Oxford, July 24, [1842].

You will duly appreciate the bearing of the enclosed [letter of John Edward Gray to Professor Buckland, as follows], upon the question of holes corroded by garden snails. Please to return it to me. If you will gather a snail dry from a tree, and set it crawling on paper coloured by lithmus, the purple is instantly turned red; the acid is in small quantity, but that is my case.

John Edward Gray to Prof. Buckland.

Ilfracombe, July 22, 1842.

Dear Buckland,—When you read your paper on the holes in the limestone, I said there was no reason why the holes might not have been made by Mollusca, but that I had never seen holes of the kind so made by them. Since I have been here I have seen several parts of the rock in the sea with very irregular holes, and some of them, as in your case, communicating with each other or pierced through the thickness of the stone. This morning I was so fortunate as to be able to determine that they are made by limpets, Patella vulgata. The larger holes seem to have been made by large specimens, or those that had grown to their full size, and the other cavities which have irregularities in their form are pierced by smaller specimens settling themselves on the holes after they have been left empty. In some holes I found five or six or more young ones, each forming a hole for itself on the surface and the cavities of the larger ones. The limestone here, or certain parts of it, appears to be very much affected by these animals, for it is not uncommon to find a limpet not half an inch long having formed a hole more than its height in depth, and the animal, I should think, could not be more than a few weeks old. I have several specimens, but none small enough to send by post. The holes are not so large as those you found. In some places the rocks are quite honey-combed with them. They are generally across, or on the broad side of the laminæ of the strata, but sometimes they are made on the edge.—Yours, &c., J. E. Gray.

William Baker to Prof. Buckland.

Bridgwater, July 25, 1842.

Accept my best thanks for the sight of Mr. Gray's interesting note [as above] on the action of the Patella on the rocks near Ilfracombe.

The lias is similarly worn by these Mollusca, and I believe by Nerita and Turbo littoreus, on the shore at Blue Anchor and Watchet. I observed a short time ago, in the Botanical Gardens and Victoria Park at Bath, a great quantity of grotesque freestone thrown up in heaps, as artificial rock-work. These stones were very extensively hollowed and perforated, apparently by the weather; besides, they had numerous smaller indentations and holes, like those in the Cannington stone. I afterwards saw an abundance of specimens in the same state on the oolite hills about Bath, loose on the surface or partly buried in the ground.

Prof. Buckland to William Baker.

Oxford, August 1, 1842.

By the enclosed [letter of John Edward Gray as follows], which please to return to me, you will see that the evidence is all right. Did you ever notice how the Pholades make their holes? I believe the P. dactylus works by rasping with the tubercles of its shell.

John Edward Gray to Prof. Buckland.

Ilfracombe, July 29, 1842.

My Dear Buckland,—I went on the beach this morning, and caught a gentleman, *alias* a Patella, making a hole. I put him in the lithmus paper, and the whole surface of the foot appears to be equally acid, and strongly so, for the paper became instantly bright red, as you will see by the specimen enclosed. Roget, who is here, was quite astonished at the instantaneousness of the change. We will try the nature of the acid and its strength. The place where the surface of the paper is corroded is where the foot first touched it.— Yours ever truly, J. E. Gray.

William Baker to Prof. Buckland.

Bridgwater, August 2, 1842.

I return, with many thanks, Mr. Gray's letter and its contents,—the lithmus paper. These have set me at work testing the secretions of other snails than hortensis, and I promise myself the pleasure of writing to you soon on this subject, and on the boring of the Pholades.

William Baker to Prof. Buckland.

Bridgwater, August 5, 1842.

I wrote a note to Mr. Anstice this morning, giving him some account of the late discoveries relative to the excavating power of the garden snail, Patella, &c., and asked him if he did not think that the discovery of the acid in these Mollusca would give us reason to believe that the

Pholades make holes for their habitations in rocks by some solvent fluid, and not by rasping with the tubercles of their shells; and our dear friend's note in reply is so interesting, and shows so much clearness and vigour of mind at this his late period of life, that I think you will be pleased with it; I therefore enclose it with this. I have never had an opportunity of observing how the Pholades make their holes. Have we now any reason to suppose that the tubercles of the Pholas shell are used for rasping, when we find that the smooth-shelled Helix and the Patella can make their habitation in rocks with their solvent acid only? I think we have not. I enclose some lithmus paper acted on by Helix hortensis and nemoralis, which are your aspersa and wood snail, also Limax cinereus. The green stains are produced by the froth or slime of hortensis, procured by irritating the animal with a feather. I am somewhat surprised to find the different secretions.

Robert Anstice to William Baker.

August 5, 1842.

My Dear Mr. Baker,—I never doubted that the animals of most sea shells had the power of dissolving calcareous bodies, by means of some acid which would not act injuriously on their living structure till the powers of life had escaped. Without such a provision how can we account for the powers of many, if not all, of those Testacea in removing the varices and spines, which would otherwise stand in the way of the periodical enlargement of their dwelling; and that the limpet has a like power to make himself a sunken and therefore more fixed dwelling in the rock is, I think, certain. This acid being found also in the land snails goes far to convince me that your opinion concerning their hybernacula-making is correct. Respecting the boring of the Pholades, I recollect it has been the subject of our discussion often, and believe we agreed in opinion that their operations were the effect of the joint action of an acid and the finishing off with their rasp-like shells. The only apparent difficulty in comprehending this to be so, arises from the action of the acid not seeming to act on the shell itself, and that the rock being harder than the shell, that that also should not act injuriously upon it; but I think both these may be solved as difficulties, by considering that the acid may be so applied to the rock as to be withheld from the shell till it became neutralised and inoperative before the animal began its turnings and raspings; and any wearing it must be easy for the animal to repair, endowed as it is with the power of making the shell itself. I would gladly enlarge, but am not up to it to-day. I hope we may yet talk

it over. You will allow for my scrambling writing after what I have said, I well know. When you write Dr. Buckland, have the goodness to mention my most affectionate and respectful remembrances to him. —Believe me, my dear sir, yours most sincerely, ROBERT ANSTICE.

On the 16th of May last I went to Cannington Park, near Bridgwater, with the object of examining the rocks and large stones at the top of the hill, the late William Baker having observed, more than twenty years ago, that many of them were perforated with holes which he believed to be the work of the common large snail, Helix aspersa.

I found that many of the rocks which protrude above the surface of the ground are perforated with holes or scooped with little hollows, both on the flat or more or less inclined upper surfaces and in the sides, but I did not find any in the under surface of such of the large stones as I was able to overturn, though many of them were somewhat hollowed and indented underneath, and had the appearance of being eroded by some means. Under some of these stones there were living snails and many old snail-shells, and there were a few of each in the holes in the protruded rocks. For the greater part they were Helix aspersa, but there were a few of H. hortensis.

William Baker must have found holes different from those which I have been able to find, for he speaks in his correspondence with Professor Buckland of "marks of very recent operations of the snails," and I well remember, from our conversations at the time, that he was strongly of opinion that the perforations are the work of the snails. He also speaks of "weather-worn indentations and holes distinct from those made by snails," and he adds, "The effects of the weather are seen on the upper surface and sides of the stones; and the operations of the snails are from the sides and under parts, commencing near the surface of the ground." William Baker was a naturalist who did not hastily adopt a theory; he carefully examined the facts before he formed an opinion: but were it not for his observations and opinions, my impression, from what I observed this morning, I believe would be that all these perforations are the work of a marine mollusk at the time when the rocks formed the bed or the border of the sea, and that the snails have merely taken possession of them for their homes.

THOMAS CLARK.

Halesleigh, May 13, 1864.

The Boring Snail of the Bois des Roches, &c.—In an article in the 'Zoologist' (Zool. 9012), on the "Boring Snail of the Bois des Roches," the accuracy of statements made by the late Dr. Buckland and by Mr. Jeffreys is called in question. I should be very unwilling to doubt such authorities; and I cannot think that so accurate and painstaking a conchologist as Mr. Jeffreys would publish anything "relying on the statement of [even] Dr. Buckland," without quoting his authority, unless he was himself cognisant of the fact. There seems no doubt about the "boring faculty" of the Helix hortensis: may not the Helix aspersa and other snails possess the same? I remember, when I was a boy, noticing a portion of a garden wall, near Limerick, built of the dark gray limestone so common in that locality, which was a favourite haunt of the H. aspersa. The under surfaces of some of the larger stones, where the mortar had partially fallen out, were every year tenanted by these snails, and exhibited a number of circular depressions, varying from one-fourth to three-fourths of an inch in depth, and from half an inch to an inch or more in diameter. I often took snails from these holes, which were, I believe, formed by these animals. I have frequently regretted since that I did not secure one of these perforated stones. It is a curious fact, that although these snails and limestone walls both abounded in this locality, I never found the perforated stones in any other walls. I may not have looked carefully enough, as I was then but a young conchologist, and cared for little more than making a good collection of shells.—*W. Hill Evans; Bradford, Yorkshire, April* 20, 1864.

Do the Larvæ of the Genus Argynnis Hybernate?—I suppose there is no reason to doubt that the British species of Argynnis oviposit during the summer months, and that they do not, like the Vanessas and others, come forth in early spring for that purpose. Now, in what stage are the insects during the winter? are they ova, or larvæ, or pupæ? No entomologist of my acquaintance has ever found these butterflies in any of these states during the autumn or winter months. Yet one can hardly imagine that the ova, laid in August at the latest, remain unhatched till the ensuing year, when the different species of Viola are sufficiently grown to afford them sustenance. A. Paphia, it is said, feeds also on species of Rubus and Urtica. We know, moreover, that our species of Melitæa do hybernate in the larva state. It is to be regretted that, owing to the Diurni being readily taken on the wing, few entomologists devote any attention to their larvæ. It would be well for those who reside in those spots where A. Adippe and A. Aglaia are most abundant to seek out and publish the histories of their larvæ, of which in this country scarcely anything is known.—*John R. S. Clifford;* 21, *Robert Terrace, Chelsea, June* 14, 1864.

Economy of Sesia tipuliformis.—This insect, which was first, I believe, recognised entomologically from specimens taken in Whitehead's Grove, Chelsea, is still pretty numerous in this locality. The young larvæ enter the smaller twigs of the currant bushes, and proceed downwards towards the stems. I have found no examples of their working a fresh track upward, although they will sometimes pass up and down a mine already formed. When full-grown, which is generally about the middle of May, the larva forms a cocoon of the pith and frass, usually selecting for its resting-place the junction of a branch with the stem, or of a small branch with a larger one. The imago appears in about three weeks. The females fly very little, and the males only during

sunshine, neither sex being found far distant from their food-plant. I once, however, captured one resting upon a window about twenty feet from the ground.—*John R. S. Clifford.*

Cells of Bees and Wasps.—I have been very much interested in this controversy of the bees and wasps, &c., cells, whether they are produced by pressure, or whether they are the natural result of instinct (so called) of the insects themselves. Now I must say, from what I have seen of the architecture of these insects, I must defend the theory brought forward by Mr. Smith,—that it is the result of instinct or rather reason, of which the former is only a modification of the latter. I have enclosed a sketch of a small nest, of, probably, Vespa norvegica in my possession: from the size of the cells in this it will be seen that the angularity extends to the outside, and even to the rudimentary cells, showing at once that it is not the result of pressure, for, taking the outside cells as a criterion, where they still have the hexagonal form without the lateral pressure, it argues very strongly against the pressure theory. In this nest the Nos. 1 and 2 appear to have been the first constructed cells, and they are sharply hexangular as near their whole length as it is possible to make them, and No. 1 slightly projects above the level of the other cells; even here it is as angular as when subject to the so-called pressure. Again, where the cells of these insects are built up of small atoms, and added bit by bit as they are—similar, indeed, to masons building a house with bricks—see how the so-called pressure is exerted. I can understand if a mass of plastic cells be placed side by side, and equal force be applied to the mass, that they would be forced into hexagonal cells; but when cells are built up bit by bit, and seem in an unfinished state, others completed,—and these, all of them, on the same almost invariable hexagon,—I think the argument is strongly in favour of the instinct, reason theory.—*Edward Parfitt; June* 2, 1864.

Rose Scent of Cicindela campestris.—At Pembury, about the latter end of May this year, I caught a large specimen of Cicindela campestris which emitted a very strong scent of roses. The insect was kept for several days alive in a bottle, but the odour did not diminish.—*J. Jenner Weir;* 6, *Haddo Villas, Blackheath, S.E., June* 3, 1864.

Occurrence of the Otter at Kingsbury Reservoir.—On the 20th of May a fine otter was surprised in some long grass near this Reservoir, and was killed by a powerful dog, after a severe struggle. It weighed fourteen pounds, and is now in the hands of a birdstuffer for preservation. An otter has not been seen here for more than fifteen years, and at so short a distance from London may well be considered a rarity.—*J. Edmund Harting; Kingsbury, Middlesex, May* 22, 1864.

[I have learned on the most reliable authority that three other otters have been killed in the same locality. I shall feel much obliged to my readers if they can give any reasonable explanation of the manner in which the otters reach this comparatively isolated water.—*Edward Newman*].

Bonnet of the Whale.—Temminck's 'Fauna Japonica' is the only work in which after diligent search any mention of the whale's bonnet has been found. It is there shown in two figures—lateral and dorsal views—of Balæna australis, the "right" whale of the Pacific, and is represented as a white oval prominence on the upper surface of the nose of the animal. This agrees with the description given of it by the

American whalers, except as regards its colour, which, like the surrounding skin, was black when it was received, exuding oil and covered with whale-lice, fresh from a whaler at the Sandwich Islands. Temminck's description of this curious production is very meagre, and amounts to little more than a statement of its presence on the nose of the particular species of whale. My brother fortunately brought home two specimens of the bonnet, one of them only six inches long, and showing in that early state of development essentially the same characters that mark the larger example. The external appearance of the specimens, especially in the larger one, is that of a clinker, as Mr. Buckland describes it, or perhaps, more strictly speaking, that of a large rough piece of black cork, deeply grooved and channelled, generally in the direction of its long axis, with a rude sort of symmetry, even in these irregularities of its surface. I will forgive Mr. Buckland his joke, although at the expense of the whale's character. I understand that Professor Owen believes this "bonnet" to be only a piece of diseased skin, and says that a similar specimen is in the museum of the Royal College of Surgeons: this specimen, however, cannot be discovered. The bonnet is undoubtedly a portion of the epidermis unusually thickened, and its growth is so far abnormal; but its symmetrical form, and, according to the whalers, the constancy of its presence and position on the animal, point to something more than a state of disease, and incline me to rank it with those unintelligible formations,—the warts on the legs of a horse, or the still more remarkable protuberances on the face of the wart-hog. Three species of whale are hunted in the Pacific, and of these the "right' whale is found the furthest north; the sperm whale has the greatest range southward, and between them is a species known as the "bow-nosed" whale—such is the information given by the Pacific whalers. It must be remembered that the "right" whale of the Pacific—the one on which the bonnet is found—is not the familiar "right" whale of the Greenland seas. I may add that my brother has seen several of these bonnets brought in by the whalers, and some of them three feet in length. Further inquiries are being made about the history of the whale's bonnet, and I hope before long to obtain additional information about the mysterious subject.—*E. W. H. Holdsworth.*—'*Field.*'

The Birds of Walney Island.

By J. Edmund Harting, Esq., F.Z.S.

The island of Walney is situated on the north-west coast of Lancashire, to the west of Low Furness, and is about nine miles long by a mile broad at its greatest breadth. It rises like a wall in the sea, and from this circumstance it appears to have derived its name, being called by the Saxons Waghney, Woney and Walney, or a wall in the water.

Being an island only at high water, when the tide is out, it may be reached on foot from Barrow, from which it is distant about a quarter of a mile. It contains four small hamlets, *viz.* North-end, North Scale,

Bigger and South-end, and some portion of the land in the centre of the island is now under the plough.

Being a great lover of Nature, and a great admirer of the habits of birds, it occurred to me that a visit to this island would be productive of much interest, and, as it proved, I was not mistaken. I accordingly started on the 30th of May, taking with me as little luggage as possible, including, however, a box with some tow for eggs, a "Westley Richards," a good glass by Ross, and a note-book.

Landing at the small hamlet of North Scale, I enquired of the ferryman for a person who knew the island well, and who could point out to me the breeding-places of the various birds inhabiting it. By good luck his brother appeared to be the very man I was in search of, and although at first he declared he could not leave his work, a promise of extra wages, and the insinuation that he would probably find my work much more interesting, finally prevailed with him, and he agreed to accompany me. The first fact that I learned from him was that the blackheaded gull and Sandwich tern ("large sea-swallows," as he termed them) were breeding on private ground, and were strictly preserved. Moreover, that the owner was particularly strict, and that there was but little chance of my obtaining leave to take any of the eggs. This was anything but encouraging; however, I resolved to pursue the safest course, and endeavour, if possible, to obtain permission. Leaving my guide at a little distance with my gun and a basket for eggs, I proceeded to the dwelling of the stern proprietor, and stated the object of my visit to the island. At first I met with a decided objection on his part, but on my stating that I had come all the way from London on purpose to ascertain what birds were breeding here and to collect a few of their eggs, he gradually relented, and said he would accompany me himself, and then we would see what might be done.

Not half a mile from the house we came upon the breeding-ground of the blackheaded gull, and while walking there I had leisure to observe the numerous small birds which we disturbed on our way. The linnet and meadow pipit were common, and the wheatear particularly numerous. I also saw a pair of stonechats, but, with the exception of the rock pipit and cuckoo, to be noticed hereafter, these were the only birds of the order Insessores which I observed.

On reaching the ground occupied by the gulls an extraordinary sight presented itself. It seemed as if all the rabbits, wheatears and blackheaded gulls in the county had congregated at this one particular spot, and continuing in perpetual motion, to one unaccustomed to such

sights, it was almost bewildering. The rabbits seemed almost regardless of our presence; the wheatears merely retired to a little distance, uttering their peculiar "chat, chat;" and here I may remark that I never observed anywhere wheatears either so large or so finely coloured as those on Walney. The blackheaded gulls kept hovering over the spot where their nests were placed, rising and falling like monster snowflakes, till the eye became dazzled by looking at them. The nests were placed on the ground, within a few feet of one another, and for the most part built in tussocks of coarse grass. The material was invariably dry grass only, and every nest contained either eggs or young birds, while in some cases I noticed both. As a rule, the majority of nests contained three eggs each, but many of them had four, and in a few instances I saw three eggs (cracked) and a young bird. Several of the young birds, two or three days old, were running about or hiding in the coarse herbage, while overhead, I may say without exaggeration, hundreds of the parent birds were dashing about on outstretched wings, uttering their wild screams, which were almost deafening. Examining every nest, I proceeded to pick out the handsomest eggs, until I had collected about a score.

We then left the gulls in quiet possession, and proceeded to the eyrie of the Sandwich terns. Long before we reached the spot, we could point to the exact situation of the nests, for the birds were continually hovering above and around them. As we approached they rose perpendicularly to a great height, keeping up a succession of harsh screams, not unlike the sound produced by running a sharp stick across a comb. The nests in structure were very similar to those of the blackheaded gulls, being composed entirely of grass, and placed quite close to each other on the ground, the only difference being that the gulls' nests were placed on somewhat level ground, whereas those of the Sandwich tern were situate on the side of a sand-hill among long thin grass. Standing still for a few minutes I counted seventeen nests, all close to each other, all containing eggs, and the majority having three. They had been robbed once, much to the annoyance of the owner of the land, and he was therefore very loth to allow any more eggs to be taken. As a particular favour, however, I was allowed to select three of the handsomest from different nests, and these I carefully placed in the basket, consoling myself with the thought of the old adage that "half a loaf is better than no bread." The proprietor then left us, after exacting a promise that we would not shoot anywhere in the vicinity of his nests. This I readily agreed to, and we proceeded on our way.

Along the north and west coasts of the island runs a long line of sand-hills, about fifty yards above high-water mark, perforated in many places with rabbit-holes, in some of which, as I learned from my guide, the shieldrake breeds every year. This was interesting intelligence, and I had some hopes of obtaining not only a few of their eggs but also a pair of the birds themselves.

In the centre of the island, upon that portion which is not cultivated, we walked over a beautiful carpet of flowers. The burnet-rose (*Rosa spinosissima*), the crimson cranesbill (*Geranium sanguineum*), and a beautiful little pansy (*Viola tricolor*) were growing close together in profusion, and were all in full bloom, and while the eye was delighted with the colours, white, crimson and blue, a delicious smell came from the flowers of the rose.

Instead of walking abruptly over the sand-hills, I went down on my hands and knees and crept cautiously to the top, regardless of the noisy cry of a pair of oystercatchers that kept flying round me in large circles, and convincing me by their manner that they must have a nest at hand. On peering through the long grass which covered the hill-top, what a pleasing sight met my view! The tide running out, and a score of shieldrakes, male and female, feeding below high-water mark, about four hundred yards distant. They were easily recognized by their bright colours and by their walk, which is more like the firm step of a goose than the waddle of a duck, and appeared to be feeding on the cockles and small shell-fish left by the receding tide. Oh! if I could only crawl within range of them. But the thing is impossible. Long before I could reach them, they would see me, and be off. The only plan, therefore, is for my guide to try and drive them to me. Accordingly he started off, keeping behind the sand-hills, and endeavouring to get to a spot from whence he might run down to the beach and put the birds up between us, in the hope of driving them over me, as I lay concealed in the grass. Two or three times, as a single pair rose from the scattered flock, and came flying inland at a great height, I fancied they were coming towards me; but, as if sensible of a hidden danger, they wheeled again and disappeared round the abrupt sand-hills. Before my guide could reach the spot he intended, the whole flock had risen and disappeared, without having afforded me a single shot. Several times subsequently did I endeavour to get within range of these wary birds, but they were so shy that I found it impossible to reach them even with cartridge. The only other method I knew of to obtain a pair was by trapping, and by this means, I am almost ashamed to add, I subsequently obtained a

very handsome pair. Although we explored several burrows, we were not lucky enough to discover any nests of this species; but I afterwards purchased an egg which had been taken by a boy from a burrow the previous day, and was still unblown.

Crossing the sand-hills at the North-end, and proceeding along the west coast, I began carefully to search the shingle above high-water mark for eggs of the oystercatcher, ringed plover and terns, although as yet I was uncertain what species of the last-named I should find breeding there. The sloping beach was of fine sand, thickly sprinkled over, above high-water mark, with rough gray stones and scattered shells (Cardium rusticum, C. edule and Buccinium undatum), affording by its colour a tempting nesting-place to the waders and terns.

Opposite to North-end and across the water rose the Cumberland mountains, Blackcombe and Coniston ("Coniston Old Man," as the latter is called), the tops covered with snow, although it was the last day of May; while to the left, and the left of that again, we could see the Isle of Man and the Welch mountains.

Two hundred yards off, at the edge of the water, were four oystercatchers, or "Sea-pies," as they are called, and near them a little flock of ringed plovers were feeding. Many times have I tried to stalk these oystercatchers, crawling along the ground for a considerable distance to try and get within range, but without success. They are such wary birds that, unless some boulders of rock or stone intervene as a screen, it is almost impossible to approach them. No one who has not tried it knows the luxury of standing upright, after crawling horizontally along the ground for two or three hundred yards, and I have more than once been glad to lie flat on my back on the sand to rest after this tiring work. A peculiarity which I have remarked with regard to both oystercatchers and ringed plovers when in flocks is this, that whenever I disturbed them, so as to cause them to fly down wind, they invariably turned again before alighting, so as to pitch with their heads to windward, and the reason of this would appear to be that in the event of their alighting when going down wind, if the breeze were strong, they would probably be carried over the edge into the water.

Blackheaded gulls and terns were constantly passing over our heads as we advanced, several of the latter carrying small fish in their bills, and I was delighted to see, besides the common and Sandwich terns, several of the lesser species amongst them: they were easily distinguished when flying in company with other terns by their size and by their cry, which is a single sharp note frequently repeated.

We had not proceeded far along the shore before I almost trod upon

four eggs of the oystercatcher, which were placed in a slight hollow scooped in the sand, and without any appearance of a nest. So closely did the eggs resemble the stones which surrounded them that it was difficult to see them at any distance. While stooping down to pick up the eggs, the note of a curlew attracted my attention, and turning round I was just in time to see one of these birds crossing the water and heading for Cumberland. It would be on the mountain-side no doubt that this bird had its nest, and not upon the sandy isle of Walney, where it would only resort for food, and find plenty of mollusks and sand-eels. A second curlew soon after appeared and followed the direction of the first. These were the only two which I observed.

In a little bay, as it were, of sand, between two sand-hills, and well sheltered from the wind, I found four eggs of the ringed plover. As in the case of the oystercatcher, there was no nest, the eggs being placed, with the small ends together, in a hollow scooped in the sand: this I attributed to situation and want of materials, for I believe it is usual with this species to make a nest of small pebbles. I have found many nests of this bird on the Sussex coast, and observed in every case, without exception, that they were concavely paved with very small pebbles, which, being placed with their flat sides uppermost, looked like little bits of tessellated pavement.

It was only in the case of the gulls and terns that we actually disturbed the birds from their nests. The oystercatchers and ringed plovers we never found near their eggs; they had probably taken the alarm quicker, and gone away before we perceived them.

I looked in vain for turnstones and sanderlings, although I had found the latter a day or two before, in pairs, on the coast at Warton, and shot three of them. No sandpipers of any sort could we find; in fact, Charadrius hiaticula was the only small wader we saw on the island: this bird appeared tolerably common, and we afterwards found several more of their nests; although they had paired they seemed to congregate at feeding time, for we saw several little flocks of them on the sands when the tide was out.

I was very anxious to ascertain whether the lesser tern was breeding on the island. I had seen five or six of the birds, and after a long search I was fortunate enough to find three nests, the first containing four and the second and third three eggs each. These nests—if nests they can be called, being merely slight hollows in the sand—were not placed close together, as in the case of the Sandwich tern, but were at a considerable distance apart. The eggs, which were all very similar,

were of a pale sea-green colour, with small black blotches and spots: after they were blown the delicate green tint faded entirely, and they are now of a pale stone-colour. A peculiarity which I noticed with regard to the breeding of the lesser tern was this: the only eggs which I found of this species were all of them laid on the beach *outside* the sand-hills, in view of the sea, and not in the interior of the island. With the common and arctic terns it was just the reverse; I found about a score of nests of the common tern and four of the arctic tern, and in no instance did I find them *outside* the sand-hills; they were invariably on the *inside*, where it was more sheltered from the wind, and from whence the sea could not be seen.

As far as my experience goes, neither of the two last-mentioned birds make any nest, the eggs being laid on the bare ground, and, owing to the great similarity between the birds and eggs of both species, it requires some care to distinguish them. The arctic tern, however, is slightly larger, and has the tarsus shorter and the tail longer in proportion; the bill is also shorter, and not tipped with black, but red throughout, while the under parts, which in the common tern are pure white, in the arctic tern are pale gray. The eggs of the common tern are generally very round, and are more profusely marked; while those of the arctic tern, as a rule, are more pointed at the smaller end, of a lighter ground-colour and have fewer markings. As I have stated, I found four nests of the last named tern, and in three instances bagged one of the old birds, thus making certain of the species. The common tern on the coast of Lancashire is called "sparling," and when I first heard my guide exclaim, "Here are some sparling's eggs," I was fairly puzzled to know what eggs they could be. I have since found mention of a bird, in Dr. Leigh's 'Natural History of Lancashire,' called the "sparling fisher," but the description given of it is so vague that I cannot guess what bird it may be. The author says, "It is about the bigness of a duck, and by a wonderful activity in diving catches its prey, and yields a very pleasant diversion when pursued by water-dogs."

The terns are very pugnacious in attacking other birds that approach their nests. I saw a lesser tern actually attack a herring gull, following it for a long way, and every now and then making a swoop and endeavouring to strike it with its bill. The gull, like a great coward, made no attempt at resistance, but only tried to avoid its attacks by flight, now and then uttering a short angry bark. I also saw a crow pursued by a common tern, and very much harassed he seemed to be, and glad to make his escape.

I have mentioned the herring gull, but although I saw a pair of these birds on the island, this species does not breed there, the blackheaded gull being the only gull to be found breeding. I discovered another nesting-place of the last-named species, apart from that which is preserved, and collected a few more varieties of the eggs, while the man I had with me took between thirty and forty of the common type to carry home for consumption, considering them much superior to hen's eggs. The variety which exists in eggs of the blackheaded gull is very curious, and perhaps there are no other eggs which differ so much, except those of the common guillemot. I may mention a few of the most marked varieties which I have taken. Common type, olive-brown, with dark spots and blotches. *Var.* 1. Green, with dark spots or blotches. *Var.* 2. Light gray, with olive blotches. *Var.* 3. Pale sea-green, with a zone of spots at larger end. *Var.* 4. Pale bluish white, with scarcely any markings at all.

The blackheaded gull, as well as some of the terns, used formerly to breed at the south end of the island, but they were so frequently disturbed by having their nests robbed, that they forsook that part entirely, and my guide assured me it would now be useless to explore there. Accordingly we continued our walk along the west coast, now inside the sand-hills, now on the outside, according as we were attracted by the note or sight of some bird we were in quest of. Crossing the foot of a sand-hill where the long grass was growing rather more thickly, a rock pipit rose within a few yards of us, and after a little search we found the nest, containing four eggs, which I took. I subsequently found that they contained young birds, and in consequence had some trouble to blow them: they were of the usual size and colour, scarcely differing from some that I had taken the previous May on the Fern Islands. While stooping to pack them up a tern came towards me, flying at no great height, and as it approached, I felt certain, from the beautiful pink tint of the under parts, that it was a roseate tern. I seized my gun and stood up, but, quick as thought, the bird, seeing my movement, rose perpendicularly in the air. As it hovered for an instant, I pulled the left barrel, which held a cartridge, and thought the bird would fall: it dropped its head, shook it, and seemed to stagger a little, but recovering itself flew on, and was crossing the water, when suddenly I saw it tumble headlong into the sea. To reach it was impossible, as the waves were carrying it away, and so I could only walk on in the hope that I might see another and be more successful. But although I subsequently saw and shot at three more birds, which I believe were roseate terns, I did not kill

any of them. I had read that this species was to be found on Foulney Island, nearly two miles distant from the south-eastern extremity of Walney, and therefore I thought it not impossible that a few pairs might be found on Walney, and perhaps breeding there. Never having taken a nest of the roseate tern myself, and only knowing the egg from specimens in the collections of different friends, and a single egg in my own collection from the Fern Isles, I was uncertain in what situation to look for the nest, and moreover was ignorant whether the roseate made a nest like the Sandwich tern, or simply laid the eggs on the bare ground, like the common and arctic terns. However, not far from the spot where I had seen, as I believe, three roseate terns, I found a nest, evidently that of a tern, from the eggs, but so different from any that I had hitherto found, that I exclaimed at once, "This must be a roseate tern's."

The Sandwich tern, as I have before observed, makes a nest of dry grass; the common and arctic terns lay in a hollow on the sand (in no instance did I find any deviation from this); but the nest in question was composed of sticks, little pieces of drift-wood and dry straws, and contained two eggs, which, as regards shape and colour, certainly resembled the eggs which I have seen of the roseate tern. No bird was near the nest, and therefore, failing to identify the eggs by this means, I am anxious to ascertain, *first*, whether the common and arctic terns *invariably* lay on the ground *without* any nest, and, *secondly*, whether the roseate tern makes a nest such as I have described. I shall be obliged by the experience of any other correspondent. In the event of these two queries being answered in the affirmative, and having seen roseate terns on the island, I think I may safely conclude that the nest belonged to a pair of these birds.

To mention all the eggs I took would in many cases be a repetition. Suffice it to say that as we proceeded we continued to find eggs of the oystercatcher, ringed plover and common tern; and I may observe that in one instance only did I find any deviation from the rule that these three species lay in the hollow of the bare ground: this was in the case of an oystercatcher, where I found a very pretty nest formed of shells, most of them broken, and evidently collected from a distance, as there were no other shells anywhere near the nest.

On the cultivated portions of the island I noticed several peewits, but found no eggs. Indeed I did not care to lose time by searching for them, as I find plenty every year at home.

I was rather surprised to hear a cuckoo on the sand-hills: I suppose it had flown there to drop an egg in the nest of a meadow or rock

pipit, both of which birds are common there, particularly the former. A few days before I had seen a pair of cuckoos on the coast at Lytham, and they also were on the sand-hills. On seeing one of them alight upon the ground, I at once mistook it for a sparrowhawk; and I can only account for the cuckoo being found in a situation so unusual and so unproductive of its ordinary food by supposing that it had flown there merely for the purpose of laying.

My guide informed me that landrails were frequently met with on the island, but we did not see or hear any. I also learned that dunlins, knots and turnstones were very common there in winter, but not seen at any other time of the year.

Preceeding along the west coast, before reaching South-end we turned to the left, crossed the interior of the island and followed the line of east coast until reaching North Scale, from whence we had started. Here I recrossed to the mainland, but this time on foot. The tide being out, and the water at most only knee-deep upon firm sand, I preferred to wade rather than wait till the water was deep enough to launch a boat. So, leaving my guide at his cottage at North Scale, I returned, laden with my treasures, to Barrow, after one of the most interesting rambles I have ever made.

J. Edmund Harting.

List of, and Remarks on, some of the Birds observed during a Year's Residence on the North-East Coast of Scotland, 1858-59. By Captain Henry Hadfield.

Gannet.—On entering the Clyde, the 13th of June, 1858, on my return from North America, I passed the Ailsa Rock, one of the most celebrated breeding-stations of the gannet, but at too late an hour to observe the birds. A few only had been seen during the day, but it being the season of incubation they may not wander far from the coast.

Brownheaded Gull.—June 17. In coming up the Caledonian Canal, the steamer was closely followed by a numerous flock of these interesting birds, seemingly conscious of being a privileged class, as they occasionally, in the most fearless manner, alighted within a few yards of the stern, narrowly inspecting the broken water: their power of vision is almost incredible, for on throwing overboard some small fragments of bread they were instantly descried amid the foam and

pounced on, and that too with unerring aim. I then tried them with minute particles of bread, the merest crumbs, but they were secured with equal facility, where no human eye could have seen an object ten times the size.

Swift.—June 18. Observed swifts hawking over the town of Elgin till a very late hour, and it was 10 P. M. ere they had all retired to their roosting quarters in the ruined tower of its ancient cathedral.

Dunlin Sandpiper.—June 18. Found the nest of this common species on the banks of the Lossie. The ground had been slightly hollowed and lined with coarse grass; and the nest, which was but a foot or two above the bed of the river, imperfectly concealed by a stunted furze-bush. The four large eggs, pointing inwards and inclining downwards, well nigh filled the nest; on one being broken by my dog it was found to contain a chick in an advanced stage. The birds hovered about, occasionally coming within a few yards of me, and one of them perched on a railing, but for a few seconds only, emitting a plaintive cry.

Blackbird.—June 21. The song of one was heard at 10 P. M.

Willow Wren.—June 24. A young bird was observed.

Nightjar. — June 26. When walking through a wood in the vicinity of Elgin, a nightjar suddenly appeared on the path before us, tumbling about in the most extraordinary manner, and flapping the ground with its wings. As we advanced it gradually retired, half running, half flying, and though pursued by my sons with their spaniel for some distance, did not quit the path, but kept fluttering on in front of them in the most tantalizing way, occasionally taking a summersault, till it had drawn them away from the nest, which doubtless was concealed among the fern by the road-side; it then disappeared.

Tawny Owl.—June 26. An owl of this species, I believe, was found sitting on the branch of an oak: my attention was directed to it by the alarm-note of some chaffinches.

Creeper.—June 26. Saw a few birds of this species.

Redstart.—June 26. Observed an old bird with three or four young ones, which it was endeavouring to keep out of harm's way.

Whinchat.—June 28. Found a nest with six young birds, but one had been crushed to death. The nest was placed in the forked branch of a furze-bush, but so low as to be concealed by the long grass: it is composed of coarse grass, and has a lining of wool and hair. Two young whinchats, subsequently taken, captured flies readily enough; they survived only a few hours.

Sand Martin.—June. This species is very abundant, breeding in the pits and banks of this sabulous district.

Turtle Dove.—July. Two were observed on the wing.

Wood Pigeon.—July. Very numerous.

Pied Wagtail.—July 13. A young male, nearly full grown, was shot.

Lapwing.—July. Towards the middle of the month a young female lapwing of nearly adult size was shot.

Wheatear.—July. Occasionally observed.

Whitethroat.—July 1. A pair of whitethroats, accompanied by their young, were seen to-day.

Rock Dove.—July 29. Inspected the Cowee Caves, in the cliffs of the Moray Firth, about seven miles from Elgin. Looked into several without finding the pigeon, but at last had the satisfaction of seeing a pair dart out of one of the largest caves, the sandy floor of which was impressed with innumerable foot-marks, and strewn with their feathers and a few egg-shells. But few holes or shelving rocks where their nests could be placed were observed, so doubtless they build in the clefts of the cliffs higher up. Though I got more than one shot I failed in procuring a specimen. No one who has not tried it can conceive the difficulty there is in shooting them, there being frequently two or more openings to the caves, so that one cannot foresee through which they may chance to escape. Their exit, too, is often as sudden as unexpected; so that they may pass within a few feet of one's head without being seen, and rising abruptly disappear over the edge of the cliffs, which are here of no great elevation. Their appearance, too, is as sudden as their departure; a whirring sound is heard, but they have reached the sheltering cave unobserved. Amid these chaotic and gigantic rocks they appear so dwarfed in size that one can hardly recognise them. After reascending the cliffs a small flock was observed, in which there were a few of varied plumage, evidently of mixed breed. On revisiting the caves on another occasion a wounded pigeon escaped by concealing itself among the rocks, but was found two days after on the sea-shore: it being unable to fly, I was greatly astonished to find the crop full of charlock-seed, and could only account for it by supposing that it had been sought for and fed by its partner: it was an old bird.

Ringed Plover.—July 31. Found a large flock on the sands near Lossiemouth, but I only managed to kill a couple, both birds of the season. They have the base of the lower mandible slightly tinged with orange, but there is little appearance of a black band on the forehead.

Sanderling.—August 17. Shot a bird of this species. On the 28th three more were procured.

Wild Duck.—July. On visiting the ruined Castle at Loch Spynie, young ducks were to be seen skulking and hiding among the long grass. Some caught for inspection were nearly full grown, and on being released flew into the loch. Later in the year a drake was shot on the coast, measuring 37½ inches in extent of wings.

Golden Plover.—October 22. Found a large flock on the sea-shore; secured four. When the hills are covered with snow vast numbers of plovers are to be seen on the sands at low water probing for worms. I found them unsuspicious at first, but after being fired at they could only be approached under cover of the grass-covered sand-hillocks.

Turnstone.—October 25. Shot a bird of this species, the only one observed.

Shore Pipit.—November 6. Shot one of these pipits, which appears scarce on this coast.

Purple Sandpiper.—November 11. Found a flock of about thirty sitting in the hollow of a rock on the sea-shore. Allowing a near approach, three of their number were readily killed.

Oystercatcher.—November 13. Shot one of these common birds.

Rook.—November 14. Seeing a number of rooks flying in and out of a plantation of Scotch fir, I was induced to watch them closely: I then perceived that on emerging from the wood they held something in their beaks, but what it might be I could not even conjecture, so I endeavoured by a close inspection to find out, but the thickness of the foliage prevented my doing so; however, I observed that as soon as they had secured the object of their search they alighted with it on an open space, and immediately commenced striking and tearing it with their bills: this operation over, and it was not prolonged above a minute or two, they forthwith returned to the wood for a fresh supply. As I had, after a diligent search, failed in finding out on what they were feeding, it occurred to me that possibly the fir-apples strewn over the ground might have been brought there by the rooks, so a few were picked up and examined; they were in different stages of decay, and in some a white grub or maggot was found, on which they were doubtless feeding.

Common Bunting.—November 29. A bird of this species was observed, the first I had noticed.

Brownheaded Gull.— November. This and other gulls are to be seen daily in vast numbers frequenting the newly-ploughed lands, hovering over the plough, regardless of the reiterated cries of the

ploughman, and settling down in the furrows to pick up the worms and grubs: on reaching the end they momentarily disperse before resuming their search. The lapwings, though more numerous, are constantly chased by the gulls, but their irregular, jerking, tumbling flight secures them from prolonged pursuit.

Redbreasted Merganser.—December. Shot one on the Frith.

Garganey Teal.—December 14. Found a small flock of garganeys a mile or so from the harbour: they allowed us to row within fifty or sixty yards of them without taking wing, so I felt confident of securing some. Taking deliberate aim at a splendid old male I fired, but ere the shot reached him they all dived, rising again at a considerable distance, and flying out to sea. Though I endeavoured to get a second shot I did not succeed. On an isolated rock, some distance out at sea, I saw an innumerable flock of sandpipers reposing about mid-day.

Black Scoter.—December. Small flocks were frequently seen feeding near the surf, but generally out of gun-shot.

Longtailed Duck.—January 5, 1859. On rowing a mile up the Frith, I fell in with a few of these elegant ducks, but their flight is peculiar, the tail being so depressed. I found them shy and difficult of approach, though feeding just outside the breakers. On being fired at they took a long flight, and I was struck with their peculiar but melodious note, so like to what one imagines the Æolian harp to be: I could hardly divest myself of the idea of its being the sound of music borne on the breeze.

Cormorants.—January. Many birds of this common species are to be seen. When disturbed or shot at, they retreat to the Beacon Rock, where they are unapproachable. A numerous colony has been established—probably for ages, the rocks being greatly stained and blanched—on the ledges of the lofty and precipitous cliffs to the westward of the caves. The cormorants may here be seen by scores standing in rows, in their usual stiff sedate manner, but when alarmed stretching out their necks in an awkward way to peer at the intruder beneath, before dropping off and flying out to sea. If a specimen be required, the surest way of obtaining it is by making a *détour*, and appearing suddenly on the edge of the cliff. However, on their return of an evening, full fed, they are not so vigilant, or they cannot discern an object directly opposed to them. This is observable in some animals—the hare, for instance: one that I started ran towards a man ploughing a field, nor did it deviate from the direct course till it must have heard the trampling of the horses; it then bounded off at a right angle.

Gannet.—Have occasionally observed them fishing in the Frith, but at a considerable distance from the shore. They descend on their prey with amazing velocity, sending the spray many feet into the air: they often turn sharp round before taking the plunge; in doing this the body is distorted, but their general movements are light and buoyant.

Song Thrush.—January 13. Heard the song of a thrush, but the notes were not prolonged.

Redwing.—January 13. Saw a bird of this species.

Cole Tit.—January 13. Several were observed.

Goldencrested Regulus.—January 13. A few were seen.

Missel Thrush.—January 13. Observed a pair in the garden cowering on the ground at the foot of a tree to shelter themselves from the tempest. Unlike a "storm cock" this!

Black Guillemot.—January 15. Shot a bird of this species on the Frith.

Razorbilled Auk.—January. Frequently observed.

Snow Bunting.—January 22. First observed the snow bunting near Burghead on a barren and uncultivated tract of land, thickly dotted with furze, and skirted towards the beach by sand-hillocks covered with sea-grass (*Zostera marina*). They were in small straggling flocks, but easy of approach, and when fired at would often realight at no great distance, so I had no difficulty in procuring specimens; one, a splendid old male, so white as to have been quite remarkable. A dark grub was found in the gullet of one, and a few grains of corn and pieces of quartz in the stomach. On other occasions flocks were seen feeding on the shore, running among the sea-weed, but keeping close to the sand-mounds, which they occasionally traversed, though seldom diverging from the coast line.

Sky Lark.—February 20. First heard the song of the sky lark: the day was bright, and the thermometer had risen to 50°.

Rooks.—February 27. Though there was not one to be seen among the lofty trees of the rookery at Gordonstone, I observed hundreds in a field of newly-sprouted corn, so busily engaged, too, that my approach was seemingly unnoticed. I now remarked that they walked and fed in pairs, and could distinguish the sexes; besides when flushed they generally rose and flew in pairs, alighting in the same order. I disturbed them again and again, but always with the same result, except here and there a straggler. March 6. Found the rooks very clamorous, so that they were heard long before they were seen. The cawing proceeded from a grove of Scotch firs with bare and

massive trunks, but crowned with a profusion of lateral branches, on which the nests are placed. My arrival was no sooner announced than there was a general rising of the whole colony, with a deafening clamour; but ere long they were dropping singly or in pairs among the branches, in their usual awkward manner, but none did I observe on the nests, though one was seen carrying sticks. All seemed bustle and confusion, without any perceptible result, though they may have been choosing a new site or asserting their claim to an old one: I saw but one fight, and that not *à l'outrance*. On the 10th of March I had another look at the rookery; some of the nests were well nigh completed, but I saw no rooks on them during the half-hour that I remained on the spot, though they continued flying round and about the trees. One with building materials, on seeing me, alighted in a ploughed field.

Yellow Bunting.—February 27. A bird of this species was observed to have commenced building.

Wigeon.—March 4. Some were observed on Loch Spynie.

Teal.—March 4. A few teal were observed on the Loch.

Egyptian Goose.—March 4. Some very large water-fowl were seen; their black and white plumage led me to believe they belong to this species.

Curlew.—March. Several were seen about the Loch.

Heron.—March. A large heron was observed standing knee-deep in the water of the Loch, perfectly motionless, with rigidly outstretched neck and head, intently watching its finny prey; but its patience must have been sorely tried, for during the half-hour or so that I watched it through a glass it neither struck at fish or frog, and moved its head but once as if about to dart, but the motion was so slight and sudden as to be hardly perceptible. But for the glass the heron might have been mistaken for a stranded log, so inanimate did it appear. The fish doubtless are deceived too.

Gray Plover.—March 8. A few were observed, also lapwings; but the latter have been seen, though in no great numbers, throughout the winter.

Wood Pigeon.—March 10. Observed a flock, numbering some hundreds, rise from a turnip-field.

Blackthroated Diver.—March 17. An immature bird of this species, shot at Speymouth, was brought to me for sale, but being much injured it was not purchased.

Bernacle Goose.—March 28. A handsome old bird, but slightly wounded, was shown me.

Wren.—March 29. One was observed, with its beak crammed with dry grass.

Wheatear.—April 6. Saw two wheatears.

Greenfinch.—April 17. Still gregarious. The weather has been cold of late, but to-day the thermometer has risen to 44°.

Reed Bunting.—April. When walking from Elgin to visit the ruins of Pluscarden Abbey, numbers of these birds were observed among the alders on the banks of a rivulet flowing through this beautiful valley. They were constantly flitting on before me till by degrees a considerable flock had collected.

Thrush.—April 21. Found a thrush's nest placed against the garden-wall, resting on the trellis and supported by a branch of a fruit-tree, but it being leafless the nest was quite exposed. My every motion was watched, but the bird did not leave its nest, probably fearing to expose the eggs, the weather being still unseasonably cold: thermometer yesterday at noon 38°.

Chiffchaff.—May 1. Observed first chiffchaff.

Yellow Wood Wren.—May 5. First observed this species. By the middle of the month several nests were found on a warm bank in the garden. One, containing its full complement of eggs, was placed under a small furze-bush; the rest among the long withered grass beneath trees, where they might have been trodden under foot. I was surprised at finding so many of their nests, and that, too, so soon after their arrival. It would appear that both this and the preceding species build more freely here than in the south. I have observed but few in the Isle of Wight during the breeding season, nor do I remember finding their nests in the under-cliff.

Swallow.—May 7. Saw two swallows. This species is not so common as in the south, and the martin is still less numerous.

Swift.—May 9. First observed the swift. A few days later found them constructing their nests in the fissures of the rock in a disused quarry. The swift abounds in this locality, more so than in any part of England with which I am acquainted.

Heron.—May 21. Went over to Forres, and from thence walked up the left bank of the Findhorn, till an elevated ridge was reached, opposite to and commanding the far-famed heronry, in a clump of dwarfish oaks on the right margin, which is but slightly raised above the level of the river, that here takes a sudden bend. On approaching the edge of the cliff or precipice, which is some hundred feet high, we were observed, and the herons rising simultaneously dispersed, leaving their young, apparently full grown, standing erect

and motionless, some in the nests, others perched on the sides: all had a rigid and lifeless appearance. The leafless trees, too, with their gnarled, weather-beaten and withered lichen-covered branches, have a stiff coral-like appearance, and the large flattened nests a blanched and petrified look. A colony of jackdaws have taken possession of the opposite cliffs, the narrow stream only separating them from the herons. What the latter may think of the incessant clamorous cawing it is impossible to say, but their noisy chatter may be heard with about as much pleasure as a grave man listens to that of an intrusive vulgar neighbour. There are in a few of the trees three or four nests, some so low down as to be well nigh within reach. The heronry might not only be approached with facility from the left bank, by fording the stream, but is also accessible on the right, though covered and concealed by a wood of larch and other trees, where there is a rookery, the inmates of which would doubtless give the herons timely warning should an inroad be attempted from that quarter. I observed but one bird standing in the water, though at this season fish must be abundant. The sea-shore, their usual resort, is but a few miles distant. Both sides of the river are well wooded, larch and beech being the common trees; but some parts are bare, and the stream confined by shelving rocky cliffs. From the bold prominent point referred to, a magnificent view of the river is obtained, both above and below the heronry, and is in itself a sufficient attraction. The clear, crystal-like stream, owing to the continued drought, is now, apparently, little more than knee-deep, and, where the receding margins permit the greater expansion of the water, it is seemingly barely sufficient for the free passage of the larger salmon, which might readily be seen in their upward course.

Tern.—May. Numbers of these elegant birds are to be seen daily at the mouth of the Lossie, feeding and fishing as the tide ebbs, standing knee-deep in water, with outstretched and upraised wings.

Water Ouzel.—June 1. Procured a bird of this species: it is $7\frac{1}{4}$ inches in length, and $10\frac{3}{4}$ inches in extent of wings. Though well nigh a year old it has not attained its perfect adult plumage. It is not commonly met with on the larger rivers: I twice sought for it on the Spey, once twenty miles up the river, but did not fall in with it; neither did I find it on the Findhorn, and only once on the Lossie, near the village of Birnie, about three miles from Elgin; but I was informed by a miller that he had not observed their nests there of late

years. Higher up the stream the dipper is said to be more abundant. The one referred to was flying up the stream, following regularly each bend in the river, never cutting off an angle. Having alighted on a stone a little above the level of the water, I approached it under cover of the furze-bushes, and, at the distance of about thirty yards, remarked that the body was in constant motion, not a mere flirting up of the tail, but a regular and graceful movement. Its flight is low and direct, like that of the kingfisher, but not so rapid.

Hooded Crow.—This species seems to be common.

Herring Gull.—Very abundant, and during the herring season a constant attendant on the shoals.

Coot.—Frequently observed on Loch Spynie.

Moor Hen.—A very common bird.

Robin.—Rarely met with: not one did I observe in the garden during my residence in the north.

House Sparrow.—Far less numerous than in the south, but quite as familiar. For instance, one day in spring on entering the house I found a sparrow with her brood in the hall: she was very emaciated, and her plumage worn and ragged. There can be little food for them early in the season in these northern villages. I noticed during the winter a dwarfish sparrow, fully a third less in size than those with which it was associated.

Magpie.—But once or twice seen, but there is little suitable cover near the coast.

Osprey.—When strolling on the sea-cliffs a large hawk was observed, probably the osprey. With buoyant flight it was ascending and descending in circular sweeps, but not having a glass I could not well distinguish the colours of the plumage, but brown seemed the predominant colour. During my stay in the north I saw but few hawks and no eagles.

Chaffinch.—A very numerous species, almost as much so as the greenfinch, and equally familiar, allowing one to walk beneath the fruit trees on which they are perched. On the 21st of April I observed a large flock of the latter feeding among the pear trees, but whether on buds or insects I did not discover. Nowhere have I found the two species so abundant as in the North of Scotland.

The goldfinch, so common a bird in the south, was not met with, though its food is plentiful enough. I have observed that most species of birds are tamer, or easier of approach, than with us, owing doubtless to their being less sought after or molested. The small

birds may be considered "poor fowl," and not worth the powder and shot, as a Manx man observed of snipes.

HENRY HADFIELD.

On the Nest and Eggs of the Coach-whip Bird and of the White-fronted Epthianura, with some General Remarks on the Nidification of Australian Birds. By A. DOBRÉE, Esq.*

As neither Mr. Gould's work on Australian Ornithology nor such others as I have been able to consult contain any particulars of the nidification of the two above-mentioned species, I am led to the conclusion that, although probably casually discovered, no description has as yet been published, and beg therefore to communicate the following notes, from personal observation.

1. PSOPHODES CREPITANS, Gould. *Coach-whip Bird.*

This bird is well known to most Australian colonists, though, probably, far more frequently by the peculiar note whence it derives its current name than by its appearance, as it generally keeps itself concealed amidst thickets and brushes. To naturalists this species is extremely interesting, as its singular characteristics have long rendered it a matter of doubt what precise place to assign to it in the ranks of Australian birds. The details of its nidification may lead to the further elucidation of this point.

It will not be out of place first to quote a few of Mr. Gould's very accurate remarks on the habits of this bird. He says, "It is only to be found in dense brushes, and is a shy and recluse species; for, although its full notes—ending sharply like the crack of a whip—indicate its presence, it rarely exposes itself to view, but generally keeps in the midst of the densest foliage and amongst the thickest climbing plants, frequenting alike those that have intertwined themselves with the branches of the tallest shrubs and those that form almost impenetrable masses near the ground, and through which it threads its way with the utmost ease. It is extremely animated and sprightly in all its actions. Of its nidification, I regret to say, I know nothing, although I paid great attention to the subject myself, and offered rewards for its nest and eggs, and for any information respecting them."

* Read before the Royal Society of Victoria, August 27, 1860, and obligingly communicated by N. F. Dobrée, Esq.

The present nest and eggs were obtained by me near the banks of the Yarra Yarra, near Heidelberg, on one of those points of land, or "bends" of the river, still left in their original state, and where the underwood and tangle are extremely dense. Being on a visit in the neighbourhood, on the opposite side of the river, late in the previous summer, my attention was attracted by the remarkable note of this bird, but as the breeding season was then past, I merely noted its haunt. Finding, however, on reference to Gould's work, that its nidification was unknown, and relying on a general fact I had often observed, namely, that the same pair (apparently) of birds will, if undisturbed, return for several years to the same locality for breeding, I revisited the spot about the commencement of the next summer, and, after a short search, was rewarded by the discovery of the nest, on which the female bird was sitting so closely as almost to allow herself to be captured; thus removing all doubt as to the identity of the nest and eggs. The nest was in the most tangled part of the thicket, and placed in the forked branches of a shrub, about four feet from the ground: it is cup-shaped, about five inches outside diameter; the exterior of dry slender twigs, and the interior lined with thin fibres and a few pieces of horse-hair, the latter evidently owing to the accidental vicinity of some farms; the whole structure is neither very solidly nor elaborately built. It contained two eggs; length exactly one inch; extreme width, three-quarters of an inch. In shape they are not much pointed at the thinner end, and the greatest girth is at about the middle. Their ground colour is pale greenish blue, with streaks and dots of various sizes scattered pretty equally over the whole surface: these markings are of a brownish black colour, and of two kinds, the one being very distinct and sharp, the other somewhat less numerous, more grayish and much fainter, having the appearance of being under the shell. From the fact of the bird sitting so closely, I conclude that no more than two eggs are generally laid, though the present ones had not yet been perceptibly incubated.

I regret to say I have kept no precise memorandum as to the date of finding the nest, but believe it to have been about the end of October.

2. Epthianura albifrons, Gould. *Whitefronted Epthianura.*

This bird, which, at the first cursory glance, recalls the familiar English water wagtail, both by its general appearance and motions, is by no means uncommon round Melbourne.

Mr. Gould writes as follows in his notice of this species:—"I first

met with it in a state of nature on the small islands in Bass's Straits, where it had evidently been breeding, as I observed several old nests in the barilla and other stunted shrubs; its natural province is the ground, to which it habitually resorts, and it decidedly evinces a preference for spots of a sterile and barren character; it trips along with amazing swiftness, with a motion that can neither be described as a hop nor a run, but something between the two, accompanied by a bobbing action of the tail. Of its nidification, I regret to say, nothing is at present known."

It may be met with in the dry portion of the swamps extending between the Saltwater and Yarra rivers. I discovered its nest about four feet from the ground, in a stunted bush, on the edge of the dense "tea tree" scrub, which covers part of that locality. The structure is cup-shaped, somewhat deep and about four inches outside diameter; dried fibres, fine twigs and stalks form the exterior, and the lining is composed of horse-hair and fine grasses. It contained three fresh-laid eggs; length eleven-sixteenths of an inch; extreme width seventeen-thirty-seconds of an inch; shape not much pointed; ground colour white, with fine red-brown markings, consisting of points, streaks and rounded dots, the larger markings being most abundant at the thicker end, where they form a sort of wreath, while some of the smaller ones are scattered over the other parts of the surface. The markings are, in nearly every case, surrounded by a faint ashy margin of their own colour, imitating the appearance of their having been painted on the white ground before the latter had properly dried, thus causing them partially to run into the white surface. This seems to be a decided characteristic in these eggs. The nest was discovered about October.

Mr. Dobrée then proceeded to make some general remarks on the most interesting forms of nidification of Australian birds, in which respect he stated this country maintained its reputation for singularity. He alluded to the mound-raising Leipoa, or mallee-scrub pheasant, an egg of which he exhibited; the yellowtailed Acanthiza, of whose singular double-roomed pendant nest a specimen was shown; and remarked on the burrowing habits of the Pardalotus, as well as the hanging structure of the yellowthroated Sericornis, which he produced for inspection; he also recurred to the fact of the Australian representatives of the cuckoo family, though deprived of the familiar note, differing in no way from their European cousins in their habit of confiding their progeny to foster-parents. He further exhibited a valuable collection of

Australian eggs, including that of the lyre-bird (*Menura superba*), of which hitherto only a limited number of specimens has been obtained; and pointed out that many further observations were still desirable for the completeness of information in this branch of Natural History. He remarked, in conclusion—

One of the secondary causes of the often-noticed scarcity of birds in Australia, as compared with England, is undoubtedly that so many species here lay a much less number of eggs. Amongst the commoner of Australian birds, the honeyeaters (*Meliphagæ*) average two, and some species only one solitary egg; the wattlebirds (*Antocheræ*) two or three; the Sericornis tribe, three; the Zosterops, three; the wood swallows (*Artamis*) four, &c.; and this opinion is corroborated by the fact that the few exceptional species whose individuals are really numerous, such as the common quail (*Coturnix pectoralis*) and the parokeet tribe, are found to be large layers, the quail producing eleven to fourteen and the parokeets six to eight eggs. In England, nearly all our commoner birds average five, or at least four eggs, and there are many instances of a larger number. I said that this is a secondary cause, for reason at once ascends higher in the scale and asks *why* it should be so arranged that only a limited average is produced? Is it that this country would, in the case of most species, not offer sufficient food of a suitable kind to maintain a greater number of individuals, and therefore the all-balancing hand of Nature has struck the present adjustment as the true one between supply and consumption? Or, to change the line of inquiry, can we entertain the notion of a more recent origin of Australia, and thence deduce that the scarcity of animal life is in some degree owing to the fact that the same amount of time has not elapsed as in the older countries to enable this continent to be stocked up to its full capability? However this latter may be, it is certain that the rate of reproduction, as represented in the instance of most Australian birds, cannot be proceeding at a rate nearly equal to the annual increase in many other countries. In order to investigate fully this subject of the abundance or scarcity of animal life, it would, however, be necessary to take into account the different destroying causes in the countries under comparison, as well as the reproducing ones; and altogether the matter is one which deserves more than the few hasty glances here incidentally bestowed upon it.

Two Days at Madeira. By Alfred Newton, M.A., F.L.S., F.Z.S.

To a naturalist, beyond any other traveller, I think, the aspect of a country he is visiting for the first time, in whatsoever part of the world it may lie, is a matter of great and never-ending interest. This interest is, of course, greatest in the case of a country whose natural productions are entirely unknown; but it would not be inconsiderable even in one, if such there be, whose Fauna and Flora have been already thoroughly worked out. It accordingly follows that localities of the intermediate and most numerous class, where the animals and plants are already more or less catalogued, must possess an interest inversely proportionate to the amount of facts which are on record concerning them. Such an instance of the middle class is offered by the cluster of islands known as the Madeiras, the field wherein one of the most reflective and diligent zoologists of our time has so long laboured. Even of those among us who take no special heed of Entomology, there can scarcely be one who has not been charmed with the writings of Mr. Wollaston, whether from the ardent love of nature and the keen powers of observation they betray, or the masterly handling of results and the sound inductive philosophy they evince. Ornithologists may well wish that a naturalist so gifted had paid as much attention to the birds of the Madeiras as to its beetles, and this without in any way depreciating the useful information respecting the former, furnished at various times by Mr. Edward Vernon Harcourt.* It is rather in the hope of encouraging some one who may have the opportunity of further studying Madeiran Ornithology that I venture to offer the following remarks; for I myself, during my late short visit, collected no specimens, and made no personal observations, possessing any novelty.

The European character of the Madeiran Fauna is well known. Of the ninety-nine birds included in Mr. Vernon Harcourt's latest and most complete list (Ann. and Mag. Nat. Hist., June, 1855, 2nd ser. vol. xv. pp. 430—438), only *one*, Procellaria pacifica, *Aud.* (if that be a good species, and rightly identified, which I think open to doubt), appears to be a straggler from the New World; but *three* are to be con-

* "Notice of the Birds of Madeira," P. Z. S., 1851, pp. 141—146, reprinted in Ann. and Mag. Nat. Hist. 2nd ser. vol. xii. pp. 58—63; 'A Sketch of Madeira,' London, 1851, pp. 115—123; "Description of a New Species of Regulus from Madeira,' P. Z. S., 1854, p. 153; and "Notes on the Ornithology of Madeira," Ann. and Mag. Nat. Hist., 2nd ser. vol. xv. pp. 430—438.

sidered African, Musophaga africana, Porphyrio Alleni and Procellaria mollis*; while *four* are given which are common and peculiar to the neighbouring Atlantic islands, Fringilla butyracea, F. Tintillon, Cypselus unicolor and Columba Trocaz. To these latter may probably be added Anthus Berthelotii, first distinguished by Dr. Bolle (Ibis, 1862, pp. 343—348, and Journ. f. Orn., 1862, pp. 357—360) as distinct from A. pratensis, under which name he supposes that it figures in Mr. Vernon Harcourt's list, and making therefore *five* species which are not inhabitants of other parts of the world. There is besides *one* species which, as far as is known, is confined to Madeira only, Regulus maderensis.† The remaining *eighty-nine* have never been accounted otherwise than identical with European species.

It is a very true remark of that prince of observers in Natural History, Gilbert White, that "that district produces the greatest variety which is the most examined." Hence I cannot but infer that the species of birds to be found in the Madeiras are much more numerous than even Mr. Vernon Harcourt's catalogue shows. I have the greater confidence in this belief from information given me by a gentleman resident in those islands. He told me he had himself, though paying no particular attention to the subject, met with several species, of which he did not know the names, not included in that list. Islands situated at a distance from other lands seem to be much resorted to by birds that, in the course of their periodical migrations, have gone astray; and it only requires the constant presence of a good watchman to secure these stragglers and record their occurrence. This I believe to be the chief reason for the otherwise unaccountable richness of the Ornithology of an isolated rock, like Heligoland. Now, unfortunately, the Madeiras do not possess a Herr Gätke: as far as I am able to learn, they have not a single ornithologist permanently resident and always on the look out for a novelty. Ornithologists, and some of them good ones, have visited the island, nay, have passed perhaps many seasons there; but their powers of observation have often been limited by other causes. They have either been invalids themselves,

* This species, although figured by Mr. Gould in his 'Birds of Australia' (vol. vii. pl. 50), probably only occurs in Australian waters as a straggler. It is stated by him to be "very abundant from the 20th to the 40th degrees of S. lat." (Ann. and Mag. Nat. Hist., vol. xiii. p. 364). Its only known breeding place, as far as I am aware, is on the Dezertas, whence my friend Dr. R. T. Frere has had many specimens.

† Mr. Darwin appears to have overlooked this decidedly distinct species, when he states ('Origin of Species,' p. 391) that "Madeira does not possess one peculiar bird."

like Dr. Heineken,* or have been the companions of invalids. Consequently, of the character of the casual additions to the Madeiran avifauna we are quite ignorant. On the other hand, I do not suppose that the number of species really inhabiting the islands is likely to be materially increased by any future observations.

Still there is much in the Ornis of the Madeiras that merits or requires further elucidation. The facts that Scolopax rusticula is stationary all the year, and constantly, though in small numbers, breeds in latitude 33° N., and that Petronia stulta, departing from its customary habits of seclusion on the continent of Europe, is met with on trees in the centre of the town of Funchal, are such as, if they did not come to us on undoubted authority, would scarcely be credited. It is almost impossible that these should be the sole exceptional peculiarities of their kind in Madeiran Ornithology.

To British oologists the Madeiras have for some years been known as the locality whence they have obtained a plentiful supply of the eggs of various Procellariidæ. These were, I believe, first imported into this country by my friend Dr. R. T. Frere; and it is very much to be regretted that we have so little information respecting the breeding habits of the birds which produce them. Some of us who are afflicted with the mania for egg-collecting, and who are sceptical on every point pertaining to our favourite study, have expressed doubts as to the genuineness of the specimens called by the name of Puffinus obscurus. These entirely want the strong musky smell which is so characteristic, as far as we know, of eggs of the whole family; and, I believe, insinuations have been occasionally uttered respecting the bantam hens which might be kept to lay these valuable objects. I confess to having been at one time among the disbelievers; and therefore I feel bound to record the fact, of which I was not formerly aware, that the Dezertas are uninhabited islands, and consequently that there is no domestic poultry there. At the same time I wish I could hear of some ornithologist visiting these barren rocks at the breeding season, and putting the matter for ever at rest.

The geological relations of the existing Fauna and Flora of the Atlantic isles and the European continent have, as far as known, been treated by much abler hands than mine; and I can scarcely hope to add any reflections on the subject which are worth the printing. Yet hitherto the birds of these interesting groups (the only relics of an

* I have not seen the paper said to have been published by this naturalist in the 'Edinburgh Journal of Science,' 2nd ser. vol. i. p. 229, and am only acquainted with that in the 'Zoological Journal,' vol. v. pp. 70—79.

Atlantis which ever had a real existence) have been entirely neglected from this point of view. I cannot persuade myself that an examination of their Ornithology would be void of result; and I would here beg to offer one remark on the peculiar distribution of the species of the genus Fringilla, as now restricted by most ornithologists. It contains six very well-marked forms; and the following list exhibits their breeding range, as well as I can ascertain:—

1. F. montifringilla; Northern Europe and Asia.
2. F. cœlebs; Europe and Asia, from lat. 68° N.
3. F. spodiogena; Algeria.
4. F. Moreleti; Azores.
5. F. Tintillon;* Madeiras, Canaries, Cape de Verde Islands?
6. F. teydea; Canaries.

Thus showing that one half of the known species are confined to the Atlantic Islands—a fact suggestive enough to those who are acquainted with the deductions inferred from similar cases by Professor Edward Forbes, Mr. Wollaston, and, chief of all, Mr. Darwin.

In connexion also with this topic, I would remind my readers of Mr. Wollaston's admirable remarks on the effects of isolation and exposure to a stormy almosphere upon the insect world.† I fully believe that similar effects are to be traced among birds; and, if I am not mistaken, the first and most apparent effect of the latter cause is an obscuring or darkening of the plumage. We have examples of it in our own country. Few of our native birds attain the brilliant hues observable in their continental brethren. When do we ever see an English yellow bunting or a bullfinch as brightly coloured as a French, or, still more, a German one? The dark back of our pied wagtail has led it to be described as a species distinct from the continental Motacilla alba. Our longtailed titmouse is equally deserving of a like recognition. I will say nothing here of the *quæstio vexata* of the difference between Lagopus scoticus and L. albus; for in that case probably other causes have come into play. If we go to the other extremity of the Palæarctic region, we find the same thing occurring. Orites trivirgata differs from the continental O. caudata, just as our own longtailed titmouse does. Accentor rubidus bears the same relation to the continental specimens of A. modularis as our own hedgesparrow.

* One of my fellow-passengers informed me that some difference was observable between the specimens of this bird killed in the northern and southern parts of Madeira. I hope to obtain confirmation of this.

† 'Variation of Species,' p. 70 *et seq.*

In a word, several, perhaps many, British forms are repeated (I do not say exactly, but to some degree) in Japan. If I am right, how can the fact be reconciled with the doctrine of the continuity of specific areas? Simply, I imagine, by similar conditions obtaining in localities so far apart; and the most obvious of these similar conditions I take to be the prevalence in both localities of an insular, as opposed to a continental, climate. Mr. Vernon Harcourt has already remarked that "all the birds of Madeira are darker than their European brethren;" and I can of my own knowledge confirm his statement in several instances. The variation here observable is very much greater generally than in the case of British as distinguished from continental forms; and Mr. Wollaston has pointed out the probability of variation being dependent on the length of the period through which isolation has lasted. It is, accordingly, well to examine the evidence afforded by Geology. Professor Edward Forbes supposed that the Madeiras and other Atlantic Islands were the summits of a Miocene continent;* and Sir Charles Lyell has quite lately declared his belief that, "waiving all such claims to antiquity, it is at least certain that, since the close of the newer Pliocene period, Madeira and Porto Santo have constituted two separate islands;"† while he further asserts that the naturalist is "entitled to assume the former union, within the post-pliocene period, of all the British Isles with each other and with the Continent."‡ It, therefore, appears to me that the differences of variation observable between the birds of the British islands and Madeira respectively and those of the Continent of Europe are exactly in accordance with these statements.

The foregoing remarks I have made only in the hope of showing how much more remains to be done by the ornithologist in the Madeiras. I must now recount my own impressions, formed during my short stay of two days. On October 20th, 1862, I left Southampton, a passenger on board the Royal Mail steam-ship "Tamar." We had a rough night of it going down channel, and the following morning found ourselves at anchor in Torbay, where our captain determined to wait till the spell of bad weather was over. How it rained, and how it blew, and how those on board managed to kill time, I need not here say. The scenery of that beautiful bay, to me so familiar, was generally obscured; but every now and then one obtained a glimpse of some well-known feature, bringing back lively and pleasurable remi-

* 'Geol. Survey of the United Kingdom,' vol. i. pp. 348—350, and p. 400.
† 'The Antiquity of Man,' p. 444. ‡ Ibid. p. 277.

niscences of more than ten years since. One agreeable circumstance of our three days' detention was the recognition of a party of old friends, whose acquaintance it had been my good fortune to make several years before in far distant latitudes. A company of about thirty Pomatorhine skuas (*Lestris pomatorhinus**) were in close attendance on our ship, and about as many more round each of two other craft, weather-bound, like ourselves. They were very tame, coming close alongside the quarter-deck in quest of food; and dire was the strife, and loud the contention, as one lucky bird after another seized on some choice morsel, and conveyed it far astern to devour it at leisure. Late in the evening of the 23rd the wind shifted, the glass rose; and shortly before midnight we had our steam up, our anchor weighed, and we were rounding, first, Berry Head, then the Start, and then were fairly on our course for Funchal. The next few days were passed as days are commonly passed at sea. We had favourable weather, and the passengers came gradually creeping up to deck, as flies show themselves in the first sunny days of spring. Two or three gulls, apparently kittiwakes (*Rissa tridactyla*), occasionally convoyed us; and the various persons on board slowly fraternized. I was gratified to find several representatives of zoological science among my companions,—Mr. William Hinton, to whom Mr. E. Vernon Harcourt was indebted for many ornithological facts, as recorded in his earliest paper; Mr. J. Y. Johnson, who has lately pursued the subject of Madeiran Ichthyology with as much zeal as success; and Mr. Robert Swift, the well-known conchologist, of St. Thomas, West Indies. On the 28th, about noon, we were boarded by a pretty Saxicoline bird, no doubt a South-European species, and I should suppose, either Saxicola stapazina or S. aurita; but as it was to all appearance a young bird in the first plumage, and I am not acquainted with either form in its immature dress, I could not be certain. It was tame enough, but declined to take any notice of a few crumbs of bread (all I had to offer by way of hospitality); and it did not stay with us very long. About five o'clock in the evening, land was announced on the starboard bow, which our captain recognized as Porto Santo. By the time I got on deck it was shrouded in a heavy rain-cloud, and required some amount of faith to believe in its existence. Later it became much plainer, and we ran by it, then sighted Madeira proper and the Dezertas, and finally dropped our anchor in Funchal Roads about midnight.

* I fully accept Herr Preyer's derivation of the name of this bird, commonly written "pomarinus," and Dr. Sclater's emendation of the same ('Ibis,' 1862, p. 297).

Next morning, looking out of the port-hole, the first thing that attracted one's attention was the intensely blue water—so blue as to appear almost opaque. The sky was clouded, and the hills above the town draped in mist. Our steamer was surrounded by gay-looking boats, stocked with live turtle, bananas, and neat wicker cages crowded with canary birds. The moment an unwary passenger showed himself in the waist, a general chorus of tawny boatmen in indifferent English invited him to go ashore. By the kindness of one of our fellow-voyagers, horses had been ordered for my brother, my nephew and myself. When we got on to the beach, and had satisfactorily concluded the wrangle inevitable in such cases, as to boat-hire, the rain began. We paddled about the town for a couple of hours or more, as the idea of starting on a ride was absurd. We looked into the fruit-market; were offered a string of semiputrid quails by a man in the street (said quails being decidedly darker in colour than our Coturnix dactylisonans); visited the Convent of Santa Clara, whose inmates have an ornithological turn, since they make very pretty artificial flowers out of feathers; and finally inspected the fort, which is defended by certain soldiers of His Most Faithful Majesty, and a glacis covered with prickly pear. From the ramparts a good view of the town is obtained; but what I looked at more was some three or four couple of small dark swifts (*Cypselus unicolor*), which were wheeling to and fro under its walls. Beautiful little birds they were, and a very good living they seemed to be making, judging from the constant rapid jerks in their flight, and the abundance of small insects that, in spite of the rain, filled the air. At length the sun shone out, and in desperation we determined no longer to defer our ride. Accordingly the horses were brought out, and off we started at a gallop, each of us being accompanied by a man (a *burriquiero*) whose business it is to hang on by the tail. The first mile was over the stones, and up a hill so steep that, having some regard to my reputation for veracity, I shall refrain from mentioning what I believe to be its angle of inclination. I can only say I do not think I ever rode (much less gallopped) up a more tremendous ascent. Each side of the road was bounded by high walls, festooned and overhung with brilliant flowering plants; but every here and there one obtained a look-out. The rain came on again, more heavily than before, accompanied by a storm of wind; and we several times had to take shelter from it. At length we arrived at the Church of Nossa Senhora do Monte, upwards of 1900 feet above the sea, which forms so

conspicuous an object from the bay. Here we turned sharply to the right, the weather improved, and after emerging on a comparatively open country, arrived at a spot which the fragments of broken glass showed to be a favourite picnic ground. A beautiful prospect was before us. At our feet lay Funchal, with its heights all dwarfed; to the eastward the craggy Dezertas, the home of a thousand petrels, looking unspeakably desolate, notwithstanding the golden glare with which their peaks were lit up; and extending far away to the south and west nothing but the calm sea, overshadowed here and there by a passing cloud. After enjoying this view for some little time, we turned our horses' heads, presently stopping at a small cottage—a *venda*—where our attendants begged a draught of wine. Horrible stuff it was, manufactured, if our tastes could be trusted, chiefly of rum and raisins. Fine Spanish chestnuts and thriving pinasters were dotted about; and passing down a rocky gully, a buzzard (*Buteo vulgaris*) flapped slowly from the top of a half-dead tree. At length we reached the object of our ride—the Curral dos Romeiros, a secluded valley, placed among a multitude of wild ravines. A small stream ran at the bottom, and made its exit, sparkling in the light, through a narrow gap. Crossing this, we ascended the opposite side, disturbing two or three more buzzards; and, finally, striking the Caminho do Palheiro, were soon in the town, where we re-embarked on board the steamer.

Next morning we were on shore again betimes. A kind friend, who had invited us to breakfast, met us on the Praza, and accompanied us to his own house. I took a seat in an ox-sledge, which is the form of vehicle that in Funchal represents the Hansom cab of the British metropolis. The streets are paved with small flat pebbles, set edgeways, over the well-worn surface of which these sledges glide easily, their progress being assisted, like those at Amsterdam, by the occasional application of a greasy rag to the runners. Notwithstanding this precaution, however, so heavy is the draught up the steep hills, that the poor beasts were constantly down on their knees. At length we arrived at our friend's house, a pleasant *quinta;* and having done justice to his hospitality, and admired the view from his garden, we started on our expedition to the Curral dos Freiras. The day was beautiful. As we rode on, the strangeness of the scene struck us with increasing force at each succeeding step. On each side were fields of corn or sugar-cane, cabbages or yams, or sometimes a vineyard that had survived the ravages of the Oïdium, studded with orange or apple trees, and intersected by high rows of fuchsias or blackberries; while overhead were fig trees and pines, poplars and dates, enough to

confuse for ever one's notions of geographical Botany,* and rivalling the odd jumble of the classic "Groves of Blarney." We passed over a comparatively low range of hills to the north-west of the town, when a wonderfully bold headland, Cabo do Girao, upwards of two thousand feet in height, appeared on our left; then a deep ravine, the channel of the Ribeiro dos Socorridos, spanned by a viaduct of almost Roman proportions. About the streams of water, whether natural or artificial, were numerous gray wagtails (*Motacilla sulphurea*), a species I had long known, on Mr. Hewitson's authority, to be found in the island. Flocks of linnets (*Linota cannabina*), the cock birds with their breasts still crimsoned, rose twittering cheerfully from the furze-bushes and cactus-thickets by the road-side. In the air were poised dark-plumaged kestrels (*Tinnunculus alaudarius*, var. *rufescens*, Sw.), occasionally dropping down, I presume in quest of the lively little lizards (*Lacerta Dugesi*), of which plenty showed themselves on the dry stone walls. As we gradually reached a higher level, we were favoured by a repetition of yesterday's rain. At length, passing by the Jardim da Serra, and through a wood of Spanish chestnuts, which no doubt would have been picturesque had we been able to see it, we emerged at the foot of a steep slope overgrown with coarse grass. Here we got off our horses, and were each set upon by a couple of natives, who seemed to think it impossible for an Englishman to reach the top without hoisting him up. Partially availing ourselves of their assistance, we arrived there after a little trouble (for the grass was wet and slippery), and found ourselves on the brink of a tremendous crater-like gorge, occupied by a bright rainbow, far, far, below us. A magnificent sight it must be in fine weather; but the clouds filled the valley beneath, so that its bottom was hardly discernible, and clung obstinately to the mountains above, only for a few moments breaking to reveal Pico Grande, the highest point of the island. Being by this time wet through, we thought it advisable to retrace our steps. Riding down hills is generally worse than riding up them. Here it was awful work, but we at last accomplished it without mishap. We returned by a different route, crossing the valley before mentioned much lower down, over a fine bridge and a half-finished causeway leading to a level new road—a gratifying change after the ups and downs we had encountered. I went to visit a gentleman (Dr. O'Herlehy) who, I had been kindly informed by Mr. Johnson, was a great bird-fancier, and in whose house

* It will, of course, be understood that nearly all the prevailing plants are introduced species.

I hoped to see examples of the curious variety of the blackcap (*Curruca Heinekeni*, Jard. & Selby) and other Madeiran birds alive. Unfortunately the doctor was not at home, and, what made it worse, had the key of his pets with him. Then, following my companions, we went on board ship; and about an hour after sunset, amid the blaze of blue lights, the "Tamar" steamed away, and Madeira vanished into a memory.

ALFRED NEWTON.*

Elveden, February 28, 1863.

Struthionidous Birds, Extinct and Recent.

THE former existence of huge struthionidous birds in several and distant localities is one of those facts which, at first received with hesitation and doubt, have of late years forced themselves on our notice, and made themselves part and parcel of the science of Natural History. There is much teaching in the assured discovery that the magnitude of the species constituting a family or order was at some, and perhaps not very remote, period, vastly superior to what it is at the present time: this fact, now clearly established, receives additional importance from the cognate fact that the larger animals still lingering on the earth are gradually disappearing even while we are speculating on the subject, and are undergoing the inevitable process of being removed from the category of things that are into the catalogue of things that were. Yet in almost every instance these colossal creatures have left representatives behind them which serve as guides to their systematic arrangement; thus Colossochelys is represented by Testudo, Iguanodon by Iguana, and the crocodile in the oolite of Poictiers, estimated by Valenciennes to have been at least a hundred feet in length, has its likeness stamped on the comparative lilliputian which still floats log-like on the waters of the Nile. As with reptiles, so with sucklers: the Megatherium is represented by the diminutive sloth: the mammoths and mastodons of earlier ages are brought vividly before us by our living elephant. Again, among birds the dodo is said to be typified by Didunculus, Æpyornis by the ostrich, Dinornis by the cassowary and mouruk. It requires neither the research nor the imagination of a Darwin to accept the teaching which these facts

* Reprinted from the 'Ibis,' April, 1863, and obligingly communicated by the author.

afford; such bulky creatures require space and solitude; we express our surprise that the dodo should disappear, whereas the greater wonder would be that it should remain; how could it exist with man for a companion and an enemy? The Æpyornis, in like manner, has yielded its place to man: when New Zealand was discovered the moa was certainly in existence, and has existed almost up to the day in which we live. The vast solitudes of the Great Sahara still protect the ostrich; and the boundless wastes of South America preserve the Rhea from destruction; these inhospitable regions bid defiance to man, and hence offer a refuge to the creatures that man would inevitably destroy. The emeu, cassowary, mouruk and kiwi are certainly doomed, unless, under the care of some such protector as Mr. Bennett, they should be converted into domestics, and, like the camel and the horse, lose all claim to the title of *feræ naturâ*. There is no necessity for any hypothesis, there is nothing inconsistent with the immutability of species, in the fact that the dodo has expired: so would the mouse if shut up with the cat: in all the changes now in progress we shall find no indication of any more miraculous power than this, that civilized man is forcing his way into every corner of the earth, and that while his advance favours the increase of his parasites, the rat, the mouse, and the sparrow, it is fatal to the existence of those bulky creatures which strive, but strive in vain, to escape the influence of his presence.

These observations are induced by the simultaneous receipt of papers so replete with interest as those which I have here associated; papers which it must ever be the chief aim, the legitimate object of the 'Zoologist,' to preserve from oblivion, to set them up in the desert of time as landmarks by which some future Cuvier may shape his course.

Mr. Rowley's paper takes precedence of the others, not only because it is of earlier date, but because it goes back to a more remote period in the history of these giant Struthionidæ: the observations by Mr. Buller, followed by the invaluable researches of Mr. Allis, serve to link the past with the present, while Mr. Bennett's praiseworthy efforts show what may yet be accomplished in the way of inducing those huge wingless birds still to linger on earth's surface under the fostering care of man.

It has been my good fortune to be permitted to see and examine the huge egg which forms the subject of Mr. Rowley's paper, and it is therefore with peculiar pleasure that I transfer his description without note or comment to the pages of the 'Zoologist;' but my readers will,

I am sure, see that in printing opinions so opposed to each other as some of those which are here collected, it is impossible for me to endorse the whole. To neither communication have I made the slightest addition; but I have eliminated from Mr. Rowley's treatise a great deal that did not appear to me to be perfectly relevant or in any way essential to the right understanding of this most interesting subject. Mr. Rowley must now speak for himself. I ought to add that the short notice of my friend Mr. Allis's paper on Dinornis robustus is penned by myself.

EDWARD NEWMAN.

The Egg of Æpyornis maximus, the Colossal Bird of Madagascar.
By GEORGE DAWSON ROWLEY, M.A.*

THREE different parts of the world appear to have possessed enormous tridactyle birds. North America points to the footprints of the Brontozoum giganteum in the sand stones of the Connecticut valley; New Zealand boasts her fifteen or twenty species of Dinornis, of which the moa (*Dinornis giganteus*) is the largest, and Madagascar has lately revealed to us the [former] existence of the Æpyornis maximus. The Brontozoum giganteum belongs to the triassic period of Geology, the vast antiquity of which, in some degree, weakens our interest. For the mind's eye, retrospectively looking, takes dimly into its vision an object seen through countless ages of bygone time. The two island giants are well ascertained to have existed not very remotely, in fact in "the Recent;" and come home to our imaginations in all their vivid reality, as things only of yesterday, or perhaps even [of] to-day, as is thought by some, though of this I never have had any very great hope. * * *

There are three eggs of the Æpyornis maximus extant, the largest and finest eggs in the world. Paris possesses two and some fragments, the one in my collection is the third. When I purchased this, I was assured that it exceeded in magnitude the two others, which I find, from a paper entitled 'Compte Rendu des Séances de l'Académie des Sciences,' No. 4, 27 Janvier, 1851, par M. Isidore Geoffroy Saint-Hilaire, tome xxxii. p. 101, to be the case. * * *

Its dimensions are as follows:—Shape an ellipse; major axis $12\frac{1}{4}$ inches; minor axis $9\frac{3}{8}$ inches; great circumference $34\frac{3}{16}$ inches;

* Reprinted in part from a pamphlet of sixteen pages, published by Trübner & Co., Paternoster Row. 1864. Price one shilling.

small circumference 29⅛ inches; weight avoirdupois 3 lbs. 11½ oz. nearly. Contrast these with the following, taken from ostrich eggs in my cabinets:—Smooth North-African ostrich [egg]: major axis 6⅛ inches; minor axis 5 inches; great circumference 18¾ inches; less circumference 17 inches. A rough South-African ostrich [egg] has major axis 5⅝ inches; minor axis 5 inches; great circumference 17⅝ inches; less circumference 16½ inches. The former of these was picked out as a very large egg, but the axes of the Æpyornis give nevertheless a proportion of nearly two to one. Are we, then, to make the former double the altitude of the ostrich, *viz.* 14 or 16 feet? This question has been dealt with by M. Geoffroy Saint-Hilaire, from whose writings I derive chiefly my knowledge of the bird and its bones. He is of opinion that we cannot go that length. With the Paris eggs came the lower portion of the metatarsal of the left leg, found in the same locality with at least one of the eggs. This, he says, indicates a bird with shorter legs in proportion than the ostrich, yet with a much thicker body, and he puts the height of the Madagascar bird at between three mètres and four mètres, *i.e.* 9 feet 10·11237 inches and 13 feet 1·48316 inches, and leans to the belief that it slightly exceeded the New Zealand species in altitude. He computes the contents of his eggs at about 8¾ litres, *i. e.* about 7 quarts 1 pint, and equal to those of six ostriches, seventeen emeus, or one hundred and forty-eight hens, a statement which Professor Owen confirms, but justly says, that eggs of birds are not always in proportion to the size of the species which lay them. It is true this is most strikingly the case in Apteryx Mantelli or kiwi, the fresh egg of which, as stated by Dr. Sclater, weighs 14½ oz., while the living bird is 60 oz., so that the egg is nearly equal to one-fourth of the bird. * * *

The first Paris egg [of Æpyornis maximus] was discovered in 1850 by M. Abadie, captain of a merchant vessel, in harbour at Madagascar, on the S.W. coast of the island. This was perforated at the end, and used by a native for domestic purposes. Soon after another perfect specimen of nearly equal volume, taken from the bed of a torrent, in the remains of a small landslip (*parmi les débris d'un éboulement*) came to light from the N.W. extremity. Later, a third [egg] and some bones were discovered in a recent formation. This last egg was unfortunately smashed on the voyage to Paris, where the three were sent by M. Malavois, a French gentleman of the Island of Réunion or Bourbon, who received them from Madagascar. My egg was found at Mananzari on the east coast (this is not Mananhari farther north on the same side) at a depth of forty-five feet in a hill of ferruginous clay, "dans le

terrain diluvien," by Malgaches when digging for an iron mine, and was sent to the Mauritius and thence forwarded in 1858 to Paris, by Messrs. Thomas Lachambre and Co., of that island. * * * Some bones are said to have been found with the egg, but they were unfortunately broken before they were taken out. This I the more regret, because the fragments at Paris are so very imperfect. The surface is much stained with clay, consequently the fine lustre, which I suppose it originally had, has vanished. The colour was probably the same, when first laid, as that of the ostrich (*Struthio Camelus*), *viz.* a pale yellow-white. In granulation it resembles South African specimens of the same bird, but the indentations are vastly coarser and larger. * * * Nature has taken care to wrap up the egg of the Æpyornis maximus in a shell of the very greatest strength: had it been otherwise it could hardly have stood the wear and tear it must have undergone, for though the bird has existed probably in modern days, yet it, I should say, only lingered. Therefore, this last-found egg may be many hundred years old, but taking it at two hundred years, that is a long time for an egg to remain in clay. In my specimen some heavy substance rattles when shaken, and I have been asked if it contains an embryo—but I do not think this likely: perhaps it may have in it one of those calculi common in ostrich eggs, which vary in size from a pea to a marble; I have one now before me, which appears to be of the same substance as the shell—it will not scratch glass. In 'Wild Sports of the World,' by Greenwood, p. 324, speaking of these calculi or concretions of shell, he gives the following:—"I find Barrow says, these are pale yellow, in one egg we found nine, in another twelve." Thunberg says: "A stone is sometimes found, hard, white, flat and smooth, about the size of a bean; they are sometimes cut and made into buttons." The substance in my egg appears very like one of the above; but I hesitate to satisfy my curiosity, to do which I must bore a hole in a specimen at present in the most perfect condition, and as regards England unique. * * *

Perhaps the Madagascar bird, which was probably polygamous, had the habit of scattering eggs all over the country, as does the Rhea and also the ostrich. Darwin says of the former: "In the months of September and October, the eggs in great numbers lie, either scattered or single, all over the country." If this was the case with the species of which we are treating, the four eggs obtained would most likely be solitary ones, and a full nest of Æpyornis maximus may yet be discovered, particularly as the immense strength of the shell appears to defy time. But bones are our chief desiderata: these will probably

turn up in some bog or banks of a river. Rheas were seen by Mr. Darwin swimming across the Santa Cruz River where it was four hundred yards wide, with a rapid stream. Sturt came upon two emeus in the same way in the Murrurbridge in Australia, and one of the great eggs was at least washed out by a stream. Bones of the New Zealand giant were found in a morass, and in such a situation I should search in Madagascar.

It is strange that so colossal a creature could have lived in modern days and yet escape notice. M. Geoffroy Saint-Hilaire, quoting Mr. Strickland ('Annals of Natural History,' No. 23, November, 1849, p. 338), states that M. Dumarele, a French merchant, sent an account of an enormous egg, in 1848, to M. Joliff, surgeon of the "Geyser." This was seen by him in Madagascar at Port Leven, but he could not buy it of the natives, as it belonged to a chief of the Sakalawas tribe, and on account of its rarity was held in great estimation by them. Most likely M. Dumarele's specimen is one of those in Paris.

Perhaps the bird, though probably now extinct, has not been so more than two hundred years, as some of the cartilages, according to the French account received by me with the egg, were still adhering to the bones when found. The condition of the shell, perhaps, can hardly be called semi-fossil: it is said to be three times the thickness of the ostrich's. Of all the bones in a bird, we could scarcely have selected one more valuable than the metatarsal to Science, as indicative of fixed ornithological laws, which is so far most fortunate. * * *

Just as this paper was going to the press, my attention was called to Mr. Strickland's translation of M. J. G. Saint-Hilaire's pamphlet, in 'Annals and Magazine of Natural History,' 2nd Series, No. 39, March, 1851, p. 161, and also Professor Owen's remarks upon the same subject, in the above periodical, No. 75, March, 1854, p. 229. Neither of these papers had I seen, nor was I previously aware of their existence. I therefore append a portion of Professor Owen's valuable remarks. He gives the following admeasurements of the Paris eggs:—

	Ovoid egg.	Ellipsoid egg.
	ft. in. lin.	ft. in. lin.
Greatest circumference lengthwise	2 10 9	2 9 6
Breadthwise	2 4 3	2 5 6
Extreme length in a straight line	1 0 8	1 0 5

"The portions of bones, of which casts were exhibited" (at the Zoological Society), "consist of the lower end of the right and left

metatarsal bones and the upper end of the right fibula. These are nearly equal in size to the corresponding parts of the skeleton of the Dinornis. * * *

"In neither the Dinornis nor the Æpyornis is the metatarsus perforated, as in Casuarius and many other birds, above the interspace between the outer condyles: that interspace is simply deeper, or curved higher in both. The outer trochlea, which is entire in both portions of the metatarsi in Æpyornis, is, in a marked degree, smaller than in Dinornis, as is also the inner trochlea, as far as one may judge from the posterior part which is preserved. The interspaces of the trochleæ are wider posteriorly in Æpyornis, and the outer one is more angular at its upper end. The middle portion of the posterior surface of the lower third of the shaft of the metatarse in Æpyornis is more produced than in Dinornis, and a ridge is continued from it to each lateral trochlea, dividing the back part of the shaft above them into three surfaces; whereas the corresponding surface in Dinornis is simply flat from side to side. Above this part in Æpyornis the posterior surface on each side of the middle prominence is concave, and meets the anterior surface at a ridge which is narrowest at the outer border of the bone. In Dinornis both borders of the lower third of the shaft are thick and rounded.

"The Æpyornis does not show any trace of the rough tract for attachment of a back toe, as in the Palapteryx robustus; in this respect it resembles the Dinornis. At six inches from the lower end the shaft begins to be concave along the middle of the fore part, the concavity deepening as it ascends; whereas in Dinornis the anterior median concavity of the shaft does not begin to appear until above the upper half of the bone. In this character the Æpyornis resembles the cassowary; but it differs from the cassowary in the much narrower or sharper lateral margins of the shaft of the metatarsus. Like the cassowary, however, the breadth of the shaft is greater in proportion to that of the trochlea than in the Dinornis or Palapteryx.

"It would be hazardous to conclude as to the length of the entire metatarse from the breadth of the distal end; for this is equal in Dinornis giganteus and Palapteryx robustus, whilst the length of the metatarse is 1 foot 6 inches in the one, and 1 foot four inches in the other. I think it more probable, however, that Æpyornis had a shorter rather than a longer metatarse than the Dinornis giganteus.

"That its leg-bones were smaller is significantly indicated by the difference of size in the fibulæ.

	Dinornis.	Æpyornis.
	ft. in.	ft. in.
Longest diameter of the upper end . .	2 11	2 9
Shortest diameter of the upper end . .	1 4	1 0

"This bone in Æpyornis shows a flat, full, oval articular facet on its tibial side, of which there is no trace in Dinornis.

"Upon the whole, therefore, Professor Owen concluded that the Æpyornis maximus did not surpass in height or size the Dinornis giganteus, and that it was more probably a somewhat smaller bird.

"The fragments of the egg of Dinornis or Palapteryx—of what species of course cannot be determined—show, after arriving approximately at their size by a curve of the fragments, that the shell was not only absolutely thinner, but relatively much thinner than in the ostrich, and *à fortiori* than in the Æpyornis. The air-pores, also, have a different form, being linear not rounded, and the external surface is smoother.

"In the smoothness and thinness of the shell, the egg of the Dinornis resembles that of the Apteryx; in the thickness of the shell and the comparative roughness of its exterior, the egg of the Æpyornis more resembles that of the ostrich and cassowary.

"It is most probable that the entire eggs of the Æpyornis were excluded in the usual fertile state, but had suffered such want or interruption of the usual heat requisite for their incubation as to have become addled."

The Recent Moa.

At the meeting of the Linnean Society of London, held on the 17th of June, my friend Thomas Allis, F.L.S., and Vice-President of the Yorkshire Philosophical Society, exhibited some of the bones of the moa, together with two beautiful photographs by Monkhouse and Co., of Pendall, York, and read a paper descriptive of the bones, and the circumstances under which they were found, including suggestions as to their probable age. The first plate exhibited the following bones:—the sacrum, three vertebræ, normally anchylosed, and having the left ribs attached; one other vertebra with attached rib; the sternum with its second and third right ribs, and its second left rib still attached; a fibula with a portion of the outer skin still attached; the left inner toe, with the sole still adhering, and a portion of the sole of the foot also attached; the head, which is perfect with the exception of the

left zygomatic bone. The second plate presented an outer view of the sacrum covered with skin which is dotted over with the quill-points of feathers; a femur having a portion of flexible cartilage still *in situ;* the anterior margin of the sternum showing the fossæ within which are contained the articulory surfaces for the attachment of the wing-bones; the tarsus; the head as seen from below, showing the absence of the left zygomatic bone; and the lower mandible. The following bones were wanted to make the skeleton complete: the left zygomatic, the atlas, two, three, or more cervical vertebræ, the first pair of dorsal ribs, the first pair of sternal ribs, one of the wing-bones, and the middle left toe. The skeleton was found by gold-diggers, near Dunedin, in the middle island of New Zealand, under a deposit of shifting sand, and the bird had been surprised whilst sitting on its young ones, the bones of which were exhibited with those of the parent.

A long discussion, in which Professor Busk, Professor Huxley, Dr. Hooker, Henry Deane and others took part, followed the reading of the paper. Dr. Hooker suggested that the perfect condition and high state of preservation which the bones exhibited, might possibly be the result of preservation in ice, similar instances being on record, especially that of the Siberian Mammoth, in which even the flesh was preserved; but the other speakers took an entirely different view of the subject, and thought that the bird to which these enormous bones belonged had probably been living within ten years. If this conclusion be correct, it seems extraordinary that no more precise information can be obtained from the natives, a race remarkable for their intelligence; for, if so gigantic a creature were living ten years ago, it seems impossible that no more accurate information respecting it should exist, than the vague and most unsatisfactory reports which have been collected by English emigrants. However, a very important point is settled in bringing the history of the bird down to the time when New Zealand was colonized by the British: it were indeed presumptuous to affirm that a moa will still be found alive; but the evidence now before us shows that such an event is anything but impossible. In considering this subject, we must bear in mind that, being continually at war with the natives, we are debarred from that free access to the interior and from that unrestrained exploration which are absolutely necessary in such a case as this. The wary character of the ostrich tribe is well known: in the Great Sahara the ostrich himself is only to be discovered at an immense distance, and yet there are no intervening objects behind which he could shelter: it is very different in New Zealand: there the moa, if possessed of half the subtlety of the

ostrich, might escape for years the notice of the few Europeans who have ventured to intrude on his haunts.

Notice of the Remains of the Moa and other Birds formerly inhabiting New Zealand. By Walter Buller, Esq.*

On seeing the extraordinary and marvellous accounts in the New Zealand papers regarding the discovery of the moa, and which were republished here, I wrote to my brother, the Archdeacon of Wellington, for information; and he has by this mail forwarded a paper written by an ornithological friend, in which I find my opinion (as communicated at the time to the Editor of the 'Zoologist') respecting the non-existence of the moa corroborated by a naturalist of some standing and experience in the colony,—one, too, who it will be readily seen, has devoted much time and attention to the subject, and whose valuable remarks I am privileged to make use of, and therefore send for publication in the 'Zoologist.'

Henry Hadfield.

Ventnor, Isle of Wight,
June 22, 1864.

From Walter Buller, Esq., to Archdeacon Hadfield.

March 17, 1864.

My dear Archdeacon,—With regard to your query respecting the moa, I fear I can tell you little or nothing that is new. As to whether it is still in the "land of the living" is, to my mind, a settled question. Like the Irish elk, mastodon and mammoth, the moa belongs to a *past* generation of colossal beings, although of course its extinction is of far more recent date. Nothing now remains to us of the moa but the extensive bone deposits in various parts of the islands, and the rude history of the bird as preserved in Maori tradition. That the Dinornis was contemporary with the Maori in New Zealand is sufficiently established by the fact that broken and calcined moa-bones are not unfrequently found associated in the same heap with the usual refuse of Maori feasts of that period—human bones, fish bones, shells, &c.; and if it be admitted that the first Maori emigrants arrived in the country about five hundred years ago, we bring the extermination of the species down to a comparitively recent date. To

* Communicated by Captain Henry Hadfield.

talk of a gigantic moa turning up with future explorations seems to me mere idle speculation.

The whole of the North Island has now been explored, at any rate sufficiently for the purpose, and the general character of the half-explored West-coast regions of the Middle Island,—rough, mountainous and wooded,—blights all hope of moa discovery in *that* direction.

But I must qualify what I have said by explaining that by "moa" I mean the Dinornis, of which there appear to have been at least six species (D. robustus, D. dromioides, D. rheides, D. struthioides, D. curtus and D. didiformis). The natives applied the name "moa" indiscriminately not only to these but to several other species of smaller stature and belonging to genera altogether distinct. The Notornis and the Apteryx they distinguish as the "molio" and "kiwi," but the three other ascertained genera, Palapteryx, Brachypteryx and Aptornis were all "moas" with the Maories.

The Palapteryx (of which more presently) was a brevi-pennate bird, resembling in its principal characters the emeu of Australia, and standing about seven or eight feet high. The Brachypteryx is described as a gigantic short-winged rail; and the Aptornis as equalling in size the great bustard (*Otis tarda*), to which, in its osteological structure, it has some affinity.

Now, it is not only possible but highly probable that some of these smaller struthious birds still inhabit the solitudes of the Middle Island and the unexplored forests of the North. Their remains have been found mixed with those of the "moa" (proper) in the menaccanite-sand deposits of Waiugougoro, and in the moa-beds of Waikouaiti. Those from Waiugougoro especially are in a high state of preservation, owing probably to the character of the sediment in which they lie embedded: these bones have been interpreted and classified, with wonderful sagacity, by Professor Owen. Brachypteryx remains are scarce, and, compared with Dinornis, Palapteryx remains are very local in their distribution. Not long ago, however, I found in a sand-hill, a few miles up the Manawatu River, a small bone which I marked "Palapteryx?" and sent in to Mantell for examination. He confirms my opinion. If we are right in the conjecture, the discovery is an important one. Aptornis bones are common enough, I think, in the Middle Island, but only a few imperfect specimens (so far as I am aware) have found their way to Europe. Owen originally mistook the bones of Aptornis for those of a Dinornis, naming the supposed new species Dinornis Otidiformis. Dr. Mantell was the first to point out the distinct generic characters.

But to return again from the dry ossiferous remains to the living bird. The discovery by Walter Mantell, in 1850, of a live Notornis, of which the generic characters had long before been determined by Prof. Owen from an examination of the Waiugougoro fossils, while it proved the soundness of the Professor's physiological inferences, established at the same time the fact that the Waiugougoro collection represented the living as well as the dead. Dr. Mantell speculated a good deal on his son having secured to Science "the last of a dying race," but another live Notornis was afterwards taken, and the skin is now in the British Museum.

Again, the smaller representatives of the tribe,—the Apteryx, of which there are at least three existing species (A. australis, A. Owenii and A. Mantelli); the woodhen (*Rallus australis*), which is the true type of the Brachypteryx; the Porphyrio and the small short-winged "swamp rails,"—are still comparatively plentiful in the remote parts of the country. Apterous birds must of necessity disappear before such enemies as the wild dog and cat, and, were there no other cause in operation to check its existence, the kiwi would ultimately become extinct. A few years hence and an Apteryx will probably be as great a rarity as a live Notornis! Nevertheless the kiwi does exist in the land now, and that is sufficient for our argument. May not Palapteryx, Brachypteryx and Aptornis, all or some of them, still inhabit the unfrequented parts of the interior? I think we have some evidence presumptive of the fact:—

1. Mr. Mantell tells me that Watts Russell, in his West-coast journey in the Nelson Province, a few years ago, killed and innocently ate (!) a bird which he described as resembling a Rhea or cassowary. Was it not a Palapteryx?

2. The Middle Island natives speak positively of a huge wood-hen, which they call "takahe," as still frequenting the broken mountainous country at the extreme south. May not this be a Brachypteryx?

3. Sir George Grey, when he was last here, told me that Tamati Waaka had gravely assured him that a "moa," standing about four feet high, was still occasionally met with in the wooded country near the Bay of Islands. When the Governor affected to doubt his word, the old man got angry, and said he would prove it by bringing one, some day, to Government House!

4. Mr. Rochfort, the Provincial Surveyor of Nelson, describes (in the 'Nelson Examiner,' August 24, 1859) a bird which he had seen in the Paparoa Elevation as "a kiwi, about the size of a turkey, having spurs on his feet, which, when attacked by a dog, defends himself so

well as frequently to come off victorious." The natives call this bird "roa," and Professor Hochstetter has proposed to name it Apteryx maxima; and, lastly,—

5. Dr. Haast, who is now exploring the alpine region of the Middle Island, writing to me, under date, July 26, 1862, says, "I believe I have convincing oracular proof that in those never-before-trodden alpine forests (Canterbury Province) exists a *very large* kiwi, the existence of which till at present was quite unknown. I have heard many times the roa, the large kiwi of the west coast, but his call is like the cry of a baby to the voice of a powerful man when compared to the call which we heard in the Alps, while camping near the edge of an extensive forest. * * * It was towards midnight, and although fast asleep we were all awakened by this enormously loud call." Was not this, think you, the scream of a veritable Palapteryx?

Yours faithfully,

WALTER BULLER.

Acclimation and Breeding of Emeus (Dromius irroratus, *Bartlett*) *in Surrey.* Chapter II. By WILLIAM BENNETT, Esq.

I LEFT my young emeus (Zool. 8323) just parted from their affectionate father, and not yet fully reconciled to beginning the world on their own account. The sense of deprivation gradually wore off, and occasionally they were indulged with an interchange of visits, in order to keep up acquaintanceship and mutual interest. During the winter they had each a severe illness, one following the other. My friend John Steele, one of our ablest medical practitioners of Reigate, and a warm naturalist, hearing of their indisposition, called professionally. On examination of the symptoms, apprehending it was the liver that was affected, probably by the difference of our climate, he prescribed one-grain calomel pills, to be given every third day, followed by a gentle aperient. They were very difficult patients to administer anything to. Somehow, however, this was managed for a fortnight, and they both recovered, after one had been entirely given over. They are now grown fine birds, nearly as tall as their parents, but not, I think, mature for another season at least. The two are very different in their bearing and manners, one being much higher spirited and less tractable than the other; but both have for some months began to put on the *boom*, the peculiar indication of the female bird, though one is much more distinctly pronounced than the other, and it is exceedingly

difficult to determine the sexes, until quite mature. They likewise had a severe quarrel, lasting for nearly a month, in the spring, which looks like jealousy, but perhaps it was only to establish supremacy, for they are now entirely at peace. The two from the same stock of the preceding season, in the Zoological Gardens, Regent's Park, have thriven well, are now considered to have arrived at maturity, and are pronounced both males. My adult birds became reconciled to each other in due course.

The next season (1863) was most prolific in eggs, but proved an entire failure as to any further result. The laying commenced on the 2nd of January. There was an interval of four days between each of the three following eggs, and then the process continued with the utmost regularity, on every third day, even to the time of the afternoon. It was invariably within a margin of one hour on either side of four o'clock that an egg was deposited, up to the twentieth in number (see "Diary," Zool. 8494). I had learned to interpret the voice of the bird, namely, a low muttering sound she regularly makes for an hour or so before laying, which rendered the observation of the time a matter of but little difficulty, whenever I was at home. The same precautions were taken with respect to the safety of the eggs from frost as the previous season. After this number of eggs had been laid, the male bird exhibited the usual symptoms, and he was set upon thirteen eggs on the 5th of March.

The early period of sitting was as close as before. The first view obtained of the contents of the nest was on the 9th, when two more eggs were found to have been added. The bird at large was seen to deposit another on the 12th. It was the 21st before another view of the nest was obtained. There were then seventeen eggs in it. Three were removed, under the idea that there would still be as many as the bird could do justice to. An incubator was started for the reception of the surplus eggs.

The bird at large continued to lay until the enormous number of twenty-eight was completed. From the average known weight of the bulk of them, it must have amounted to about 40 lbs. in all.

The management of the incubator was conducted exactly, as recommended at the Zoological Gardens, as nearly as circumstances admitted, except that the average temperature aimed at being maintained was 104° instead of 108°. All my subsequent observations lead me to conclude that the former may be somewhat too high. During the first four weeks everything went on admirably. In the fifth week I was summoned from home by the illness of a near relative. Though only

absent a day or two, a source of disturbance occurred which I did not know of till afterwards. Nothing amiss with the sitting bird was detected on my return. Early on the afternoon of the day following, however, I found the bird off the nest, and wandering about, to my great dismay, in a state of the utmost excitement. Nothing could reconcile him, or attract him back again to the nest. After some inquiry I learned that a pleasure-boat had just gone up the river,—a privilege we by no means wish to deny our neighbours up or down our sullen, but attractive and sylvan little stream,—and that previously, in the week, the same or another boat had landed some of the party, to notice the birds, during my absence from home. The sight of strangers, especially ladies in black, or with flying gay ribands, or loud voices, or unaccustomed noises of any kind, always greatly disturbs and excites them. But it was the plash and sound of the skulls in rowing that I believe was the great cause of offence. I have since noticed that the beating of a carpet or a drum, anywhere within hearing in the neighbourhood, greatly distresses them; and I have now no doubt it was a boat coming up the river that Sunday morning that was the unknown and mysterious cause of disturbance on the first occasion (see Zool. 8319). I had ample evidence that the sight or sound of a boat is something of which these birds have a remarkable dread or antipathy to, when, on going my round two or three days afterwards, I again found the two young emeus, then a year old, in a state of the greatest anger and alarm, with flaming eyes and mouths open, one of them having leaped the fence in its terror. On looking round for the cause, *there was the boat*, having just landed opposite their inclosure,—come to make an apology,—the lady and gentleman having heard of the unfortunate disturbance!

My poor sitting emeu—that was! Everything I could think of to quiet and console him, and attract him back again to the nest, was persevered in till hopeless. All the more likely eggs were then removed to the incubator. As I anticipated, the bird sat again that night, and the bulk of the eggs were restored. I clung to the hope that he would forgive and forget the offence, and resume the sitting, though, from certain symptoms observed, I was not very sanguine. My first visit in the morning satisfied me it was all over. The bird was off the nest, and chafing violently against the railed door of the house, which had been shut that night for safety. The eggs were returned to the incubator.

No accident that need have been fatal to the successful hatching out of at least some of the eggs happened, as far as I am aware of, to

the incubator. Some ordinary chickens were hatched in it during the process. But two months is a long time to keep up the normal conditions; and many little delicate handlings of Nature repeatedly wanting, may tell. Various eggs, one after another, gave undoubted signs of being addled, and were removed; and all, but not till after they were much overdue, were eventually given up. I tried to console myself with the thought that perhaps the whole batch, this season, might be barren eggs, and thus afford a possible reason why the bird was the more readily disturbed. Experience has since showed that the reason would have failed had the fact proved so. All my disappointment and mortification returned in full, when, on preparing the eggs for specimens, by emptying the contents, I found, altogether, a large number of embryo chicks, in various stages of development,—several with beak, claws and plumage complete,—apparently just ready to break through the shell! The process must, therefore, have gone on properly in the incubator, very nearly to maturity; but I very much doubt, from subsequent experience, whether any of these, if healthily hatched, could have had strength to have been healthily reared.

I think I may say my adult birds continue to improve in manners and plumage every year, so far. The first egg this season was dropped on the 23rd of December, 1863, as usual, in the first place, down by the water side. Another was not found till nine days afterwards, namely, on New Year's Day, and the third not till the 12th of the month. One, however, was subsequently found, down by the water, in a dirty condition, that had evidently been long laid, which probably intervened, and possibly more than one may have been lost. The two next eggs occupied four days each, and then the laying proceeded every third day, with the accustomed regularity, and the observance of the average time of four o'clock in the afternoon. The total number laid this season does not nearly reach to last; but they have annually increased in size, several this year weighing over $1\frac{1}{2}$ lb. It is very curious the bird, in sitting, kept the precise anniversary of the year before last, namely, St. Valentine's Day, the 14th of February. The number of eggs he was settled upon, in the first place, was ten. Extra precautions had this year been taken to shut out any unusual sight or sound, and promote perfect quiet, by the erection of a double screen of evergreens before the house, and a bar was respectfully placed on the proprietors of boats, not to pass beyond a certain point for the necessary period.

The bird sat, if possible, more closely than usual; so much so, that a sight was not obtained of the nest till the expiration of the fourth

week. It was then found to contain fifteen eggs, so that five had, during the time, been laid into it. As heretofore, the bird, after this period, became much more restless. The eggs had been marked on previous occasions, so as to endeavour to learn their individual history, but the markings had not proved permanent. This year a pigment of copal varnish and vermilion was employed, and each egg, as laid, conspicuously numbered in two places, which proved effective. In the sixth week the last laid egg was found turned out of the nest; and, as they had not always been well covered, it was not replaced. Early in the seventh week an experiment was tried on one of the eggs, in the usual way, with hot water, and it showed manifest signs of life; and the hen bird was now shut off for fear of disturbance. On the 6th of April an egg was found laid just outside the house, because she could not get in! The closing day of the eighth week the sitting bird was most uncomfortably restless throughout, and gave me much anxiety about the result, but settled again towards night. The first thing next morning I found an egg turned right out, and being a slope had rolled a considerable distance. It was stone-cold: I brought it in, however, and thought we would just try it with hot water. To our wonder and admiration it kicked—that is, the chick within it—most vigorously! Of course it was instantly replaced under the bird. The following morning *the same egg* was again found rolled out of the nest, but not to so great a distance, and it had not become so cold. What could this mean? It was again treated with hot water, and not only manifestly moved with increased strength, but a distinct *chirp* was heard inside! Again, on the next morning, three more eggs, all differing in their number to the previous one, were turned out and exposed; so it was not any particular antipathy to that unfortunate egg. They were all tried, and showed ample signs of life, and upon being placed close to the ear a strong internal movement, like fermentation, was distinctly perceptible. They were all immediately replaced. On the next morning, April 13th, the first young emeu was hatched out, to our great delight: it was No. 13, the identical egg that had been twice dislodged from the nest, and once was taken up so death-like cold! On the 14th Nos. 12 and 10 hatched out, and on the 15th Nos. 5, 11 and 7.

On the morning of the 16th a death was found to have occurred in the night. It was not one of the last three, and there was no apparent cause. I am strongly inclined to suspect it was poor unfortunate No. 13, a large strong chick to all appearances, but perhaps died from inflammation or a cold caught in the egg, from that night's exposure.

It was replaced, however, by No. 8 being hatched in the course of the day.

The day following was a day of rest. The next morning produced another, an unnumbered egg, being the first, no doubt, of the additional ones laid into the nest. The three remaining of the original numbered eggs, were now tried, found to be lifeless, and removed.

There were still three left of the additional more recently laid eggs, which would each require the corresponding multiple of at least three days for the normal time of hatching. Two of these exhibited unmistakeable signs of life, and one distinctly chirped.

The bird, with his large family about him, was now naturally very much off the nest by day. The two living eggs were therefore brought away, and exposed to the full sun (ranging from 100° to 118°) whenever it served, or kept by the fire at something over 100°, and put under the bird at night. The more forward of the above two was safely hatched on the 22nd. The other one progressed in strength daily; was heard to chirp four days beforehand, but did not begin to break out of the shell till the 28th. It was nineteen hours in completely extricating itself, and that not without some assistance from its parent, and even from its active elder brothers and sisters, to the eminent peril, apparently, of its poor little life. It was not healthily hatched, though it grew and gained in strength for several days. It had one foot cramped from the first, and, being once fed (forced with food), never took anything of its own accord. Over-heating is almost an invariable cause of weakness and cramp, and I think it had probably too much before the fire. It had to be nursed almost entirely in-doors, and during its short life became evidently much attached to those about it. Though it could only hobble at best, it would follow me when doing little matters in the sunshine about the garden, and would utter the familiar plaintive cry when I was long out of sight. It was always put back to its parent at night, and was found crushed in the nest on the morning of the 8th, aged ten days. The remaining egg was finally abandoned. Thus a brood of ten young emeus have been hatched this season altogether. One other misfortune I have to record. On returning home late from a necessary day's absence, and proceeding at once, as usual, to the emeu-house, I found one fine strong little one, the second in age I believe, stretched lifeless on the ground, from an accident, I apprehend, that further experience may avoid. The remaining seven are thriving well, grow fast, all but one appear quite healthy, and they form a most lively and interesting family. A trying period comes on at about four months of age.

It was found necessary to separate the mother bird as before, or the young ones being let out. The parents spar occasionally across the fence when anything occurs to excite them. *He* is most gentle and attentive to the little ones, and steps about amongst them with the most admirable care. Let, however, a strange dog or cat, or other supposed enemy, make its appearance, and the scene is absolutely sublime. *She* is in full sight of them, and struts about with a full pouting breast of feathers, and evident satisfaction, like a great turkey-cock. The young ones, instead of the ashy brown adult plumage, are elegantly longitudinally striped, their heads very prettily dappled; they are anything but shy, feeding freely out of the hand, and are very playful, imitating all the odd actions of the parent birds.

I draw the following conclusions, in addition to, or correction of, former observations as to the habits of these singular birds:—

1. The normal period of incubation is about sixty days.

2. The number hatched in the natural state is probably very small, though the number of eggs is so large. The eggs are probably laid about, with an affection for sheltered damp places, and when the breeding time comes the male bird gathers together the few he can find, sits upon them steadily for a month, becomes restless as soon as he feels life in them, perhaps very much exposes them to the sun for the last fortnight, and, when two or three are hatched, walks off with them away from the mother bird, leaving the rest to perish.

3. The principle of life is remarkably strong in the young bird, both while an embryo in the egg and afterwards.

It would not be right to omit acknowledging the extreme attention and active liberality of the Société Imperiale D'Acclimatation of Paris, who, through their Secretary, M. Pierre Pichot, have, in the most gratifying manner, awarded me their first-class honorary silver medal, for success so far, before the present season, in the propagation of the emeu. The medal has been duly received through the kind offices of the Acclimatisation Society of London.

Wm. Bennett.

Brockham Lodge, June 4, 1864.

Eagles in the Highlands.— On the 4th of the present month (June), when fishing on Loch Tummel, Perthshire, my son saw an eagle take a fish (of about two lbs. weight apparently) from the surface of the water. From the white tail my son concluded that the bird was a sea eagle, or erne; but he tells me that owing to the distance (some 150 yards) he could not be sure that the tail was wholly white, and not tipped with a dark band, as in the immature golden eagle. The body appeared to be

dark brown, with some white about the head. The fish was taken with the talons. A few days afterwards, when fishing in Loch Erricht (to the north-west of Loch Rannoch), my son saw an eagle settle on a high crag, on which, he was told, eagles still breed. In 1862 an acquaintance of mine saw, and narrowly missed shooting, an eagle on the high moors a little to the west of Schiehallien. Last season another friend of mine was, with his gilly, early one morning, waiting for deer in Glen Morrison, when an eagle swooped down from the neighbouring mountains, flew round them in diminishing circles, and came at last so close as sorely to try my friend's forbearance, when the gilly made some movement, and the bird was off like a flash of lightning. I cannot vouch for the ornithological knowledge of my two friends, but the first of them believed his bird to be the golden eagle. The Trosach's Hotel and the Invergarry Inn, in Glengarry, each contains (or did contain a very few years ago) a stuffed eagle, killed in the neigbourhood not long before, and both these birds are immature golden eagles. There is no mistaking the feet and the feathered legs. From all I have seen, heard and read on the subject, I believe that the golden eagle is the common eagle of the inland districts of the Highlands, although the erne may be more numerous in the maritime parts. Blue hares were, and no doubt still are, very abundant on Schiehallien and the neighbouring hills; and if they are, as is most probable, equally abundant in many other parts of the Highlands, the annual destruction of lambs by the few eagles now remaining in Scotland can scarcely be large. I suppose the grouse-shooter in Scotland considers the blue hare as great a nuisance as the game-preserver in England does the rabbit, and if left for the eagles the lambs may escape. — *Henry Hussey; The Deanery, Peterborough, June* 20, 1864.

Osprey near Beverley.—A most beautiful old female specimen of the osprey (*Falco haliaëtus*) was shot within a few miles of Beverley, by Mr. Kemp, gamekeeper, of Skerne, on the 4th of May, 1864. The bird was shot nearer to Driffield than to Beverley, but still only about twelve miles from the latter town. It had no doubt been feeding on trout taken from the far-famed stream that runs close to the town of Driffield, so well known to most followers of the gentle art. Never having previously seen a specimen of the osprey in the flesh, I was naturally enough delighted to have an opportunity of dissecting one, and this I was enabled to do by the purchase of the fine specimen above recorded, which has since been beautifully mounted by our able taxidermist, Mr. R. Richardson, of Beverley. Referring to my notes taken at the time of the dissection, I find jotted down the following remarks. "The bird presents perhaps the most marvellous combination of concentrated power and activity I ever beheld in a form of flesh and blood, measuring 2 feet from tip of bill to tip of tail; its huge wings rather exceed 5 feet 5 inches in their span. Whether we consider the development of the bones, with their ridges and processes for the attachment of those muscles called into play during flight,—the enormous power of the muscles themselves, when compared with the same muscles in other birds,—or the primary feathers of those wonderful organs of locomotion, that rival the whirlwind in their proportionate powers and speed,—we find subject, indeed, for wonder and admiration—evidence most striking of the surpassing design and wisdom of that great Creator who has fashioned all these beautiful objects of Nature, and supplied them so bountifully with the means of enjoyment and usefulness in life. The greatest concentration of power in this bird is to be found in the leg and foot, whose resistless force and grasp may to a certain degree be appreciated by an endeavour to prize open the talons within several hours after death,—which, in the act of death, had been spasmodically flexed upon them-

selves. This cannot be accomplished without first severing across the tendons of those muscles that in life endow the talons with their enormous prehensile power. The talons laid back or extended from the sole of the foot, we find the under surface of each toe and the sole or ball of the foot itself clothed with a cuticle so rough and horny, in texture and arrangement, that it more resembles a file than any organic structure, each separate epithelial particle being drawn out to a rigid, tooth-like point. This roughened palm and resistless grasp enables the osprey to hold with ease the slippery prey on which it feeds, and, without apparent effort, to set its struggles at defiance even during flight. The shank of the leg is shorter and at the same time thicker, in proportion to the size of the bird, than in any other species of the great falcon family. This, too, lends power to the limb, and, as the skin and fibrous expansion that binds the tendons in their places are also immensely thickened and strong, the whole arrangement presents one of the most striking examples of concentrated strength, and perfect aptitude for its appointed offices, that we can meet with in creation. The unusual mobility and length of the outer toe also, which can voluntarily be advanced or drawn backwards, adds still further to the prehensile power of the member. The grasp of this outer toe is much increased by its unusual relative length, which is not far short of the middle toe, the proportion being as follows, *viz.*, middle toe, $1\frac{3}{4}$ inch; outer toe, $1\frac{1}{4}$ inch. The general condition of the bird was unusually good for a bird of prey whose body generally appears rather muscular and lean than fat. This specimen must have lived in clover, and fed leisurely for some time, as it was both muscular and fat. Dissection proved the sex female, and one fully mature; but although this is about the nesting time of the osprey, and several of the ova were as large as good-sized peas, no other bird of the species has been observed in the neighbourhood, in spite of a very sharp look-out I have established, in order to detect the male in case that my specimen had been paired. The crop of this female osprey was distended with food. This seemed to be chiefly the soft parts of fresh-water fish, mixed up with a few bones, apparently swallowed inadvertently with the soft parts, rather than as food, or to serve any other purpose in the process of digestion. From the pulpy state of the fish in the crop shortly after death, I should suppose that organ to be endowed with glands secreting a fluid which possesses a certain solvent effect on the food lodged within its cavity. This is, however, merely a supposition on my part, arising simply from the condition of the contents of the crop as I observed them. This bird cannot have fed very long before it was shot, which probably accounts for the peculiar manner of its flight. The man who shot it states that it was flying about twenty feet from the earth, certainly not more, when he shot it. The food at the time of death was in the act of passing from the crop to the stomach: the ventriculus succenturiatus and first portion of the stomach had become nearly filled with matters precisely similar to those found in the crop, and in an exactly similar condition as to their consistency. The stomach itself was peculiar, being somewhat similar to that of the smew, goosander, &c. (all fish-eating birds), but curiously enough exhibiting the order of its parts reversed, *viz.*, the thicker or more muscular portion attached to the ventriculus succenturiatus and œsophagus instead of to the bowel, and the purely digesting, thin, almost transparent portion attached to the bowel instead of to the gullet, &c. Why this reversal of parts it is difficult to surmise, unless indeed it be to insure a more perfect solution of the food previous to its being passed onwards for the purposes of assimilation. The food, first pulped thoroughly by the combined action of solvent fluids and mechanical muscular force, is

lastly subjected to the action of more perfect solvents, which complete the softening process so rapidly as to admit of the food being directly applied to its ultimate end on passing from the stomach. The osprey, whose powerful muscles and active habits, under various circumstances, require great and frequent sources of restoration, needs a more rapid and perfect digestive process than those other fish-eating birds which continually dwell on the watery element, and whose powers of flight and endurance are not so constantly and severely taxed. The intestine was no less than 12 feet 4 inches in length (good measurement). I have preserved the stomach in spirits of wine, and intend making a series of preparations of the stomachs of various species of birds, for the purpose of comparison, &c.— *W. W. Boulton; Beverley, May* 20, 1864.

Peregrine Falcon at Flamborough.— I have this day (May 20) received a splendid and unusually large specimen of the peregrine falcon, in the flesh. It was shot close to Flamborough, by Thomas Long, of that place, on the 18th instant. Dissection proved it to be a mature female. The stomach contained the remains of a rock pigeon, which included, amongst other portions of the bird, one entire foot and shank, and a few feathers. An old male bird, which had probably been paired to my specimen, has been seen in the neighbourhood of Flamborough since mine was shot, but hitherto it has escaped capture.—*Id.*

Peregrine Falcons taken at Beachy Head and Seaford Cliffs. — I have just seen three fine young peregrines, taken at the above places about a fortnight since, by Mr. Collins, of Meads, Eastbourne. Four were taken from a nest in the Seaford Cliffs, and three from one in the high cliff between Beachy Head and the Lighthouse. Six have been purchased at £1 each.—*J. Dutton; Eastbourne, June* 11, 1864.

Montagu's Harrier near Weston-super-Mare. — The beginning of this month a fine female Montagu's harrier was trapped upon Brean Down, about two miles to the west of this place.—*M. A. Mathews; Weston-super-Mare, June* 10, 1864.

Redwing Singing in England. — Several times it has been my fortune to hear the song of the redwing. Indeed I never thought that it was at all unusual for the redwing to sing here before it left in the spring, and so, on the occasions when I heard it, I had not considered it a circumstance worthy of particular note. On fine sunny mornings in March I have often, in North Devon, heard the redwing singing from the top of some tall hedgerow tree. I am quite certain that it *was* a redwing on each occasion, as I not only plainly distinguished the bird, but also was attracted to look upwards in order to discover whence a sweet, soft song, which was new to me, proceeded.—*Id.*

Redwing Singing in England.—I have just returned home, after passing the winter in the sunny South, and on reading up the last six numbers of the 'Zoologist,' which have accumulated during my absence, I am surprised to see so much doubt cast upon the accuracy of a statement made by the Rev. A. Matthews respecting the singing of the redwing in England. Granted that it is not the *usual* habit of this bird to favour us with much of its song during the cold months of winter, when alone we have an opportunity of observing it; yet when we recollect the high character as a first-rate songster which it bears in its own native country, and the great reputation it has there for melody, sweetness and power of voice, and that of so high a class as to have procured it the *soubriquet* of the "Swedish Nightingale," I think it is not unreasonable to conjecture that on occasions—such as the mildness of the weather, the bright sun, or other favourable circumstances may call forth—the redwing will indulge us with a specimen of its rich and powerful song, wherewith it notoriously is wont to gladden

the hearts of Scandinavians during their bright and nightless summer. That it does occasionally so honour us the assurance of so excellent an ornithologist as Mr. Matthews convinces me, though the occurrence may possibly be infrequent, and so may escape the notice even of careful observers. But I apprehend that there are many facts yet to learn with regard to the song and habits of even our commonest birds, and that on the part of those who have watched them for years; at least so my own experience assures me, for I am continually finding out new traits, and discovering peculiarities hitherto unnoticed even in those species which frequent my own garden, and with which I thought myself most familiar; and so I shrewdly suspect it will be to the very end of the chapter, for of Natural History it may be said, perhaps more truly than of anything else, "There are more things in heaven and earth, Horatio, than are dreamt of in your philosophy."— *Alfred Charles Smith; Yatesbury Rectory, Calne, June* 11, 1864.

Song Thrush's Nest on the Ground.—The site which Mr. A. S. Bradby (Zool. 9108) mentions as having been chosen by a song thrush for its nest is, as far as my observation has gone, not at all an unusual one. The bottom of a hedge, or a ledge on the bank of a ditch or stream, is frequently preferred to a bush or tree, perhaps as being less easily found by nest-hunting boys, who in many places (especially near London) are far more destructive than rats or mice. Macgillivray ('History of British Birds,' vol. ii. p. 135) says that the nest "is placed in a thick bush of any kind, or in a hedge, at a small height, or on a rough bank among shrubs or moss. In the unwooded parts of the country it is found under shelter of a projecting stone or crag, or in the crevice of a rock, or at the root of a tuft of heath, or among the stunted willows on the rocky bank of a stream." So also in 'Birdsnesting,' p. 10, it is said to build on the ground; but Yarrell and some other authors take no notice of the occurrence, common as it is.— *Charles Bygrave Wharton; Aspen Lodge, Sudbury, Middlesex, July* 11, 1864.

Lesser Redpole's Nest near Chester.— On the 12th of June, 1864, I found, in a lane near Chester, a lesser redpole's nest. It was built in a hazel-bush, and made of twigs and moss, lined with willow-down. At first I had some doubts as to what species it belonged, but at last I saw one of the old birds, with whose song I am well acquainted. There was only one egg in at the time, and on visiting the nest again I found that it had been pulled. The egg was greenish blue spotted with orange, principally at the large end. Is it not rather far south for this species to breed?— *J. Hamilton; Manchester.*

Nesting of the Mountain Finch or Brambling (Fringilla montifringilla) *in Yorkshire.*—I have before me a nest and egg, with the description of the mother bird, which leave no room for doubt that the brambling has nested this year in a wild state with us. The nest was first noticed in an early stage of its construction, on the 13th of April. It was built at a height of about six feet from the ground, on the side shoots of an oak tree and close to the trunk, the materials employed being principally moss and wool, with an intermixture of brown hair, a few stems of dry grass, and some silky-looking substance which is probably the inner bark of some plant, perhaps a thistle. The lining is of white hair and feathers, beneath which wool shows more abundantly than the moss. There were in all six eggs in it, and the bird was very shy, and soon forsook the nest on finding itself observed. Hewitson's illustration of the egg of the brambling might very well have been taken from the egg now before me, but the peculiar plumage of the bird, which was well and closely observed,

renders the identification quite positive. The nest, which was met with in Baldersby Park, near Thirsk, was, together with the accompanying eggs, forwarded to me by the Hon. Guy C. Dawnay, to whom also I am indebted for the careful observations which have enabled me to record this fact.—*J. C. Atkinson; Danby in Cleveland, July* 2.

Extraordinary Arrival of Starlings to Ireland in June. — On the 28th of June I saw three large flocks of starlings come across the sea as if from the Welsh coast, due east, and pass over this island in a westerly direction. The next day four flocks were seen by a fisherman to pass in the same direction. It is nothing unusual for me to see, in severe Novembers and Decembers, thousands of starlings, skylarks, thrushes, fieldfares, redwings, linnets, greenfinches, &c., pass over in the same way from east to west; but to see starlings arriving while the hay is making is quite strange to me. For about a fortnight back I have seen a flock of these birds frequenting some fields in the neighbourhood of the Beggar's Bush Barracks, Dublin. Of this circumstance alone I had intended to send a note, the congregating of these birds so soon as the 18th of June being, I think, unusual. The starling rarely breeds in this locality. I am well aware that starlings, before roosting, fly about their breeding haunts in flocks, but have never before seen them feeding in flocks in the fields so early as the date I mentioned.—*H. Blake-Knox; Bartragh, Dalkey, Co. Dublin, July* 2, 1864.

Avocet near Chichester. — On the 27th of June an avocet was killed in a tide-mill pond at Sidlesham: it proved on dissection to be a male. The gizzard contained nothing but a few small stones. The feathers were much worn. This specimen is now in my collection. I am not aware that a bird of this species has been killed about here since June, 1859, when one was shot in the same pond. — *W. Jeffery, jun.; Ratham, Chichester, July* 8, 1864.

Cuckoo's Egg in Reed Warbler's Nest. — We have not many reeds in this part, consequently the reed warbler is a scarce bird. I only know of one reed-bed near Chichester where it is to be found. In that place last year one man took five or six cuckoo's eggs, and one or two young cuckoos, from nests of the reed warbler. This year he has only taken one nest, and that contained two reed warbler's eggs and one cuckoo's; these were partially incubated; so that either the reed warbler only laid two eggs, or the cuckoo ejected some when it deposited its own. Yarrell does not give the reed warbler in his list of nests in which the egg of the cuckoo has been found, and Morris makes no particular note of it; so that this seems to be an exception to the general rule. Perhaps some correspondent living where the reed warbler is more abundant can enlighten us on this subject. — This was written before I saw Mr. Mitford's note (Zool. 9109).—*Id.*

Occurrence of the Spoonbill in Dublin Bay. — On the 10th of last March I had the pleasure of noting the occurrence of the spoonbill in this Bay. Four examples, evidently much fatigued, alighted upon a rock a few yards distant from the coast. Being in my boat I approached within about ten yards of the rock, and had a magnificent view of these rare visitants. Like the heron, they stood, with crouched heads, upon one leg, the other being buried in the plumage of the abdomen. After sitting thus motionless for the space of about a quarter of an hour, they flew in a northerly direction, most probably to the strand, or "slob," at Dolly Mount. Their flight was from the south-east."—*H. Blake-Knox; July* 2, 1864.

Ringed Guillemot at Flamborough.—On the lofty limestone cliffs of Flamborough thousands of various species of sea-birds congregate during the breeding season. No species is more abundant than the common guillemot, and yet it is quite an

exceptional circumstance to meet with its close congener, Uria lacrymans. It is three years since I obtained a specimen of this latter species, and the bird had been shot and stuffed several years previously. It had been shot on the cliffs of Flamborough. On May the 20th of the present year I purchased a fine specimen of Uria lacrymans in the flesh. It had been shot the day before (May 19th), by Robert Cross, of Flamborough, from a boat, as it was sitting on the water just outside the principal cave. It is a rather remarkable circumstance that Robert Cross had been out with a party shooting sea-birds for several hours. They had failed in bagging any bird worthy of special interest, and, having expended all their ammunition, with the exception of a single charge, were returning home. A guillemot was observed by one of the party on the water at the very mouth of the principal cave, and Cross, the owner of the last "shot in the locker," was requested to bring it to bag. This he succeeded in doing, and the bird proved to be an unusually rich specimen of the ring or bridled guillemot, which I have since added to my collection. On dissection I found it to be a mature female.—*W. W. Boulton; Beverley, July* 8, 1864.

Errata. — In my paper on the Birds of Eastbourne (Zool. 9096), for "Ampton Place" read "Compton Place," and for "Boxhill" read "Bexhill."—*John Dutton.*

Proceedings of Societies.

Entomological Society.

July 4, 1864.—A. R. Wallace, Esq., V.P., in the chair.

Additions to the Library.

The following donations were announced, and thanks voted to the donors:—'Proceedings of the Royal Society,' Nos. 62, 63 and 64; presented by the Society. 'Journal of the Proceedings of the Linnean Society,' Vol. viii. Botany, No. 29; by the Society. 'The Journal of Entomology,' No. 10; by the Proprietors. 'Catalogue of the Coleopterous Insects of the Canaries, in the Collection of the British Museum,' by T. Vernon Wollaston, M.A., F.L.S.; by the Author. 'A Treatise on Insects injurious to Gardeners, Foresters and Farmers,' by Vincent Köllar: translated from the German, and illustrated by engravings, by J. and M. Loudon, with Notes by J. O. Westwood, Esq., F.L.S., &c.; by James Bladon, Esq. 'Sitzbungsberichte der Königl. bayer. Akademie der Wissenschaften zu München,' 1864, I. Heft. 1, 2; by the Academy. 'Exotic Butterflies,' Part 51; by W. W. Saunders, Esq. 'Horæ Societatis Entomologicæ Rossicæ variis Sermonibus in Rossia usitatis editæ,' Fasciculus secundus; by the Entomological Society of Russia. 'The Intellectual Observer,' No. xxx.; by the Publishers. 'The Zoologist' for July; by the Editor. 'The Entomologist,' Vol. ii. No. 3; by the Editor. 'The Entomologist's Monthly Magazine,' No. 2; by the Editors. 'Stettiner Entomologische Zeitung,' Vol. 25, Parts 7—9; by the Entomological Society of Stettin. 'The Journal of the Society of Arts' for June; by the Society. 'The Reader' for June; by the Editor. 'The Athenæum' for June; by the Editor.

The following addition by purchase was also announced:—'Entomographie de la Russie,' par Gotthelf Fischer. Tomes 1—3.

Exhibitions, &c.

Prof. Westwood directed attention to a paper in the second part of the 'Horæ Societatis Entomologicæ Rossicæ' on the parasites of bats: not only were several species of Pulicidæ and of Nycteribia enumerated, but also species allied to the latter, yet differing so much in structure as to necessitate the creation of new genera (or subgenera); he might remind the members present of the extraordinary mode of transformation of Nycteribia, the larva state being passed within the egg, which was not extruded from the body of the female until after the pupa state had commenced.

Mr. A. R. Wallace mentioned that he had found Nycteribiæ in the tropics, but not in large numbers, though probably a sufficient examination would show that each species of bat was infested with its own peculiar species of Nycteribia.

Mr. Tegetmeier exhibited one of the frames from the bee-hive, mentioned in the minutes of the previous Meeting, in which wax had been secreted for the purpose of repairing the old comb and fastening it securely, with a view, as he thought, to future occupation of the hive. He added that the expected swarm had not taken possession, for the recent cold weather had killed the young queens, and the hive from which had issued the bees which did the repairs had not swarmed at all.

Mr. A. R. Wallace inquired what evidence there was of any purpose or design of taking possession of the empty hive? Had not the bees simply obeyed a mere impulse to make wax?

Prof. Westwood asked whether it was certain that there had not been a "false swarm," or that the queen had not been accidentally killed? If Mr. Tegetmeier's hypothesis were true, that the bees, without a queen, had repaired the old combs with the intention of taking possession of them, how was the swarm to compel the queen (who was commonly supposed to lead the swarm) to carry out their design and enter the repaired hive?

Mr. Tegetmeier replied that it was a common occurrence for bees to visit a tenantless hive, in which comb was left, and clear out the refuse, after which a swarm would take possession of the hive: in the present case the existence of the new wax was indubitable, the scales on the floor-board showed that it had been recently made in the hive, and it was found in those places, and those only, in which the old combs had become detached from the sides of the frame and required support. If a queen had entered the hive she would immediately have laid eggs, and the bees would then have remained. He believed that bees somehow or other decided beforehand upon the place of which, on swarming, they would take possession; it was difficult otherwise to account for the perfectly straight and rapid flight of a swarm to a window or other suitable spot, such selected spot being often at the distance of a mile or two from their starting point. His view was that the swarm carried the queen, and not that the queen led the swarm.

Mr. Tegetmeier also exhibited a number of pieces of comb of the honey-bee showing singular formations of cells; the specimens had been picked out of heaps of old combs, and were not the result of special experiment or of artificial manufacture. One piece of comb contained a row of sixteen central (not marginal) cells which were pentagonal, two of the angles being right angles; a second piece contained a group of cells, some pentagons, some hexagons, of various degrees of irregularity, in the middle of a mass of the regular hexagonal form; a dependent piece of old comb had had formed on its edge a number of shallow cells which were nearly hemispherical cups,

and which gradually ran into the hexagonal shape where they came in contact with the regular cells of the old comb; other pieces contained cells which appeared to be circular-cylindrical; and a specimen of comb containing three queen-cells had on each of those cells a number of hemispherical excavations. Mr. Tegetmeier was of opinion that the cell of the hive-bee was invariably hemispherical at its commencement, and a section of a cell which was not in contact with other cells was always circular; hemispherical cups or depressions were hollowed out, these excavations were made near to one another, almost in contact, and the bees enlarged them until they came in contact; the enlargement being continued to the full extent possible (or, in other words, the bees gnawing away all the material so far as was consistent with the integrity of the comb), the cells of necessity assumed the hexagonal form. He did not believe that the pressure of contiguous cells upon each other had anything to do with the form of the cell, nor did he believe in the existence of a "hexagonal instinct" or "geometrical instinct" in the bee; the hexagonal form was a consequence of the property of space that, of seven circles of equal radii, six will just surround the seventh; if it had been the case in nature that seven circles would just surround another of equal radius, then the cells of bees, when in contact, would have been heptagonal, instead of hexagonal.

Mr. F. Smith remarked that Mr. Tegetmeier's observation that a cell was invariably commenced as a hemisphere, if true of the hive-bee, was not true of all wasps, those, *e.g.*, which built dependent nests, starting from a flat or plane base.

Mr. F. Smith read the following account, supplied by Mr. S. Stone, of Brighthampton, of the manner in which that gentleman had induced a colony of wasps to construct the series of six nests, of extraordinary shapes, which were exhibited at the previous Meeting of the Society:—

"About the middle of the month of August, 1862, a large nest of Vespa germanica was taken by a person residing at Stanlake, a village adjoining Brighthampton. It was brought home by him, tied up in a handkerchief, and deposited for the night in a room in his house. In the morning word was sent me that if I could go down and fetch it away I might have it. Now it so happened that I could not go that day or the next, so it was allowed to remain where it was; but, as might have been expected, the insects very soon found their way through the handkerchief in which the nest was enclosed, completely riddling it, when a second was tied round it, which of course soon shared the fate of the first. It was then placed in a sack, such a one as those used by farmers or millers, through which they were not long in making their way, although they must have found it tougher work than eating through the handkerchief. The sack with its contents was next put into a hamper and tied down. On the third day I had an opportunity of sending for it, and on its arrival proceeded to remove the different coverings, and make some arrangement for placing the combs contained in the nest (which, in consequence of the treatment to which it had been subjected, was of course in itself a complete ruin) in a more favourable situation for work than the one they then occupied. This was a ticklish piece of work, but somehow or other I managed to separate two or three combs from the mass, which I reduced in size with a pair of scissors, and running a wire through them placed them inside a small square box (No. 1 of the series), the combs resting on the bottom of the box and the wire reaching from thence to the top: I then fixed the box in the window of a room, making an aperture through the back of the box to correspond with one in the window, for the purpose of allowing the insects to pass out and in. The front of the box was of glass, moveable at pleasure, by means of which I could introduce a constant supply

of sugar. I now collected together, in the best way I could, the workers belonging to the nest, and introduced them into the box; they numbered, I should think, somewhere about three hundred, and as the box contained only three small pieces of comb it was only possible for a limited number to work at them: the consequence was, that by far the greater number, after providing themselves with materials, were compelled to work wherever they could find room: the wire and all the sides of the box, except the glass front, which was frequently being moved, were speedily covered with the paper-like fabric the produce of their labours. The insects were placed in the box on a Thursday afternoon, and on the following Saturday the work had proceeded, and was proceeding so rapidly that I could perceive if, I let them go on till Monday, the box would be filled with a mass of work without beauty or design, so I determined upon fitting up another box in a somewhat similar way, and causing the insects to pass into it from the one they then occupied. I accordingly cut two or three more pieces of comb, and passing a wire through them suspended them inside a box (No. 2 of the series) of about the same size as the first, and similar thereto in other respects; then by tapping upon and shaking box No. 1, I caused most of the insects to leave it and pass out through the aperture in the window into the open air, then, by means of a sliding door, preventing their immediate return, I took box No. 1 away, and in its place put box No. 2; then, withdrawing the slide, the insects crowded into it and with seeming unconcern began working away as before. The combs not resting upon the bottom of the box, as in the former case, but being raised an inch or two above it, caused the workers to form a structure differing considerably from the first. On the following Wednesday the work had become so far advanced that I found it necessary to provide the workers with a fresh box; a larger one (No. 3 of the series) was therefore procured, and fitted up much in the same way as the last, and the insects were introduced into it in the same way as before; in seven days a structure somewhat resembling the last, but much larger, was raised, when another box (No. 4 of the series) was procured; this was provided with a moveable wooden back, which, when the building was finished, was replaced by one of glass. The box was fitted up in a way quite different from the preceding ones: two rows of pillars formed of wire, four in a row, the rows being about two inches apart, reaching from the bottom to the top, were placed at regular intervals across the box; at the base of each pillar, and also at the top, a small piece of comb was fixed. The filling up of this design occupied the insects fifteen days, when another box (No. 5 of the series) was procured: this was fitted up in a manner differing somewhat from the last; four pillars were placed across the box, a little behind the middle, and two a little in advance, while between the two a short one, three or four inches only in height, was inserted, at the top of which, but not at the base, a small circular piece of comb was placed, while at the bottom as well as the top of the other columns pieces of comb were fixed: the erection of the singularly beautiful structure contained in this box only occupied the workers five days, when a fresh one (No. 6 of the series) was procured, fitted up in nearly the same style as the last: in other five days they raised a structure very similar to the preceding one, when they were shifted into a much larger box, fitted up in nearly the same way as the two previous ones had been, but the weather becoming cold they did not make progress enough to bring their work in this box to anything like perfection.

"One of the chief objects wasps have in view in their building operations is to enclose the combs so as to ensure as high and as uniform a degree of temperature as may be,—a thing essential in the hatching of the eggs and the well-being of the larvæ

when produced: thus by placing combs or pieces of comb in particular positions the insects are literally compelled, in their endeavours to cover them in, to carry out the design of the person so placing them.

"One reason why the work was not attached either to the back or front of cases 4, 5 and 6 was, that the pillars or columns were placed at some distance from each of those sides, and as there were no intervening combs, or pieces of comb, to be covered in, the operations of the insects did not extend in either of those directions sufficiently far to reach them during the period they were allowed to remain in each box."

Mr. Stainton exhibited a new Gelechia, allied to G. nigricostella, and for which he proposed the specific name of Lathyri, the moth having been bred by Mr. Brown, of Cambridge, from larvæ which fed on Lathyrus palustris.

Prof. Westwood mentioned that the larvæ found by Captain Cox in a bin of bran, and exhibited at the Meeting on the 2nd of May last, had proved to be Pyralis farinalis.

Paper read.

Mr. Roland Trimen, of Cape Town, communicated a paper entitled "Descriptions of some new Species of Butterflies found in Southern Africa." Sixteen species were characterized, one of which belonged to the Pieridæ, one to Satyridæ, six to the Lycænidæ, and eight to the Hesperidæ. Ten out of the sixteen were discovered by Mr. James Henry Bowker, Inspector of Mounted Police, who for several years has devoted his leisure to the observation and collection of the Flora and Fauna (especially the Lepidoptera) of Kaffraria.

New Part of 'Transactions.'

A new part of the Society's 'Transactions' (Third Series, Vol. ii. Part 1), being the second quarterly Part for 1864, containing Major Parry's Catalogue of the Lucanoid Coleoptera, with descriptions of new, and remarks on some of the rarer, species, and illustrated with twelve plates, was announced as ready for distribution.—*J. W. D.*

Scarcity or Abundance of Wasps in 1864.—I partly agree with my friend Mr. F. Smith (Zool. 9137) as to the causes in this case: at present the wasps are becoming numerous in this locality earlier than usual, owing to the dryness of the spring. I had a nest in my lawn with more than a hundred young wasps on the 1st of July: this is early. Nothing is so inimical to the queen-wasps as a wet spring: they generally make their appearance between the 15th and 20th of April, and should a cold, wet month follow this at least three-fourths of them die. A vast number appearing in April or early in May is no criterion of their abounding at the end of the summer; but I am of opinion that wasps will be very numerous in Gloucestershire this summer, as the nests are being found in great numbers in all directions. Another observation made by me is this, that when on a visit to a friend in Hampshire in August, twenty-five years ago, I found wasps very numerous and mischievous to the wall-fruit; while at the same time, in Gloucestershire, wasps were exceedingly scarce, and no annoyance whatever. I have also found a very open, mild winter, with continuous rain, a very great cause of the diminution of these insects in the following spring, and indeed of all the Hymenoptera. A smaller and darker species, I have noticed, is very rare, and seldom appears except in dry seasons.—*H. W. Newman; Hillside, Cheltenham, July,* 1864.

The Badger: its period of Gestation.

It were much to be wished that some competent observer, who, like Gilbert White, should be totally uninfluenced by the desire to make a book, would devote his time and attention to the life-histories of our British sucklers. I scarcely know of any field of inquiry in which so rich a harvest of facts is to be reaped. As subjects for especial interest, I need only allude to three,—torpidity, food and period of gestation,—in order to show how little is known. We find it repeatedly asserted that the badger is a cleanly animal, emitting a disgusting odour, living under ground, baited by dogs, and given to somnolency; but we are left to conjecture whether the existence of these peculiarities has really been observed and confirmed; or whether, in our veneration for ancestral lore, we have transferred them from book to book, without taking the trouble to ascertain if they are facts or fictions.

These thoughts have often disturbed my peace of mind. I have repeatedly asked myself whether Natural History is to remain a science of book-making, or whether we are to elevate it to a science of observation. Is it not possible to effect the latter? Does not the continuous demand for new editions of the "Selbourne" clearly demonstrate that the demand for fact is quite equal to the supply? Can the best of compilations on Natural History boast a like demand? Say, for instance, Bingley's 'Quadrupeds' or Bell's 'Quadrupeds.' Both these have, in addition to the vast erudition they display, the immense advantage over White of admirable illustrations, yet we have no second, much less any fortieth or fiftieth, edition of these volumes. We naturalists complain bitterly of want of patronage; we form joint-stock companies for the purpose of bringing out our compilations; and why? simply because we know they will not sell: so we appeal to the affluent to take pity on our incompetence, to gratify our self-esteem. No man would beg a joint-stock company to publish his book if he had any faith in there being a remunerative sale for it. It is the real experimental knowledge that these heavy compilations are invariably still-born that compels a man to sue *in formâ pauperis*. He grows old and wears out in his search for a *patriotic* publisher, who will take the risk, and in sheer despair offers his compilation to a joint-stock company, the result of whose patronage will, after all, be to bury his labours in oblivion, for against the public, the real consumer of intellectual wares, the publications of a publishing company are hermetically sealed.

These remarks arise naturelly enough out of that particular inquiry which I have selected as a title for this paper; it is one to which my attention has been repeatedly called by the following paragraphs selected from the 'Field' newspaper. Have we really no observers capable of solving so simple a problem? Must we ever rely on what "An Old Bushman" calls "general opinion"? The modification "general opinion *here*" leaves the context equally vague. Would he himself be satisfied thus entirely to ignore the foundation of all Science, observation?

I appeal to the readers of the 'Zoologist': not merely to every principal town, but to every village, to every hamlet, whither the 'Zoologist' wends its way: surely it is not too much to expect that, amid such a host of readers, some scraps of reliable information may be gathered, and, when gathered, preserved in these pages for the use of naturalists yet unborn.

EDWARD NEWMAN.

Period of Gestation of the Badger.—Being an old sportsman, and a constant reader of the 'Field,' I take considerable interest in your columns on Natural History; and as I have had pretty good opportunities of watching the badger, I propose to give you the result of my observations, hoping that by so doing I may induce some more learned man than myself to explain its habits, food, time of gestation, &c. About the year 1831, as I was looking after the game in Weston Wood, about four miles from Leamington, I footed a badger over a sand-hill full of rabbit-holes, and tracked it into a hole. I put a terrier in after it, and as I heard a hot engagement going on between the badger and the dog, I set to work to dig them out. After bagging the badger, I took it to Weston Hall and turned it loose into a perfectly secure hothouse. The badger lived there on rabbits, meat, milk and water for thirteen months, and then one morning we found her suckling one young one. Of the performances of this young one I can give you several anecdotes in a future letter, if you wish it, as it was raised by hand in a farm-house, and shared the hearth-rug with some pet dogs. I much regret that I am not able, at this distance of time, to say what month the badger was caught in and what month she whelped, as I made no memorandum of it at the time. But I am quite sure she was confined in a perfectly secure place for thirteen months before she dropped her cub. If a badger could have got into her place she could have got out; therefore I am anxious to know what is the period of a

badger's gestation. It is just possible she might have been in the family way some time before she was caught. I think it is not generally known that the badger delights as much in devouring a wasp's nest as a bear delights in robbing a bee-hive. I have footed many a badger up to a wasps' nest, and have seen the hole he has scratched to get at it. A few yards off I have noticed where he sat down to eat his buttered toast. Are their skins proof against the venomous sting of a wasp?—*Frederick Heycock; Bedford.*

[As far as we are aware there is no authentic account of the period of the badger's gestation. Several instances are on record of badgers having produced young in confinement, but when the young were begotten no one could tell. In the 'Field' of April 6, 1861, Mr. Henry Shaw, of High Street, Shrewsbury, gives an account of a fact very similar to that now reported by Mr. Heycock. It was as follows:—"A badger which has been in confinement since April 3, 1860, at Haughton Hall, Salop, brought forth on April 12, 1861, two young ones alive, which appear scarcely to have arrived at maturity; unfortunately, both have died since. The badger was taken in Cornwall, and sent per rail to the above place in a box, since which time she has been confined in a place where nothing could by possibility get at her." In reply to Mr. Shaw's question as to the ordinary time of gestation, "An Old Bushman" stated in the 'Field' of May 11, 1861, that "the female goes with young never longer than ten weeks;" but the only evidence he gives is that the male and female come together early in November, and new-born young are found at the end of February (which really amounts to some thirteen or fourteen weeks). This fact, however, would be as compatible with gestation lasting about fifteen months as with its lasting only three months, unless there were some means of identifying the individuals, which we do not see could be effected with certainty by any other means than by keeping them in confinement. Have any other of our readers evidence to offer? and have female badgers containing young been killed during the summer months? which would not be likely to be the case if "An Old Bushman's" statement be correct.—*Ed. of 'Field.'*]

Period of Gestation of the Badger.—In answer to Mr. Heycock's inquiries about the period of gestation of the badger, I dug out a male and female badger from a small earth last year in the month of April. I kept the female until the end of June, when she died. On opening her I found three young ones distinctly developed; so that the mother

must have gone the greatest part of her time in young. These badgers had deserted a very large and strong earth, although it had not been disturbed, and had taken up their quarters about half a mile off, in what seemed to be merely an enlarged rabbit-hole. I have often heard of the great age a badger lives to; is there any good evidence of this? —*S. E. S.; Christ Church, Oxford.*

[Our correspondent's expression, "distinctly developed," is far from clear, and might apply to the condition of the fœtus at a very early period. All that his statement goes to prove is that in this instance the badger would have brought forth young after the month of June, and more than two months after being rigidly confined. There are two questions in dispute: *first*, what is the period of gestation in the badger, to which this case does not apply; and, *secondly*, what is the usual month of their bringing forth young, which it settles, as far as one case can, that it is not February, unless gestation lasts more than twelve months.—*Ed. of 'Field.'*]

Period of Gestation of the Badger.—I have observed your editorial remarks on this subject in your impression of June 25th, and your reference to my note of May 11, 1861. I certainly expressed myself loosely. I ought to have said "the general opinion here" is that the badger does not go with young longer than ten weeks, for I cannot prove, from personal observation, at exactly what season the male and female come together; but the idea of all the foresters round about where the badger is common is that the pairing takes place just before they lay up for the winter, and I have myself seen young ones (very small, but they might, however, have been three weeks old) dug out early in March. As to the two instances of the badger bringing forth in confinement, when she has been totally excluded from the male for a period of thirteen months, mentioned in your paper, I can offer no opinion. We must either come to the conclusion that the badger goes longer with young than, I believe, any other known animal, or that they are able to bring forth without an actual connection with the male,—which idea no one, of course, can entertain for a moment,—or that there is some mistake in the matter, which is hardly likely either. Surely one or other of those gentlemen who had the female badger in confinement, must have remarked how long the female had been in confinement before she began to show symptoms of being heavy, and this might lead us to some conclusion. But it is still my opinion that, like its nearest generic congener, the bear, the Swedish badger brings forth

once every year, in early spring, in her earth; and that, like the bear, the connection takes place during the summer or autumn (the general opinion is, just before they lay up for winter). Moreover, I never heard of a single instance of a female badger being killed at any time in the summer heavy with young, and I have asked this very question of many woodmen and hunters here; and if the period of gestation extends over a period of upwards of thirteen months, this must surely have occasionally happened. Till this is proved I shall certainly adhere to my original opinion, as above stated, notwithstanding your remark that the fact of the new-born young being found in the end of February is as compatible with the period of gestation lasting fifteen months as with its lasting only three; for I have better evidence to prove that this is the case generally with the female badger here, than I fancy you can adduce to show that their period of gestation extends over fifteen months. I will ask you this question, Do you know of any mammal in which the period of gestation lasts fifteen months? I do not; but of course there are many of whose habits I know nothing; but I believe, although that may be very different, it is the nature of every mammal of which I know anything, except perhaps in cases of accident, to bring forth at least once within every twelve months, as long as they are capable of breeding. It is strange that I am unable to find in any Natural History book to which I have access, a good account of the breeding habits of so common an animal as the badger. Since writing the above I have found an excellent treatise on the habits and the chase of the badger, by the late Pastor Ekstrom, not only one of the keenest sportsmen of his day in Sweden, but an excellent naturalist. Among many other interesting remarks on the natural history of the badger, he says: "In the middle of Sweden the winter sleep of the badger lasts generally from the middle of November to the middle of March, dependent upon the season. That this winter sleep is not deep is proved by the fact that if a long thaw sets in they will leave their earths and come out to seek for their food." (This I can corroborate to the letter). "The badger lives in a state of monogamy, but the male and female are seldom seen together except about the pairing time, and then not often. We fancy that the male seeks the female in her earth, and that she drives the male away after the union. It is hardly fully agreed at what time this takes place. Some few fancy in the spring; but others, and by far the most, say that it is in November, or late in the autumn" (and I never heard any other opinion up in Wermland). "This appears more probable, for it is only at this season that the male and female are commonly seen together. The young are born in spring. The

young badger which now lies before me was killed on June 20; it is fifteen inches long, and the milk-teeth are still remaining, which leads me to believe that it was born about the end of February. The female goes with young nine or ten weeks" (and I never have heard this point disputed), "and brings forth three to five young, which are blind for nine days. These she suckles for about three weeks, and after that they follow her through the whole summer. It is supposed that they do not attain their full size until they are two years old." The only mystery which I ever heard attached to the breeding habits of the badger here is that I never can meet with anyone who can prove as an eye-witness when the union takes place; and this is not wonderful, if, as Ekstrom says, it occurs under-ground. Every forester in Wermland with whom I have spoken on the subject, says distinctly that the pairing takes place when the old female seeks her winter quarters in the autumn. This is the only time, they say, that the male and female are seen together. If a male is killed in the summer he is always alone, and, during that season, you invariably see the old female in the forests attended by her cubs. Moreover, an instance has never been recorded here of a female badger heavy with young having been killed either in the summer or the autumn. As to the idea of their being thirteen or fifteen months with young, all our naturalists ridicule it. Is it not just possible that the two female badgers mentioned in your paper had by some means or other allured the old males to their places of confinement? It may appear impossible that such would be the case, but many things are considered to have been impossible till they are thoroughly investigated; and when men state any very extraordinary facts in Natural History, such as the present, it is a great pity they do not give us every particular. You have a Zoological Gardens in London, where the habits of almost any animal can be observed almost as freely as in a state of nature. How easily many doubts respecting their breeding and other habits could be cleared up if only the authorities and keepers of the Gardens would trouble themselves to make observations. Here is a point in dispute, which could be easily set at rest in a place nearly as well adapted for studying the habits of smaller animals as in a state of freedom.—*An Old Bushman; Sweden.*

[When the first instance was mentioned of a badger producing young after it had lived in seclusion for thirteen months, we thought, with "An Old Bushman," that there was some mistake, which, however, can hardly be explained by the supposition that the female had allured a male, for, as was remarked a few weeks since, if there were means of ingress and egress for the one, there would be opportunity of

escape for the other, which undoubtedly would have been taken advantage of. When a second instance was recorded, we thought it desirable to draw out further evidence, if possible, and accordingly added the note to which our correspondent refers. Since he wrote he doubtless will have received the 'Field' of July 9, containing an account of what he says he has never heard a single instance of, namely, a badger containing young in the summer months. We have also, in the letter of Mr. Allies (published below), two other instances of gestation extending over a very long period. The evidence sent us now amounts to three female badgers having produced young after being kept apart from the other sex more than twelve months; a fourth where the separation had lasted ten months; and a fifth which died at the end of June, and was found to contain young. We shall be glad of any further evidence tending to clear up the mystery. "An Old Bushman" asks, "Do you know of any mammal in which the period of gestation lasts fifteen months?" Of our own knowledge we do not; but it is said that gestation in the elephant lasts twenty months.—*Ed. of 'Field.'*]

Period of Gestation of the Badger.—In answer to the question, "What is the time of gestation with the badger?" I send you the following facts:—Some twenty years ago Mr. Joseph Thomas, head ostler of the Bell Hotel, Broad Street, Worcester, bought a female badger for baiting with dogs. She was constantly subject to these baiting entertainments for full ten months, when she brought forth three young ones, two of which were reared up to twelve months old, and then sold to go to the Surrey Zoological Gardens. The owner of the mother-badger was ignorant of her interesting condition, or I feel sure he would not have allowed such cruelty to be practised. A very respectable gentleman of my acquaintance says that he had a badger in his care in confinement for more than twelve months, after and about which time she proved to be with young, which were brought forth alive and well.—*Frederick Allies; 8, Foregate Street, Worcester.*

Note on the Byblus-Bok.—In the same plate of Speke's sketch, that excellent animal-artist, Mr. Wolf, has given the figures of a fine antelope, called nzoé or "water-bok." The male of this species bears a pair of noble, long, twisted horns, and he is said to be "closely allied to a water-bok found by Dr. Livingstone on the Ngami Lake." It is an aquatic species, and, from living in the moist element, the hair of its

coat is "long, and of such excellent quality that the natives prize it for wearing almost more than [that of] any other of the antelope tribe." Its chief food being the long filaments of the panicles of the Byblus-rush, in order to record this interesting fact in connexion with so important an African plant as the Papyrus or Byblus, I should prefer to call this new antelope Tragelaphus byblophagus instead of T. Spekii, the name suggested by Dr. P. L. Sclater. Another character of this animal is very worthy of note—namely, the extreme length of the toes or fore parts of the hoofs, so that "it could hardly walk on the dry ground," but of course most useful for traversing the mud and marshy shores of the lakes. This provision of nature reminds me of the long toes of the water rail, gallinule and other kinds of the family Macrodactyli of Cuvier, which he characterizes as having "les doigts des pieds fort longs et propres à marcher sur les herbes des marais;" and, in like manner, it adapts that antelope to walking over and being supported upon the long stems of the Byblus-rush and other fluviatile "plants so densely interwoven in the waters"—or, in the exact words of the philosopher Seneca (Nat. Quæst. lib. vi. cap. 8), "ita implicitæ aquis herbæ"—not only of the Upper Nile itself, but also of the Reservoir lakes which feed that mighty and sacred river.—*John Hogg, in 'Annals and Magazine of Natural History.'*

[I cannot concur in the opinion that living in water has any tendency to produce long or excellent hair: it certainly does not appear to have effected this for the hippopotamus or the dugong. It is better in such cases for observers to confine themselves to the facts, and leave the conclusions from facts for those more accustomed to such speculations.—*Edward Newman.*]

Natural-History Notes, principally from Formosa.

By Robert Swinhoe, Esq.

The following facts, gathered from a reliable friend, may prove of interest to some of your readers.

1. A large white porpoise was seen floating into the harbour at Swatow quite dead. A boat was sent to tow it alongside the ship, when it was found that a large yellowish fish, weighing 7 lbs., was sticking in its food-pipe. The porpoise had evidently over-calculated the capacity of its swallow, and had seized and attempted to devour too large a fish, which had stuck fast mid-way, and had choked it.

2. An osprey flew past the ship with a snake-like creature in its claws. The quarry wriggled round and about the wings of the bird, and greatly impeded its flight. After soaring about some time, and finding it in vain to try and master the prey in the air, the osprey carried it to a rock, where it soon settled the difference. My friend confidently affirmed that the prey was a snake, but I feel pretty sure it must have been a conger eel, or perhaps a murry, both of which abnormal fish might at a distance, even through the best telescope, be mistaken for a snake. It is impossible to believe that ospreys prey

upon snakes, though it is not at all improbable that they may sometimes pounce upon an unwary eel.

3. A thick Cactus-like Euphorbia, whose specific name I cannot just now recall, is cultivated in patches at the Pescodores. It is cut in pieces and used by the China women to give a gloss to their hair. Its milk is applied to burns to allay the pain.

To conclude with a few words on more interesting facts I have observed with reference to shells in this locality. There is a flat Planorbis-like species of Helix frequently found under stones and at the bottom of old walls. The live shells of this species have always, so far as I have observed, their lip missing, whereas those found dead have nearly always an entire lip. I have procured them under stones attended by a black Carabus (beetle), and I thought that perhaps the shells had been dragged there by the beetles for the purposes of food, and in this conjecture I felt confirmed by finding that, when the beetles and shells were confined together in a tin box, the latter were frequently bitten and the mollusk destroyed. But on the lower parts of walls, when they occur in this mutilated state, the beetles cannot reach them; and even when under stones, in this state, the mollusks appear always to be intact, as also the rest of the shell. Perhaps therefore the thick rim-lip from some cause is cast off by the animal during its winter hybernation, to be renewed again in summer.

Again, in a black fresh-water shell (Melania sp.), which occurs in abundance, at this rainy season, in almost every stream, the apex is always broken off. I thought at first that it might be owing to the force of the stream dashing them against the rocks, but on examining some hundreds of all sizes, down to the very smallest, I found that the lips of the shell, which were very delicate, remained intact; and also, in following the streams to their sources, I observed that those found in the higher levels were injured quite in the same way with those found in the lower. The cause I therefore concluded was traceable to some other source. I narrowly inspected several shells, and they presented a perforated appearance near the apex, which is carried in broken patches and tortuous lines over a great part of the surface of the rest of the shell in older specimens. It is hard to detect the cause of this rot, but I should think it was the work of some minute worm or animalcule invisible to the eye. I observe that this eroded or decorticated apex is affirmed of most of the genus Melania, and that Bates, in the 'Amazons' (vol. i. p. 139), notes the peculiarity as

strongly evinced in a particular species found in those tropical waters.

Tamsay, Formosa, April 11, 1864.

Koksing's Shells.—There is an island between the mouth of this river and Kelung, called in Chinese "Lobster Island," whereon, in a fresh-water stream, occurs a species of Neritina of Lamarck. I sent a man there, and procured a dozen specimens. These shells are all much worn at the apex, as in several other fresh-water univalves, but to a much greater degree. They are called by the Chinese "Koksing's shells," and the story runs that when that great pirate chief, the "Conqueror of Kingdoms" (that being the literal rendering of his Chinese cognomen), landed on the island to drive the Dutch from it, and to subjugate the Indians, the rightful possessors of the soil, he was an hungered, and, picking up one of these shells, bit the end of it, but finding it bitter threw it down, and muttered a curse against the species. Since then a ban has laid upon the whole race, and every specimen is broken at its apex and marked with the impression of the conqueror's teeth. This story would appear plausible enough to the superstitious, for certainly every specimen that I have seen does look as if it had been bitten. They are said to be peculiar to this small Lobster Island, and I have not yet procured them elsewhere.

Whales.—In the spring of 1860 a large whale, probably Balæna australis of Desmarest, was stranded on the sand-spit at Ape's Hill, Formosa. I saw one myself off Swatow, in May, 1860, when on my way from Hong Kong to Amoy, and I hear that scarcely a year passes but one is stranded in the vicinity of Swatow. The whale I saw jumped almost clean out of the water, and I thus got a good view of it, though it was a mile off at least. I should judge it to have been about forty feet long, with a finless back and a large, flat-looking head, fully one-third its entire length. A friend of mine tells me that when he was stationed, some years ago, at Namoa (an island near Swatow), whales used frequently to visit the neighbourhood in May. They were mostly cows, with their calves, about twenty feet long. Some of the adults were seventy feet long. In the night time they used to gambol close round the ship, making their proximity known by the loud puffing noise they made, resembling the sound produced by the piston of a steam engine. In the day time they might be seen putting their long heads out of the water and opening their immense jaws. The

captain of the vessel on board of which my friend lived broke the back of one with a cannon-shot, and the animal lashed about the water for some time before it died. It drifted on shore eventually on Namoa Island, and was cut up by the native Chinese. A firm in Hong Kong, on hearing of the occurrence of whales in the Namoa Straits, fitted out a lorcha for their capture. The whalers built huts and boiling-vats on Double Island, Swatow, and then went to the pursuit. They soon returned, saying that the whales were only razorbacks, the same as are found off San Francisco: they are dangerous creatures to meddle with, and yield too little oil to compensate the risk run in their capture. The whalers took down their gear and returned to Hong Kong. As my friend naïvely observed, before erecting vats and making other preparations for boiling down the oil, they should first have caught their whale. Some eleven years ago American whalers used to rendezvous at Hong Kong, and thence send their oil home to the States; but their countrymen treated them so badly, and cheated them so much, that they now seldom come there, preferring the Sandwich Islands, which are nearer and easier of access to their whale-boats in the Pacific. While on the subject of whales, it might amuse and instruct the readers of the 'Zoologist' to give at length a paper that I stumbled across the other day in the 'Chinese Repository' for November, 1843. It relates facts on the subject of doubtless the same species as I have just been noticing. It is to be found on page 698 of that excellent work, and is headed "Art. IV. Notices of the Whale-fishery in the Chinese Seas, as conducted by the Inhabitants of the Coasts. Communicated for the 'Repository.'"

"During the months of January and February whales and their young resort to the coast of China, to the southward of Hailing Shan, in great numbers, and during those months are pursued by the Chinese belonging to Hainan and the neighbouring islands, with considerable success. The fish generally seemed to be in bad condition, and were covered with barnacles; and their object in resorting to that part of the coast during that season is probably to obtain food, for themselves and young, from the great quantity of squid, cuttle, and blubber-fish which abound, and perhaps also to roll on the numerous sand-banks on the coast, in order to clear their skin of the barnacles and other animals which torment them. They are often seen leaping more than their whole length out of the water, and coming down again perpendicularly, so as to strike hard against the bottom.

"It is an exciting scene to see these boats out, in fleets of from fifty to seventy, scattered over the bays as far as the eye can reach,

under full sail, cruising about in search of their prey. Some steer straight ahead, with the crew facing in different directions, observing the boats in their company, and leaving no chance of a spout escaping unnoticed. Upon others the harpooner may be seen leaning over the bow ready to strike, and occasionally waving his right or his left hand to direct the helmsman after the fish in its various turnings, the strictest silence the while being observed.

"The boats are admirably adapted for following up the fish, as they sail well, make little noise in going through the water, and may be turned round and round in half the time and space that a foreign boat occupies. They are of different sizes; the smallest are about three tons, and the largest about twenty-five, carrying two small boats on her deck, and a crew of twelve men, of light draft of water and good length. On the bow is a crooked piece of timber, supported by a stancheon, which serves as a rest for the harpoon when not wanted; it enables the harpooner to stretch well over the bow, and see the fish as they pass below the boat. In this position they are struck, for the weight of the harpoon prevents it being thrown any distance. Abaft the mainmast the deck is rounded so as to form the roof of the cabin; on its top the whole line is coiled.

"The harpoon has only one barb, and about fifteen inches from the point of the iron it is made with a socket, above which an eye is wrought, with a cord attached to the iron, to which the whole line is fastened, and stopped slack along the wooden shaft, so that when the fish is struck, the iron and the line tighten, the shaft draws out, and leaves less chance of the iron cutting out, or loosing its hold of the skin of the fish.

"The whale-line is made of native hemp, and is about sixty or seventy fathoms long, and from four to six inches in circumference, according to the size of the boat. Great length of line is not required by them, for there is shoal water all along the coast for many miles to seaward. One end of the line is fastened round the mainmast; the remainder is coiled away on the top of the house, and carried forward to the harpoon on the bow, where it is made fast, leaving a few fathoms of slack line.

"The boats come out of the different harbours at daylight, and soon spread themselves all along the coast: as soon as a fish is seen blowing, away they go in chase. If fortunate enough to get it fast, the sails are lowered, the bight of the line got aft, the rudder unshipped, and the boat allowed to tow stem foremost. The rest of the fleet, seeing the sail lowered, come up to assist; and as the fish now

keeps pretty much on the surface in its struggle to get away, they soon manage to fasten eight or ten harpoons into it, and in a couple of hours or so it is dead from wounds and the loss of blood. They always strike the fish a little behind the blow-hole, on the top of the back. When the fish is dead it is lashed alongside one or two of the boats to float it, and to allow the others to make their lines fast to the tail, and tow it on shore. It is surprising that the boats are not stove in or completely destroyed from their manner of attacking the fish, *i. e.*, sailing right over it and then striking it; but from the cool way in which the Chinese manage the whole affair, I have no doubt that personal accidents occur more seldom than with our fishermen. Their greatest danger is when two or three whales are struck together in the same place, and swim round and over each other, so as to foul the lines. The boats are then drawn against each other and over the fish, and run great risk of being soon swamped and stove in pieces. In one instance of this sort that fell under my observation they had three of their boats swamped, but managed to clear the lines, and kill the fish in a most dexterous manner, after which some of the spare boats returned, and towed the damaged boats on shore. They had no lances in their boats, nor in fact any other weapon except the harpoons, which they refused to sell at any price. All the boats had parts of the whale-flesh salted, which they used as provisions. They refused to give any account of what use they made of the fish, and in general were not disposed to be very civil to strangers, which might arise from jealousy, or a fear of our interfering with their fishery. The fish are, I believe, what whalers call the right whale, and were calculated by those on board to yield, on an average, fifty barrels of oil each."

Van der Hoeven, in his 'Handbook of Zoology,' vol. ii. p. 624, in speaking of Balæna australis, says, "On it affix themselves Balani (*Tubicinella Balænarum*), Coronula balænaris, and species of Cyamus, of which animals not one has ever been observed on the Greenland whale."

I am informed by a travelling friend that at Japan, where he spent two years, the right whale is taken in the inland sea by the Japanese in strong nets; that the flesh is prized as a delicacy, and is sold at about fourpence a pound.

ROBERT SWINHOE.

Tamsay, Formosa, May 19, 1864.

Ornithological Notes from Shetland. By Henry L. Saxby, M.D.

(Continued from p. 9131.)

Golden Plover.—The golden plover is one of our earliest breeders, usually beginning to lay in the middle of April, but this season being a very backward one, laying commenced about a fortnight later. Eggs will be abundant until the end of June, but it is by no means unusual to find them as late as the second week in July. In Mr. Newman's useful little book 'Birdsnesting,' p. 34, the materials of the nest are spoken of as "scarcely any, a few fragments of heather and dried grasses carelessly scraped together," and on referring to my note-books I find that those very words might have well been applied to eleven out of the fifteen nests of this species therein described. Occasionally, however, and particularly during the first few weeks of the breeding season, the nest is constructed with more than ordinary care, and then consists of a deep saucer-shaped cavity, thickly and compactly lined with the above-mentioned materials, measuring between five and six inches across. It is almost invariably situated among moss or heather, sometimes by the side of a stone or upon the top of some slight eminence, where there is sufficient growth to afford concealment. The only opportunity which has fallen to my lot of observing the length of time occupied by incubation, occurred three years ago. About noon, on the 7th of May, I found four warm eggs, and on blowing one, ascertained that it was perfectly fresh. I afterwards visited the nest almost daily, and on the evening of the 23rd observed that two of the remaining three eggs were already broken by the chicks. Next morning, on my approaching the nest, three young birds, mottled gray and yellow, ran out of the neighbouring heather. There was no appearance of the broken shells either in or near the nest. I have never known the male take any part in the task of incubation, although he is very attentive to his mate, and constantly supplies her with food while she is sitting; but both birds are so shy that, at such times, their habits can be witnessed only by means of long and patient watching from some place favourable for concealment, such as a large stone or the deep channel of a burn. While the female is sitting the male takes his station upon some eminence near the nest, giving warning by his loud peculiar whistle the moment an intruder appears, who, if he be sufficiently quick-sighted, may see the female start from the nest and run swiftly away: sometimes she will take wing at once, but this most frequently happens when the nest is situated in a valley, or upon the side of a

hill, so that an enemy is able to make his appearance suddenly from above. The same thing will occur in any situation when the male is absent, and therefore no warning is given.

Manx Shearwater.—Manx shearwaters, or "lyries," as they are called in this island, appeared on the 3rd of May. As soon as they arrive they either commence digging burrows in the dry crumbling soil in the steep cliffs, or return to old ones which have been used during the previous summer. The holes vary in depth from eighteen inches to two feet, or even more, and are so narrow that the introduction of the hand is a matter of difficulty when the hole happens to be new, and therefore but little worn by the passage of the bird. When a bird is taken from the nest and tossed into the air it seems perfectly bewildered, and, after a little uncertain fluttering, creeps back into the hole, but is nearly sure to desert it soon afterwards, even although not further molested. Very slight disturbance of the soil at the entrance is sufficient to cause desertion. Sometimes the egg is deposited far back in a deep crevice of a rock, and in most cases a sort of nest is made with pieces of dead plants or hay, but sometimes the dry soil alone is sufficient. After the egg has been taken the bird often remains in the hole for several days before finally resolving to quit. Some persons assert that the bird lays only once in the season, but my own observations lead me to the conclusion that, although a second egg is not produced immediately after the first has been taken, the female either seeks a new nest or returns at intervals to the old one and lays again when the proper time arrives, some weeks afterwards. This year the first eggs were found on the 7th of May, but last year I saw them about a week earlier; others will probably be found in a fresh state until the middle or end of June. Although in this species the bill has a somewhat slender appearance, it is well adapted for the work of burrowing in the loose soil, and possesses considerable strength; the hooked point is very hard and sharp, as a certain scar upon one of my hands can testify. It is said that the young reamin in the nest long after they are fully feathered. Eggs of the common barn-door fowl are often passed off as those of the Manx shearwater, and even an experienced eye will sometimes be deceived. Intending purchasers should select specimens which have the shell thin, smooth, perfectly white, and of extremely fine texture, and the ends should be without wrinkles or rough spots. The well-known musky smell and the pale yellow yolk render it easier to identify a fresh specimen. The average length of the egg is about two inches and five lines; the breadth one inch and eight lines.

Snipes.—On the 4th of May I met with great numbers of snipes, both upon the hills and in low marshy ground. Most of them were in pairs, but a few were seen singly. One rose from beside a burn, and within a couple of yards of the same spot I nearly set my foot upon another; it sat crouching among the heather, perfectly motionless, with the head lower than the body, until I again moved, when it flew off, uttering its usual cry as it rose. I have not seen any eggs yet, but there are doubtless plenty about, for young birds are always to be found by the end of May. Although the snipe begins to lay so early, it is not at all uncommon for the peat-boys to bring home fresh eggs during the first two weeks of August.

Common Bunting.—Common buntings arrive in large flocks regularly every autumn, but only a very few remain with us during the breeding season. This year the greater number left on the 8th of May, with a stiff breeze from N.E.

Curlew.—Curlews have been pairing and retiring to the hills for several weeks past, and none are now remaining upon the shores. The first eggs were brought to me on the 15th of May; they were found by a small pool in a peat moor near Hermaness.

Rock Pipit.—Rock pipits were building very early in May. The nests are extremely abundant in the islands of Balta and Hunie, where they are to be found among loose rocks high up in the cliffs, under large stones upon the level ground above, and even in rabbit-burrows. The nest is composed of short, dry grass, sometimes with a few horse-hairs inside, and not unfrequently some small pieces of dry sea-weed are added to the outer part. The eggs are shorter and rounder than those of the sky lark, but are sometimes very similar to them in colour.

Richardson's Skua.—Richardson's skuas arrived on the 6th of May, and at once took up their quarters at the breeding grounds upon Hermaness and Vallafiel, but no eggs have yet been found.

Cormorant and Shag.—Cormorants and shags are sitting; the former commenced laying on the 16th of May; the latter on the 7th. The eggs of the shag vary greatly in shape, some being roundish, others pointed at one end, and others again narrow and greatly elongated. Cormorants nest apart from other species in the precipitous cliffs of one of the North Skerries: the eggs of the second laying are often very small. Both cormorants and shags keep to the nest almost continually after the first egg has been deposited.

Merlin.—On the 15th of May I saw a female merlin fly out from her nest, which was placed upon a ledge of rock about fifty feet from the

top of a high sea-cliff. Some fishermen told me that she had been sitting for several days, and that they had made several unsuccessful attempts to reach the nest.

Hooded Crow.—Hooded crows were seen building on the 16th of May, but I met with no eggs earlier than the 23rd.

Sparrowhawk.—On the 18th of May a sparrowhawk visited the garden, and remained there for several days. I have not seen another this year, but a few occasionally breed in our cliffs.

Twite.—Twites begin to lay early in May, but the eggs may occasionally be found as late as August. One very favourite situation for the nest, besides those already mentioned in the 'Zoologist' (Zool. 8194) and elsewhere, is under a long strip of turf which has been nearly reversed by the plough. In such a situation I lately found the commencement of a nest, and derived much interest from watching the progress of the work. When one of the birds disclosed to me the site of its future habitation by flying out suddenly at my feet, I discovered nothing more than a slight hollow which had been scraped beneath the turf, and although I afterwards frequently visited the spot, nothing more was seen of the bird until about twenty hours afterwards, when the pair began placing a number of fibrous roots in the form of a half circle in front, the back part of the cavity being left untouched. In a few hours' time some stalks of plants were added, and from four o'clock in the afternoon until noon the next day the birds disappeared. They next laid the foundation of the other half of the circle, continuing steadily at their task until the whole structure was equal in height all round. They now appeared more eager to proceed, working so diligently that by the evening of the fourth day the mass of roots, grass and stalks of plants formed a perfectly circular wall, an inch and a half in height, and about two inches in breadth, somewhat loose and irregular upon the outside, but with the inside neatly interwoven, and sloping rather suddenly towards the bare patch of ground enclosed. On the morning of the fifth day I observed a few feathers upon the ground in the centre, and the number rapidly increased until the sides were covered more than half-way towards the brim: in the evening the feathers were almost concealed by a quantity of cows' hair, among which a little wool was intermingled. More work was done upon that day than upon any other. Having often found rabbits' fur in the nest of the twite, I now procured a quantity of that material, and strewed it over the ground—not too near, lest it might cause suspicion. Although it was soon discovered, the birds were not quite contented, using it rather sparingly, and carefully working it into a felt-like mass with wool and

the hair of cows and horses. This process appeared to be one of difficulty, and to require great care, for it was not before the evening of the eighth day that the task was completed, the brim of the cavity being by that time neatly finished off with a few long, black horse-hairs, and measuring exactly two inches and a quarter in diameter. On the ninth day the birds were not to be seen, but by the morning of the tenth day the first egg was laid: every succeeding morning I found an additional one until five had been laid and the female began to sit. I am now eagerly awaiting the appearance of the young birds. It is seldom that the lining of the nest touches the ground, as it did in this instance; a layer of fibrous roots, &c., is nearly always interposed. I observe that the thickness of the lower part of the nest is greatest in those specimens which have been found in bushes, far above the ground. The eggs of this species vary considerably in size and colour. Occasionally they are largely blotched or streaked, and although the ground-colour is generally almost white, it is sometimes of a rather deep greenish blue. The twite is our only native linnet. The common linnet (*Fringilla cannabina*) is often described as breeding here, but I have never yet even met with the bird, although it is said to have been seen near Lerwick.

Sky Lark.—Sky larks are very abundant here in summer, but the greater number leave as soon as winter begins to threaten. The eggs are to be found from the middle of May to the middle of July. I have noted several instances in which the birds have nearly filled a partly finished nest with dry grass, and then, when a sufficient quantity has been collected, built it all into the walls in the usual manner.

Eider Duck and Common Gull.—Eider ducks and common gulls began to build in the island of Uyea about the 21st of May. The nests of the former species are situated either among the rocks a little above high-water mark, or among grass and heather, often more than a hundred yards from the sea. Last year I found eggs of the common gull in the middle of July, among the scattered stones of an old ruined wall which formerly enclosed a small piece of ground about fifty yards square. In that one spot there were more than a dozen nests.

Oystercatcher.—Oystercatchers began to lay about the 24th of May. I have seldom found the eggs earlier than the 20th, and never later than the middle of July. Occasionally the nest is situated upon a ledge of rock in a high cliff. I have never met with more than three eggs in one nest.

Great and Lesser Blackbacked Gulls and Commom Guillemot.—Great and lesser blackbacked gulls' and common guillemot's eggs were

first found about the 24th of May. Guillemots are now (May 31st) becoming rather scarce. In places where a man used to take as many as seven dozen eggs in a day he now scarcely finds a dozen.

Snow Bunting.—On the 28th of May, a cold sleety day, with N.E. wind, I observed several small parties of snow buntings flying northwards, uttering their usual clear, ringing notes.

Redshank.—Redshanks are still to be met with upon several parts of the shore.

Longtailed Duck.—Longtailed ducks are still here, but there are very few adult birds among them.

Whitetailed Eagle.—Whitetailed eagles have hatched in Yell. Now and then they pay a visit to this neighbourhood in search of food for their young, but I am glad to say they have hitherto kept out of reach of guns.

Arrivals in May.—The following completes the list of arrivals in May:—

May 3. Wind S.E. A sand martin. Very seldom seen here.
„ 9. „ N.E. A flock of about two hundred fieldfares.
„ 13. „ N.E. The first whimbrel.
„ 14. „ N.E. Two bramblings and a willow wren.
„ 17. „ N.W. Two common sandpipers.
„ 28. „ N.E. Land rail. About a week later than usual.

Skua (Lestris catarractes).—I was unable to ascertain the precise date of the skua's arrival, but the first egg was found on the 14th of May. They commonly stay with us from the end of April to the end of August. One of the only three breeding-grounds in the British islands, and the only one in Unst, is situated upon a hill called Hermaness, on the west side of Burrafirth, but there are very few skuas there now. Instead of the fifty or sixty pairs which used formerly to breed there, only about five pairs now remain, and even they will soon disappear. Some used to be found upon the opposite hill of Saxaford, but the last eggs were taken there three years ago. In some seasons the skuas select the very top of Hermaness, and in others the sloping ground facing the east; sometimes when they are much disturbed by egg-gatherers they change their ground two or three times in the course of the summer. If you come upon the ground soon after their arrival, you will see them flying about overhead, as though in doubt as to your intentions. If you have never read the fable of the goose and the golden eggs, and are desirous of obtaining a shot, you need only toss up a dead gull, or even wave a white handkerchief, and an opportunity will not long be wanting; but at any time

a dog running by your side will answer the purpose equally well, only he must be prepared to part with a little of the hair of his back occasionally, for in spite of the utmost vigilance upon his part, one of the birds will be nearly sure to sweep down and strike him unexpectedly, and be far out of reach by the time that he first catches sight of a small portion of his coat flying to leeward. As soon as laying has commenced, the birds become extremely bold. As you approach suspicious ground, you will hear a low croaking sound, and at the same time a skua, in all probability a female, will begin circling round and endeavouring to lead you away in one particular direction. But if you wish to find the eggs you will turn your face as nearly as possible towards the opposite point of the compass and walk towards it in a zigzag manner; then attentively watch the movements of the two birds (for by this time the male will have appeared upon the scene), and the nearer you approach the nest the more daring they will become. As many as two or three times in a minute a bird will make its attack, each time charging directly at your face, rising suddenly when within a few feet, and passing close over your head—so close, indeed, as sometimes even to knock off your hat. The bird acquires an extraordinary amount of velocity in its descent towards the object of attack, and it is no exaggeration to compare the sound of the steadily expanded wings to the rushing of a small sky-rocket. In places where skuas are much persecuted, as they unfortunately are at Hermaness, they are rather less bold, but even there they become utterly regardless of danger as soon as the young are hatched. I have not yet seen an eagle make its appearance near the forbidden ground, but have twice witnessed the complete discomfiture of a party of ravens. The nest consists of a hollow in the moss and heather, carefully lined with small pieces of lichen, moss, heather and dry grass, and measures nearly a foot in diameter. The eggs are so much sought after that the birds seldom hatch, and to this cause the great variety in the appearance of the eggs may chiefly be attributed, the colouring matter being exhausted by repeated laying, so that the latest eggs are always the lightest in colour, as well as the smallest in size. In many collections I have seen gulls' eggs of different species labelled as those of the skua, and although it is easy in most cases to detect the imposition, it is very difficult to define the precise points of distinction. However, generally speaking, the egg of the skua is finer in texture, rather more glossy and smoother to the feel, and more frequently either of a clayey or a purplish brown colour; the spots are fainter and more scattered, and, if we were looking at an artificial production, we should say that

the markings had been more carefully laid on and softened away at the edges. The dark variety tinged with purplish brown does not, so far as I am aware, occur in any gulls' eggs. The specimens which are most difficult to identify are those of the pale bluish green and nearly spotless variety, for which similar ones from the nests of the lesser blackbacked and herring gull are often substituted, but the finer texture in genuine specimens is a trustworthy guide in most cases. Those eggs which are laid late in the season are often rough at the ends. Although one can scarcely be too particular in describing anything connected with a bird so rapidly disappearing from among us, yet I fear that those of my readers who have ready access to Mr. Hewitson's work on the 'Eggs of British Birds' (and I trust that there are few who have not), may consider the above details somewhat unnecessary.

Baltasound, Shetland, May 31, 1864.

Snow Bunting.—During the early part of June small parties of snow buntings were still to be seen flying northwards. On the 4th I saw a female among some loose stones upon the beach at Balta, but my search for a nest was unsuccessful. The only instance in which I have obtained the eggs has already been recorded (Zool. 7709), but there can be no doubt that this species breeds regularly in the cliffs below Saxavord, where it may often be met with in the months of June and July. The most likely spot for a nest cannot be thoroughly explored without great risk, even by the best climbers; indeed it was only last year that a portion of the loose rock gave way beneath the feet of a man, and dashed him upon the beach two hundred feet below. A few days ago I saw some snow buntings in full summer plumage.

Razorbill and Kittiwake.—About the 1st of June razorbills and kittiwakes began to lay. The former species can scarcely be said to abound here now, although some years ago its eggs were almost as common as those of the guillemot are at present.

Rock Dove.—Although rock doves began to breed in April, no eggs were brought to me this year before the 3rd of June. This bird inhabits deep caves upon the sea-coast "all the year round," and certainly rears more than one brood in a season. It has been asserted that the eggs are to be found at nearly all times of the year, but it is almost needless to say that this is an error. I have never heard of fresh eggs being found earlier than April or later than August. Most of the nests are placed upon ledges so near the roof, that, to a person

standing below they are quite lost in the gloom. I have often landed in these caves, and although nests must have been abundant upon every side, I have seldom been able to get at them. The few within my reach have always been quite flat, and composed of grass, either dry or green, and sometimes in full flower. Well-feathered young birds and fresh eggs may frequently be found upon the same ledge. At harvest-time flocks of rock doves resort to the corn-fields, and there feed largely upon grain. Some persons, wishing to defend this beautiful bird from persecution, state most positively that it seeks its food only upon the ground, and therefore merely picks up that portion of the grain which would otherwise be wasted, but, as might have been expected, this statement has only had the effect of causing our numerous gunners to watch the bird more closely, by which means they have discovered what they never took the trouble to ascertain before—that it occasionally alights upon the sheaves themselves and devours the grain in large quantities. The result is that its enemies, having now established the charge, the species is rapidly becoming exterminated. In the crop of one bird, shot in the very act of robbing a sheaf, I have counted upwards of seven hundred grains of oats. Now even allowing that all these were taken directly from the sheaf, and that for one whole month it was the custom of each bird to procure its entire daily food in the same manner, no wise farmer would attempt to banish the doves from his fields without first ascertaining whether the damage done during that one month really counterbalanced the good service rendered during the other eleven months. A little trouble, although it might cause the death of a few birds, would convince him that even when a rock dove is feeding in the midst of abundance of grain, it almost invariably picks up in addition astonishing quantities of small seeds, and that, during the greater portion of the year, the seeds of various weeds, together with great numbers of roots, particularly those of the destructive Triticum repens, or couch grass, alone furnish it with the means of subsistence. The seeds which are most commonly found in the crop are those of Plantago maritima and Sinapis arvensis, and I have occasionally seen the bird picking at the ripe pods of Capsella bursa-pastoris.

Dunlin.—Dunlins were laying early in June, but sometimes the eggs are found about the second week of May. All the nests that I have seen have been situated among tall grass or heather, either in low meadows or upon peat moors, but it is not often that they occur very high above the sea-level. On the 18th of June I found three newly-hatched young birds, apparently not more than a day old, and beauti-

fully mottled with cream-colour and various shades of rich reddish brown. They run from the nest very soon after they are hatched, and are always accompanied by both parents, who then show but little fear of danger, running round an intruder, as if for the purpose of leading him away, but I have not yet seen them feign lameness, as they are said to do.

Puffin.—Puffins are more than usually numerous this year, and commenced laying about the 4th of June. A very remarkable specimen of the egg was brought to me on the 16th; although the ground colour and the shape are as usual, it is completely covered with numerous long irregular streaks of light brown and purplish gray of various shades. Puffins breed abundantly in many of the cliffs in the north of this island, sometimes occupying deserted rabbit-burrows, but usually, I believe, digging out holes for themselves. I have seen both sexes employed at this work. Sometimes there are two entrances to one nest, but this seems only to be the case—when the face of the cliff being irregular—a new burrow happens to strike the course of an old one. The fashion seems to be to lay the egg upon the bare sand, and to add a few pieces of grass by way of a nest as incubation proceeds; occasionally, however, a little grass is found under a perfectly fresh egg.

Ring Ouzel.—On the 6th of June I saw a ring ouzel upon the rough ground beside the Burn of Watley, but there were no signs of a nest. At that time the wind was blowing strongly from S.E.

Black Guillemot. — Black guillemots began to return to their breeding places about the middle of June, but they are late breeders, and no eggs have yet appeared.

Whimbrel.—Whimbrels, which were so numerous during the latter part of May, have now almost entirely disappeared from the coast and retired inland to breed. The few which I have shot upon the shore at this time of year have, with one exception, been males. On arriving here they appear in couples, or in very small parties of about six or eight, at high water, haunting flat grounds inland, or the tops of low cliffs, but leaving these for the shore as soon as the falling tide begins to expose the sea-weed-covered rocks. Never having seen the eggs before the beginning of June, I conclude that this species may be considered a later breeder than the curlew.

Wren.—One of the very few wren's nests which I have seen here was brought to me on the 11th of June; it contained seven eggs, and was found at Woodwick inside the roof of a "lodge" or hovel occupied by a number of men and boys during the fishing-season.

Richardson's Skua.—Richardson's skuas began to lay early this month. In this island a large colony occupies the greater part of the top of Hermaness, and a few scattered pairs breed regularly upon several of the high moors. In the islands of Fetlar and Bressay they are very numerous. In their habits they closely resemble the larger species, but are less bold in their approach to man. The eggs are among the most beautiful which are to be found in these islands, and may easily be obtained in all their varieties, from very dark and almost uniform olive-brown, to clear, bright, spotless green: specimens beautifully zoned are of frequent occurrence. The bird's habit of fluttering and tumbling in front of an intruder upon the privacy of their haunts is well known, but it does not appear to be entirely confined to the breeding-season. At all times this species is fond of sitting half buried among the heather and grass, and this is more particularly the case in rainy or foggy weather.

Snowy Owl and Eagle Owl.—On the 20th of June I was informed that a snowy owl had been seen about the hills for nearly a week previously, and next day a man shot it, after a chase of five hours, when, finding that it was very slightly wounded, he brought it alive to me. In the hope of being able to learn some interesting particulars regarding its habits, I at once determined to keep it alive, and I am happy to say that at the present date it has every appearance of being in perfect health. The man told me that he saw another of a grayish colour and rather smaller flying near it, and there can be very little doubt that this was a young one of the same species, for the bird now in my possession bears the marks of considerable age, and the feathers of the breast, wings and tail are much worn, as though it had lately been engaged in incubation. All my endeavours to procure the second one have hitherto proved fruitless, although it has been seen several times by some of the people. It is strange that although snowy owls bear a very heavy shot, a very slight wound is sufficient to bring them to the ground. My prisoner only received a mere scratch upon the back, and as soon as it came into my hands it was able to fly all about the room, yet scarcely an hour before that, it had been brought down by the shot and carried off. The only way of accounting for this is by supposing that the contact of the shot conveying the impression that the enemy was at close quarters, the bird at once threw itself into the attitude of defence, and thus allowed itself to be taken in hand: there can be no doubt that if the man had not at once run up the bird would soon have recovered from its surprise and made its escape. Like most other birds of prey, the snowy owl when wounded throws itself upon

its back and strikes fiercely with its claws, but any person who feels bold enough to handle an angry "kat-yogl" would do well first to examine some very ugly scratches upon the stock of a certain gun in my possession. A man to whom I showed my captive told me that last autumn he saw an owl about the same size, only it was of a dark colour, and had "ears like a rabbit's." It was sitting upon a stone on a low piece of ground near Haroldswick, and allowed him to get very near. Of course this must have been an eagle owl, a bird which formerly visited these islands not unfrequently, but is now of extremely rare occurrence.

Raven.—Ravens are still at Uyea Sound in almost incredible numbers. On visiting the island of Uyea some evenings ago, I was astonished to observe the edges of some of the cliffs perfectly blackened with crowds of these birds: I heard several estimates of their number, and, after making full allowance for a considerable amount of exaggeration, certainly satisfied myself that eight hundred would be very near the mark. The gathering was largest on the evening of the 18th of June, since which time it has been rapidly decreasing.

Peregrine Falcon.—I heard that young peregrine falcons left their nest on the 28th of June.

Redthroated Diver.—Redthroated divers are now laying. The eggs are very seldom met with in this island, although they were abundant a few years ago. At this season there are always plenty in the island of Yell.

Wheatear and House Sparrow.—Wheatears sometimes build in holes of walls upon the remains of old nests of the house sparrow. I found a nest in such a situation about a fortnight since; it was composed of the usual materials, and could easily be lifted entirely away from the flattened remains of the old nest. Sometimes the order of things is reversed, and, if the crevice be sufficiently large, a house sparrow will construct its own comparatively clumsy habitation upon the neat little nest of a wheatear.

Common and Ringed Guillemot.—Common and ringed guillemots are now breeding plentifully. On looking over my notes I can find very little that is new regarding the right of the two birds to be classed as distinct species, but as many ornithologists are still in doubt, I beg to offer such small amount of evidence as I have been able to collect. It was only when I began to examine for myself that my belief in the two varieties (?) breeding apart was discarded. It is true that, now and then, one sees one particular portion of the rock inhabited solely by three or four of the ringed birds, but by far the greater number

breed in company with the common ones. With great difficulty I procured a large number of the eggs of Uria lacrymans, almost from under the birds themselves, and then, naturally enough, comforted myself with the notion that, "species or no species," their parentage at least was beyond all dispute; but a paper by the late Mr. Wolley (Zool. 3477) convinced me of my error. I was then led to confirm his views by means of careful observation, and soon became satisfied that when sea-birds nest together in large numbers they do not always keep to their own eggs. However, no matter what theories may be advanced, the fact is plain, that as a rule the eggs of the two birds differ considerably, and this will at once be allowed by any ornithologist who will favour me by examining my collection. It will be seen that generally in the eggs of U. lacrymans the blotches are larger, the ground colour is clearer, there are fewer under tints, the markings are better defined and less prone to take the form of streaks; in size and shape, too, the egg is peculiar, being rather small, and shaped something like that of the razorbill. Yet for all this, it cannot be denied that many specimens are so like those of U. troile in size, form and colour that to distinguish them is utterly impossible. Now, if a mere observer may offer an opinion in the matter, I would confess my belief that U. lacrymans and U. troile represent one species in two states of plumage, nor does the difference among the eggs form any objection to the view, for it is well known that young birds as well as very old ones produce the smallest eggs, but at what precise age U. lacrymans acquires its peculiar plumage there is as yet no evidence to prove. One would imagine that in such a place as Shetland the problem might easily be solved by keeping the birds for some time in confinement. I have tried the experiment, but they have invariably died. However, it is my intention this year to have a number of birds kept by different people who can be depended upon to keep them with care, and should this plan also fail it will only remain for me to endeavour once more to discover the cause of failure and "try again."

Turnstone.—A few turnstones are still remaining with us, but they show no signs of breeding here; I have usually met with them in pairs at this season, and once, in the middle of June, I shot a female containing a nearly perfect egg. Very suspicious-looking so-called snipes' eggs have sometimes been brought to me from localities frequented by the turnstone.

Herring Gull.—Herring gulls are breeding in immense numbers in most of the cliffs. Among the many strange varieties of the egg obtained by me this year I have one no larger than that of a pigeon, but

shaped and coloured precisely like an ordinary specimen; the discovery that it contained no yolk at once destroyed all my speculations as to the probability of some rare species of gull having taken a fancy to breeding in our cliffs. A rather common variety of the herring gull's egg is of a pale bluish green, with a few scattered spots of pale neutral tint.

Redbreasted Merganser.—Redbreasted mergansers are now to be seen in pairs upon various parts of the coast. Although they often lay among long grass they seem to prefer the shelter of a roof of some kind, and thus it is that the eggs are most commonly found under rocks, in rabbit-burrows, and even in crevices of old walls, but whatever be the situation chosen the nest almost always consists of a hollow scraped in the ground, and lined to a greater or less extent with down, feathers and dead plants, the amount of material being increased as incubation proceeds. Sometimes it happens that no attempt is made to line the nest until after the first few eggs have been deposited.

HENRY L. SAXBY.

Baltasound, Shetland, June 30, 1864.

Remarks on the Birds seen during a Visit to Flamborough, in the last Fortnight of July, 1864. By JOHN CORDEAUX, Esq.

HAVING just returned from an ornithological excursion to Flamborough, a few remarks on the present state of this once famous breeding-place, and on the birds still to be found there, may be interesting to the readers of the 'Zoologist.'

Many thousands of guillemots, razorbills, puffins and kittiwake gulls still frequent these magnificent chalk cliffs for the purposes of incubation. The numbers, however, have of late years been greatly on the decrease. This circumstance, much to be regretted by all true ornithologists, is owing to two causes; one, the plunder of the eggs during the spring by the neighbouring villagers, and the other, the wanton and wholesale destruction of the birds themselves by the visitors who frequent the neighbourhood during the summer months. Formerly two old men seem to have had almost the monopoly of this dangerous kind of birdsnesting. Now, I am told, there are as many as twelve "cliff-climbers" who gain a part livelihood by plundering the nests of the sea-fowl, and selling the eggs as an article of consumption. Since the railway has been opened along the East Coast, through Bridlington and Filey, hundreds of persons are brought down by "cheap

excursion trains" who otherwise would never have visited Flamborough, and boats and guns are too readily obtained to give any chance of a quiet life to the poor sea-fowl. It is scarcely possible to take a stroll along the top of the cliffs, during any fine day in the summer months, without hearing the constant report of guns fired from boats below. It reminded me more than anything else of a rook shooting day in a well-stocked rookery.

Many hundreds of kittiwake gulls are shot during the season for the sake of their skins, which are preserved and sent up to London, to fashion into the ornamental feathers used for ladies' hats. This constant persecution of the birds must in time (as it has already done to the cormorants and great blackbacked gulls) drive the remaining sea-fowl to seek refuge in some other quarter less exposed to the ravages of man. Formerly great numbers of birds nested comparatively unmolested on the rocks in the immediate vicinity of the lighthouses; but these cliffs being of low altitude and easily come at, the birds have been driven away. They are now only to be found, in any quantity, on the magnificent range of cliffs between the north landing at Flamborough and Speeton. For some miles between these two places the cliffs rise perpendicularly to the height of between three hundred and four hundred feet; in some places higher. The face of these rocks is worn, by the action of many a wintry storm, into narrow ledges and shelves; and they are also intersected by deep clefts and interstices, affording ample room to the thousands of sea-fowl which resort thither in the spring. The constant wash of the waves has excavated the base of the rocks into deep caves and holes, in some places forming grand natural archways: these are the sea-washed cotes of the rock pigeon.

I subjoin a list of the birds, which, with two exceptions to be mentioned, came under my observation during a visit to Flamborough in the last fortnight of July.

Jer Falcon. A fine specimen of the jer falcon, in immature plumage, was trapped a few weeks since on the Leckton Moors, near Pickering. It came into the hands of Mr. Jones, of Bridlington Quay, for preservation: he informed me that he sold it to Mr. A. Clapham, of Scarborough. I was unfortunate in being a few days too late to inspect the bird.

Peregrine Falcon. By no means a rare visitant to these cliffs; more especially seen, however, during the autumn and winter, doubtless attracted by the numerous rock pigeons. I was shown several stuffed specimens of the peregrine falcon killed at Flamborough.

Kestrel. Not uncommon.

Buzzard. One afternoon, during a stroll along the south shore, I saw a large hawk gliding along the face of the cliff. It came right over me at the distance of about forty yards. From its flight and colour I have no doubt it was a buzzard, and probably, from its general light appearance, Buteo lagopus.

Wheatear. Common. In my rambles on the cliff-tops constantly saw this lively little bird flitting along from buttress to buttress of the great broken masses of boulder clay which cap the chalk cliffs.

Rock Pipit. Numerous, more particularly along the south cliffs. Here the sea leaves, at low water, a narrow beach of rock and shingle covered with the common bladder-weed. This was a favourite haunt of the pipit, and they might be seen, several together, searching busily amongst the mass of sea-weed for marine insects.

Jackdaw. Numerous. Breeds in holes near the cliff-top. I saw two young birds, hardly yet able to fly, on a narrow ledge of rock in close vicinity to some guillemots. The jackdaws are said to commit great havoc amongst the eggs of the sea-fowl.

Sand Martin. Common. Several colonies of sand martins exist on the coast: there is a considerable one in an almost inaccessible position near the south landing. The holes are bored in a narrow band of sand between the chalk and boulder clay.

Rock Pigeon. Breed in considerable numbers in the sea-caves at the base of the cliffs. At this season they go far inland to feed, returning in the evening to their cotes in the cliff. As they dash rapidly out of these caves on the passing of a boat, they offer a very difficult mark to the roving gunners, and are seldom killed. By being often shot at they have become very shy and wary, and dash out of the crevices, and away over the cliff-tops, on the least noise made by approaching boats. In extremely severe seasons they will resort for a time to the dove-cotes in the neighbourhood, and feed in company with the domestic bird.

Sanderling. Five or six seen.

Oystercatcher. Several flocks arrived on the Flamborough coast during the last week in July. I saw one numbering sixteen and another nineteen birds. In walking home late one evening along the south coast, at low-water, I heard the shrill whistle of the oystercatchers as they rose from their feeding-grounds on the mussel beds, near the shore, long after it was too dark to see the birds.

Whimbrel. Three seen. A few of these birds (July 26th) have already arrived on the coast.

Redshank. Shot one, in full summer plumage, near the south

landing. I saw this bird swimming, evidently with great ease and dexterity, in a pool of water left amongst the rocks by the receding tide.

Dunlin. Saw several small flocks, both on the north and south shore, near Bridlington Quay.

Common Coot. Several seen on Hornsea Mere.

Black Scoter. One seen; it was flying close in shore.

Great Crested Grebe. I saw three, one male and two females, on Hornsea Mere, also a young bird, covered with down, swimming and diving in company with the old birds. The upper parts of the young bird striped with light brown; under parts gray.

Redthroated Diver. I saw one, in the possession of Mr. Bayley, of Flamborough, shot off the coast that morning (July 26th); a remarkably fine bird, the throat showing a slight trace of the red feathers.

Common Guillemot. Exceedingly numerous; more commonly seen than any other bird.

Ringed Guillemot. Scarce. Out of many hundreds of guillemots which, with the aid of a powerful landscape-glass, I examined from the cliff-top, I only detected one of this closely allied species. I had a most distinct and perfect view of the bird, which was certainly not more than eighty yards from my position. It was sitting on a ledge of the opposite cliff, in company with several of the common guillemot. One of the principal bird-stuffers in the neighbourhood told me that, on the average, two or three of this species pass through his hands, for preservation, every year; this year, so far, he has only had one. The ringed guillemot is well known to the Flamborough boatmen, and several have been seen by them this season. The eggs are said to be *invariably* white, or nearly so: of two which I saw in the possession of an egg-collector, one was white, the other *white*—marked, however, with a few slight brown streaks round the thick end. [See *ante* p. 9241.—*Edward Newman.*]

Puffin. Numerous. The eggs of the puffin are extremely difficult to procure from the cliffs, as, according to their usual habit, they deposit their eggs at the very end of the deep and narrow crevices which penetrate these rocks.

Razorbill. Common, but in much less numbers than either the puffins or guillemots.

Common Cormorant. Formerly bred at Flamborough; only one seen. It was about one hundred yards from the shore, and busily engaged in fishing. I counted slowly thirty-six to forty during the time the bird dived to its reappearance again.

Sandwich Tern. One seen.

Common Tern. Several seen in Bridlington Bay.

Blackheaded Gull. Common. There is a large breeding-place of the "peewit gull," as it is called, on Hornsea Mere.

Kittiwake. Very numerous. Breeds in large numbers on the most precipitous part of the Speeton Cliffs. It was remarkable to see the extreme narrowness of the ledges of rock which afforded a cradle for the young kittiwakes; apparently the slightest movement on their part would precipitate them to the bottom of the cliff. Nothing can be more dissimilar than the adult and immature plumage; the black beak and spots on the head, and the black tertiaries and band across the tail of the young birds, giving them quite the appearance of a distinct species.

Common Gull. Frequent.

Herring Gull. Less commonly seen.

Great Blackbacked Gull. Three seen together. One of them, a young bird in immature plumage. These gulls formerly bred at Flamborough.

Common Skua. Occasionally seen off the coast. I saw a very fine specimen of the skua which had just been shot on Filey Bay.

Manx Shearwater. Not often seen; one shot during my visit.

JOHN CORDEAUX.

Great Cotes, Ulceby, Lincolnshire,
August 10, 1864.

An additional List of British Birds found in South Africa.—The occurrence of the following species in South Africa has come to my knowledge subsequently to drawing up the "List of British Birds occurring in South Africa," which was published in the 'Zoologist' for 1863 (Zool. 8675). The birds in the following list from Walvisch Bay, and those from Damena Land in the previous list, were collected by Mr. C. J. Anderssen; those from Natal, mentioned in both lists, were mostly obtained by Mr. Thomas Ayres; and to these two gentlemen I am chiefly indebted for the information I have obtained on this subject.

Sanderling (*Arenaria calidris*). Natal, Walvisch Bay.
Glossy Ibis (*Falcinellus igneus*). Natal.
European Night Heron (*Nycticorax europæus*). Natal.
Great Crested Grebe (*Podiceps cristatus*). Walvisch Bay.
Pomarine Skua (*Lestris pomarinus*). Walvisch Bay.
Caspian Tern (*Sterna Caspia*). Walvisch Bay.
Solan Gannet (*Sula bassana*). Walvisch Bay.

I have also had the opportunity of personally examining South-African specimens

of the following species, which I included in my former list on authority only, not at that time having seen South-African examples of them, *viz.*:—

Gray Plover (*Squatarola helvetica*). Natal.
Turnstone (*Strepsilas interpres*). Natal.
Little Stint (*Tringa minuta*). Natal.
Whimbrel (*Numenius phæopus*). Natal.

In my former list I included (on the authority of Dr. Hartland) the islands of Madagascar, Mauritius and Bourbon as localities for the European waterhen (*Gallinula chloropus*). This is an error, which I take this opportunity of correcting, the waterhen found in Madagascar and Mauritius belonging to a nearly allied but distinct species, to which my friend Mr. Alfred Newton has assigned the name of Gallinula pyrrhorrhoa.—*J. H. Gurney.*

The Fieldfare in Leicestershire in July.—On the 29th of July, 1864, a fieldfare (*Turdus pilaris*) was shot in the garden of Mr. H. R. Hurst, The Oaks, near Kirby Muxloe, Leicestershire. The bird had been about the garden during the summer. This seems so unusual a circumstance that I have sent the bird up to the editor of the 'Field' for confirmation. Mr. Hurst also states that a redwing built in his grounds this spring. He is a keen observer and not likely to be mistaken. One bird only was hatched, and he has kindly sent me one of the addled eggs. It is a trifle smaller than a thrush's egg, more rounded at the ends; the ground colour is a greenish white, spotted with reddish brown of various shades. I am not competent to form an opinion from the egg, but it certainly is none of our resident thrushes.—*Joseph H. Ellis; Leicester, July* 30, 1864.

[I have met with many well-authenticated instances of the fieldfare continuing in Britain throughout the summer, but I have never known it breed. I must not venture an opinion on the supposed egg of the fieldfare.—*Edward Newman*].

Wood Wren and Chiffchaff in the North of Scotland.—In Capt. Hadfield's interesting notes on "Birds observed on the North-East Coast of Scotland" (Zool. 9165), he notices both the wood wren and chiffchaff as occurring plentifully. This is, I believe, the first notice of their being found so far north; even in the South of Scotland both species are considered much rarer than the willow wren. Perhaps Captain Hadfield will kindly give us more information on the subject, and set at rest all doubts on the identity of the birds observed.—*C. R. Alston; Stockbriggs, Lesmahagow, Lanarkshire.*

Lesser Redpoles' Nests near Birmingham.—At Zool. 9210 Mr. Hamilton, of Manchester, notices the occurrence of a lesser redpole's nest near Chester. In reply to his inquiry, Whether it is not rather far south for this species to breed? I beg to remark that I have repeatedly taken the nests and eggs of this bird in the neighbourhood of Birmingham.—*T. Beaven Rake; Fordingbridge, August* 8, 1864.

Has the Great Black Woodpecker occurred in Norfolk?

By Henry Stevenson, Esq.

The introduction of the great black woodpecker (*Picus martius*) into the list of Norfolk birds rests entirely upon the following passage

in Yarrell's 'British Birds' (2nd edition, vol. ii. p. 134),* where, in enumerating the various records of the appearance of this species in England, that author says:—"A few years since a communication was made to the Zoological Society of London, that two examples of the great black woodpecker had been at that time killed in a small wood near Scole Inn, in Norfolk."

This note, on Mr. Yarrell's authority, has been since copied by Macgillivray and Morris, and amongst local authors by the Rev. R. Lubbock, in his 'Fauna,' by Messrs. Gurney and Fisher, in the 'Zoologist' for 1846 (Zool. 1315), and still more recently by myself in a paper on the "Ornithology of Norfolk," written in 1863 for the third edition of White's 'Gazetteer' of this county (see also 'Zoologist,' 1864, p. 9025). I had long had an impression that in this instance a mistake might have arisen between the great spotted and the great black woodpecker, when this idea was confirmed very recently by circumstances originating in a conversation with Mr. Spalding, of Westleton. Whilst inspecting that gentleman's collection in the summer of 1864, I happened to mention the Scole woodpeckers with some expression of doubt as to the identity of those specimens, when he referred me to Mr. Francis Drake, of Billingford, as an individual most likely to be able to afford information. At once taking the hint, I shortly received the following obliging letter from Mr. Drake, who, to my great surprise, proved to be the very person who had shot the birds in question.

"Billingford, June 29, 1864.

"Dear Sir,—In reply to yours, and being equally interested with yourself and Mr. Spalding in birds, I feel inclined to think the birds I shot many years since at Billingford, near Scole, were the large spotted woodpecker, although I was told at the time they were the black.

"Yours very truly,

"Francis Drake."

In a subsequent letter, in answer to further inquiries, Mr. Drake says, "It must have been more than thirty years since I shot the birds. They were evidently larger than the wryneck, with red heads. I was not aware they were in print, until I saw them mentioned in Mr. Lubbock's work on the 'Fauna of Norfolk.' They were *not preserved.*

* The first edition of this work, in which the same statement occurs, was published in 1843 in a completed form, but had been issued in bi-monthly parts since 1837.

I cannot remember if they had white about them." Having pursued the inquiry thus far, I was desirous of finding the notice referred to by Yarrell, in the Zoological Society's 'Proceedings,' but failing in this, I wrote to the Secretary, Dr. Sclater, to know if he could in any way assist me in discovering by whom the "communication" had been originally made. In a few days I received the following reply, assuring me of that gentleman's persevering, though fruitless, efforts to comply with my request.—

"Zoological Society of London,
July 16, 1864.

"My dear Sir,—I have searched in vain in our 'Proceedings,' and also in our written remarks, for any traces of the paper you mention. I cannot find anything like it. I fear it was only mentioned in the way of conversation at the Meeting, or perhaps specimens exhibited, and was never entered in our Minutes.

"Very truly yours,
"P. L. Sclater."

Here, therefore, my researches must end, but I think enough has been elicited to render it more than doubtful whether the birds referred to were really specimens of the great black woodpecker, and that, until some more authentic instance of the occurrence of that species shall entitle it to be replaced, it will be best removed altogether from the Norfolk 'List.' Mr. Drake particularly remarks that the birds were not *preserved*, which would undoubtedly have been the case had they been exhibited before the Society in London, and Mr. Yarrell speaks only of a "communication" made without any reference to specimens. Supposing also, as Dr. Sclater suggests, that the matter was only "mentioned in the way of conversation," without any entry being subsequently made in the Minutes, it is most probable that Mr. Yarrell was himself present at the Meeting, or was informed of the circumstance by some other Member of the Society.

Henry Stevenson.

Norwich, August 14, 1864.

[I am extremely gratified to find Mr. Stevenson taking up this subject. I heartily wish that one or other of my correspondents would investigate, in an equally searching manner, every instance in which the great black woodpecker is reported to have visited this country. The habits of this bird are so well known, and are so

opposed to anything like an oceanic flight, that it seems in the highest degree improbable that it ever made its appearance here.—*Edward Newman.*]

Black Swan near Beverley.—Nearly a year ago, curiously enough it fell to my lot to record the capture of a black swan on the River Hull. The bird shot on the 1st of August, 1863, was an old male, in perfect plumage, and with wings unpinioned. Although I subsequently found that a black swan had escaped from a private water in the neighbourhood, I have never been able to identify with certainty my specimen as the escaped bird. I have now to record a similar capture on the same river. On the morning of June 23rd, 1864, between four and five o'clock, a second specimen of this rare and elegant bird was shot on the River Hull, close to the Hull Bridge, and about one mile and a half from Beverley. No intelligence has been received up to the present date of the loss of such a bird from any water in this neighbourhood. I saw the swan in the flesh, and had the pleasure of dissecting it. Its length, from tip of bill to tip of tail, was 4 feet 2 inches; span across the wings 5 feet 8 inches. Its weight was 11 lbs. The condition of the bird was excellent, the body being loaded with fat. The sex was female (mature). The gizzard contained a quantity of vegetable matter, too far advanced in trituration to admit of its exact nature being recognized. It was mixed up with flinty gravel. By reference to my notes on the measurements and dissection of the black swan, shot on the 1st of August, 1863, I find that, although both the specimens were fully mature, the male bird was the largest. In external contour, plumage, bill, eye and foot, both birds were very similar, and the difference in size was not so great as to be readily perceived. The female was altogether a lighter made and more delicate-looking bird, but this is only apparent when the specimens are compared side by side. The following will demonstrate at a glance the exact difference in size between the two specimens:—

Male, shot August 1, 1863.	*Female, shot June* 22, 1864.
Total length, from tip of bill to tip of tail . . . . 4 ft. 5 in.	Total length, from tip of bill to tip of tail . . . . 4 ft. 2 in.
Across wings . . . . . 6 „ 5 „	Across wings . . . . . 5 „ 8 in.
Weight, 11 lbs. (very thin).	Weight, 11 lbs. (very fat).

—*W. W. Boulton; Beverley, July* 8, 1864.

The Bridled Guillemot at Flamborough Head.—I observe in this month's 'Zoologist' a note from Mr. Boulton (Zool. 9211), in which he mentions the capture of a bridled guillemot (*Uria lacrymans*) at Flamborough Head, and remarks that it is of such rare occurrence that one has not been seen there for many years. It so happens that I am able to record a more recent capture of another specimen at the same place. On the 22nd of June last, a friend of mine, whilst walking at Flamborough Head, fell in with a man who was returning from sea-fowl shooting, and purchased from him a fine specimen of the bridled guillemot, which he had shot. It appears to be known to the sea-fowlers by the name of "silver-eyed scout," and is admitted by them to be a scarce bird. My friend, knowing the interest I take in everything relating to British birds, packed up the specimen and forwarded it to me. It certainly proved to be a bridled guillemot, but I must confess that I feel very doubtful whether the bird so

called is really a distinct species from Uria troile. A variety it certainly is, but I think something more than the white line round the eye is necessary to constitute it a species. At some future time I may perhaps trouble you with a few remarks upon this subject.—*J. Edmund Harting; Kingsbury, Middlesex, August* 5, 1864.

Description of the Eggs and Larvæ of Chortobius Davus.—For the last three or four years I have felt very anxious to obtain larvæ of this species, and this season my efforts have been crowned with complete success. On the 12th of July I put a female of this species into a pill-box, and the next day she deposited eleven eggs, which hatched on the 25th of the same month. The eggs are barrel-shaped and ribbed: when first laid they are of a beautiful green colour, but after a day or two they become marbled all over with brown. The larvæ, when first hatched, are of a dull flesh-colour, with five longitudinal reddish brown stripes, two on each side, and one down the back. When I found my larvæ crawling about in the pill-box I went down to Hatfield Moors for such plants as I could find in the haunts of this butterfly, although I always believed the beak rush (*Rhyncospora alba*) to be its food-plant, on which my larvæ are now feeding and doing well. I have since been to the Moors and found more larvæ feeding upon this plant, which seems to be their only food. They feed exposed by day. The larvæ are now about a quarter of an inch in length, of a dull green colour, with the five longitudinal stripes pale reddish brown. Head brown.—*Samuel Hudson; Epworth, Bawtry, August* 14, 1864.

Description of additional Varieties of the Larva of Eupithecia fraxinata of Crewe. During the past spring I was fortunate enough to get a small batch of fertile eggs of Eupithecia fraxinata from a pair of moths bred in confinement. Amongst the larvæ reared therefrom were some very beautiful varieties, the following description of which may perhaps interest the readers of the 'Zoologist.' I am happy to say that my friend Mr. Buckler has, with his usual skill, executed some most life-like coloured drawings.

Var. 1.—Ground colour deep velvety green. Central dorsal line wanting. Subdorsal lines represented by a series of pale yellowish white spots. Spiracular line yellowish white. On the centre of each segment, between the subdorsal spots and spiracular line, a rather large purple blotch. Belly whitish green, with a central dark green line.

Var. 2.—Ground colour dull reddish purple. Central dorsal line deep dusky purple, enlarged into an arrow-shaped blotch at the segmental divisions. Subdorsal lines dull orange, much broken. Spiracular line bright yellow, orange in the centre, spotted with purple at the segmental divisions, and bordered broadly on the lower side with dull purple. Anal tip of central dorsal line reddish. Belly greenish or yellowish, with a central, narrow, purple line.

Var. 3.—Ground colour pale yellowish olive. Belly paler than rest of the body. Central dorsal line deep purplish red, enlarged at the centre of the segmental divisions, much paler between, very dark on the capital and anal segments. Subdorsal lines dull yellow, purple at the centre of the segmental divisions. Spiracular line yellow, blotched with purple at the centre of the segmental divisions.

Var. 4.—Uniform bright velvety green. Central dorsal and subdorsal lines purple, the former very faint, the latter only appearing in detached spots at the centre of the segmental divisions. Spiracular line pale yellow, blotched on the upper side with

purple at the centre of the segmental divisions. Centre of belly whitish or yellowish, with a slender central green line.—*H. Harpur Crewe; The Rectory, Drayton-Beauchamp, Tring, August* 17, 1864.

Notes on the Food-plant of Eupithecia pulchellata, and Description of the Larva and Pupa.—I have great pleasure in at last sending to the 'Zoologist' descriptions of this interesting and hitherto unknown and undescribed larva. The merit of its discovery is due to my excellent and indefatigable friends Mr. Hellins and Mr. Doubleday. The former gentleman, together with myself, has for the last two years been vainly endeavouring to find a food-plant for the larva. The eggs which were sent us hatched freely, but though we supplied the young larvæ with every likely flower we could think of, not one would they touch, and all perished miserably from starvation. This summer Mr. Hellins again succeeded in obtaining fertile eggs. Mr. Doubleday, having observed that Hübner had figured what he called three varieties of the larva of E. linariata upon the flowers of Digitalis lutea, suggested to Mr. Hellins that he should try his young larvæ with the flowers of our common English foxglove (*Digitalis purpurea*, L.). He did so, and found that they fed freely upon it. He immediately communicated this fact to his entomological friends, and the result is that the larva has been found in some plenty in various parts of England. I found about thirty in less than an hour in a wood in this neighbourhood. Some relatives of mine have taken it in numbers at Warstone, near Leek, Staffordshire. Mr. Greene has taken it freely at Cubley, and Mr. George Bates at Breadsall Moor, near Derby, and Mr. Batty has met with it near Sheffield. It feeds, as I said before, on the flowers of Digitalis purpurea. It spins the lip of the flower together and eats the stamens, and occasionally the unripe seeds and seed capsule. Those flowers which contain a larva appear to remain on the stem after the others have dropped to the ground. It is not at all hard to find. It is rather a variable larva. I append descriptions of those varieties which have come under my notice. Hübner would seem to have found this larva and to have confounded it with the larva of E. linariata, from which, however, it is very distinct.

Var. 1.—Ground colour dull yellowish green. Central dorsal line broad, continuous, dull dingy purple. Subdorsal line dull dingy purple, narrow, interrupted on the anal segments. Spiracular line narrow, broken, dingy purple. Head brownish, marked with lines or spots of a deeper shade. Belly whitish green, with a whitish central line. Whole body strewed thinly with whitish hairs, and occasionally suffused and clouded with dull dingy purple. In shape it resembles the larva of E. linariata, in markings that of E. centaureata.

Var. 2.—Ground colour dull yellowish or whitish green. Central dorsal line dusky green. Subdorsal lines dusky green. Segmental divisions yellowish. Spiracular line very narrow and faint, dull green. Belly whitish, without lines or markings.

Var. 3.—Ground colour pale primrose, slightly suffused with green. Central dorsal line dull faint green, nearly evanescent on the posterior segments. Subdorsal lines dull faint green, much broken, having more the appearance of detached spots. Spiracular line very faint, pale yellow. Belly whitish.

Var. 4.—Ground colour bright yellowish green. Central dorsal line pale olive, rather broad. Subdorsal lines pale olive, narrow. Spaces between central dorsal and subdorsal lines bright yellow. Spiracular line dusky green, faint and broken. Belly sea-green. The larva is full-fed from the beginning of July to the beginning of August. I am happy to say that my friend Mr. Buckler, of Emsworth has, with his usual skill, taken most life-like drawings of all the varieties. Pupa enclosed in a slight earthen

cocoon. Thorax and wing-cases transparent yellowish green. Abdomen reddish yellow. Abdominal divisions and tip dark red.—*H. Harpur Crewe.*

Description of the Larva and Pupa of Eupithecia lariciata of Frey.—Var. 1.—Ground colour bright grass-green, somewhat darker on the centre of the back. Central dorsal line dark green. Anal tip of central dorsal line reddish. Subdorsal lines wanting, or so faint as to be scarcely visible. Spiracular line whitish or pale straw-colour. Segmental divisions yellowish. Belly whitish, with a dark green central line. A long, slender larva, tapering towards the head. Resembles in appearance the larva of E. fraxinata of Crewe.

Var. 2.—Ground colour yellowish red or reddish buff. Central dorsal line brownish olive. Subdorsal lines brownish olive, occasionally very faint. Spiracular line pale greenish yellow. Anal tip of central dorsal line reddish. Belly whitish, with a dusky central and two broad lateral lines. Strongly resembles the larva of E. indigata of Hübner. Feeds on larch and spruce fir. Full-fed the end of July. Pupa enclosed in a slight earthen cocoon. Rather long and slender. Thorax yellowish olive. Wing-cases deep green. Abdomen yellowish green, tinged with red. Abdominal divisions and tip red. This insect, which has only lately been ascertained to be British, was first taken, some three three years since, in Kent, by Mr. Eedle. During the present season Mr. Edward Hopley and Dr. Gill have again taken it in Surrey. The former gentleman most kindly sent me a small batch of impregnated eggs, from which I reared about ten larvæ. From these the foregoing descriptions were taken. The perfect insect appears at the end of May and beginning of June.—*Id.*

Immense Swarms of Syrphus Pyrastri.—Enclosed are some species of Diptera that are swarming here in countless thousands. My attention was first drawn to them on Sunday, the 14th inst., the walls of my house being literally covered with them. Yesterday they passed over this place in an eastward direction in large masses. At the Rev. C. Pritchard's and other places they were seen passing continuously for six hours. One old lady in this place, the owner of a fine orchard, declares it to be a blight upon her apples, as they completely covered her trees yesterday in their eastward migration. Every house in this place is infested with them. No doubt you will receive notices of their occurrence in other places. I certainly think such an unusual occurrence worth recording.—*H. Rogers; Freshwater, Isle of Wight, August* 16, 1864.

Postscript.—Since writing the foregoing communication I have gained the following additional particulars. I went to Freshwater Gate yesterday: there the dead bodies of these flies formed a line on the shore and under the cliffs more than four miles in length, *viz.*, from the Needles to the Monument. Colwell Shore presented the same appearance, and millions were still flying about there, to the annoyance and discomfort of our lady visitors, many of whom seemed quite alarmed at the unusual occurrence. I then visited Yarmouth Bridge, where men are employed at the present time painting the rails, this being the direction the swarm had taken the day before. For fifty yards the rails were completely covered with flies firmly fixed to the wet paint. There were stragglers to the right and left, but this seems about the width of the main body. If you consider a mass fifty yards wide passing over for six hours, the number seems almost incredible.—*H. Rogers; August* 18, 1864.

[The flies sent are Syrphus Pyrastri. Mr. Rogers is quite right in supposing I should receive similar announcements from other quarters: I have been inundated with correspondence on the subject, generally accompanied with a demand for a remedy for *this destructive pest.* The history of the fly is on this wise: it is sent by an allwise and

ever-watchful Providence to keep in check those countless myriads of Aphides which, in dry seasons like the present, cover the young shoots and feed on their juices, and which, if unrestrained, would desolate the earth. The fly lays its eggs among a colony of Aphides, and the grub, on emergence, finds itself surrounded by its natural food: it slays right and left, and devours the slain. It is, indeed, one of the greatest benefactors to man, who, as usual, mistakes a friend for an enemy, and, as in the instance of our small birds, does all he can to destroy the remedy provided by the Almighty against an unquestionable evil.—*Edward Newman*].

Proceedings of Societies.

Entomological Society.

August 1, 1864.—The Rev. Hamlet Clark, V.P., in the Chair.

Additions to the Library.

The following donations were announced, and thanks voted to the donors:—'Memorias de la Real Academia de Ciencias de Madrid,' 1a Ser. Tom. 1e, par. 2a; 2a Ser. Tom. 1e, par. 3a, Tom. 2e, par. 1a; presented by the Academy. 'Schriften der Königl. Physikalisch-ökonomischen Gesellschaft zu Königsberg,' vol. 4, parts 1 and 2; by the Society. 'Bulletin de la Société Imperiale des Naturalistes de Moscou,' 1863, Nos. 1 and 2; by the Society. 'Transactions of the Zoological Society of London,' Vol. v. part 3; 'Proceedings of the Zoological Society of London,' 1863, parts 1—3; by the Society. 'Proceedings of the Royal Society,' Vol. xiii. No. 65; by the Society. 'The Zoologist' for August; by the Editor. 'The Entomologist,' Vol. ii. No. 4; by the Editor. 'The Entomologist's Monthly Magazine,' No. 3; by the Editors. 'The Reader' for July; by the Editor. 'The Journal of the Society of Arts' for July; by the Society. 'British Moths and their Transformations,' by H. N. Humphreys and J. O. Westwood; 'Essai Monographique sur la Tribu des Psychides,' par T. Bruand; 'The Lepidopterist's Calendar,' by Joseph Merrin; 'La Flore des Insectophiles,' par Jaques Brez; 'Catalogue Synonymique des Coléoptères d'Europe et d'Algerie,' par J. Gaubil; 'Genera et Index Methodicus Europæorum Lepidopterorum,' a Doctore J. A. Boisduval; 'Europæorum Micro-Lepidopterorum Index Methodicus,' par. A. Guenée; 'Du Tineen und Pterophoren der Schweiz,' von Prof. Frey; 'Letters of Rusticus;' 'Wahre Parthenogenesis bei Schmetterlingen und Bienen,' von C. T. E. von Siebold; 'On a true Parthenogenesis in Moths and Bees,' by C. T. E. von Siebold, translated by W. S. Dallas; presented by J. W. Dunning.

The following addition, by purchase, was also announced:—'Bericht über die wissenschaftlichen Leistungen ein Gebiete du Entomologie,' 1838—1847, von Dr. W. F. Erichson.

Exhibitions, &c.

Mr. Bond exhibited Gelechia pinguinella, a species new to Britain, found on the trunks of poplars near London; and a specimen of Nyctegretes Achatinella, one of the rarer British Phycidæ, captured by Mr. Thomas Brown near Yarmouth.

Mr. J. Jenner Weir exhibited an albino variety of Eubolia bipunctaria, caught on the South Downs.

Professor Westwood, in calling attention to the preparation, by Mr. Baker, of Cambridge, of a larva of Zenzera Æsculi, took occasion to observe that the upholders of the law of priority in nomenclature were bound to restore the name Zenzera in lieu of Zeuzera: Zenzara was the name first given to the insect by Latreille, and it was only by a typographical error that Zeuzera had ever appeared.

Mr. M'Lachlan exhibited a specimen of Libellula striolata, from Montpellier, having the veins at the basal part of the anterior wings covered with specimens of a red species of Acarus.

Prof. Westwood remarked that the Acari had probably taken up their position for the purpose of sucking some fluid matter, which went to show that the wing-veins were not (as had been supposed) mere horny matter, not containing fluid.

Mr. F. Smith doubted whether the Acari had placed themselves on the wing-veins in search of food or suction; humble-bees were often covered with these insects, and 300 or 400 Acari might be found on a single specimen, so that the humble-bee actually fell to the ground through their weight; he thought that the Acari fed on the comb, and crawled upon the body of the humble-bee when within the nest, and so were carried out. The presence of Acari on the dung-beetles (*Geotrupes*) also was notorious.

Mr. Edwin Shepherd referred to the frequent occurrence of Acari on butterflies, and thought they were picked up from the flowers which the butterflies visited.

Prof. Westwood directed attention to the editorial note appended to an article headed "Larval Reproduction in Insects," at p. 56 of 'The Entomologist,' vol. ii.: Mr. Newman there stated as a fact that the larvæ found by Prof. Wagner within the Dipterous larvæ from Kasan were "those of one of the Pteromalidæ which habitually infests the larvæ of Diptera." This might be so, but no grounds for the statement were adduced, and it did not appear that Mr. Newman had had any opportunity of investigating the point. It should be borne in mind that Prof. Wagner was perfectly well aware of "the familiar parasitism of the Ichneumonidæ" before publishing his discovery in Siebold and Kölliker's Zeitschrift, and in fact the course of his observations had been guided by his knowledge of the habits of the Pteromalidæ. At any rate, he (Prof. W.) protested against the dogmatic assertion of the editor of 'The Entomologist,' as tending to shut out from further inquiry a question which, to say the least, was as yet an open one, and of which further investigation was most desirable.

Papers read.

Mr. Baly read a paper entitled "Descriptions of uncharacterized Genera and Species of Phytophaga," in illustration of which the new species were exhibited.

Mr. Hewitson communicated "Descriptions of four new Butterflies" (with drawings),—Helcyra Hemina from East India; Limenitis Labotas, from Menado; S. Ligyes, from Northern India; and Laogona Lilæa, from East India.

The Rev. H. Clark read "Notes on the Genus Hydaticus of Leach, with descriptions of new Species." The new species were eight in number, *viz.* Hydaticus Bakewellii, from Moreton Bay; H. Adamsii and H. aruspex, from China; H. verecundus (from South America and Java?); H. Bowringii, from China and Australia; H. Ussherii, H. paganus and H. matruelis, from the Gold Coast.—*J. W. D.*

Life-History of Saturnia Mylitta, the Tusseh Silkworm. By Captain Julian Hobson, H.M. Bombay Staff Corps.

I beg to send you a few notes on the Saturnia Mylitta, or Tusseh silk-moth: as the subject of Tusseh silk is at the present moment attracting some attention, I trust a few words on the cultivation and habits of the larva may be acceptable.

For the last seven or eight years I have yearly procured about a hundred cocoons of this magnificent moth; they are to be found in great abundance in the Tanna districts (in the Coucan or lower Ghauts), about forty miles from Bombay, and though I have at times had as many as four or five females out in an evening, and about as many males, strange to say I never, until the 2nd of last May, succeeded in finding them *in coitu:* the next evening the male left his mate and flew away; a few hours afterwards she deposited a number of eggs, and about the same number the following evening. I left the paper covered with the eggs exposed to the open air, and, to my astonishment, on the 12th (nine days after the first batch of eggs was laid) a small brood made their appearance: being quite unprepared for such a sudden arrival of these little creatures, I was quite at a loss what to feed them on. I tried them on the common mulberry, Ziziphus jujuba, Getonia floribunda, but the little fastidious things would not touch any of these leaves; at last I tried them on the Pentaptera coriacea (a tree very common in the Coucan), which I was pleased to find they greedily attacked.

The small larvæ on emerging from their eggs, which are about the size of a Jowaree seed (*Holcus sorghum*), with a black horizontal ring round them, measure about three lines in length, slightly hairy, and of a brownish tinge, with two rows of small tubercles along the back and two along either side, from each of which protrude small black hairs; the two posterior tubercles are close to each other and thickly covered with small black hairs; there is also an anal tubercle situated between the two last dorsal tubercles; head very dark brown, almost black, with a small circle of hairs round it.

On the 15th of May the first moult took place, when the larvæ became a dark green colour, the tubercles a shade lighter, the hairs proceeding from them scarcely visible, but the tufts of hairs on the posterior and anal tubercles jet-black. On the 17th the second moult took place, when the larvæ became a lovely yellowish green, tubercles beaded with bright orange, with six black short rigid hairs proceeding

from each tubercle in stellate form; the tubercles on the second and third segments, also the anal tubercle, are dark brown: in some of the specimens all the dorsal tubercles are tipped with dark brown instead of orange-red; head and prolegs brown; middle and hind legs or claspers the same colour as the body; spiracles light brown.

On the 20th some dozen underwent the next moult; the tubercles were then of a light buff colour, the six hairs in stellate form much lighter colour and less rigid, with one silky long hair protruding from the centre of the tubercle; colour of the body much lighter, approaching yellow; prolegs brown, the meso or sucker-legs covered with short brown hairs, not visible in any of the former stages; a curious V-form of slate-colour on both sides of the hind or clasper legs, and an inverted V quite white on the forehead. The day after this moult the dorsal tubercles were of a bright golden hue, and the next day two bands of yellow were visible along the six posterior segments on either side. Directly after the larva has emerged from its old skin, the light hairs on the tubercles lie on the body most regularly in a diagonal position, forming a diamond-shaped mark between the dorsal tubercles.

On the 24th the farthest advanced passed through another moult: in this there is a great difference in the larva; the dorsal tubercles are of a much more coppery hue, those on the first, second, third and fourth segments especially: the side tubercles have a bluish tinge, with the exception of those on the fourth, and sometimes fourth and fifth segments,* which are of a bright silvery hue; the spiracles are of a brown colour, with a just perceptible white rim; the first, second and third segments [? second, third, and fourth] are covered with short light rigid hairs; long silky hairs are dispersed over the other parts of the back; prolegs brown; meso-legs or suckers same colour as body, which is a beautiful green, covered with small rigid brown hairs; anal segment brown on the sides; the yellow line along the side above the spiracles more strongly developed. In this moult the body is more transparent.

Just at this time I had to leave the Coucan and proceed to the Deccan: on the march I had great difficulty in procuring fresh leaves, so that, from being exposed to the sun and from want of fresh leaves, many sickened and died. As the Pentaptera coriacea is not procurable in the Deccan, I had again to hunt for leaves that they would

* I have no doubt that the silvery tubercle, in some cases on the fourth segment only, and in some on both the fourth and fifth segments, is a distinguishing mark of sex.—*J. H.*

eat; fortunately I lit upon the banyan tree (*Ficus indica*) the very first day, and this they devoured greedily.

By the 5th of June some appeared to have passed all their moults, from which time they grew rapidly. In the last stage the dorsal tubercles on the five anterior segments are very large and of a beautiful bright golden hue: the silvery tubercle on the fourth segment on the side is much larger; the skin very transparent. On the 17th the first larva commenced weaving its cocoon, which in a few hours was so thick that the larva could not be seen. The cocoon, which is of a brownish hue, is about the size of a pigeon's egg.

Now it occurs to me that this larva might be easily cultivated, and that the silk, which is very strong, would be of the greatest importance in a commercial point of view: the silk appears to be stronger than that produced by the common silkworm (*Bombyx Mori*).

JULIAN HOBSON.

Sattara, June 21, 1864.

Long Duration of the Pupa-state in Eriogaster lanestris.—A friend favoured me with a larva of Eriogaster lanestris in May, 1861, which changed to a chrysalis during the following month. I expected to see the imago appear during the February following, but was disappointed, as they did not emerge until the latter end of February and the beginning of March, 1863. Is it not an unusual circumstance for this species to remain so long in the pupa state?—*T. E. Gunn.*

[I think not: I have had them as much as five years in the pupa state: it is a curious and wonderful provision of Nature that many insects have this diversity in the duration of the pupa state, a state much less liable to destruction by any sudden catastrophe than either the larva or imago.—*Edward Newman.*]

Larva of Eupithecia pulchellata, Steph.—In my note on this larva (Zool. 9253), I inadvertently omitted to mention that Mr. Hellins and myself were indebted to the kindness of Mr. Hodgkinson, of Christchurch Street, Preston, for our eggs of this moth. The persevering energy which this gentleman has shown in endeavouring to assist us by procuring these ova cannot be sufficiently praised, and I regret very much that I did not in my former note couple his name with those of Mr. Hellins and Mr. Doubleday. Dr. Breyer, of Brussels, informs me that during the present summer Dr. Boissler, of Wiesbaden, has taken larvæ on the flowers of Digitalis contigua, which he has little doubt belong to this species.—*H. H. Crewe.*

Errata.—In my note (Zool. 9253) "Warstone, near Leck," should be "Warslow, near Leek," and "Mr. George Bates" should be "Mr. George Baker."—*H. Harpur Crewe.*

Eupithecia pulchellata.—Your notes on Eupithecia pulchellata (Zool. 9253) tell the history of the discovery of the larva and food-plant as far as known to you: had I been aware that you were about to publish so soon, I would have furnished you with some additional particulars, which would have made the history more interesting, and would have enabled you, as I am certain you would yourself have desired, to

avoid all appearance of slighting any one who was concerned in the discovery. The impression that foxglove might prove the food-plant was strongly felt by several entomologists as early as August, 1863, when Mr. Hodgkinson, who had worked very hard during the previous June in getting eggs, and also Mr. D'Orville, independently of each other, searched the Digitalis purpurea well, and succeeded each in finding the larva of a Eupithecia, unfortunately not the right one (E. pulchellata probably being in pupa at that date), but only that universal feeder E. castigata, to which no green thing that grows seems to come amiss, and which I need not tell you is of a type totally distinct from that to which E. pulchellata belongs; and I know I received the same species from another entomological friend who had been searching the foxglove, but at this moment I do not recollect from which of my friends it was. Late in the same year (October 27), and not at all in connection with the captures mentioned above, I received from Mr. Doubleday the suggestion that Hübner had mistaken the larva of E. pulchellata figured by him on Digitalis lutea for a variety of E. linariata. However, during the winter and spring other engagements had pretty well put all entomological thoughts out of my head, and I was determining to do little or nothing in the way of rearing larvæ this season, when, on the 4th of June, Mr. Hodgkinson, bent on getting this species worked out, if possible, sent me some eggs again. Being too much occupied just then to spend any time in searching for food, or even to recall distinctly our last year's doings, I begged him to tell me just the three or four plants which he found most abundant in the locality of the moth, and it was from the information furnished in his reply that when the larvæ hatched I supplied them with two or three flowers of foxglove, some heather, and some Galium saxatile; this last because Mr. Hodgkinson told me that Mr. Gregson had found the larva on it last year; and according to my custom in dealing with "unknowns," I added a little Polygonum aviculare. In four or five days' time I found that about five out of the fifteen little larvæ were ploughing grooves in the foxglove flowers, the others having missed the right food and perished from starvation. The rest of the story is known, and I will only add that I claim no merit to myself in the whole matter.—*The Rev. J. Hellins, of Exeter, in a letter to the Rev. H. Harpur Crewe, who communicates it.*

Occurrence of Eupithecia campanulata of Herrich-Schæffer in Britain: Description of the Larva and Pupa.—A few weeks since, whilst walking in a beech wood near Tring, I found a number of larvæ of some to me unknown species of Eupithecia feeding in and upon the seed-capsules of the nettle-leaved bell-flower (*Campanula trachelium*, L.). Dr. Breyer, of Brussels, having mentioned that he had bred Eupithecia campanulata, *H.-S.*, from larvæ feeding on the seed-capsules of this plant, I at once surmised that my larvæ might probably be this species. I therefore enclosed two full-fed larvæ in a quill, and posted them to Dr. Breyer, who at once pronounced them to be true and indubitable larvæ of E. campanulata. The larva belongs to the Absinthiata group, but is totally distinct from all the British members of this family and from every other British Eupithecia I am acquainted with. I am happy to say that Mr. Buckler has taken some most faithful and life-like coloured drawings. I have much pleasure in affording the following description of the larva and pupa:—Rather short and stumpy in shape, closely resembling the larvæ of E. minutata and E. absinthiata. Ground colour light ochreous-brown. Central dorsal line very deep brown or black, intersecting and uniting a chain of very strongly defined black or deep brown lozenge-shaped spots placed in the centre of each segment. Subdorsal lines very slender and faint blackish or deep brown. Head dingy brown or black.

Spiracular and central ventral lines dingy black or brown. Central dorsal spots becoming corpulent and merged in the central line on the anterior and posterior segments. Skin rough and wrinkled, sprinkled with a few short whitish hairs. Feeds upon the unripe seeds and seed-capsules of Campanula trachelium, *L.*: till nearly full fed remains on the surface of the capsule, just at the crown. When very young lives in the dry corolla-tube. In confinement will feed upon various garden species of Campanula. Full-fed end of August and beginning of September. Pupa enclosed in a slight earthen cocoon. Thorax and wing-cases golden yellow. Abdomen reddish. Abdominal divisions and tip red. Resembles the pupa of E. expallidata. The perfect insect in some respects resembles E. expallidata, but is very distinct from all the other members of the Absinthiata group.—*H. Harpur Crewe; The Rectory, Drayton-Beauchamp, Tring; September* 7, 1864.

Agrotis Segetum and the Turnip Crop.—I yesterday found thirty larvæ of Agrotis Segetum at the root of one small turnip: I could not have believed this possible had I not dug them up with my own hands, and seen them with my own eyes.—*H. Harpur Crewe.*

[I have received an almost incredible number of communications on this subject: the ravages of the larva are doing incalculable mischief in almost every part of the kingdom. I am preparing its life-history for publication in the 'Entomologist,' but must await the emergence of the imago, being uncertain as to the species.—*Edward Newman.*]

The Beating-Net or the Umbrella?—The question has been mooted, which of these is best to use in our researches after larvæ. I have used and found serviceable the former (consisting of an iron folding ring, such as anglers use for a landing-net, to which is attached a bag of stout holland), which I have already commended in print. This is portable, as it can be conveyed in the pocket, though it necessitates the carrying of two sticks; one to serve as a handle, and the other as a striking implement. Latterly I have found that an umbrella (gingham or alpaca) does decidedly answer best. It takes in a much greater extent of leaves and twigs, and the objects precipitated into it by beating are more readily seen and secured. In the holland bag, to examine its contents, you must pause occasionally and turn it inside out, a tedious, and when the wind is rough a rather difficult, process. For sweeping, or for beating low plants or grasses, it is handiest, and may be occasionally resorted to. The entomological umbrella does not certainly improve in its personal appearance. Its ribs become bulgy, its outer surface rough, and it is known and shunned by everybody but its owner. A true naturalist, however, lightly esteems this and similar annoyances. I have found that a much larger proportion of the larvæ taken by beating die in the process of rearing than of those captured in other ways. With some, there is no doubt, it arises from an injury inflicted by this method; and the weakly or diseased larvæ of certain species will more readily fall from their positions. Sharp, jerking taps given to the branches or twigs are more effective in obtaining larvæ than a prolonged and gradual shaking. It must not be forgotten that searching must not be neglected entirely; as there are some species of which we shall only find the larvæ in this way. I may instance Gonopteryx Rhamni and the genus Dicranura.—*J. R. S. Clifford;* 21, *Robert Terrace, Chelsea, September* 7, 1864.

Life-Histories of Sawflies. Translated from the Dutch of M. Snellen van Vollenhoven, by J. W. May, Esq.

(Continued from page 9072).

Cimbex axillaris, *Panz.*

Imago, *Panzer, Fauna Germ.* 84, f. 11. *Jurine, Nouv. Méthode,* pl. 6, fig. 1. *Klug, Versuch einer Darstell. der Fam. und Arten der Blattwespengatt; Cimbex,* p. 84. *Hartig, Blatt und Holzwespen,* f. 68.

Larva undescribed.

Cimbex niger, capite fusco, antennis ac tarsis rufo-flavis, clypeo, prothorace, abdominis segmentis 3o, 5o, 6o, 7o, 8o, ac 9o flavis.

Some years ago I met with a Cimbex larva in the collection of my friend Dr. J. Wttewaall, which was quite new to me, and of a striking appearance, both on account of its size and the beautiful arrangement of its colours; the larva in question was preserved in spirit. At that time I thought my friend told me that this unknown larva had been taken feeding on raspberry bushes in the neighbourhood of Voorst in Gelderland, and as I much wished to have such a larva alive, I asked him to do what he could to get me one or more of them. I afterwards received from my friend Dr. Herklots some drawings which he had some time previously bought at the sale of books and engravings of Professor Reinwardt, in one of which drawings were represented two similar larvæ, together with a coarse large cocoon and an imago of Cimbex axillaris, accompanied by a pair of East Indian Scutelleridæ.

A year passed by, during which time Dr. Wttewaal informed me that, notwithstanding all his efforts, he had not been able to find a Cimbex larva of the species I had named. As he was about changing his place of residence, and so the chance of obtaining the larvæ of C. axillaris from Voorst was as good as gone, I addressed myself to Mr. E. A. de Roos van Westmaas, who lived at Velp, and requested him to look out both there and at Daalhuizen for the larvæ I wanted, and in order to enlist the country boys in the search I offered a premium of twenty-five cents for each specimen. The result of my friend's exertions was that on the 14th of July, 1860, a larva was sent to me, taken, not on the raspberry, but on a hawthorn hedge, and on which hedge, according to his letter, it was to be found annually in small numbers. I made a drawing of the larva the same day I received it, and afterwards, in order to rear it, took it with me to

Brummen, where I was going to spend a few days with Dr. Ontijd. During my stay I searched more than once, principally in the evening after sunset, on the hawthorn hedges, which are so plentiful at that place, but the only result was that I met with a single example on the 31st of July, in that year, at Rhienderstein.

Thus I have only had an opportunity of watching two larvæ of this species, but as, fortunately, both spun up, pupized and emerged, and as one turned out to be a male and the other a female, I may consider that I am sufficiently acquainted with the life-history of this species to include it in these papers.

I was subsequently assured by Dr. Wttewaall that my idea as to the nature of the food of the larva was to be attributed to some misunderstanding on the part of one of us, and that the first larva which I had seen preserved in spirit was found on the hawthorn (*Cratægus oxyacantha*), as were the other two. The larvæ are very pretty and beautifully marked creatures. Their colour is bluish white, with somewhat reddish heads. They usually remain curled up, as in fig. 1 of our plate 1, and when they move about or feed, they still almost always keep the last segment of the body curled round underneath. The head was globose, the eyes small, circular, black and seated in round black spots low down on each side of the head. The feelers were also black and extremely minute. A longitudinal suture was distinctly observable on the vertex and two transverse impressions. The body was bluish white, except at the sides, where a yellowish tint was perceptible. Along the back was a broad bluish white line, on which were first four large elliptical spots, and then alternately after every other one a larger and a smaller round spot, as shown in fig. 4, somewhat enlarged. On either side of this dorsal line is a line composed of small transverse black and orange spots, as represented at figs. 3 and 4, enlarged. On each segment the markings are as follows:—*first*, a little wedge-shaped black line, close against it an orange spot, broadest at the end directed towards the dorsum; succeeding this are one or two longer black lines, then a smaller one, and, lastly, three of nearly equal size, all black. The last segment has three black spots in the centre, and on either side one orange and three black lines. The stigmata were shaped like the impression of a stag's hoof (see fig. 5, much enlarged). Above the stigmata were clearly to be seen round black valves, as if belonging to excretory ducts, as is usually the case with Cimbex larvæ. I have, however, never seen these larvæ eject any fluid (see on this point the description of the larva of Abia ænea, vol. i. p. 144; Zool. 7524), but the one taken at Rhienderstein

was quite wet and covered with drops when found. The prolegs were white; at the end of the penultimate joint was a small black transverse line, while the last joint was longitudinally striped with black. The claws were black, the belly and legs entirely greenish white.

The larger of my larvæ was thirty-seven millimetres long. I cannot well remember whether these larvæ fed during the day time, or at night, and I have made no note of the circumstance; I think the former, in which they would agree with the large Cimbex of the alder, and not with Cimbex Betuleti. They fed voraciously. Their excrement was somewhat remarkable, for each particle had a small reddish spot on one side, the remainder being quite black (see fig. 6).

At the beginning of August the larvæ were full grown. The one which I had found at Brummen began to spin up on the 10th of August. This one came out at Leyden on the 25th of April, 1861. The one from Velp had already spun up on the 2nd of August, and came out a few days before the other. They spun up between the leaves and the bottoms of the boxes in which I had placed them. The cocoon was brownish yellow, single, very hard, shining, strongly cemented, and very smooth inside (see fig. 7).

The perfect insects are very handsome creatures, as may be seen by a glance at figs. 8 and 9. The first represents the male, the second the female. The external distinctions between the two sexes consists solely in the thickness of the femora and the appearance of the under side of the abdomen.

The head is brown on the vertex, and the cheeks darker above the antennæ; below them and on the clypeus shining yellow, and everywhere covered with fine brown hairs. The antennæ consist of five joints and a thick knob, which again appears to be composed of three joints, but this circumstance is not quite clear. The first joint is short, thicker than the following one, brown, hairy; the second is the smallest, also brown; the third is much longer, round, narrow, somewhat expanded at the end, brown at the base, becoming obscure orange further up; the two following joints are also of this latter tint, they are of very nearly equal length; the thick round knob is also concolorous with them.

The compound eyes are dark purplish brown, oval, prominent; the three simple eyes of the colour of garnet. The upper jaws are bidentate, dark brown; palpi pale brown. Thorax brownish black, and thickly hirsute, the prothorax bright yellow, and the scutellum red; the sides below the wings are also more or less red. The tegulæ are shining black, the posterior margin being yellow. Wings shining,

pale brown; the fore wings from the anterior margin to the externo-medial nervure, and including the marginal and submarginal cells, are a decided yellowish brown, which is also the colour of the nervures in all four wings. The apices of the anterior wings are smoke-coloured, and more or less those of the hinder wings also.

The legs are ferruginous as far as the tarsi, which are yellowish red. Coxæ, apophyses and femora are marked with black longitudinal lines; the legs are very hairy, as far as the first joint of the tarsi. In the male the coxæ and femora, more especially those of the second and last pair of legs, are much coarser, longer and thicker than in the female; and in the former, on the posterior border of the intermediate coxæ, is found a hatchet-shaped projection ending in a little blunt spine below.

The abdomen is yellow. The first, second and fourth segments are black on the dorsum; the first segment is curved in a forward direction on the posterior margin, and, as it were, cut out, so that a space is left between it and the following one; this space is filled up by a clear white membrane, which may be seen to be frequently moved up and down by the breathing of the animal. In the centre of the dorsum of the third, fifth, sixth and seventh segments is a small black triangle, bordered with brown: in the female this occurs on the eighth segment also. On the under side of the abdomen, which is yellow, the middle segments have little black lines, while the organs of generation are concealed by a broad ferruginous plate on the last segment. The valves of the saw in the females are yellow, with two little black lines.

My two examples were not very lively, and soon died: I was not able to discover the nature of their food.

The body, exclusive of the antennæ or the legs, was 16 mm. long; the male with his legs covered a circle of three centimetres diameter. The female expanded to 37 mm., the male to 40 mm.

Hexagonal Form of the Cells of Bees.—When will this controversy come to an end? In former numbers of the 'Zoologist' the subject was canvassed very often, and if any apiarian will only examine those honey-combs so frequently left in wet, cold summers, before the cells are filled,—in fact, in deserted hives or deserted combs, where no heat or pressure has been able to act on them,—that person must be obdurate to doubt for a moment that the hive bees' cells are originally all formed (except the queens' and drones' cells) of the hexagonal form exactly. But I have no doubt that in many old stocks which have stood a very hot summer, and in which breeding has been going on, or which have been moved in a very heavy state, that the hexagonal

shape may have been altered. My opinion is that a heat of 84° to 88° in the shade has a great effect on the wax; even the circumstance of a heavy hive being placed a little on one side on its board will affect the shape of the cells. Mr. Parfitt's statement (Zool. 9155) is perfectly correct. Mr. Tegetmeier has made one observation in which I perfectly coincide: he says it is the bees which carry the queen, and not the queen which carries the bees, to take possession of an empty or deserted hive with old combs. Scout bees may often be seen entering these hives in the swarming season in numbers, and ransacking the combs. But who ever observed a queen enter among these scout bees to put the combs in order, or to reconnoitre, any time previous to the day of swarming? I have recorded that near Burnham, in Somersetshire, a second swarm or "cast" entered a vermin-trap, and on scouring the country it was found that no bees were kept nearer this spot than four English miles.—*H. W. Newman; Hillside, Cheltenham, August* 3, 1864.

Singular Freak of the Insect and Feathered Tribes.—At Hungerford House, Madeley, the residence of Mr. J. S. Wilkinson, a pair of swallows having perfected a nest under the eaves of the roof of the house, were summarily ejected therefrom by a swarm of wasps, who, taking full possession of the tenement, have constructed a very curious pyramidal or inverted cone nest, which is in itself quite a curiosity. What is still more remarkable, however, is that the swallows, nothing daunted, commenced to build a new habitation within two inches of the wasps immediately after being driven from the old one, and have since completed it and reared a brood of young birds, the insects and the birds appearing to carry on their work in the most friendly manner.—*Contributed by Mr. George Maw, of Broseley.*

Larva and Pupa of Ripiphorus paradoxus.—Both coleopterists and hymenopterists will doubtless feel interested in the announcement that the discovery of the larva and pupa of the above parasite has at length been made. On Saturday morning last I was fortunate, on opening a cell contained in a nest of Vespa vulgaris, in discovering a larva of Ripiphorus in the act of consuming the spun-up larva of the wasp to whose body it was firmly adhering. It had not then made much progress in the work of destruction, but in the course of the following forty-eight hours it entirely consumed its victim, with the exception of the skin and mandibles. From other cells in the same nest I obtained pupæ of the parasite as well as specimens of the perfect insect.—*S. Stone; Brighthampton, Witney, August* 23, 1864.

The Locust in Cornwall.—A specimen of the locust (*Gryllus migratorius*) was captured on the cliffs near this place on Tuesday last.—*John Cornish; Penzance, September* 9, 1864.

Proceedings of Societies.

Entomological Society.

September 5, 1864.—F. P. Pascoe, Esq., President, in the Chair.

Additions to the Library.

The following donations were announced, and thanks voted to the donors:—'Catalogue of North American Butterflies,' by J. W. Weidemeyer; presented by the Author. 'Abhandlungen der Naturhistorischen Gesellschaft zu Nürnberg,' Bd. 3; by the Society. 'The Zoologist' and 'The Entomologist' for September; by the Editor.

'The Entomologists' Monthly Magazine' for September; by the Editors. 'The Naturalist,' Nos. 1—9; by the West Riding Consolidated Naturalists' Society. 'The Intellectual Observer,' Nos. 31 and 32; by the Publishers. 'The Journal of the Society of Arts' for August; by the Society. 'The Reader' for August; by the Editor. 'The Athenæum' for July and August; by the Editor.

The following addition by purchase was also announced:—Thomson, 'Skandinaviens Coleoptera,' Vol. 6.

Election of Member.

James Bladon, Esq., of Pontypool (already an Annual Subscriber to the Society), was ballotted for and elected a Member.

Exhibitions, &c.

Mr. Dunning exhibited a number of full-fed larvæ of a Noctua (Agrotis segetum, or A. exclamationis?), which had been sent to him by Mr. J. D. Kay, from Brantingham, in the East Riding of Yorkshire. Mr. Kay had had a field of turnips, worth £150, entirely destroyed by these caterpillars. Numerous similar instances from various parts of the country, and it was mentioned that their ravages were not confined to the turnip-crops.

Mr. E. W. Janson exhibited four species of Coleoptera hitherto unrecorded as British, and communicated the following in reference thereto:—

"1. Euryusa sinuata, *Eric.*

Euryusa sinuata, *Eric. Kaef. d. Mark Brand.* i. 372, 1 (1839); *Gen. et Spec. Staph.* 199, 1, tab. 1, f. 2 (1839). *Kraatz, Naturg. d. Ins. Deutschl.* ii. 73, 1 (1856).

A single specimen, the only indigenous example of this interesting species which I have seen, captured by the Rev. A. Matthews, many years since, in Oxfordshire.

It is readily distinguished from its near ally, E. laticollis, *Heer*, by its short prothorax, the sinuate hinder margin of this segment, and its nearly rectangular posterior angles.

"2. Leptusa analis, *Gyll.*

Aleochara analis, *Gyll. Ins. Suec.* ii. 388, 11 (1810).

Oxypoda analis, *Eric. Gen. et Spec. Staph.* 154, 29 (1839).

Leptusa analis, *Kraatz, Naturg. d. Ins. Deutschl.* ii. 62, 2 (1856). *Thomson, Skand. Col.* ii. 275, 1 (1860).

Captured during the past month in the Black Forest, Perthshire, by Mr. D. Sharp.

Differs conspicuously from L. fumida in its superior size, reddish brown hue, semiopaque surface, and more strongly and coarsely punctate abdomen.

"3. Aleochara spadicea, *Eric.* (Var. *major.* Long. 2 lin.; elytris piceis.)

Ocalea spadicea, *Eric. Kaef. d. Mark Brand.* i. 300, 3 (1839); *Gen. et Spec. Staph.* 61, 3 (1839).

Aleochara spadicea, *Kraatz, Naturgesch. d. Ins. Deutschl.* ii. 98, 18 (1856).

Taken by Mr. J. A. Brewer, in Cumberland, in the autumn of 1863.

I communicated this specimen to Dr. Kraatz, who returned it to me labelled "Ab *Aleochara spadicea* vix distincta."

It appears to me not improbable that Aleochara procera, *Eric.*, *Kraatz* (Ocalea procera, *Eric*), will ultimately prove to have been founded on large dark individuals of the species now under consideration; the specimen exhibited presenting, in its superior

size, piceous elytra, and foveolated prothorax, several of the characters assigned to A. procera.

"4. Homalota notha, *Eric.*

Homalota notha, *Eric. Gen. et Spec. Staph.* 126, 101 (1839). *Kraatz, Naturg. d. Ins. Deutschl.* ii. 323, 127 (1856).

Gyrophæna exigua, *Heer, Faun. Col. Helv.* i. 312, 7 (1839).

Gyrophæna pilosa, *Hampe, Stett. Ent. Zeit.* xi. 348, 5 (1850); teste *Schaum, Stett. Ent. Zeit.* xiv. (1853).

Captured by Mr. J. A. Brewer beneath rejectamenta of the River Medway.

The extraordinary resemblance which this species bears to the members of the genus Gyrophæna has, as will be remarked by the above synonymy, misled more than one author concerning its true affinities."

The Rev. Hamlet Clark exhibited a specimen of Buprestis ocellata, a native of Central India, which had been found on board ship between Mauritius and Madagascar, and upwards of fifty miles from land. Prof. Westwood thought the beetle had probably been bred on shipboard.

Mr. B. T. Lowne (who was present as a visitor) said that he once took a specimen of a moth belonging to the genus Audea at sea, and more than 200 miles from the West coast of Africa, which was the nearest land to windward at the time. The genus Audea was previously known to contain two species only, both from Sierra Leone; but the specimen captured as above had proved to be a new and undescribed species, which, so far as he was aware, still remained unique. He had also noticed a butterfly and several grasshoppers on board the ship, all of which must, he thought, have been on the wing for several days, during which they were borne over the sea by the trade-wind.

Mr. S. Stevens exhibited a complete set of the species of butterflies and beetles captured by Mr. Lowne in Southern Syria and Palestine, during the present year.

Mr. Lowne said that the greater part were captured in the months of April and May. Amongst the butterflies, he called attention to a new Lycæna, an Anthocharis, probably new, two species of Gonepteryx, one from the valley of the Jordan, the other (G. farinosa of Lederer?) from Hermon and Lebanon, and to a Papilio closely allied to P. Podalirius, but in his opinion distinct. It differed from its European ally in the greater length of the wing-tails, in the ocelli at their base, and in the markings on the under side of the wings; he had not found P. Podalirius in Syria at all; the new insect, which he regarded as the Eastern representative of P. Podalirius, had occurred near Damascus only. With respect to the Coleoptera, Mr. Lowne said that the country was generally but ill supplied with water, and was too dry for collecting; he had found sweeping unproductive; some Geodephaga he had taken on the coast only; Heteromerous beetles were the most numerous insects, and occurred on flowers, under stones, and in fact everywhere. But on the whole he considered the insect Fauna of Syria poor in comparison with the Flora; like the latter, it was chiefly European in its character, though some of the insects from the South partook of the African type.

Mr. J. R. Larkin, of Elm Cottage, Old Brompton Road, exhibited a novel form of case for the reception of insects; the top and all the sides were of glass; the bottom corked in the usual manner, and framed, so that the whole might be hung picture-wise against a wall.

Mr. Tegetmeier read and presented to the Society an extract (probably) from a provincial (Ipswich?) newspaper of 1833, which contained an account of the first

scientific meeting of the Entomological Society of London. [This extract is now affixed to the first volume of the 'Transactions' in the Library.]

Mr. Tegetmeier also brought under the notice of the Society the letters recently published in 'The Times' on the subject of bees and bee-keeping; and quoted numerous errors into which the writer had fallen; such, *e. g.*, as the statement that the queen selects her husband and passes her honeymoon amid the flowers, that a swarm of bees is as large as a bunch of grapes, that bees are affectionate and fond of children, &c. It was to be regretted that a fictitious value had been given to so worthless a compilation by insertion in the columns of an influential journal; many of the statements of the writer had been answered and exposed by Mr. Woodbury in the same journal, but as a further communication from that gentleman had been refused insertion in that newspaper, Mr. Tegetmeier thought it right to give the Members of the Society an opportunity of placing on record their opinions on the matters in question, lest entomologists abroad should imagine that the letters of "The *Times* Bee-master" represented the amount of practical and scientific knowledge current in this country on the subject under discussion.

Prof. Westwood and the Rev. Hamlet Clark also remarked upon the inaccurate and improper manner in which the question had been treated by the anonymous correspondent of 'The Times.'

Prof. Westwood mentioned that he had recently been informed by a correspondent of a disgusting practice which was alleged to prevail in the public parks of London; the charge was nothing less than this, that lice were placed upon the public seats in the parks, with a view to compel the frequenters of those places of resort to hire the chairs which, for their private advantage, certain persons were allowed to let out at a small charge.

Lieut. R. C. Beavan, Bengal Revenue Survey, communicated the following "Remarks on the Tusseh Silkworm of Bengal."

"Syn.—Antheræa Paphia, *Linn.* Bombyx Paphia, *Sykes, Trans. As. Soc. Lond.* iii. 541 (plate); Saturnia Paphia, *Helfer, Journ. As. Soc. Bengal*, vi. 42 (1837); Tusseh Silkworm Moth, *Hind. Helfer;* Bughy Silkworm Moth, of the Beerbhoom Hills, *Roxburgh;* Kolisurra Silkworm Moth of the Mahrattas, *Sykes;* Munga Silkworm Moth of the Méchis, *B. H. Hodgson;* Koukuri Mooga of the Assamese, *Hugon, Journ. As. Soc. Beng.* vi. 32 (1837).

"Further mention by writers.—Horsfield's 'Catalogue of the Lepidopterous Insects in the East India House Museum,' ii. 385, No. 916 (1858-9); Col. Gastrell's 'Report on Survey Operations in the District of Bancoorah;' Capt. Walter Sherwill's 'Report on Survey Operations in the Beerbhoom District;' Lieut. Kittloe's 'Journey through the Forests of Orissa,' Journ. As. Soc. Beng. viii. 680; Mr. F. Moore's paper 'On the Silk-producing Bombycidæ of Asia,' Proc. Zool. Soc. 1859; Dr. Walker, 'On the Natural Products of the Country about the Pundeelah River in the Nizam's Territory,' Journ. As. Soc. Beng. part 2, vol. x. (1841); and various notices in Journals of Agri-Horticultural Society.

"List of trees on which the Tusseh larva feeds.—Sal, or Sakwa, or Sakooa (*Shorea robusta*, Roxb.); Badaam, or country almond (*Terminalia catappa*, Linn.); Pullas or Dhak (*Butea frondosa*, Roxb.); Arsun (*Terminalia alata* or *T. glabra*, Wight); Teak or Sagwan (*Tectona grandis*, Linn.); Bair or Byre (*Zizyphus jujuba*, Lam.); Toot or Toout, "Indian Mulberry" (*Morinda citrifolia*, Linn.?);

Semul or cotton tree (*Bombax heptaphyllum*); Koossum or bastard safflower (*Carthamus tinctorius*, Linn.)

"The tusseh silkworm is reared in considerable quantities in Maunbhoom, Bancoorah and Beerbhoom, and its silk, both in the raw and made-up states, forms one of the principal articles of export from these and adjoining districts. In Maunbhoom the arum tree is planted by the natives in small plots near their villages for the purpose of affording food to the larvæ, and the branches are annually lopped off, to prevent the larvæ from getting beyond the sight and reach of those who watch them. The larvæ when first born are placed on these trees, and forage for themselves until the time arrives for them to change into the pupa-state, their keepers merely keeping off birds, ants, snakes, squirrels and bats, all of which are said to feed on the worm, though I am inclined to doubt its being the case with the last three animals. The tusseh-breeders in Maunbhoom are either Bonries or Sonthals: many of them cultivate lac as well, which also requires to be watched, and as this insect thrives best on the same tree as the tusseh, *viz.* the arsun, they are able to combine the two pursuits. I am not aware that any animals prey upon the lac insect; ants are very fond of them, but I fancy only on account of the sweet fluid exuded by this as well as other species of Aphidæ, and not with murderous intent. These are obliged to be watched, in order to keep them secure from the thieving propensities of the other villagers."

After quoting at some length from Dr. Walker's paper (*ubi suprà*), and noticing that many of the facts therein recorded applied equally well to other parts of the country than the territory of the Nizam, the author proceeds:—

"In Maunbhoom the cocoons are sold at the rate of eighty to one hundred per rupee by the tusseh-breeders. I have found it quite easy to rear the tusseh worm in captivity. Having procured a batch of some fifty fresh cocoons from the Maunbhoom jungles in April, 1864, I proceeded to try the experiment, and being of opinion that this species might be easily acclimatized on the mulberry in England, sent thirty-five cocoons, through Mr. F. Buckland, to the Acclimatization Society, as well as some of the eggs laid by the moths that came out of the remaining cocoons. I have not as yet (July 18, 1864) had the advice of their safe receipt. With regard to those I have reared myself, I take the following extracts from my note-book:—

"On the 4th and 5th of June the moths began to come out of their cocoons, and continued to do so nearly every damp and rainy night afterwards. Out of my whole batch only one had died. They invariably come out at night, and seem strictly nocturnal in their habits in the imago state. The average expanse of wing of the female is 7 inches to 7½ inches, and of the male 6¼ inches to 6½ inches. The colour of the cocoons, and of both sexes of the moths, varies considerably; the males are generally of a dark fulvous-buff, fulvous-gray and light slaty gray colour; the females fulvous-gray, light gray or bright grayish yellow. The sexes copulate freely in confinement, always at night, and generally the second night after birth. The females do not try to fly away, though the males do, and damage themselves much in the attempt. They seem to prefer hanging head downwards, and from the under side of a leaf: this probably is a wise provision of Nature to keep them hidden during their diurnal sleep by the leaf they may be on, from their numerous winged enemies. Of all the cocoons I had only one came out during the day, and that early in the morning; they mostly appear between midnight and 4 A.M. The moths are very tenacious of life; after being kept twelve hours under chloroform they recover, and a pin dipped in prussic acid and

put through them has no other effect than to make them discharge a black liquid from the wound. For a long time I was quite at a loss how to put an end to the existence of those I wanted as specimens, and at last found that the only effectual method was to plunge them into boiling water, keeping only the body immersed, for about two minutes. The female moth lives longer than the male; the latter dies after copulation, which takes place more than once, if he is disturbed at first. The females begin to drop their eggs the second or third day after birth, often before impregnation, and die after all are laid, *i.e.* in five or six days.

"On the 17th of June the first batch of worms made their appearance, and on being placed on the young leaves of the Badaam or country almond (*Terminalia catappa*), began to feed greedily. The leaves are changed every morning, and kept in a tumbler of water or damp mould, placed inside a gauze-covered box. Care had to be taken, when the worms got large, to keep them supplied twice a day with fresh leaves, morning and evening, and not to put too many together. I lost a large number, more than half-grown, from overcrowding. The heat thus generated caused them to get quite putrid, and one dead one in this state, unless speedily removed, will cause quite an epidemic amongst the rest.

"June 17. The tusseh worm when born is about one-fourth of an inch in length; body hairy and of a chrome-yellow colour; head and tail black, a tuft of black hairs on the neck, just behind the head, and another smaller tuft of the same colour near the tail; a row of minute black spots down the middle of the back connects these two; there is also a row of similar black spots down either side above the legs. Head and body fringed with yellow hairs. Head black and shining, and large in proportion to body.

"June 21. The worms born on the 17th are now nearly an inch long, and have lost the brownish tinge they had when first born. The colour is now a light green, covered with little light green spines, each spine terminating in a tuft of light-coloured hair. The head at first is black; behind it, and separated from it by a little green band, is another patch of black; there are two little black spots or spines on the second segment, and one on the anal segment; these spines are tufted with black hair. The row of black spots down the back are of a bluish tinge, and those down the sides appear to be the spiracles.

"June 21. (Second stage). The ground colour of the worm is now a bright yellowish green; he is still about an inch in length, but thicker and broader, especially about the head and shoulders. The black spots down the centre of the back have entirely disappeared; instead, on either side of where they were, are two rows of yellow spines or dots, light yellow at the base, orange-yellow at tips, and surmounted by star-shaped tufts of black hair, the pair on the second segment the largest. The head and prolegs brown. Four separated black spots, in place of the black patch on the head. The row of spiracles is scarcely visible; on each side of them a row of yellow spines has appeared, making, with those on the back, altogether six rows of these spines from head to tail parallel with each other, and covered with tufts of hair. A brownish tinge on last pair of legs and lower part of anal segment, the latter covered with hairs.

"June 25. (Third stage). The caterpillar is now little more than 1½ inch long, of a beautiful light green colour, with a yellow stripe down each side from the third segment to the tail, which has a brown triangular patch on each side, edged with light yellow. The spots on the rows of spines on the back have changed to a glittering golden yellow colour, the pair on the second segment surmounted by a star of black

hairs. The spots on the two rows down each side have also changed; they are now orange at base and sky-blue at tips. Prolegs and head light brown, as also are the hind legs, with small black spots and hairs above them. A yellowish collar of skins round the head, with its attendant spines, which are yellow on the capital segment, and, like the rest, surmounted by black hairs. The eight spiracles down each side are plainly visible, between the two side rows of spines and below the yellow band.

"June 27. The caterpillar, when in a state of rest, hangs head downwards, prolegs and head doubled up, and hanging only by its hind legs. They grow wonderfully fast, and appear on the whole hardy, not requiring much care. At this stage they are much like the figure of the larva of Actias Selene in Horsfield's Catalogue.

"June 29 or 30. (Fourth stage). The caterpillar is now about two inches in length. The spots on the two middle rows of spines are all of a glittering golden orange colour, still surmounted by a few black hairs, but several pure white hairs have appeared about them, on the back only, not extending down the sides. The upper and lower rows of spots on the sides are of a bright blue colour. The head and prolegs of a rich brown; the spiracles orange-brown inside, edged first with black, then with light yellow.

"July 4. (Fifth stage). Caterpillar much the same as before. The spots on the sides, especially on the first few segments are like shining silver, based by blue, and contrast beautifully with the golden hue of the spots on the back.

"July 13. The first caterpillar began to spin. Before doing so the blue spots changed to a beautiful mauve-purple colour, which change, accompanied by increase of length to 3½ inches, about the 8th or 9th of July, may be called its sixth stage, for although I did not see the skin cast, it might have been done during the night.

"The larvæ invariably eat their skins after casting them.

"When about to change, the worm is 4¼ inches in length. The process of spinning is well described by Lady Gilbert, whose account I quote (from Horsfield's Catalogue):—'The caterpillar commences its operations by drawing a few leaves slightly together, as if to screen it from observation. It then spins a strong cord, composed of many threads, altogether about the thickness of a crow-quill, at the end of which it weaves the cocoon.'

"One end of this cord is looped round a twig, and when hard the cocoon cannot be detached without cutting the twig close to this loop. In the Maunbhoom jungles the cocoons may be seen hanging from the bare branches of the Sàl trees in March, and are apparently constructed without any assistance from or connexion with the surrounding leaves. Lady Gilbert continues:—'The cocoon is so transparent for the first six and thirty hours that the larva may be distinctly perceived at work in the interior; after that time the cocoon gradually acquires consistency by the continual industry of the caterpillar, and becomes quite opaque from the addition of a glutinous liquid with which it moistens the whole. When that dries the cocoon appears as if covered with white powder, and in the course of a couple of days becomes perfectly hard.'

"I have not observed this transparency of the cocoon. Some of my cocoons are much darker than the rest, and some light yellow, though the worms have all had the same food."

Papers read.

Prof. Westwood read "Descriptions of new Species of Sagrides and Megalopides from the Old World and Australia."

The Rev. Hamlet Clark read "Descriptions of Species composing the genus Schematiza, *Chev.*, *Dej. Cat.* (Phytophaga, Gallerucidæ)."

New Part of the 'Transactions.'

A new part of the 'Transactions' (Trans. Ent. Soc. Ser. 3, Vol. ii. Part 2), which had been published since the previous Meeting, was on the table.—*J. W. D.*

Swarm of Syrphus Pyrastri on the Coast near Bridport, Dorset.—On the 16th of August, as I went to bathe at my usual spot, about one mile west of Bridport Harbour, I was startled at the number of bees buzzing around me, and, on closer attention, I observed that the insect was a trifle longer than our common bee, with a deep black body, and several (I think six) transverse bars on the back. As far as my experience went, it was stingless. On swimming out about a hundred yards I noticed the same bees floating on all sides. The same day my son, who was bathing at one mile to the east of me, observed a similar phenomenon. I am informed that a boat two miles off at sea was surrounded in like manner. There was a gentle breeze shifting from north to south, and a long drought had preceded the first day of their appearance. On the Sunday following (the 21st) my friend Mr. Sholl called my attention to several specimens of the same insect in my garden, at a mile and a half from Bridport Harbour. I regret having failed to secure specimens. I conclude this species to be migratory, as I have very rarely seen any of the common flies and butterflies of the coast driven out to sea.—*George Symes; Bridport, August* 26. 1864. [Communicated by Mr. F. Smith, who appends the following note.]

Note on the "Migratory Bees" ? in Dorsetshire.—The migratory bee was no doubt Syrphus Pyrastri. I saw them in thousands at Bournemouth; one day a line of dead ones extending from Pool Harbour to Christchurch Bay, a distance of not less than six miles: their numbers were really incredible.—*Frederick Smith; British Museum.*

Notes on the Distribution of Insects in the Channel Islands.

By F. Walker, Esq., F.L.S.

These notes were made between the 26th of May and the 17th of July, 1860; and these seven weeks were thus divided between the Islands and the French coast by St. Malo:—Guernsey, May 26th—June 3rd; June 15th—19th. Sark, June 4th—11th. Herm, June 13th—14th. Jethou, June 14th. Jersey, June 20th—July 6th. St. Malo, June 27th—29th. Alderney, July 7th—9th.

The weather, till the beginning of July, was generally cold and windy, and the previous months were remarkable on account of the low temperature and the quantity of rain, and the backward vegetation.

The Flora of these Islands has been described by Mr. Babington, in his 'Primitiæ Floræ Sarnicæ,' which work includes a sketch of the geology of the same district by Mr. Lukis, who observes that the rocks differ somewhat in structure from those of Brittany, and from those of Devonshire and Cornwall. It appears that during an early period, when the distribution of land and of sea was very different from what it is now, an island extended from Italy across France to the West of England, including Brittany and the Channel Islands. In the course of a long succession of ages some parts of this region were submerged, and the Channel Islands, whose configuration indicates their previous existence as mountain-tops, still continue, though they are gradually sinking into the sea. They were thus isolated from Brittany and from Western England, and from each other, before the bed of the cretaceous sea was elevated, or before the region that includes the South of England and the opposite district of France rose above the waters.

Thus their Fauna, though resembling that of Western England, is more exclusively primitive, for it has not been increased by the Germanic Fauna, that spread from Germany to England before these two countries were divided; nor by the French Fauna, that at a later period spread from France to South England before the sea separated the opposite coasts. It has been still less intermingled with the Scandinavian Fauna, and with the Spanish Fauna; and the mildness of the climate of these isles is owing to their small size and to their low elevation, and to the Gulf Stream which partly washes their coasts. The bright blue colour and transparency of the sea around the Islands differs remarkably from the green and dull sea about the English coast.

Guernsey may be divided into two districts, which differ much from each other in aspect and in their respective Faunas.

The first district consists of low plains, which have been overspread with sand and with *detritus* from the sea-shore, as they gradually sank nearer to a level with the latter.

The other district forms the more lofty part of the Island, and is bordered on the coast by precipitous rocks, which are intersected with picturesque little ravines or valleys leading to the bays here mentioned.

The first district is composed of the following bays:— St. Samson Harbour, Bordeaux Harbour, Grand Havre, Saline Bay, Cobo Bay, Vazon Bay, and Pyrelle Bay.

The second district may be divided into these bays:— Rocquaine,

Pleinmont, Creux Mahie, Bon Repos, Corbiere, Le Gouffre, Saint Bay, Petit Bôt, Moulin Houet Bay, and Fermain Bay.

Herm, in its western part, is like the first district of Guernsey; in its eastern part it resembles the second district.

Sark and Jethou are wholly like the second district of Guernsey.

Jersey has a much more extensive Insect-Fauna than is afforded by all the other Islands, and it may also be divided into two districts.

The first district corresponds with the lowlands of Guernsey, and contains St. Ouen's Bay, St. Aubyn's Bay, Granville Bay, and St. Catherine's Bay.

The second district is like the second district of Guernsey, and includes Rozelle Harbour, Boulay Bay, Grève de Lecq, and others which I had not an opportunity of visiting.

Grève de Lecq and St. Peter's Valley, which leads to St. Aubyn's Bay, are well wooded, and when they are thoroughly investigated the present Fauna of the Island will probably be much increased.

Alderney, with the exception of Braye Road and Corbelets Harbour, resembles the second district of Guernsey.

The coast about St. Malo consists chiefly of low, sandy plains, and the Fauna, in the neighbourhood of the sea, is to some extent like that of the first division of Jersey and of Guernsey; at a short distance inland several continental forms appear, and these have migrated northward or westward thus far, but do not extend to the Channel Islands.

Arachnida.

I am indebted to the kindness of Mr. Blackwall for the names of the species here mentioned. These species indicate two distinct Faunas of the Channel Islands, one much earlier than the other. The first Fauna is represented by the ground-spiders, the Lycosæ, the Drassi and the Dysderæ; these are very plentiful, and occur under nearly all the large loose stones; they are especially abundant in Guernsey and in Sark, and, as the surface of the isles is gradually diminishing, the spiders may have become more and more crowded thereon. The species of the second Fauna are of comparatively recent diffusion, and some of them seem to have been lately introduced. This Fauna is most prevalent in Jersey, and is represented by the Epeiræ, the Thomisi, and the Theridiona. The Epeiræ are most numerous along St. Ouen's Bay. The only specimen of Thomisus citreus seen was in a garden at Rozelle Harbour; this spider is sometimes yellow, sometimes white; the yellow variety frequents yellow flowers, and the

white variety frequents white flowers; and the spider is thus less apparent to the insects on which it feeds when they are stupified with the juice of the flowers. Pholcus phalangioides also seems to have been recently introduced, and the only specimen observed was in an apartment.

The following list shows how the species appeared to be distributed through the Islands:—

Guernsey.—Lycosa obscura, L. piratica.

Guernsey and Sark.—Lycosa agretyca, Drassus pedestris, Pachygnatha Degeeri, Tetragnatha extensa, Epeira antriada.

Guernsey, Sark and Jersey.—Salticus scenicus.

Guernsey, Sark, Herm and Jersey.—Dysdera erythrina.

Guernsey, Herm and Jersey.—Drassus lapidicolens.

Sark and Jersey.—Salticus cupreus, Thomisus cristatus, Drassus clavator, Ciniflo similis.

Sark.—Philodromus cespiticolis, Ciniflo atrox, Neriene graminicola, N. longipalpis.

Herm.—Drassus ater, Pholcus phalangioides.

Jersey.—Lycosa exigua, Dolomedes mirabilis, Thomisus erraticus, T. citreus, Clubiona amarantha, Ergatis benigna, Theridion lineatum, T. pulchellum, Epeira apoclisa, E. solers, E. calophylla.

Alderney.—Thomisus bifasciatus.

St. Malo.—Thomisus pallidus, T. incertus, Tegenaria alpestris, Theridion Carolinum, Linyphia tenuis, Epeira acalypha.

F. WALKER.

(To be continued).

Curious Worms within the Peritoneal Sac of a Redthroated Diver shot at Flamborough.—I received a few days ago, in the flesh, a specimen of the redthroated diver which had been shot off Flamborough, by Thomas Leng, of that place. It was in the summer or breeding plumage, and I believe of the second year, for the shades of colouring are not so perfect as in a fully mature specimen, and the red on the throat is of more than usually circumscribed dimensions. This imperfection of colouring may, however, have been due to other causes than that of immaturity. On opening the body to ascertain the sex, I was astonished to find within the peritoneal cavity or sac numbers of small white worms, varying in length from a quarter of an inch to nearly an inch. These worms appeared in the greatest numbers within the folds of the mesentery, although they were scattered here and there throughout the whole peritoneal sac, and were consequently external to the bowel. Their locality appears to me very strange, for although Entozoa dwell in and feed upon most of our own organs and their cavities, as well as those of the lower animals,—of which the "fluke" in the liver (especially of the sheep), the "hydatid" in the liver and brain, &c., and

the various intestinal worms are the most familiar examples,—I have never before heard of worms external to the cavities of the stomach and bowel, or those special organs in the substance of which they find a suitable habitat. That the largest bag of serous membrane in the body should be the abode of parasites, so formidable in power and appearance, is very strange; and yet the bird in every respect, unless we except the dullness of plumage, appeared to have been in good health and condition. It therefore would seem that no organ or organized structure is exempted from the presence and attacks of the parasitic entozoon in one form or another. The liver, kidney, brain, and even the eye and heart, have been the selected abode and prey of parasitic life, and it would appear that the delicate and highly sensitive surface of the chief serous membrane of the body is equally liable to their predatory attacks. These worms were evidently of the genus Tænia, and were more or less jointed. They appeared to be made up of a mouth or sucker, presenting a circular concave disk, with four or five holes or suckers arranged in a circle, just within an outer circular lip, and external to an inner circular concavity (possibly a provision for the production of a vacuum, by means of which the creature attaches itself to its living prey), a narrow neck (like that of a bottle), a vermiform-looking body, which is the thickest part of the parasite, and which, like the whole structure, is of a dusky white colour, and a tail, made up of several segments or joints varying in number from four to eight, according to the size of the worm. The creature would seem to add to its length by the growth of additional segments rather than by an increase in the size of those it originally possessed. Indeed these segments would hardly appear to be essential to the existence of the worm; for in some of the smaller specimens I examined there was no trace of any joint or segment whatever. These joints seem to fit into or overlap one another in the same way as the vertebræ do in the spinal column of an animal.—*W. W. Boulton; Beverley, July* 26, 1864.

Period of Gestation in the Badger.—Since my quotations on this subject were made from the 'Field' newspaper (Zool. 9218), Mr. Freeland Young has published a well-authenticated instance of a female badger producing young after being fifteen months in solitary confinement.—*Edward Newman.*

Seals of the Coast of Yarmouth.—About two months since two fine examples of the seal were captured off the coast of Yarmouth by some fishermen, by getting entangled in their nets; they were exhibited for several days in the streets of this city by their captors: a third specimen was taken on the 12th instant. The last mentioned is now in the hands of a naturalist in this city for preservation.—*T. E. Gunn; Norwich, September* 14, 1864.

[Will my correspondent kindly complete this information by saying to what genus and species the seals belong; their being captured and exhibited must have afforded ample opportunity for deciding this interesting point.—*E. N.*]

Common Seal
see p. 9359

Arab Falconry.—The Sheik Bou Disah, whose guest I was, has brought with him his falcons, and afforded me an opportunity of observing for the first time the Arab falconry, a sport still pursued with all the zeal, skill and science displayed by our ancestors in the "noble mysterie." The villein who presumed to raise his hand against

the king's deer was not more certain of condign punishment from the Norman than the plebeian sehaur who should dare to cast a hawk in the Sahara. No agha or sheik of high degree ever moves for war, pleasure, or business unattended by his falconers, who are his confidential lieutenants. The care of three falcons is considered sufficient employment for one falconer with an assistant; and on the march one or two of these important personages follow, mounted immediately behind the sheik, with a hooded falcon on the wrist, another on the shoulder, and another on the top of his head. The houbara bustard is the favourite quarry, but eagles, kites, sand grouse (and, in the case of the large sakk'r falcon, the gazelle), afford equal sport to the huntsman. Our day's pursuit was to be the bustard. When one is descried the whole cavalcade instantly halt; the hawk on the wrist is transferred to the hand of his master, who, attended by the favoured few, instantly sets off, and, unhooding his bird, throws him towards the bustard. Much skill is exercised in drawing the attention of the falcon to the game before it rises. Should it unfortunately take wing before its pursuer has poised herself above it, an ill-trained or impetuous bird is very apt to strike it in the air; this, according to the view of your desert connoisseur, is a most unpardonable offence, to be punished with death. A skilful hawk will at once rise to a considerable height; then swooping down, make feints till the bustard takes to its legs instead of its wings. The falcon then poises herself over it, while a second is flung off the wrist, and the two together give chase, the speed of the houbara being such that a fleet Arab horse can scarcely keep up with the pursuit. The poor bird runs along, aiding its speed by a perpetual fanning with its wings, its head stretched forward like a corn-crake's, and its conspicuous black and white ruff folded close over its neck, a pitiable contrast to the proud fellow who was lately strutting with head erect, elevated crest and expanded ruff, challenging all comers. The pursuers hang over him at the height of only a few yards, and at each effort he makes to take wing swoop down with a feint. It is considered the excellency of a falcon to make these feints at the quarry till he is nearly exhausted, when the fatal swoop is made, and the bird instantly drops, struck dead by the hind claw having pierced its vertebræ. This manner of hunting is probably adopted to afford more prolonged excitement to the horsemen, but chiefly from the singular mode of self-defence adopted by the houbara, and which I observed on this occasion. As the hawk approaches the houbara ejects, both from the mouth and vent, a slimy fluid. A well-trained bird eludes this shower by repeated feints, until the quarry's supply of moisture is exhausted. An impatient one rushes in and gets his whole plumage so bedaubed that his flight is materially impeded, and his swoop when made is irresolute. Three houbaras and some sand grouse were captured in this day's expedition by three falcons, and the chase was terminated merely on account of the fatigue of the horses. Bou Disah expatiated much on the chase of the gazelle, and I have seen one brought into camp taken by these means. But this is a very dangerous pursuit for the falcons, who frequently impale themselves on the horns of their prey. It is not uncommon for both pursuer and victim to fall dead at one mutual stroke. In the pursuit of the sand grouse no such dallying is allowed as with the bustard. The covey rises, the hawk is thrown off with a jerk, another and another are cast off in rapid succession; each singles out his own victim, and strikes him in mid-air. But the same falcon is seldom trained for both sports. The flight of the sand grouse resembles that of the golden plover, and they attempt in wheeling circles to rise above the hawk. Thus, scattering at a great height, they often distract his pursuit, and unless the falcon has been unhooded and thrown the very moment they

were flushed, they are frequently successful. The education for this chase is by means of a trained raven, who wheels in higher circles over the young bird, tempting him higher and higher. The apparatus of African falconers seems to be the same as in the olden time among ourselves; the same hoods and gloves, the same care in feeding, and the same quaint remedies and nostrums. The price of a well-trained lanner, or sakk'r, is from 200 to 300 Spanish dollars; and, on the commission of a friend in England, I repeatedly offered, but in vain, 200 dollars. The sheik esteems a falcon as of the same value with a thorough-bred horse, and will exchange one for the other. No wonder then that I found it impossible to obtain one for my collection. Indeed it would have been a crime of the blackest dye to have shot one had I had the opportunity.—*Tristram's 'Great Sahara,'* p. 63.

Curious situation for the Skeleton of a Sparrow Hawk.—At the recent restoration of the old church here, the workmen, when clearing the interior, on removing a picture which hung over the eastern window, discovered a skeleton, or rather a mummy, of a bird, which I find to be a sparrow hawk. How came it here? May we not presume that it had followed thither some bird which had literally "taken sanctuary"? If so, the first of the string of epithets applied to it by Mr. Yarrell, *viz.*, "bold, active, vigilant, destructive," is certainly not unmerited.—*C. E. Seaman; Northwood, Isle of Wight, August* 20, 1864.

Willow Wren and Chiffchaff.—Before seeing Mr. Alston's remarks (Zool. 9248) the editor had been informed of the mistake I had made in transcribing my rough notes Zool. 9172. For "Yellow" read "Willow" Wood Wren (*Sylvia trochilus*), the young of which is noticed in the 'Zoologist' (Zool. 9166). It was this species and its nests that I subsequently found so abundant, but the chiffchaff was seen and the date recorded.—*Henry Hadfield; High Cliff, Ventnor, Isle of Wight, September* 2, 1864.

Water Pipit near Brighton.—By the help of Mr. Bree's valuable work on the 'Birds of Europe,' I have identified two pipits the names of which have hitherto been unknown to us: we have had them some time waiting to be named, and at last find them to agree with the water pipit (*Anthus spinoletta*), a species found in many parts of Europe, breeding in mountainous districts, and in the winter found generally in the vicinity of rivers or pools of water in lower countries. This species has been much confounded with the rock pipit (*A. aquaticus*), from which, however, upon examination it proves to be as distinct as it is from the Pennsylvanian pipit (*A. ludovicianus*), the species obtained by Mr. Macgillivray near Edinburgh, in June, 1824, and by Mr. Gray near Glasgow. I have compared them with different rock pipits, and find them to differ even more than Mr. Bree's description shows. The following are a few of the chief distinctions between the two species:—

Water Pipit.	Rock Pipit.
General tinge of whole bird brown or reddish brown.	General tinge of whole bird olive-green.
Head and hind neck gray; back brown, changing into richer brown on the rump.	Head, hind neck and back olivaceous.
Superciliary ridge white, extending to the occiput; in one specimen intersected by a patch of gray, the extreme end appearing as a white dot.	Superciliary ridge yellowish white, distinct over the eye, and but very faintly indicated behind it.

Water Pipit.	Rock Pipit.
Throat and sides of neck whitish, changing into tawny on the breast; under parts white, with a few faint streaks on the flanks.	Sides of neck same as the back; throat, breast and all under parts yellowish white; on the breast thickly striped with dark brown.
First primary shorter than next three, which are about equal in length.	First primary the longest; the next three successively shorter.
Tertials $\frac{5}{8}$ths of an inch shorter than longest primary.	Tertials barely $\frac{1}{4}$th of an inch shorter than longest primary.

They are also very distinct from A. Ludovicianus, which in colour is almost exactly like the meadow pipit, and has the first primary the longest. One specimen was killed near Worthing and the other on the beach near Brighton, where the tide flows in, forming several large pieces of water. I suppose this is the first recorded occurrence of this species in our country.—*John Pratt; 44, Ship Street, Brighton.*

Note on the Mountain Linnet or Twite.—I was surprised at seeing in this neighbourhood to-day (August 16th) a flock of the mountain linnet, numbering forty or fifty birds. They were sitting on the "stooks" of wheat in a field near the Humber, and I shot one out of the flock to verify them: it turned out an old female bird. Flocks of these linnets may be often found in the winter months, feeding in the stubble-fields and salt marshes on the Lincolnshire coast. They have always, however, been associated in my mind with winter weather, their single sharp notes instinctively reminding me of snow and sleet sweeping over the fields, and a cold wintry sky, instead of the thermometer ranging as high as 102°, as it did to-day. I have never seen the mountain linnet so far south as this county so early in the season. Perhaps some of the able writers for the 'Zoologist' can say if this is an unusual occurrence.—*John Cordeaux; Great Cotes, Ulceby, Lincolnshire.*

Food of the Starling.—Rooks and starlings have suffered much from the dry weather, and I never knew our friends the rooks commit greater depredations amongst the ripening corn than in this season. For some days lately I have seen a large flock of starlings feeding in a field of green vetches, just in pod, and so much attached were they to this particular field, that when put up they would only fly for a few yards, and commenced feeding again as greedily as ever. An old labourer remarked to me, to use his own words, "*Starns* are getting no end of them tares, sir," and I almost suspected he might be right, and that the starlings, having been deprived of much of their usual food by the intense drought, were driven to find a substitute in the tares. So I shot two for examination, and on opening them found the stomach crammed with insects,—the remains of several earwigs and some small bronze-winged beetles; the rest a mass of a large green Aphis. On examining the vetches, I found the stems literally crowded in masses with this green nuisance; and these, with an occasional beetle, &c., appeared to be the entire food of the starlings.—*Id.*

Note on the Occurrence of the Lesser Spotted Woodpecker at Reading.—On the morning of the 5th of September, 1864, I saw a beautiful male specimen of that somewhat rare bird, the lesser spotted woodpecker (*Picus minor*), in a small but quiet suburban garden on the outskirts of the town of Reading. When I first saw the bird it was on a small apple tree, distant only about twelve paces from the dwelling-house attached to the garden above mentioned. After thoroughly investigating the tree on which I first saw it, the woodpecker similarly visited two other apple trees in succession,

equally near to the house, and then took flight, and apparently left the garden altogether. The motions of this little climber were characterized by wonderful agility and considerable restlessness, both as it ascended the trunks of the apple trees and their principal boughs, and also as it flitted from twig to twig, the latter being an action to which it appeared much addicted. On one occasion I observed that it descended the trunk of an apple tree for several inches, progressing tail foremost in its downward progress, with the utmost facility. At another time, in ascending a sloping branch, its upward course encountered a sparrow, which was perched on the bough, but which immediately took flight when the woodpecker came up to it. I observed that the bird in climbing propped itself on its tail, and also tapped the bark with its bill, holding its head at right angles to the trunk of the tree, in true woodpecker fashion, but I do not think that in doing this it attempted to pierce the bark, but merely to explore its crevices in search of any insects which might there be harboured. I ought to add that in the neighbourhood of the garden where I watched this very beautiful little bird, there is an avenue of large elm trees, which it in all probability makes its home.—*J. H. Gurney.*

Scarcity of the Common Swift in the Neighbourhood of Beverley in 1864.—Last summer I recorded in the pages of the 'Zoologist' (Zool. 8726) the comparative scarcity of this bird. The correctness of my observations was questioned by your talented correspondent, Mr. Norman, of Hull, who stated that he had seen many of these birds in that locality (Zool. 8767). I can, however, only hold myself answerable for, and vouch for the correctness of, those circumstances and events which come under my own observation; and I consider it to be the duty of all students of Nature, in common justice to their own interests and those of the glorious study they have espoused, to weigh most carefully all matters committed to print. Still the most cautious observer is liable to error, and feeling the full force of these remarks applied to myself, I have most carefully noted all such matters of interest during the present summer. The result of my observations on the arrival and numbers of our migratory birds is to convince me more firmly than ever that they are decidedly less numerous, both on their arrival and during the breeding season, than in former years. With reference to the swift especially this remark holds good, for although I am driving about the country on all sides of Beverley every day of the week, I have thus far seen only *four* specimens of this bird. I have heard of several being seen hawking over the River Hull, but I have not seen them myself, and I can only state, with every confidence as such, facts that have come under my own observation. These remarks on the scarcity of the common swift, &c., of course only apply to the immediate neighbourhood of Beverley.—*W. W. Boulton; Beverley, August* 6, 1864.

Abundance of the Swift at Leominster.—Mr. Boulton's observations on the scarcity of the swift in the neighbourhood of Beverley, of the accuracy of which I have no doubt, induces me to publish a fact of an opposite character, namely, that the number of swifts at Leominster, in Herefordshire, is this year much larger than I have ever known it. Swifts, during the month of July, were, compared with swallows, as three to one, and, compared with martins, as two to one: it was no uncommon thing to see a hundred swifts on the wing at once, and these scattered widely, not collected into little screaming companies, as we so frequently see them.—*Edward Newman.*

Scarcity of some of the Summer Birds of Passage at Moundsmere in 1864.—About Moundsmere and Bradley, last year, I could see any evening in June from twenty to

thirty pairs of swifts, but this year I have not seen more than three birds of this species at one time, either at Moundsmere or Bradley, except on the evening of July 22, when a vast flock flew over in a S.W. direction. In the villages near, I am assured, they have been as numerous as ever this summer. I have not seen more than half a dozen spotted flycatchers in this neighbourhood all the season; and, as far as my observation goes, I have not seen a single redbacked shrike about our hedges since last September: this I think rather remarkable, as a nest of young birds were hatched and allowed to fly off unmolested last year, the nest being built near Bradley. I saw a single bird of this species sitting on a hawthorn-hedge near Salisbury in May last.—*Anthony S. Bradby; Moundsmere, Hants, September* 22, 1864.

Martins congregating in August.—On the 13th of August last, while passing along Willesden Lane, I noticed about two hundred martins (*Hirundo urbica*) collected on the roof and chimneys of a new three-storied house. I could not distinguish any swallows (*Hirundo rustica*) among them. The weather on that day was fine, sunny and hot. Is not this rather early for martins to prepare for their departure?—*Charles B. Wharton; Willesden, Middlesex, September* 2, 1864.

Food of Young Cuckoo.—A short time ago I shot a young male cuckoo which had attained its full length of fourteen inches, but was still attended and fed by its foster-parents—a pair of hedgesparrows. On examining its stomach I was surprised to find that it contained a mass of fine vegetable fibres, apparently the roots of some plant, closely matted together: there were a number of the wing-cases of small beetles and a few larvæ mixed with it, the whole mass being about the size of a small walnut. Have any of your correspondents observed similar cases, or can any of them suggest for what purpose the roots had been swallowed? This specimen has already lost most of the reddish brown colour described by Mr. Yarrell as belonging to the young bird, but it retains traces of the brown streaks on the greater wing-coverts and on the sides of the neck. As observed by Mr. Morris, this change does not seem to be the result of moulting, but rather of the wearing away of the tips of the feathers. —*Edward R. Alston; Stockbriggs, Lesmahagow, Lanarkshire, August* 5, 1864.

[Were not the supposed vegetable fibres the hairs of ursine caterpillars so commonly found in the stomachs of cuckoos?—*Edward Newman*].

Partridges in a Tide Mill-Pond.—While at Sidlesham, a few days ago, a rather curious incident came under my notice. A covey of five partridges fell, or rather flew, into a tide mill-pond there, and were all captured by some boys. I am told that this sort of thing has occurred there before. The "natives" have a notion that partridges cannot fly over salt water. The lower part of the pond where this occurred is pretty well surrounded by houses, and I am inclined to think that the birds were bewildered, and that fright was the cause of their settling in the water. I believe the pond covers about thirty acres.—*W. Jeffery, jun.; Ratham, Chichester, September* 9, 1864.

Great Plover or Stone Curlew near Beverley.—On the 4th of June last a very fine old female specimen of this plover was sent, in the flesh, for preservation, to Mr. R. Richardson, taxidermist, of Beverley. I grieve to say the thick-knee has become quite a *rara avis* on the Yorkshire Wolds, where formerly it was abundant, and where, too, the great bustard (now extinct) was no unusual visitant. This specimen of the great plover had been shot on the 2nd of June, by a farmer, who presented it to Mr. T. Riley, of South Dalton, near Beverley. It was shot near Holme, on Spalding Moor, between thirteen and fourteen miles from Beverley. Several specimens have been since observed, but no other has been obtained, the birds being remarkably shy and wary. These

plover had been breeding in the neighbourhood, for a friend of mine interested in Ornithology had found a nest containing a single egg when trying to get a shot at the parent bird. The stomach contained several wing-cases of beetles and a few fibrous roots of some grass, mixed up with flinty gravel.—*W. W. Boulton; Beverley, July* 8, 1864.

The Little Ringed Plover at Kingsbury, Middlesex.

By J. Edmund Harting, Esq., F.Z.S.

You will be interested to hear of the occurrence of the little ringed plover (*Charadrius minor*).

I am not aware that this rare species has been met with anywhere in England since Mr. E. H. Rodd recorded the capture of a specimen last autumn at Scilly.

On the 30th of August last I was strolling round the water here, with my gun, on the look-out for ringed plovers, dunlin, and other waders that usually visit us at this time of year, when I observed a small bird feeding on the shore, within a few yards of a green sandpiper. The latter was very wild, and rose out of shot; but the former remained feeding, and allowed me to approach within fifty yards. I at first mistook it for a young ringed plover (*C. hiaticula*), never dreaming of Charadrius minor. As soon as it rose, my finger was on the trigger; but hearing the bird's note, which was not at all like that of the ringed plover, but rather like that of the common sandpiper, I was induced to wait and mark the bird down, in order to observe it more carefully. As it flew away I remarked no white line across the wings, and this strengthened my belief that it was not the common ringed plover. Watching it until it again alighted, about a hundred yards distant, I crawled along on hands and knees, and obtained a good view of the bird as it ran along the edge of the water, occasionally stopping to pick up some food. In its flight and note it appeared rather to resemble the sandpipers, but its actions when on the ground were much like those of the ringed plover. It did not associate, however, with the last-named species, although there was a little flock of them also at the water. After watching it for some time, I put it up again and shot it.

On picking it up there could be no doubt of the species—a veritable little ringed plover, although evidently a young bird.

More slender in form than the common ringed plover, the legs are lighter in colour, and the bill almost black. I say "almost" black, because in the living bird the base of the under mandible is decidedly

tinged with yellow, which fades, however, and becomes black after the bird has been dead a few hours. Many authors say "the bill is wholly black," but they probably described from specimens which had been some time preserved, and consequently had lost colour; and on this account, no doubt, they have also overlooked a peculiarity which at once attracted my attention. *The eye, which is full and dark, almost black, is surrounded by a circle of a beautiful bright yellow*, and looks as if it were set in gold, but this colour entirely disappears soon after death.

At the time it reminded me a good deal of the eye of the Norfolk plover on a small scale.

I have now had an opportunity, for the first time, of ascertaining that the little ringed plover differs also considerably from the common ringed plover in many other respects, as follows :—

The shaft of the *first* quill-feather only, in the wing, is white; and the white spots, which are always present on the webs of the wing-feathers in the common species, and which give the appearance of a white bar across the wing in flight, are in the little ringed plover absent, and in lieu thereof the tips only of the wing-feathers are margined with dull white. In the last-named species, also, there is a dusky spot on the inner web of the outer tail-feather on each side, which feather in the common ringed plover is always pure white. The number of tail-feathers, however, is the same.

Before skinning my specimen I took it to Mr. Gould, together with a common ringed plover, which I had killed the same day shortly afterwards, and which was useful for comparison. Mr. Gould then carefully ascertained the exact measurements and weight of each, which are as follows :—

	Common Ringed Plover.	Little Ringed Plover.
Weight	2¼ oz. 24 gr.	1¼ oz. 65 grs.
Total length	7½ inches.	6½ inches.
Tail	2⅞ inches.	2⅝ inches.
Extent of wings	15 inches.	13 inches.
Length of wing from carpal joint to end of first quill-feather.	5⅛ inches.	4½ inches.
Tarsus	1 inch (full).	1 inch.

I subsequently dissected the birds, and believe the common ringed plover to be an adult female in the autumn dress, and the little ringed plover an immature male of the year. The difference, therefore, between their respective weights is probably greater than it would have been had both birds been adult. The measurements I think would

scarcely vary; at all events they would not vary in the same proportion as the weight. If one may draw conclusions from a single specimen, the food of the two species would appear to be very similar; for I found the stomach of C. hiaticula contained the remains of worms, beetles, and numerous small pebbles; while that of C. minor was filled with small beetles and a single caddis-worm, but contained no sand or pebbles of any sort. I carefully prepared the sternum of each, and found a considerable difference in the measurement of the corresponding parts, thus:—

	Common Ringed Plover.	Little Ringed Plover.
Total length of keel	1 inch 6 lines.	1 inch 4 lines.
Length of keel from base of coracoids	1 inch 5 lines.	1 inch 3 lines.
Greatest depth of keel . . .	7½ lines.	5½ lines.
Length of coracoid	7½ lines.	6 lines.
Length of clavicle	10 lines.	8 lines.
Length of scapular	1 inch 1 line.	11 lines.
Greatest width of furcal bone . .	4 lines.	3 lines.

I may add, for the information of Mr. Rodd and other naturalists who may have seen his specimen of the little ringed plover, which was killed at Scilly in October last, that his bird and mine appear to be identical in size, age and markings.

J. Edmund Harting.

Kingsbury, Middlesex,
September 10, 1864.

Sternum of Little Crake shot in Cambridgeshire.
By W. W. Boulton, Esq., M.R.C.S.

At page 9118 of the 'Zoologist' Mr. Saville records a rare and interesting capture of the little crake in Cambridgeshire.

In detail Mr. Saville describes this elegant and rare visitant, which appears to be only the seventh really well-authenticated specimen that has occurred in Britain.

Mr. Saville has most kindly forwarded for my inspection the sternum of this interesting specimen, which he had already presented to the Oxford Museum.

Feeling sure that a detailed description of this bone, so rarely seen by British naturalists, will prove equally interesting to many of your ornithological readers as it has to myself, I will, with your permission, do my humble best to reproduce its measurements and form on paper.

The osteology of this bird has, so far as I can ascertain, never yet been described; and in truth I feel myself a most unworthy medium of its introduction to your notice.

For the purpose of comparison I have obtained specimens of the moorhen (*Gallinula chloropus*) and the land rail (*G. Crex*), both members of the same family as Gallinula pusilla, the object of our present consideration; observing, however, that the conditions of their retreat and means of subsistence are very opposite; *viz.*, one—the moorhen—in the water, in ditches and marshy places; the other—the land rail—on land, especially in meadows and amongst rough grass.

The little crake would seem, in its habits, to pass an existence intermediate between the two members of its family I have mentioned above. It inhabits marshy places and long, rough grass, but does not swim or dive in the water, excepting when under the influence of fear or necessity.

Its foot is remarkably large in proportion to the size of its body, and would prove a most efficient support to its light frame when hunting water-insects over the surface of aquatic plants, even beyond the limits of its marshy hiding-place.

This greater relative size and spread of foot I am enabled to observe by a comparison of a beautiful adult male specimen of G. pusilla in my own collection with other larger but commoner species of the same family. I purchased my specimen from a very old collector, on whose veracity I can rely, and who informed me that the bird was shot in the neighbourhood of Yarmouth, by a man named Harvey, of that place, during the year 1834.

In order to show at a glance the greater relative spread of foot in G. pusilla, when compared with other larger members of the same family, I will contrast the measurements of the common land rail with those of G. pusilla.

According to Yarrell, the total length of an adult specimen of G. Crex is rather less than ten inches; that of G. pusilla about seven inches; *i. e.*, a difference of about three inches in the length of the two birds, very nearly one-half the total length of G. pusilla.

The measurements of their respective feet, taken from specimens in my own collection, are as follows, *viz.*,

	G. Crex.	G. pusilla.
Outer toe . .	1 inch $\frac{5}{16}$.	1 inch $\frac{5}{16}$.
Middle toe . .	1 inch $\frac{10}{16}$.	1 inch $\frac{9}{16}$.
Inner toe . .	1 inch $\frac{4}{16}$.	1 inch $\frac{4}{16}$.
	(Short measurement).	

The specimen of G. Crex from which the above measurements were taken was rather over eleven inches in length, and was therefore unusually large, and more than half as long again as my specimen of G. pusilla, which measures exactly seven inches. Yet the foot of the smaller bird is of quite as great a spread as that of the larger bird, with the exception of the middle toe, and in the greater length of this toe G. Crex exceeds that of G. pusilla by only the sixteenth of an inch, which advantage is nearly balanced by the inner toe of G. pusilla actually measuring slightly more than the same toe in G. Crex.

In all members of the family Rallidæ we find a body more or less compressed or flattened on the sides, as though the bird had been forcibly squeezed between the two hands.

This peculiar formation is designed to enable the bird to run with comparative ease between the stems of grasses and marshy plants, amongst which it hides and feeds, without checking its speed on the one hand, or causing such a disturbance of the covert on the other hand as to reveal its whereabouts.

We also find the body deep from above downwards, and as a consequence in the skeleton we find a corresponding deep keel to the sternum. This is always the case in birds whose power of flight is considerable. The rails are for the most part migratory birds, being spread over an extensive geographical range, and only visiting these shores at certain seasons of the year. Their powers of flight must therefore of necessity be highly developed, and thus we find on dissection of their bodies that the muscles called into action during flight are largely developed; and the keel of the sternum, to which the muscles are principally attached, is proportionally deeper, stronger and rougher in its ridges than in many other birds of equal size.

The keel is apparently set very far back on the sternum, but this appearance is in reality due to the unusual length of the coracoid bones and clavicles, which, projecting forwards and downwards from the sternum in a very slightly curved line, give the anterior third of the bird's body a cone-like form. This peculiar formation, together with its flattened sides, enables the bird more readily to glide, serpent-like, with speed and silence, through its grassy and often tangled habitat. It is curious to observe how, in spite of its considerable powers of flight, the rail rarely, if ever, depends so much upon its wings as on its legs for a means of escape from danger. Its furtive habits, its keen senses of sight and hearing, its colour (so perfectly corresponding to the hues of those plants and sedges amongst which it dwells), lend to instinct a sense of security, independent of flight, which induces the bird, on

the approach of danger, to skulk and hide or run, or if by sudden surprise startled into flight, to drop again almost directly.

By a glance at the diagrams I have sent it will readily be perceived how much the three specimens resemble one another in their general outline, in their narrowness from side to side, and in the depth of their keels; also in the form and comparative length and strength of their clavicles, coracoid bones and scapulæ. This general resemblance is due to their general similarity in habits, which necessitates similar provisions of form, parts and powers.

It will be observed, however, that the sternum of G. chloropus is provided with the shallowest keel of the three, in proportion to its greater size. This is doubtless in consequence of the bird possessing comparatively limited powers of flight, being less migratory in its habits and a more general resident of Britain than any of the others; also because it uses its wings less, and resorts more to swimming and diving than the other two members of this family I have already named. For the same reason the sternum and clavicles in this species are wider from side to side than in any other rail, and the clavicles are slightly more arched, after the fashion of most water birds.

In the cases of G. chloropus and G. pusilla the body of the sternum is prolonged from its posterior margin on both sides of the keel, forming two distinct alæ or wings directed downwards, and in the fresh specimen, united to one another and to the posterior margins of the base of the keel by a membranous expansion which completes the upper and lower surfaces of the sternum unbroken, gives lightness to the entire structure, with a greater breadth of expanse for the attachment of muscles, and a greater resisting surface to the water when launched upon that element.

In the case of G. Crex there are no apparently distinct alæ, for those portions of the sternum which in both the other species are thus elongated and distinct, are in this species united and drawn together much more closely by a strong but very narrow band of fibrous tissue; thus reducing the narrowness of the body from side to side to a minimum, which in this species can be accomplished without impairing in any way its provisions for obtaining food and safety, as it does not frequent marsh and water, but the higher meadow lands, whilst it affords the bird extraordinary facilities for gliding through the thick and tangled herbage.

The sternum of G. pusilla, whilst it much resembles that of G. Crex in most particulars, differs from it in being provided with distinct alæ, diverging sufficiently to form, when united by a fibrous expansion,

a greater resisting surface to the water and a greater expanse for the attachment of muscles, combined with marvellous lightness. Indeed the whole structure is one of the most perfectly elegant (if I may use the term) and efficient combinations for the very peculiar and special objects it is destined to fulfil I have yet seen in Nature.

In G. pusilla the clavicles are less curved, *i. e.*, straighter, as well as longer, in proportion to the size of the bird, than in either G. chloropus or G. Crex. The length of the clavicle in G. pusilla, from its sternal to its coracoid extremity, is within an eighth of an inch as long as the keel from its anterior superior apex to its posterior inferior apex: thus the deepest point of the bird from above downwards would be exactly in the centre of the skeleton, whilst the whole anterior half of the bird is rendered funnel or cone-shaped.

W. W. Boulton.

Beverley, July 28, 1864.

Occurrence of the Ruff and Curlew Sandpiper at Kingsbury Reservoir, Middlesex. — On the 25th of August, while walking round this Reservoir, I was much surprised at seeing three ruffs, one of which (an old male) I succeeded in shooting. This is, as far as I can gather, the second time this bird has been procured there. Nineteen years ago the keeper found two, and shot them both; they were old males in breeding plumage. On the 17th of this month (September) my brother killed a curlew sandpiper at the same place; it was in company with a flock of ringed plovers. The little stint has occurred several times this autumn. My brother and I have each shot one, and the keeper has seen several others. — *W. H. Power; St. Bartholemew's Hospital, September* 19, 1864.

Occurrence of the Little Stint near Leeds.—On September 13th I shot a male specimen of the little stint (*Tringa minuta*) near the Reservoir on Yeadon Moor. It is of very rare occurrence in this neighbourhood. — *Joseph J. Armistead; Virginia House, Leeds.*

Blacktailed Godwit and Spotted Redshank near Chichester. — On the 24th August a blacktailed godwit (*Limosa melanura*) was shot at a fresh-water pond near here, and is now in my possession: it proved to be a male, and I believe is a bird of the year. I found the length to be 12¼ inches, extent of wing 26 inches, and the bill 2¼ inches long. The stomach contained the remains of insects, also a few marine and fresh-water shells, and a portion of small gravels. I have another specimen which was shot at Birdham (also by fresh-water), on the 16th of August, 1859. These two are the only birds of this species that have, to my knowledge, been killed in this locality during that period of five years. I have also received a spotted redshank (*Totanus fuscus*) from Sidlesham, which was shot in Pagham Harbour on the 29th of August. This I believe to have been a male, but it was so much decomposed that I could not be certain. I have had two other specimens of this bird from the same place, one on the 28th of August, 1860, the other on the 14th of October, 1863. — *William Jeffrey; Ratham, Chichester, September* 9, 1864.

Bittern in the Isle of Wight. — At this time, when ornithologists are agreed in fearing the quickly-coming extinction of that solitary but interesting and picturesque bird the bittern (*Ardea stellaris*), all records of its occurrence should be most carefully preserved, in order that we may watch what we cannot prevent, and have in these records an indirect index of the progress of civilization, before whose strides this bird is so rapidly retreating, as the moa has even now done. While walking, on Friday, August 26th, through the village of Freshwater, I noticed, in the entrance-hall of the hostelry of the Red Lion, a case containing a fine adult male bittern. At the time I tried to learn the particulars of its capture, but failed, owing to the landlord's being from home. However, I have since written to him on the subject, and have received an obliging answer to my inquiries. It was shot, he writes, by a Mr. Charles Theobald, on the banks of the River Yar, not far from Freshwater Church, in hard, wintry weather, in the latter part of 1860. My correspondent's name is W. Sawley.—*C. E. Seaman; Northwood, Isle of Wight, September* 13, 1864.

Occurrence of the Greenshank near Norwich.—On the afternoon of the 27th instant a fine male specimen of the greenshank (*Totanus glottis*) was shot in a meadow adjoining the river below Hellesdon Mills, and about three miles north-west of Norwich. A few specimens are occasionally obtained at Blakeney; on Breydon Water, near Great Yarmouth; and other localities near the sea-coast; but the occurrence of this species so far inland as the above instance I believe is rather unusual.—*T. E. Gunn; Norwich, August* 29, 1864.

Ruff and Reeves in Norfolk. — A fine specimen of the ruff was obtained at Runhall, a village about one mile distant from Hardingham Station, on the 14th of April last, its ruff being of a rich chesnut colour, intermixed with small patches of a purplish hue. Two nice specimens of the reeve were shot at Yarmouth, one on the 20th and the second on the 27th of last August. All the above-mentioned were in fine condition and very fat.—*Id.*

Spotted Sandpiper and Ruddy Shieldrake.—My communication to the 'Zoologist' (Zool. 9046), recording the occurrence of the ruddy shieldrake (Anas rutila of Pallas) and of the spotted sandpiper (Totanus macularius of Temminck) having occasioned several letters to be sent to Mr. Newman, expressing doubts of their occurrence here, and instead of printing them he has invited me to give more information about the birds, I have great pleasure in forwarding all I know about them. Mr. Newman thinks that a specimen of the common shieldrake (Anas tadorna of Linneus) may possibly have been mistaken for it; but this species is of frequent occurrence here, and therefore one with which I am well acquainted, and certainly could not mistake it for Anas rutila. In October, 1863, I went over to Captain Healey's decoy, situated on the eastern bank of the River Trent, about six miles from Epworth; and on looking over his collection of stuffed birds, &c., I was shown a case containing a pair of ducks (*Anas rutila*). I asked who named them, and was told Mr. Waterton, of Walton Hall, while on a visit to Mr. Healey some years ago. I had never seen specimens of the same species before. I was told they had only taken four specimens in the decoy during the last fifty-two years, namely three females and one male; therefore, on the occurrence of the fourth specimen, this season, I recorded the fact in the 'Zoologist,' not doubting Mr. Waterton's authority. My esteemed friend Mr. Thomas Allis, of York, who visits Epworth every two or three months, expressed a wish to see a specimen of the ruddy shieldrake: he seemed astonished at the form of its bill, and said he could not believe it to be a genuine specimen of Anas rutila: he could not tell what

the duck really was, never having seen the same species before; but on coming to Epworth again, a short time since, he said he had seen a male specimen of Anas rutila (not British) at Mr. Storrs, birdstuffer, of Doncaster, and requested me to go and see it, and I am sorry I have not yet had time to do so: he said it was very different from our specimen. In September, 1864, a sandpiper was shot by a man of this town, and taken by him to Mr. Gravil, birdstuffer, of the same place, who said it was the spotted sandpiper (*Totanus macularius*). The man took it away to show to a friend, and unfortunately went to a public-house and sold the bird to a stranger, who bought it with the intention of having it preserved. Mr. Gravil told me the next day he was quite certain of the species: he said the man promised to take the bird back to him the next day. I do not know the address of the man who bought it, although I know he lives near Doncaster; and if I can find him, and the bird is still in existence, I shall have great pleasure in sending you more particulars. — *Samuel Hudson; Epworth, July* 15, 1864.

Bridled Guillemot at Flamborough Head.—At Zool. 9251 I find a communication from Mr. Harting which refers to my note of the capture of the bridled guillemot at Flamborough Head (Zool. 9211). If Mr. Harting will kindly scan my remarks once more he will observe that he has—doubtless most inadvertently—misquoted me. Mr. Harting states that I assert this bird to be "of such rare occurrence that one has not been seen there (Flamborough) for many years," &c. What I said in reality was, that it is "quite an exceptional circumstance to meet with Uria lacrymans (then); I go on to say, "It is three years since *I* obtained a specimen of this latter species, and the bird had been shot and stuffed several years previously," &c. Mr. Harting will observe that I do not venture to assert that no specimen of the bridled guillemot has "been seen at Flamborough for many years," but that *I* have only obtained two specimens during a period of three years, and that it is quite an exceptional circumstance to meet with this bird at Flamborough. This statement I believe to be perfectly correct, and there is no doubt that on this coast Uria lacrymans is, as Mr. Harting states, "a scarce bird." I perfectly coincide with Mr. H. in his expressed doubts as to the propriety of considering U. lacrymans a distinct species from U. troile. I have dissected both species most carefully, and have read the accounts of those who know them both in their native fastnesses, habits and nidification. The only decided difference between the two birds appears to be the white line round the eye and extending from the posterior angle of the eye backwards and downwards for about an inch and a quarter. Indeed this difference has been referred by some authors merely to age, or those variations in plumage we so frequently observe in many species of birds.—*W. W. Boulton; Beverley, September* 13, 1864.

Sandwich Tern Shot at Flamborough.—I have just received in the flesh a good specimen of the Sandwich tern. It was shot off Flamborough Head by Mr. Thomas Leng, of that place, on the 25th of July last. On dissection, I found it to be a mature female. I have never previously heard of this tern being taken in our neighbourhood, although we have the common tern (*Sterna hirundo*), the arctic tern (*S. arctica*), the black tern (*S. nigra*) and the little tern (*S. minuta*); the first and last of these in considerable numbers at Spurn, on the mouth of the Humber (where they breed); also in variable numbers all along the coast. The black tern is only an occasional visitant. *Id.; July* 26, 1864.

Manx Shearwater Shot at Flamborough.—On Monday last, the 18th inst., I received in the flesh a most perfect specimen of this bird. It had been shot off Flamborough

on the 16th inst., by Mr. George Leng, of that place. This is the first instance I have known of the occurrence of the Manx shearwater on this portion of the Yorkshire coast, although the Rev. F. O. Morris, in his work on British Birds, mentions that specimens are occasionally obtained on the Yorkshire coast in the autumn. The plumage of my specimen, with its upper half deep brownish black, and its lower half unsullied white, indicated maturity, but I regret to say that in consequence of the injuries sustained from shot, and the hemorrhage that had taken place about the kidneys, &c., I was unable to decide positively as to the sex. I believe it to have been a female. The length from end of bill to end of tail was fourteen inches. I made a careful dissection of the mouth and throat throughout its entire length, with a view to tracing out the source of that oily fluid which these birds have the power of discharging when captured alive. I failed in detecting any special or peculiar provision for this end, but observed that the whole glandular system of this region, from the parotid glands above to the thyroid and lowest cervical glands, were more largely developed than I had before noticed in any bird of the same size. The ducts of the secreting glands seemed to me also unusually large for so small a bird. Still I cannot think that the oily fluid vomited under pressure or excitement is secreted by any gland or glands specially designed for this object. I am rather inclined to think that it is vomited from the stomach, and is made up of the combined secretions from the liver, pancreas and stomach. Its colour and quantity, as described by Yarrell (vol. iii. p. 657), I think would lead to this supposition as to its source. Many birds, as for instance the Columbidæ and Fringillidæ, have the peculiar power of regurgitating as it were the contents of their crop, &c., in the act of feeding their young. It is not impossible, therefore, that a bird may be endowed with still increased powers of discharging the contents of its stomach, &c., as a means of defence. The act of vomiting in the human subject, and the matters rejected, often mixed up with a considerable quantity of the bilious secretion, and in certain cases of disease, even with fœcal deposit, still further sustains the possibility of such a power being possessed by a truly oceanic bird whose habits during the breeding season lead it ashore, where it has few other means of protection. The last illustration of regurgitant power I have given would, I think, also point to those sources of the oily discharge ejected by the petrels that I have already suggested. The stomach was a compound organ divided into two parts; *viz.*, one, whose powers are purely digesting; the other, whose powers are purely triturating, as we usually find it amongst fish-eating birds. The organ was empty.—*W. W. Boulton; July* 22, 1864.

The Sea-Birds at and near Filey: a Plea for their Preservation.

By Colonel H. W. Newman.

I have been sojourning at Filey for a few weeks; and on the 15th of July (St. Swithin's), a magnificent day, calm and fine, had a grand *battue* at the sea-birds near those stupendous rocks at Flamborough Head, about six or seven miles from Filey. The game was in sufficient numbers, and among the rarer birds only one specimen of the bridled guillemot was killed, but a great many of the common guille-

mot and puffin tribe. The turnstone and kittiwake are very common, and there is a prodigious number of the common gull: the latter are very shy. The ducks, which breed in May in these cliffs were all dispersed, as were most of the cormorants, which are numerous early in the season. After a dozen shots near the cliffs, the birds fly out in great numbers, and the cries of those poor birds which have young are really piteous.

The number of these birds has greatly diminished during the last ten or more years, in consequence of the farmers allowing the eggs of the ducks and of many other birds to be taken in April and May: it is said men pay the farmers for the privilege, and sell the eggs to be eaten. They are taken generally by only two persons; when filled each basket is let down from the cliff into a boat by one man,—a fearfully dangerous trade, to which may well be applied the description given by the immortal bard of the samphire gatherer:—

> "There is a cliff whose high and bending head
> Looks fearfully on the confined deep:
> * * * *
> How dizzy 'tis to cast one's eyes so low!
> The crows and choughs, that wing the midway air,
> Show scarce so gross as beetles. Half way down
> Hangs one that gathers samphire—dreadful trade!
> Methinks he seems no bigger than his head:
> The fishermen that walk upon the beach
> Appear like mice." * * *

My informant says that one man only lets his mate down in a basket, who fills the basket, which is let down to the water's edge, and is then returned to the top of the cliffs again.

As so many guillemots and puffins have young ones at this time of the year (July 23rd), I have no doubt they are second broods, as nearly all the first-laid eggs are taken in the spring: this is a sad pity, and I wish the landed proprietors of these beautiful cliffs lived near to prevent such a cruel robbery. The birds are seen sitting in rows and ranks in different layers of the rocks, like soldiers: from the water they appear very near, but, from their apparently small size, at half way up the cliffs, they resemble birds of the size of a sparrow. One of my sons brought down a bridled guillemot with his rifle; the bird was nearly half way up the cliff, and at the distance of about a hundred yards.

At about a mile and a half from Filey, in the bay, a tolerable day's sport may be had by a persevering sportsman, as there are many

birds constantly swimming about, particularly puffins and guillemots. The readers of the 'Zoologist' who have not visited the beautiful Bay of Filey may need to be informed that it is one of the finest in the United Kingdom. When in office, Sir John Pakington intended to make it a harbour of refuge; the bay was surveyed and approved of, but a change of Ministry put an end to the plan.

On the 27th of July, accompanied by three very young gentlemen, I paid another visit to the magnificent cliffs at Flamborough Head; the wind was off the land, the sea was calm, and we had an excellent day's sport among the puffins, guillemots, kittiwakes and other birds, the frequenters of these cliffs. These birds continue breeding until late in July, probably in consequence of the great destruction of eggs before alluded to. What a pity that these poor creatures are not protected in the season of incubation! Yorkshire is a sporting county, and why do not the gentlemen unite and raise a small fund to prevent the collection of the eggs at unseasonable times of the year, that is, during April, May, and until the 24th of June? But for the great height of these cliffs the whole of the birds would be destroyed. At Filey it was stated that quantities of eggs of all the species of birds mentioned, besides ducks, cormorants and gulls, are sold in the town and neighbourhood, and the people say that they are as good for the table as hen's eggs: a good many of them are sold as specimens.

The bridled guillemot (*Uria lacrymans*) has become a very scarce bird in these cliffs, and, independent of their height, it is really a piece of foolhardiness to gather the eggs: the cliffs are in many places rent by fissures perpendicularly made for several hundred feet; and the caves and hollow passages touching the sea and near the "Cross," seem to give a special warning that some mighty avalanches or great land-slips are not far distant.

On the whole, I should rejoice to see some protection given to these poor sea-birds, and this can only be done by the landowners and farmers whose territory abuts upon the sea. The birds might still be shot from the water, but that would be a trifling matter compared to the destruction of their nests and eggs; and should a stringent rule be made to enforce the preservation of the latter, no good sportsman or right-thinking man would trespass at improper seasons of the year.

These cliffs are well worthy the attention of naturalists, particularly of those who delight in unravelling the histories of the different species of sea-birds, many of which have already been driven from their haunts.

On neither of these days were any ducks or cormorants to be seen, both of which used formerly to be numerous.

H. W. Newman.

Hillside, Cheltenham,
August 3, 1864.

A Toad in a Rock forty feet below Ground.—A most interesting discovery was made in Newton Quarry, near Elgin, by the workmen of Messrs. Humphrey and Rennie, builders, Elgin, lessees of the works. The men, while engaged in blasting a rock with no seam in it that would have admitted the edge of a sixpenny piece, were astonished to see, when they had blasted the rock, a small hole, and a toad creeping out of it. The hole was not in a seam, so as to countenance the probability of the toad having got into it, but, we repeat, in solid rock, and, as a proof of this, we have the evidence of our own sight, for both stone and toad are now in this office beside us, kindly sent, at our request by Mr. Humphrey. The hole would hold a man's fist, and is coated with clay or fuller's earth of a darkish colour, or brown, not very different from that of the creature that for unnumbered ages had slumbered in it forty feet below the level of the surrounding country, and more than twenty feet below the surface of the rock. It is a curious fact that the cleavage that exposed the toad laid bare four other holes exactly on the same level, all about the same size as that in which the toad had lain, and they were coated with dark-coloured clay, countenancing the probability that each of these holes may have at one time contained a toad, but that by some means all had perished but one.—*Elgin Courant.* [Communicated by P. H. Gosse, F.R.S.]

The Maigre in Mount's Bay.—A Sciæna (*Couch*) or Maigre (*Yarrell*) was taken in Mount's Bay this morning, which I note on account of its remarkably small size. Length over all, 1 foot 10 inches; length from eye to fork, 1 foot 6 inches; greatest girth, taken around the body, about two-thirds the length of the pectoral fin from the origin of the same fin, and giving a depth of about 5 inches, 1 foot. I omitted to weigh the fish, but should think it weighed 4 or 5 pounds. The lateral line ran on to the very end of the tail, scaled through the caudal fin-rays. The operculum terminated in a free membrane, and had towards the upper part of it a thin flat semitransparent bony point projecting backwards and downwards. The pre-operculum was serrated, or rather, I should say, studded along its lower edge with small detached teeth. The dorsals were connected by a membrane. The teeth of the upper jaw were very large and regular, curved inwards: those of the lower jaw were smaller, and not so regular. Inside the teeth of the upper jaw, and parallel with them, there was a rough, bony process, but no teeth. There were dentated bony processes in the throat at the entrance of the gullet. The tongue was tied down, except about half an inch of the tip. The jaws, both inside and outside the teeth, were of a dusky orange-colour. The colour was iridescent bronze on the back, shading off to white on the belly, and nowhere particularly brilliant. The fin-rays were—D 9: 1.29; P 16 or 17; V 1.5; A 1-8 (the final fin-ray very soft, and divided near its origin; C (including the scaled lateral line) 17. The air-bladder was 7¼ inches long, and had the fringed edges peculiar to the fish. In opening the fish these fringes appeared around the air-bladder like a packing of small white threads. The fish was taken on a hook and line, and had, at the time of

its capture, the tail of a pilchard protruding from the gullet.—*Thomas Cornish; Penzance, August* 27, 1864.

The Herring on the Coast of Newfoundland.—The following extract from a letter written by my brother, on the 18th of December, 1863, and dated "Indian Island, State of Maine, New Brunswick," may be interesting to some of the readers of the 'Zoologist':—"Those who own large vessels are now preparing to sail to Newfoundland after a load of herrings. Six years ago I was there four months in the winter season. It would astonish you to see the immense quantities of herrings that visit the different bays on the south-west of the island. Thirty barrels of fish are frequently taken in one net twenty-five fathoms long. They swim so deep at this season (winter) that it is necessary to sink the nets twenty fathoms deep to reach them. With the thermometer at zero, to haul one of these heavily-laden nets home is very great labour. Ten minutes after the fish are on deck they are frozen as hard as a stone. The herrings stay in the bays between four and five weeks, and then entirely disappear. An old Newfoundland fisherman told me the herrings go due north, and remain under the ice about Hudson's Bay and that region until the spring, when, about the beginning of May, they return in myriads to the bays of Newfoundland and the Magdalene Islands, which latter place is visited by about 200 sail of schooners, of from forty to one hundred and twenty tons burthen, to load every spring. I have visited the Magdalene, but can give you only a faint idea of the immense quantities of herrings that come here to spawn. Far as the eye can extend you see them coming towards the spawning-ground. Then it is the fishermen seams them with seams 400 fathoms long, and frequently land 3000 barrels at one huge haul. For a work of this kind, when the wings of the net are on shore, 200 men are required on each seam; they go alongside the cork line in large boats, and dip the fish out with a net something like an English trout-landing net, but on a scale large enough to dip three barrels of herrings at a time. The fish are rolled into the boats over the gunwhales."—*Henry Moses; Reading, August* 2, 1864.

The Lump-Sucker off Rathlin Island.—I enclose a full-sized drawing of a little fish which was captured off this coast a few days ago, and which I am unable to name. It is one of the suckers (*Cyclopteridæ*), and I think must be either a Liparis or a Lepidogaster. The sucker is not shown in the drawing. The tail is quite transparent. May I ask you the name of the fish?—*B. F. Bewley; Rathlin Island, Ballycastle, County Antrim, September* 17, 1864.

[The drawing of this exquisitely beautiful little fish was shown to Dr. Günther, who at once pronounced it to be the young of the lump-sucker (*Cyclopterus lumpus*). —*Edward Newman.*]

Life in the Deep Ocean.—We read in the 'Proceedings of the Natural History Society of Boston, U.S.,' an observation of Mr. Marcou, in regard to deep-sea soundings, that a Norwegian naturalist had recently obtained, by means of the same instruments used by Captain M'Clintock and Dr. Wallich, between Cape North and Spitzbergen, living animals from a depth of 8400 feet (more than a mile and a half). At this depth, where the temperature was only three-tenths of a degree centigrade (nearly the freezing point), were found living polyps, mussels, tunicata, annelides, and bright-coloured crustaceans. The same naturalist had found ammonites (probably Jurassic) and leaves resembling those of the palmetto (probably Miocene) at Spitzbergen.

Birds of Canada observed near Kingston, during the latter part of the Summer and in the Autumn of 1857. By Captain Henry Hadfield.

(Continued from page 6787).

Redheaded Woodpecker (*Picus erythrocephalus*). In August I shot a handsome old male of this common species. Length 9¼ inches; extent of wings 17 inches. Bill 1 inch 1-tenth; black at the tip, bluish white at the base, where numerous stiff black bristles cover and conceal the nostrils. The head is of a bright crimson. The seven exterior quills black; the eighth has a white spot on the inner web near the base; the tenth white on the greater part of the inner web and tip; the eleventh black at the base, and has a spot of the same on the outer margin towards the point, which is white, and there is a black bar across the inner web; the twelfth much the same, but the black bar decreases in size. The rest of the quills, except the last, are white with black spots. The black shafts of the secondaries contrast beautifully with the snowy whiteness of the webs. The primary and secondary coverts are black, but the latter have glossy blue margins. The back has also a bluish tinge. There is a patch of white on the rump, and the upper tail-coverts are of the same colour. The tail, both in form and colour, differs greatly from that of the young, described in the 'Zoologist' (Zool. 6781). The centre feathers are half an inch shorter than the exterior ones, and of a reddish brown colour. The two exterior feathers white at the base and tips, black in the centre, and the third and fourth are slightly marked with white at the base of the inner webs. None of the tail feathers are doubly pointed, as in the young birds, and the under parts are pure white. The nests, though often placed at no great height, are not readily got at, as the trees chosen are generally of considerable girth and the stems branchless. Though I have in my younger days taken eggs from a crow's nest at the top of a tall palm, it would have puzzled me to have climbed one of these equally tall but stouter trees. The trees in general are not very lofty, but gigantic pines are occasionally to be found so high that crows occasionally perch thereon.

Larus capistratus. Though numerous gulls frequent the sandy shores of this sea-like lake (Ontario) during the summer, I had no means of following them or opportunity of studying their habits; however, one shot out of a small flock, in August, belongs, I believe (having referred to Audubon), to this species. The bill is narrow, and measures along the ridge nearly an inch, and from the gape about half an

inch more. It is decurved, and of a dark horn-colour; nostril 3-tenths of an inch long, open, but very narrow. Lower mandible acutely angular and pointed. Forehead white; crown gray, and nape white. Anterior part of the back grayish brown; tips of feathers cream-colour; posterior grayish blue; rump and tail-coverts pure white. Tail nearly even; it has twelve rounded feathers, white at the base and tips, and there is a black band three-quarters of an inch in depth on all but the exterior feathers, which are black on the inner margins only. The under tail-coverts, like the upper, of a snowy whiteness, and very elongated, the centre ones extending beyond the quills. Throat and the whole of the lower parts pure white; under wing-coverts the same. The wing has twenty-six quills, is very pointed, and measures $10\frac{1}{4}$ inches from flexure; first quill longest; the rest rapidly decrease. The secondaries incurved; the last but one the longest. The first and second primaries are black on the outer webs, and on the inner near the shafts, and for a short space on the margin towards the points, which are black; the rest of the web white. The third quill has the outer web black and white, and the inner is partially margined with the former colour, but the tip is white. Fourth quill black and white, and the rest of the primaries are marked almost in a similar manner. The secondaries are for the most part black, but broadly margined with white, and the three last are tinged with reddish yellow. The exterior primary coverts white; shafts and points black; the rest are white, except on the shafts. Secondary coverts bluish white, tipped with cream-colour. Under wing-coverts white, and those of the secondaries very elongated. Thigh bare for a quarter of an inch above the knee.

Bittern (*Ardea minor*). On the 12th of September I shot a bird of this common but beautiful species. Weight $1\frac{1}{2}$ lb.; length $23\frac{1}{5}$ inches; extent of wings 3 feet 4 inches. One shot in Newfoundland was about 23 inches in length, so probably they are females, as the length given by Wilson is 27 inches.

Purple Grackle (*Gracula quiscala*). Shot a male of this splendid species on the 25th of September, having been attracted when snipe-shooting by their cry, not unlike that of the European blackbird when about to roost, and their manner of flying is very similar, chasing round and through the bushes skirting the marsh, their habitat. Length $10\frac{3}{4}$ inches. Wing from flexure, 6 inches; extent $18\frac{1}{2}$ inches. Bill on the ridge 1 inch and 2-tenths; from gape $1\frac{1}{2}$ inch; of a dull black, arched and curved at the point, which is very acute; nostril oval. The bill is about four-tenths of an inch wide at the base, but

suddenly narrows, the sides being much deflected and incurved; the lower mandible about an inch long, narrow and pointed as a needle. On the roof of the mouth there is a sharp tooth-like projection three-twentieths of an inch long. The tongue is one inch in length, narrow and fluted towards the end, which is slit and doubly grooved. The eye small; iris light yellow, though Wilson says silvery, but I could not be mistaken in the colour, having examined a wounded bird at noon-day; the pupil is black. The general colour of the plumage of this handsome bird, as its name denotes, is purple, but the shades vary so much with every change of light that it is difficult to describe it. Seen at a distance the grackle appears perfectly black. The head is dark glossy purple, but the feathers about the bill are black; the hind neck blue, bordered with green. The feathers on the anterior part of the back are broadly margined with bright copper, having a greenish tinge. Scapulars very elongated; they are of a violet colour, with a rusty brown tinge, and have obscure black markings. Tail feathers bright blue on the outer webs, dark blue on the inner, with obscure dusky transverse bars; they are all incurved. The wing feathers are of various lengths, but as the bird was moulting I shall not describe the quills further than by stating that they are of a glossy violet on the outer webs, black on the inner, with a bluish tinge. The primary coverts black, narrowly bordered with violet and indigo-blue. Secondary coverts black, shaded with blue on the inner web, and margined on the outer with glossy blue and purple. Smaller coverts dark blue, with bronzed edges and tips. Under wing-coverts black, with a bluish tinge. Throat and breast light blue, tinged with green and violet. The under parts bright copper, with a greenish tinge, but the feathers are black near the shafts, and have a shade of gray. Vent dark indigo. Thigh 2 inches 2-tenths, bluish black, but brown at the knee. Tarsus, toes and claws black.

Hermit Thrush (*Turdus solitarius*). On the 19th of September procured a bird of this species, a male, I believe. Length $7\frac{1}{4}$ inches; extent of wings nearly 12 inches. Bill on the ridge $\frac{1}{2}$ an inch; from gape 8-tenths of an inch; nostril oval. Upper mandible black, point decurved and notched; the lower one light horn-colour at the base, black at the point. Eye large; head dark olive-brown, back somewhat lighter, and the tail-coverts have a yellowish tinge on the margins. Tail 2 inches 8-tenths in length; it has twelve feathers, the exterior ones slightly exceeding the rest; they are all greenish yellow on the outer webs; hair brown on the inner, faintly but regularly barred with brown, and tipped with gray, the centre ones being a few shades

darker than the rest. The wing has eighteen quills; the second longest; the rest decrease rapidly. Primaries greenish yellow on the outer margins, except the first, which is gray, are all hair-brown on the inner margins, and have white and grayish white patches at the base. The secondaries have the exterior webs tinged with greenish yellow, but more faintly than the primaries. Chin white; throat cream-colour; breast tinged with yellow, and marked with spear-shaped black spots, increasing in size towards the breast, which is beautifully mottled with wavy lines of olive-brown, intermixed with buff, gray and white. The belly and under tail-coverts white. Sides gray, barred and spotted with light brown, and there are patches of the same on each side of the vent. Under primary coverts dark gray. Under secondary coverts grayish white, with a yellowish tinge at the base and on the margins. Upper primary coverts dark hair-brown, margined on the outer webs with greenish yellow. Thighs grayish white, brown at the knee. Tarsus of a light reddish brown in front, flesh-colour behind, as are the toes. Tarsus 1 inch 1-tenth. A female subsequently procured is 7 inches in length and 11 inches in extent of wings. The plumage is very similar to that of the male.

Golden Plover (*Charadrius virginianus*). Shot three out of a small flock on the 26th of September; the finest is $10\frac{1}{4}$ inches in length, and $22\frac{1}{2}$ in extent of wings. Yarrell observes, "I believe that the Asiatic golden plover is a species distinct from our bird, but identical with that of the American continent, in which the bird, though smaller, has a longer beak and longer legs, with a greater extent of naked space above the joint; the yellow spots on the feathers of the lower part of the back more oval in shape than triangular, and the axillary plume is always ash-brown, whilst that of the European bird is invariably elongated and pure white." Having frequently shot the Asiatic plover, I am also inclined to believe that it is identical with that of North America. Temminck remarks, "Les sujets tués dans les régions intertropicales de l'ancien monde sont toujours revétus du plumage d'hiver; il ne nous est pas parvenu d'individus en livrée parfaite des noces. La race de ces climats est constamment plus petite dans toutes ces dimension." The comparative measurements here given show the superiority in size of the European bird:—

	American.	European.
Length	$10\frac{1}{4}$ inches.	$11\frac{2}{10}$ inches.
Extent of wings	$22\frac{1}{2}$ ...	$23\frac{3}{4}$ ...
Bill on the ridge	$\frac{9}{10}$ ...	$\frac{9}{10}$ ...
Tarsus	$1\frac{6}{10}$ ...	$1\frac{4}{10}$ ...

	American.	European.
Middle toe	1 inch.	1 inch.
Claw	$\frac{3}{20}$ ...	$\frac{3}{10}$ ...
Inner toe	$\frac{7}{10}$ ...	$\frac{7}{10}$ ...
Claw	$\frac{3}{20}$ ...	$\frac{2}{10}$ ...
Outer toe	$\frac{8}{10}$ ...	$\frac{8}{10}$ ...
Claw	$\frac{3}{20}$ ...	$\frac{2}{10}$ ...
Tibia bare	$\frac{8}{10}$ ...	$\frac{5}{10}$ ...

There is also considerable difference in the plumage, particularly as regards the colour of the axillaries, which in the former are of an uniform ash-brown, but in the latter pure white. The spots on the posterior part of the back of the American bird are of an irregular oval shape, but in the European bird they are triangular. The former is a much darker bird, and has considerably less of the golden tinge on the plumage. According to Macgillivray, the centre claw of the European species is half an inch; but this must be a mistake, for I have generally found the claw little more than half that length: so we must look elsewhere for distinguishing marks and features, and they are not wanting, for not only is the tarsus of Charadrius virginianus proportionably longer, the tibiæ more bare by three-tenths of an inch, the axillaries of a totally different colour, the wing more pointed, and the under parts of a dull brown and yellowish gray, but the latter bird is at least a third less in size and weight. Having made these few remarks, I shall now describe it more fully. Bill black; nostril linear; eyes black and large; forehead broad and rounded, light gray, that colour extending to the cheeks, but the whole more or less spotted with reddish brown. Crown of the head black, longitudinally streaked with irregular yellowish brown spots and lines, the latter colour increasing towards the auriculars and nape. Hind neck cinereous-gray, with a yellowish brown tinge. Back black, anteriorly marked with small irregular gray and grayish yellow spots; towards the posterior the spots, increasing in size and number, become more regular, and are for the most part of a golden yellow: the spots are more oval than triangular. Upper tail-coverts black, bordered with yellow spots. Tail $2\frac{1}{2}$ inches in length, has twelve dusky black feathers, nearly even; the exterior one barred with white on the outer web, and spotted with the same on the inner, which is mottled with grayish white, and the tip is slightly tinged with yellow; second barred with grayish white, margined with yellowish white spots, and tipped with the same; third and fourth, though almost similarly marked, are darker; fifth has triangular yellow spots on the margins, and more of that colour at the

points; sixth has four triangular yellow spots on the outer margin, which is diagonally barred with yellowish white; the inner web is somewhat similarly marked, but the yellow is fainter, and the spots more irregular. The angular yellow spots on some of the feathers, encroaching on the central black, form a perfect oak-leaf pattern. The feathers are rounded, with the exception of the two central ones, which are oval. The wing has twenty-six quills; primaries black; shafts white, except at the tip and base, which is dusky; the first longest; second shorter by five-twentieths of an inch; third half an inch less than the second; the rest rapidly decrease: they are all slightly tipped and edged with grayish white. The secondaries are dusky black, broadly margined with grayish white; the first abrupt, the second diagonally sloped, third emarginate on the outer web; the rest much the same, excepting a few of the inner ones, which are elongated and tapering, margined on the outer webs with triangular yellow spots, and on the inner with elongated oval ones; tips yellowish white; shafts black; the others are white at the base. Primary coverts black, broadly margined and tipped with white. Secondary coverts dusky, deeply edged with white, and tinged with yellow on the outer web. Upper coverts black, with yellow, gray and white spots on the margins. Scapulars glossy black, with a few yellow spots on the margins; tips yellowish white. Under tail-coverts white, faintly streaked and margined with light hair-brown: they are little shorter than the tail. This lengthened and somewhat minute description of the American golden plover is given to enable those who have not had the advantage of examining it in the flesh, and comparing it with the European bird, to see at once, from the difference in size and colour, that it is a distinct species.

Yellowshanks Snipe (*Scolopax flavipes*). On the 25th of September found a considerable flock of this by no means common species, feeding in the wheat stubble not far from the town. Though rapid in flight, they are steady on the wing, and more readily shot than the common snipe. I found no difficulty in securing specimens, for when one had fallen, the flock wheeling round, passed and repassed over the dead or dying birds before resettling in the stubble, which they often did at no great distance, and it was not until ten of their number had fallen that they finally disappeared. One of the largest measures $9\frac{1}{2}$ inches in length, and $18\frac{1}{4}$ inches in extent of wings.

Bluebird (*Saxicola sialis*). On the 29th of September shot three birds of this species. Though in form the bluebird bears a striking resemblance to the European robin, Buonaparte was right, I think, in

removing it from the Sylviæ, where Wilson had placed it; neither its hooked beak nor stout legs fitting it to be so associated: its proper position is with the Saxicolæ. It was in passing through an open glade that I first observed them; they were shy and wary, keeping out of gun-shot, and as the evening was closing in I almost despaired of getting any; and it was not until I had concealed myself behind an old stump that I managed to shoot them. They were taking their evening's repast, much after the manner of the flycatcher, to which they are seemingly allied, occasionally settling on the ground for a second or two, then resuming a position on stump or branch,—more frequently the former. When alighting on a tree, it was generally on the lower or decayed branches. They were constantly darting about, whether in quest of flies or gnats I could not see, and subsequently omitted to observe. Their flight is buoyant, often soaring, too, before alighting. When stationary, which they seldom were for many seconds, the wings were drooping and feathers ruffled. In width of mouth it greatly resembles a flycatcher. A fine male is $6\frac{3}{4}$ inches in length, and $11\frac{3}{4}$ inches in extent of wings. The female is of the same size as the male, but the plumage is less brilliant.

Winter Wren (*Sylvia troglodytes*). In September I procured a wren of this species. Though about the size of the common European wren, I do not agree with Wilson, who says, "I strongly suspect it is the same species as the common domestic wren of Britain." The plumage is decidedly darker, as stated in my former notes (Zool. 6749), the feathers of the breast more elongated, and the tail is longer. The throat and fore part of the breast of the winter wren are of a light brown, tinged with rufous; these parts in the European bird are pale grayish brown. The belly of the former is black, spotted with white and reddish brown; that of the latter grayish white, tinged with yellow and spotted with light brown. The tail of the winter wren is dark reddish brown, broadly barred with black; that of the European wren light reddish brown, with dusky bars. Back of the winter wren dark reddish brown, with black and white spots; back of the European wren light reddish brown, minutely barred with dark brown. The bill of the winter wren is black; the bill of the European wren of a light horn-colour. The tarsus of the winter wren is dark brown in front, black behind; toes and claws black: in the European wren these parts are many shades lighter. But I need not carry on the comparison, the winter wren being undoubtedly a distinct species. Length 4 inches 1-tenth; extent of wings $5\frac{3}{4}$ inches.

Ruby-crowned Wren (*Sylvia calendula*). On the 9th of October

shot one of these diminutive birds. Length 4¼ inches; extent of wings 7 inches.

Little Sandpiper (*Tringa pusilla*). Procured, in October, a specimen of this minute species. Length 5¾ inches; extent of wings 11½ inches. This must be a scarce species, as I did not meet with it again.

Buffelheaded Duck (*Anas albeola*). In October I procured one of these small ducks. Length 15 inches. Both in size and shape it bears a strong resemblance to the teal, like which it has but sixteen feathers in the tail; and the eye is placed considerably lower down than I have previously observed it in the duck, so that a line drawn from nostril to nape passes through it. The bill, too, unlike that of a duck, is shorter than the head, and gradually increases in width towards the point, like that of the wigeon. Had I not read what Wilson and Audubon have written, I should have little hesitation in placing it with the Querquedulæ.

Yellow-rump Warbler (*Sylvia coronata*). Shot a bird of this species in October. Length 5½ inches; extent of wings 8¼ inches.

Carolina Rail (*Rallus carolinus*). On the 5th of October shot one of these common birds. Length 8¼ inches; extent of wings 13 inches.

Virginian Rail (*Rallus virginianus*). On the 5th of October a female of this species was shot. Length 9¾ inches; extent of wings 14 inches. These birds are very tame, and will approach within a few yards of the sportsman when standing or reloading in a swamp.

Blue Jay (*Corvus cristatus*). On the 5th of October shot a bird of this beautiful but common species. Length 12 inches; extent of wings 16½ inches.

Great Heron (*Ardea Herodias*). In October I procured a bird of this species, weighing 5½ lbs. Length 4 feet; extent of wings 6 feet 3 inches.

Whitebreasted Hawk (*Falco leverianus*). On the 7th of October I observed, when snipe-shooting, two hawks or buzzards. One was dark, but with the whole of the under parts white, possibly the white-breasted hawk, said to be the adult of Falco borealis. The other, which alighted on a tree, appeared of a bluish gray or slate-colour.

Swamp Sparrow (*Fringilla palustris*). On the 17th of October, when shooting in a marsh, observed among the alders, which they were actively perambulating, a number of these handsome birds, so like our reed bunting in size, colour and habits; so tame, too, that I found no difficulty in securing specimens. Length 6 inches; extent of wings 8½ inches.

Chipping Sparrow (*Fringilla socialis*). On the 17th of October I examined one of these common sparrows. Length $5\frac{1}{2}$ inches; extent of wings $8\frac{1}{4}$ inches.

Snow Bird (*Fringilla nivalis*). In October shot two of these birds; though common, they are not very numerous in this neighbourhood, but, like most of the smaller species, are easy of approach. Length 6 inches; extent of wings $9\frac{1}{4}$ inches.

Shore Lark (*Alauda alpestris*). In October I found a small flock feeding among the wheat stubble, and though several shots were fired they did not quit the field until three or four of their number had fallen. One slightly wounded in the wing was caged and brought to Scotland, where it met with an untimely fate, having been killed by mice or rats: it frequented the perch, and had become very tame: it was a male bird, but never sang, though emitting at times a faint plaintive note. When disturbed, I observed one or two, on quitting the stubble, perch on a rail. It cannot be a very common species, or I should have met with it oftener. They were in fine condition, *i. e.*, very fat. One of the largest is $7\frac{1}{4}$ inches in length, and 13 inches in extent of wings.

Snow Bunting (*Emberiza nivalis*). On the 29th of October, I found a large flock feeding in a stubble-field; when disturbed they rose at once to a great height, and were soon lost sight of, ascending by circular sweeps, the birds much scattered; stragglers to be seen sporting and chasing about in all directions, but invariably reuniting with the flock, which, though rising rapidly, would occasionally drop a considerable distance, and then as quickly reascend. Having watched their return, I observed them alight on a distant part of the field, which was of great extent. On following them up they again took wing, three only having fallen to my shot, in consequence of their loose order of flight. The screeching of two wounded birds brought the covey back before I had time to reload, when, passing and repassing within a few yards of me, they hovered and fluttered over them with a plaintive reiterated cry, and a few I observed settle on the ground close to the dying birds. They are strong and tenacious of life, struggling to the last: one I was nearly losing, in consequence of the rapid manner in which it ran through the stubble to some broken rocky ground, to which it was traced by the blood shed by the way, and with which the plumage was bespattered: it was quite dead when picked up. One or two more having been shot, the flock suddenly disappeared. They measure about $6\frac{1}{2}$ inches in length, and 12 inches in extent of wings. One word, in passing, respecting the somewhat vexed

question of the perching habits of this and other species, and I would remark, from the little experience I have gained, that the habits of birds are to be correctly studied in their natural haunts only, and that we can form no just conception or estimation of them by the occasional view of a few wandering stragglers. That the snow bunting, on this continent, is an occasional percher one need not be a close observer to find out. I certainly had not seen them half a dozen times before I remarked that, on being disturbed when feeding, they would, on leaving the stubble, fly into the trees; and on one occasion I remember being struck with the peculiarly beautiful effect it had, the white plumage contrasting with the green foliage, making the trees appear as if dotted with flakes of snow or white blossoms.

Roughlegged Falcon (*Falco lagopus*). On the 30th of October a handsome female of this beautiful species was secured, but not until it had been twice wounded. When on the look out for the golden plover on an extensive plain, or clearing, two of these birds were observed soaring at a great height, but before long one ventured within gun-shot, and was sweeping past in fancied security, some seventy or eighty yards overhead, when down it came, apparently stunned by one of the large cartridge pellets, but, before reaching the ground, recovered itself, and would have escaped had not my companion winged it by a second shot. Two mice were found in the œsophagus, and the remains of three more in the stomach. Length 20½ inches; extent of wings 49¼ inches.

Dusky Duck (*Anas obscura*). Procured one of these common ducks in October.

Redheaded Duck (*Anas ferina*). On the 2nd of November I inspected a duck of this species. Length 20¼ inches; weight 2¾ lbs.

Redwinged Starling (*Sturnus predatorius*). Shot one of these common birds on the 2nd of November; at this season they flock with the cow bunting, though far less numerous. Length 9½ inches; extent of wings 14¼ inches.

Cow Bunting (*Emberiza pecoris*). On the 2nd of November I found an immense flock of these birds, the most common and numerous species, perhaps, in North America; they are to be seen in vast and countless numbers, appearing at times like black clouds in the distance. Having marked the flock down, I approached under cover of the Indian corn, on which they were feeding, and on their taking wing fired, when some forty or more fell to the double discharge. They were not found very palatable. Wilson has given a lengthened description of the habits of this species, so like the cuckoo, neither

building nor incubating. That so numerous a species should find suitable nests wherein to lay or deposit their eggs seems most wonderful, so that one might be inclined to doubt it, if not authenticated by such a naturalist as Wilson. What would be thought of myriads of cuckoos laying their eggs in the nests of some half-dozen species of our smaller birds? It is hard to divest oneself of the idea that those observed by Wilson and others during the breeding season might have been stragglers, and that the cow bunting may pair, build and incubate in a higher latitude.

Hairy Woodpecker (*Picus villosus*). On the 6th of November a bird of this common species was shot. Length 9 inches; extent of wings 14 inches.

Downy Woodpecker (*Picus pubescens*). On the 6th of November likewise procured one of this species. Length 6 inches and 6-tenths; extent of wings $11\frac{1}{4}$ inches. Like the former, it is so abundant that one can scarcely enter a wood without finding it. Their shrill cry and incessant tapping is heard far and wide, and one has only to inspect the decaying timber to be convinced of the innumerable small woodpeckers that inhabit these vast and boundless forests, as few old trees are without some holes. Temminck, when describing the European woodpeckers, says, "Ces oiseaux vivent solitairs dans les forêts; ils se cachent au moindre bruit." But it is not so with those of America, which are frequently to be seen on the trunks of the trees within a few yards of one. These remarks refer to the smaller species only, the larger being more wary. Not only the woodpecker, but most species in North America are tamer than the birds of Europe, owing, no doubt to their being so little disturbed or molested in a thinly populated country like this.

Ruffed Grouse (*Tetrao umbellus*). In November shot a bird of this handsome species, which is here called the partridge, but is more like the pheasant, particularly about the head and toes: its habits, too, are very similar, concealing itself among the under-wood, and when disturbed, rising with a whirring noise, threads its way with wonderful facility between the trees and tangled branches of the fallen timber, so that they are not readily shot. Like the pheasant, too, it roosts among the trees. It feeds, at least at this season, solely on beech-masts, the crop of the bird in question and of one subsequently shot being crammed with them. Wilson says nothing of this, though he mentions both their summer and winter food. Weight $1\frac{1}{2}$ ℔.; length 18 inches; extent of wings 21 inches. The other specimen referred

to is 18½ inches in length, 23½ inches in extent of wings, and 1¾ lb. in weight.

Goldeneye (*Anas clangula*). In November procured a male of this species. Length 18¾ inches; extent of wings 27¾ inches. The white patch on the fore part of the cheek is more of a kidney than oval or egg shape, as represented by Macgillivray, vol. ii. p. 174.

Black and White Dabchick (*Podiceps cornutus*). One shot on the lake in November is 14 inches in length and 23 inches in extent of wings.

Passenger Pigeon (*Columba migratoria*). In November I examined a bird of this common species (a female, I believe). Length 15½ inches; extent of wings 23½ inches. A male subsequently shot measures 17¼ inches in length. When reposing by day they prefer, I am informed, the dead to the living branches. Though I have occasionally seen considerable flocks, I must confess to being disappointed as to their numbers; either I have been unlucky or the passenger pigeon must be on the decrease in these settlements. As to their amazing rapidity of flight, there can be but one opinion. As seen on the wing they resemble greatly the common paroquet of India.

Summer Red-bird (*Tanagra æstiva*). Shot a female Tanagra (date omitted). No bird has puzzled me more than this, and had it not been for the kindness of a neighbour it might have been long ere identified. I do not think so great a dissimilarity exists between the male and female of any of our European birds, the male with its brilliant red plumage, quills excepted, contrasting strongly with the yellowish green colour of the female. Length 6½ inches; extent of wings 11 inches.

Redbreasted Merganser (*Mergus serrator*). Procured a young bird of this species on the 27th of November. Weight 1¾ lb.; length 20 inches; extent of wings 32¼ inches.

Goosander (*Mergus merganser*). In November obtained a female measuring 25 inches in length, 35 inches in extent of wings, and weighing 3 lbs.

Blackthroated Loon (*Colymbus arcticus*). In November procured one of these birds. Weight 2½ lbs.; length 24½ inches; extent of wings 40½ inches.

Purple Finch (*Fringilla purpurea*). On the 4th of December shot one of these common but handsome finches. Length 6 inches; extent of wings 9½ inches.

Carolina Nuthatch (*Sitta carolinensis*). Shot a bird of this numerous species on the 5th of December. Though about the size of the

European nuthatch, it differs much in colour, the crown of the head, nape and anterior part of the back being black. The whole of the under parts from chin to vent white. Under tail-coverts bluish white, broadly margined with reddish brown. Primaries and secondaries black, margined and tipped with white. Second, third, fourth and fifth quills spotted with white on the outer webs, and both primary and secondary coverts are broadly tipped with white, forming a bar on the wing. Inner secondaries bluish gray on the outer webs. The cheek is white, and there is no black band running through the eye as in the European species. Length 5 inches and 9-tenths; extent of wings 10 inches and 6-tenths.

Meadow Lark (*Alauda magna*). Rather a common species in this neighbourhood, where the woods have been extensively cleared. They frequent the long grass and clover, and when disturbed do not, like the sky lark, soar aloft, but flutter along at no great height; their being in a state of moult may occasion this. They would frequently resettle within thirty or forty yards of me. One I observed, after being fired at, take a distant flight and settle on a tree. The plumage of the back is very similar to that of our sky lark, and though undoubtedly a handsome bird, the bright yellow of the under parts is in too strong a contrast to the reddish brown and black of the upper; the transition is too sudden, there being no shading or blending of colours. Wilson looked upon it as "eminently superior in plumage, as in sweetness of voice," to the sky lark; however, I cannot think that the latter would be improved by having a bright yellow breast and belly. As to its song, I never chanced to hear it. They are about twice the size of the sky lark.

Yellow Bird or Goldfinch (*Fringilla tristis*). The white, downy, lichen-covered nests of this common but beautiful and elegant little bird (already described) are to be found in considerable numbers among the stunted hawthorn bushes abounding in this rocky ground; so compact are they that they weather the winter, for I have observed many old nests still adhering to the branches.

A small bird, greatly resembling our titlark, was shot, which having failed to identify, I shall not now describe.

After the date last mentioned few birds were to be found; one might walk miles without seeing half a dozen kinds; I did not even notice a crow for some months. The nuthatch, woodpecker, and a few other species, have the woods to themselves, and a solitary hawk may chance to be seen soaring aloft. The autumn having proved the mildest known for many years may account for the late stay of some of the

species enumerated, the purple finch for instance. The descriptions, where given, are incomplete: under the circumstances they could hardly be otherwise, as they were often hurriedly jotted down after a hard day's walk, so the reader must excuse any want of order or method in the arrangement.

HENRY HADFIELD.

Ornithological Notes from Shetland. By HENRY L. SAXBY, M.D.

(Continued from p. 9243.)

Peregrine Falcon.—The young peregrines which left their nest on the 28th of June remained in its vicinity until the 2nd of July, when they ventured inland with their parents. I am told that at night they occupy any part of the cliff which takes their fancy, and that they have now entirely deserted the nest. Although several pairs breed regularly in our cliffs, it is very seldom indeed that the eggs or young are obtained, on account of the extremely inaccessible position of the nest. I have only upon one occasion succeeded in getting a close view of a nest, and that one had most certainly once been the property of ravens; the young birds had flown about a week previously. The rock-climbers can give me no information as to whether this species ever builds its own nest. The peregrine is very destructive to the wild fowl, sometimes even killing the lesser blackbacked and herring gulls, but kittiwakes seem to be its favourite food during the breeding season. It is equally partial to rock doves at all times of the year, but so swift is their flight and so perfect their command of wing that they very often elude pursuit and escape to their caves. Long observation has nearly convinced me that the peregrine seldom, perhaps never, strikes its prey while the latter is upon the ground: why, I am unable to conjecture, unless it be that it dreads the sudden shock. Any person who has seen a peregrine strike a bird in the air must have observed that the sudden contact causes them both to descend for many yards, and it is easy to imagine that a very severe shock might be the result of a swoop upon an object resting upon the unyielding surface of the ground. It appears highly probable that, in striking a bird in the air, the hind claw alone is used, for in newly-killed specimens I have frequently seen down, blood and feathers adhering to that particular claw alone. This is what I mean by *striking;* therefore, in making the statement that the bird never *strikes* its prey upon the ground, I do not mean to deny that it stoops and carries away small animals. But it procures

these in a different manner. I have seen it leisurely follow a rabbit, and then drop quietly upon it, in much the same manner as an owl drops down upon a mouse. There was no terrific swoop, and no long, gaping wound inflicted upon the unfortunate prey, yet all this becomes necessary when the victim happens to be a bird, driven by terror to its utmost speed. But it does not follow that because one single observer has never seen the peregrine strike its prey upon the ground, such a circumstance never occurs; therefore the matter must remain undecided in my mind until some kind reader favours me with the result of his own experience. Once, while I was walking in this neighbourhood, I heard a sudden rushing over my head; a tame pigeon appeared before me for a moment, and, like a flash of lightning, a peregrine struck it and sailed off. The ill-fated pigeon fell dying to the ground, and on picking it up I found a deep gash extending from the rump to the shoulders. Several times, after a pigeon has been struck I have noticed that the head was nearly torn off. Of the unwillingness of the peregrine to strike a bird in the water I was once witness to a well-marked instance. On the 9th of January, 1861, I was crossing the marsh at the head of the Loch of Cliff, when my attention was attracted by the struggles of two large birds upon the ground, about a couple of hundred yards distant. I immediately hastened towards the spot, when one of the birds, a peregrine, skimmed hastily away, and soon afterwards the other bird, which proved to be a wild duck, flew heavily for some distance up the deep burn which feeds the loch, and alighted in the water. It appeared to have suffered such injury that, thinking I should be able to catch it, I followed it up. Upon my approach it rose upon the wing, and began to follow the course of the burn, keeping about ten feet from the surface. Very soon there was a rushing sound overhead, down came the peregrine with the swiftness of an arrow, and the duck was only just in time to save itself by dropping hurriedly into the water, leaving its enemy to dash about fiercely far above, for the peregrine rose to a considerable height the moment it missed the stroke. Again and again I put up the duck, and each time with a precisely similar result, the peregrine making a dash at the poor persecuted bird every time it rose, and the latter as regularly avoiding the stroke by dropping into the water, where it was allowed to sit in perfect safety. At length the duck becoming much fatigued, concealed itself beneath some overhanging weeds at the edge of the bank, from whence it no doubt beheld the departure of its two enemies with great satisfaction. The boldness of the peregrine astonished me not a little; in its eagerness for the chase it became utterly regardless

of danger, and several times came so near me that I could easily have reached it with a coach-whip. It appeared to be an old bird in magnificent plumage, and it may easily be imagined how deeply I regretted that my gun was a couple of miles beyond my reach. Although peregrines are neither so bold nor so numerous as they were formerly, they still visit the houses and commit some considerable havoc among the poultry and the tame pigeons, but as they pay their visits very early in the morning they are seldom caught in the act. This bird requires a heavy shot. I have known it sail away after having received the full benefit of a charge of No. 4 fairly in the breast, at the distance of little more than thirty yards, and with sufficient force to knock out many of the feathers. It is a very common thing to see a peregrine sitting upon a wall near a farm, or upon one of those large isolated stones which lie scattered so abundantly over the hills, but I never knew this bird shot under such circumstances, except once, when it happened to be gorged with snow buntings, and I ran up within shot before it could get away. In my ignorance of the ways of the bird, I used to be sadly tantalized. I would see one sitting upon a large stone, and, there being no cover, would walk rapidly up, all prepared for a shot. It was not often that I was allowed to get within range, but when, upon rare occasions, I succeeded in doing so, I would stop suddenly, certain either of a sitting shot or of a chance as the bird rose; but the result was always the same,—no matter how quick I was,—the very second that I stopped the provoking bird dropped over to the opposite side of the stone and skimmed along the ground, not to reappear until long out of shot. The merlin has the same habit.

Arctic Tern.—Although the arctic tern usually commences laying about the 14th of June, I did not see any eggs this season before the 4th of July. This species breeds abundantly upon most of the small retired holms, as well as upon many of the larger islands. They usually breed in company, and the moment an intruder appears the whole of the birds rise, and hovering above his head, uttering their well-known cries, never cease these tokens of displeasure until he has quite left the spot. Some years ago I was in the island of Hunie, when a hooded crow paid a visit to the breeding-ground there, with what intention I know not, unless he felt himself unable to resist the attractions offered by the eggs and young birds. Instantly the whole body of terns arose, and assailed him so determinedly that he was glad to make off with all possible speed for the opposite shore. But his retreat was not considered sufficient, and the angry little terns followed him like a swarm of bees, even after he had left the island. One made a dash at him,

and he stooped to avoid the blow; another and another followed up the attack so rapidly that the crow, dropping as each one approached, gradually descended nearer to the surface of the water without being able to rise a single foot. Lower and lower he went, until at last the tips of his wings dipped into the water, and then his fate was decided. The poor fellow cawed and struggled most desperately, and made tremendous exertions to rise, but this only hastened his end; his feathers became saturated, and soon his head dropped beneath the surface. Seeing him motionless the terns now appeared to be satisfied, and, after a few more dashes towards his body and a few more cries of anger, they returned peaceably to their nests. In a late number of the 'Zoologist' (Zool. 9164) Mr. Harting inquires whether this species "invariably lays upon the ground without any nest." As no answer has yet appeared, I beg to offer what little I know of the matter. In these islands the favourite situation for the deposition of eggs is a sandy or gravelly beach, or a ledge of a rugged bank which has been broken by the winter gales: in such places the eggs are merely laid in a hollow scraped out by the bird; but if the soil of the bank happens to be wet, a small quantity of gravel is sometimes interposed. Often, however, the eggs are laid among the short grass further inland, and then the hollow is almost always found to contain a few pieces of dead weeds or dry grass by way of lining. Occasionally, as in Hunie, the spot selected is the dry gravelly soil among stones and rocks some distance from the beach: in such situations I have found hundreds, perhaps thousands of eggs, but only in a few instances have I seen any attempt at a lining to a nest. These few remarks may not be precisely what was required, but still they have this merit, that the arctic tern being the sole representative of its genus in Shetland, there cannot possibly be any mistake as to species.

Kestrel.—Several pairs of kestrels have hatched here this season in the sea-cliffs. Both old and young birds are now constantly to be seen hovering over the fields. I am very much inclined to believe that this species only visits us in summer.

Rednecked Phalarope.—On the 6th of July a lad shot a pair of rednecked phalaropes as they rose from a piece of marshy ground near the Loch of Belmont, a few hundred yards from the sea. I only saw the female; it was in perfect summer plumage, and contained ova about the size of No. 1 shot. Although the rednecked phalarope breeds in Orkney, I am not aware that it has hitherto been recorded, even as a visitor, to these islands.

Storm Petrel.—Most sea birds are unusually late in laying this year. Storm petrels nearly always commence laying about the middle of June, but this season no eggs were obtained before the 7th of July. In 1861 I found fresh eggs as late as the 15th of August. This species breeds abundantly in this island (Unst), whole colonies of them being found deep down among large loose stones upon the beach, among loose stones and rocks in the cliffs, and occasionally in incomplete rabbit-burrows, not more than two or three feet deep. During the day I have always found the sitting birds silent until the nests began to be exposed by the removal of the stones, but at night they keep up a constant chattering. At such times one is of course immediately attracted to the spot, but during the day-time I have never discovered the nests otherwise than *by scent*. It is almost impossible to pass over the stones under which the nests lie without perceiving the strong peculiar smell which is never absent from birds of this genus. The single egg is deposited upon a few pieces of dry grass, heather, or dead plants, often intermingled with pieces of dried mud. It is very rarely laid upon the bare ground. I once found two eggs in one nest, but fortunately for my peace of mind there was a bird upon each. The egg varies greatly in size, though very little in form. The colouring also is a little remarkable. I have specimens perfectly white, others with an almost imperceptible ring of faint red spots at one end, and others again with the ring exceedingly well marked. I have sometimes fancied that incubation has the effect of obliterating these marks more or less; but it is very certain that fresh eggs are often perfectly white, without the faintest appearance of a ring. A very short time should be allowed to elapse before the eggs are blown, for they very soon spoil. The same remark applies to the eggs of Richardson's skua, but I am utterly unable to account for the fact. The young are at first covered with a beautiful and exquisitely soft grayish black down. The parent bird sits closely to the egg, and when taken in the hand immediately throws up several drops of clear oil, which, by the way, is by no means so abominably offensive as some people imagine it to be. I have very seldom seen petrels flying in the day-time, and upon the few occasions on which I have witnessed such an unusual sight the weather was foggy, and the birds were fluttering with loose, uncertain flight, very near their nests. The fishermen regard the petrels with great superstition, and relate many strange tales about them. It is certain, however, that during the bright summer nights, when the boats are thirty or forty miles from land, and the cleaning of the fish commences, hundreds of these strange birds suddenly appear

upon the scene, although not one was to be seen previously. They often follow the boats for many miles upon their homeward way. Many of the fishermen in various parts of Shetland have assured me that sometimes, in the uncertain light, they have seen what appeared to be the buoy marking the situation of the lines, but that on pulling up to it they have found it to be a perfect mass of petrels assembled round a piece of fish-liver.

Goldeneye.—On the 14th of July there were several goldeneyes upon the Loch of Belmont, and they are no doubt still remaining there, for I have seen them in that locality at all times of the year. Eggs precisely resembling the one figured by Mr. Hewitson as belonging to this species have been brought to me from the neighbourhood of the above loch. I believe that, in an early number of the 'Zoologist,' the late Mr. Thomas Edmondston mentioned the goldeneye as breeding in Shetland. [Mr. Edmondston's words are "appears to breed here." See Zool. 463.—*E. N.*]

Heron.—Herons, which left us about the end of winter, re-appeared upon the coast about the 28th of July. Not one is to be seen in this island in spring, but there can be no doubt that a few remain to breed in other parts of Shetland, for I have bought unmistakeable specimens of the eggs, which were taken from the high cliffs in the south part of the mainland. During the winter we often see small flocks of these birds upon the shores. As a rule they are very difficult to approach, but nevertheless they may sometimes be taken unawares, as was the case in the early part of the year, when my brother-in-law, Mr. David Edmondston, returning home after sunset, jumped over a turf-wall into the midst of about a dozen. I can only suppose that the thick heather deadened the sound of his footsteps.

Redthroated Diver.—Although most of the redthroated divers are now either sitting or hatching, I obtained two fresh eggs from the island of Grunie on the 29th of July. I never saw any others like them; they are of a very pale clay-colour, spotted with dark purplish brown. This bird is now in beautiful plumage, the red throat being in its most perfect state.

Golden Plover.—Golden plovers are now collecting into flocks. Somewhat later in the year large reinforcements arrive, and for several weeks afterwards enormous flocks are to be met with. Afterwards the greater number leave us, probably for the south, but they always leave enough behind them to afford excellent and abundant sport during the winter.

Starlings.—Families of starlings are now joining. The flocks, though still comparatively small, are steadily increasing.

Twite.—Twites are also flocking, but fresh eggs are still to be found.

Ringed Plover.—Ringed plovers are gradually descending from the hills and approaching the shore, where as many as a hundred and more are already to be seen together. The flocks will not break up before next spring.

Black Guillemot.—Black guillemots are now hatching. They breed in crevices of cliffs, among rocks upon the beach, and sometimes beneath large stones upon a grassy island. They lay two eggs, which are always deposited upon the bare ground. I have a very beautiful series of the eggs, but have as yet only succeeded in obtaining one of the warm, yellowish variety described and figured by Mr. Hewitson. The yolk of the black guillemot's egg is of a very dark reddish colour, so that when an egg becomes stained with it in the process of blowing it almost looks as if the shell had become smeared with blood. Young birds will very soon be abundant. By sitting quietly near the water's edge and occasionally tossing in a small stone, they may easily be attracted quite close to the observer, who will then have an excellent opportunity of watching their movements beneath the surface.

Baltasound, Shetland, July 30, 1864.

Meadow Pipit.—Very early in August meadow pipits descended from the hills, where they had been breeding, and, accompanied by their young, appeared in great numbers in the fields, from which the hay had just been cleared, and there they fed plentifully upon the fallen seeds. I rather suspect that with us this bird is regularly migratory. From April to August it is constantly to be met with upon the hills; then it descends to the low grounds, remaining there until about the middle of September, between which month and the following spring I do not remember having met with a single individual. The meadow pipit is known here as the "hill sparrow," while the rock pipit goes by the name of "tang sparrow." Among other varieties of the egg of the meadow pipit I have some which are pale grayish white, mottled with light bluish gray.

Curlew.—The first curlews returned to the shore on the 7th of August. They seem to remain in families until the winter is nearly over, when they assemble in flocks, soon afterwards breaking up and pairing. I have not observed them in families during winter in any

places besides Shetland. Although the greater part of their time is spent upon the shore, they come inland to feed during heavy rains, when the ground has become thoroughly soaked.

Cuckoo.—On the 10th of August, a cuckoo—a very rare visitor to these parts—was shot here by a friend of mine, who mistook it for a hawk. I saw it about a week previously, and supposed that the strong winds from W. and S.W. had driven it over to the island. It was a young bird of the year, full grown and in perfect plumage. Six years ago I several times heard the cry of a cuckoo near this place, and some weeks afterwards a young one, scarcely fledged, was shot: there can be no doubt that it was hatched here.

Knot.—The first knots appeared on the 17th of August. There is very good reason to believe that it occasionally remains here to breed. In summer I have shot old birds in the rich chestnut plumage peculiar to that season, and also several young birds very weak upon the wing.

Pied Wagtail.—A pied wagtail was seen here on the 20th of August. This species never breeds here, but a few visit us almost every summer.

Wild Duck.—A good many wild ducks still breed near the Lochs of Cliff, Watley and Belmont, and a few beside the small lochs upon the peat moors. The nests are always placed close to the water's edge among the tallest herbage. The young birds are now well fledged.

Sky Lark.—I have not heard the song of the sky lark this month. The birds themselves are very abundant, but the only sound they utter is a low chirp as they rise from the ground.

Merlin.—Plenty of merlins, both old and young, are now to be seen, but they very seldom come within shot. In most of its habits the merlin very closely resembles the peregrine falcon, only it is more daring. It is continually seen in chase of the house pigeons, and now and then it kills one; but its strength, though great for so small a bird, is insufficient to enable it to carry off so heavy a prey. The merlin usually builds in the sea-cliffs, constructing rather a slight nest of heather, dead weeds and dry grass. The nest is also found upon the hills among heather, but I have never seen it in that situation. Although in some seasons the birds themselves may almost be considered abundant, I have always experienced the greatest difficulty in obtaining the eggs.

Snowy Owl.—The snowy owl which I have already mentioned as having been brought to me on the 20th of June (Zool. 9240), is still as

healthy as an owl can possibly be. It appears to be a male, and it must be of some considerable age, for it is very much whiter than most specimens which have been seen here. For about the first week of his imprisonment he would not touch food, although I kept him as quiet as possible, and offered various temptations in the form of birds of various sizes, rabbits and raw meat. For the first two days he was decidedly in the sulks, retiring to the most distant corner of the cage, and scarcely taking any notice of my approach; but afterwards he became more lively, and the moment I went near he would dash wildly about, snapping loudly with his bill, and hissing in great displeasure. At length, fearing that he would starve, I was compelled to resort to main force, and accordingly fed him for several days with ringed plovers, which I pushed down his throat as far as I could reach, first cutting off the head, wings and legs. The process seemed rather to astonish him, and no sooner was the operation over than he stretched his neck, tightened the feathers upon his head so as to make it appear ridiculously small, closed one eye, inclined his head first to one side, then to the other, and altogether behaved in such an exceedingly comical manner that it was with no little difficulty that I could identify the foolish-looking bird before me with the mighty Strix nyctea, which always looks so solemn and sedate in books and museums. However, in a very few minutes afterwards, when he had been returned to his cage, he resumed his former grave appearance, maintaining it until he received his next meal upon the following day. I observed that the pellet of bones and feathers was never cast up earlier than two hours after each meal; sometimes it was many hours later. One lucky day, about a fortnight after he came into my possession, I found a dead mouse, and forthwith deposited it in the cage. Such a tempting morsel was not to be resisted, and upon my return very shortly afterwards it had disappeared: the ice was fairly broken at last, and thenceforward he fed himself. After this I placed small birds before him regularly every evening, and they as regularly disappeared in about an hour's time. For many days I endeavoured to get a view of the bird while in the act of feeding, and frequently spent an hour at a time peeping through a small hole in the side of the cage, but it was time spent in vain, for he would never touch his food while I remained near, although he soon devoured it after my departure. I fed him regularly at sunset, and still continue to do so, never omitting a peculiar whistle when I bring him food. He very soon learned the meaning of the sound, and although at other times he regards my presence with great composure, the moment I make the

usual signal near the outhouse in which he is confined I hear him jumping impatiently about the cage, and even when I conceal the food from sight, he flaps his wings and comes as far as the netting will allow him, evidently showing that the object of my visit is perfectly understood. It is only of late that he has condescended to feed in my presence, and I have endeavoured to avail myself of the privilege to the utmost. The first thing that I observed was the demolition of the theory that because the feathers extend to the tip of the bill this species never tears its prey. No matter what may be the fashion among others of his kind, this one while he is feeding throws the feathers back upon either side, thus laying the bill completely bare, consequently when he has finished tearing up a bird or a rabbit the feathers are as free from soil as when he commenced. In some former notes upon the snowy owl (Zool. 8635) I asserted that the bird almost invariably swallows its food whole. Now although this remark has been amply confirmed, not only by my own observations, but by those of some of our best naturalists, it is quite certain that the individual of which I am writing offers a marked exception to the rule. Possibly when in a wild state, he too used to swallow his food hurriedly, and without tearing it, but that now, fearing no disturbance, he proceeds more leisurely, and devours it piecemeal. His habit is first to tear off the head, next to pluck out most of the quill-feathers, and then to tear off and swallow large pieces of flesh,—and bone also, if the bird be smaller than a crow. He will proceed in the same manner even with a twite or a sparrow. The food is always held down with the foot. A young well-fledged herring gull supplies him with a single meal, and he always picks the larger bones very neatly. In the daytime he remains inactive, and seems to sleep, although the slightest sound is sufficient to put him upon the alert. Towards sunset he becomes brisk and lively, and shakes off all drowsiness. I used to give him a large stone to sit upon, but now he prefers a thick round branch, which he seldom quits: I am quite surprised to find that in perching upon it he places only two toes of each foot in front. He knows me well from other people, and seems pleased to see me, and although for the first few weeks all attempts at familiarity were furiously resisted, now, when I hold my hand above him, he merely snaps and hisses a little, but the moment I begin to stroke him upon the head he closes his eyes and remains perfectly quiet. A few days ago I threw the food to the back of the cage instead of to the usual place in front. This seemed to puzzle him a good deal; he repeatedly looked at it over his shoulder and then at me; at last he opened his bill to the full extent, and gave

forth a shrill, chirping kind of scream, the first sound, except a hiss, that I ever heard him utter. It is not always that I can find time to shoot a sufficient supply of birds or rabbits, and fresh meat is a rarity which can only be procured at certain times of the year: perhaps therefore some of my readers will kindly inform me whether I may safely offer sea-fish. The man who brought me this owl once kept one himself for nearly two years. It was rather closely confined at first, but subsequently it was allowed the full run of the cottage, though not until the wings had been clipped. It used to sit in some dark corner during the day, giving but little notice of its presence, but as soon as all was quiet at night it would leave its hiding-place and commence flapping and tumbling all about the cottage, upsetting everything which could by any possibility be upset, and tearing to rags anything in the shape of clothing which had been incautiously left in its way. As is too generally the case in Shetland, the cottage was under the same roof with the cow-house and barn, and after the owl had ranged through these for a few nights no mice were to be either seen or heard, although the place was swarming with them previously. Towards morning the bird gradually became quiet, and then resumed its state of comparative inactivity until the succeeding evening. It was fed upon rabbits and birds, but it never seemed to require drink. Ducks and fowls were never safe when the door was open. Sometimes a live hooded crow was thrown down to it, and then a fierce encounter was sure to follow, but it was seldom of very long duration; sooner or later the head of the crow would be lying in one place and the body in another. Once the owl tried to kill a pig about a month old, but was detected in time, and upon another occasion it had the audacity to pounce upon a full-grown cat; it at once attempted to bite off the head, and would probably have succeeded if the owner had not come to the rescue, for the cat was almost powerless in its grasp. The owl often escaped, and was as often recaptured, until at last, the man having grown tired of stumbling over the rough ground in pursuit, resolved that next time he would leave it to its fate, and accordingly, when it again escaped no exertions were made to recover it. It remained among the hills upwards of two months, at the end of which time it was caught upon a low wall near the cottage, and brought home. But there was no occasion to keep the door closed. The bird having probably become aware of the inconvenience of being compelled to provide its own meals, never again attempted to escape, nor could anything induce it to leave the premises. Few pets die a natural death, and this unfortunate bird proved no exception to the rule; one

night it got into the fire, and, before it could extricate itself, sustained such severe injury that it died very shortly afterwards. Another owl of the same species was kept for several months, but it died after eating a small piece of salt fish.

HENRY L. SAXBY.

Baltasound, Shetland, August 31, 1864.

Other Notes on the Birds which breed upon Walney and adjacent Islands. By H. ECROYD SMITH, Esq.

HAVING perused with great interest the animated description by Mr. Harting (Zool. 9156) of his visit to Walney during the past breeding season, though no professed ornithologist, I cannot refrain from offering a record of my own experience during two similar visits to this interesting locality, showing not only remarkable discrepancies in the habits of some of the breeders in different seasons, but, more extraordinary still, between Mr. Harting's observations and my own, only two or three days having elapsed between that gentleman's visit and my second and latest.

Hoping to find at least a few species of sea-fowl breeding upon the *smaller* sandy islands off the Furness coast, accompanied by a young neighbour, I started from Barrow (reached over-night) early in the morning of the 3rd of June last for Foulney, first following the railway towards Peel for a mile, and thence along shore to Roe Island, insulated no longer, the railway embankment joining it to the main. A few ring dotterells were flying about, but no eggs were noticed in our haste for better sport on Foulney, access to which, the tide being up, could only be obtained by boat; and from the new pier we hailed a small cobble, somewhat disheartened, however, by a coast-guard here all but offering us a sovereign apiece for the eggs we should obtain.

Nearing Foulney several flocks of birds rose from its further side, startled, as we soon found, by the approach of a shooting party, and subsequently stragglers only were seen, chiefly oystercatchers, two of which we saw brought down, destined for specimens in a local museum. Greatly disappointed to find the whole surface of the island a dead level, without place of hiding or even partial seclusion for incubation, we returned to the strand, and made the circuit of the place without finding a single egg, and, the tide now permitting, regained Roe, by traversing Little Foulney, a huge bank of sand crowned by pebbles, but these being covered at high water cannot be available for incubation. Formerly, according to authentic report, and even to within the

last year or two, Foulney was a good breeding station for many species; but, through increased travelling facilities, the isle is now visited by so many shooting parties that I much doubt whether any birds incubate here, save perhaps a few pairs of terns or ring dotterells.

A deep channel still separating us from Peel Island, recourse was again had to the boat, which soon landed us near the Inn and ruins of the Castle, better known by its other designation "The Pile of Fouldrey," whose walls, some erect, others toppling or toppled over into the sands beneath, have a peculiarly romantic effect upon these open sandy shores, which in winter must be bleak and desolate in the extreme. The nest of a titlark was the only one found here; but, sanguine of good success in the (to me) unexplored regions of South Walney, we waded across the sloppy channel, and struck the sandhills a little northward of the Lighthouse. Here a close search among the "hawes," and in the occasional damper hollows, of a couple of hours' duration, was solely rewarded by the capture of a young ring dotterell, which, however, caused no little amusement by its artful pretence of inability to run, until a favourable opportunity presenting it scudded away, with almost inconceivable rapidity, over a long stretch of sand, and was out of sight in a moment.

The western shore was now resorted to, but with no better success, and as evening was fast wearing away, we crossed the isle to Biggar, and after some little difficulty procured a bed at the ancient village hostelry, where the landlord informed us we were too late for the eggs at the south end, as a number of birds (blackheaded gulls, probably) had been breeding in the hills still nearer to the Lighthouse than we had thought probable, and their eggs having been mostly taken by its keeper, he had been threatened with law proceedings by the tenant farmer, who claimed all save such as might be found upon the beach, *i. e.*, between high and low water.

Early next morning the exploration of the western shore was resumed, at first without discovering a single nest, though ring dotterells were becoming more and more numerous; and when at length a spot was reached, nearly opposite North End Farm-house, where oystercatchers had bred last year, and where appearances spoke of recent occupation also, without any eggs being noticed, we almost despaired filling a single box. I soon, however, had reason to suspect some nests had been already robbed, and shortly eggs of the common tern appeared in twos and threes sparingly, afterwards, however, in great numbers, with here and there a nest of the oystercatcher or ring dotterell full of eggs, which were mostly freshly laid.

For the sake of convenience, let us now compare observations, where differences appear: Mr. Harting's are distinguished by inverted commas; my own follow.

Common Tern.—May 30, 1864. "Birds actually disturbed from their eggs."

June 3, 1863. None seen on or near their eggs, 10—12 A. M.

June 9, 1864. None seen on or near their eggs, 10 A. M.—2 P. M. As many of the nests contained the full complement of eggs, and some were to a certainty more or less incubated, we can only suppose the birds were fishing at the above times.

"No real nest; eggs laid in hollows of the bare ground."

1863. No nest; eggs found just above high-water mark on bank of pebbles; several not even in a hollow; some possibly displaced by advancing spring tides, or even removed by the bird itself from a lower inundated place of deposit.

1864. But few eggs deposited on the bare pebbles, or even sand, and these invariably in hollows. Nine-tenths of the whole laid in hollows formed in the drift sea-weed.

"Eggs in no instance laid *outside* the sand-hills."

1863. In every instance outside (seaward) of the sand-hills.

1864. Mostly outside the sand-hills. Some few in hollows nearly encompassed by sand-hillocks, but closely abutting on the beach.

"Eggs very round."

1863. Eggs differing in shape, some oval as a pigeon's, others round as any sparrowhawk's.

1864. Eggs oval, without exception, though five times more numerous than the previous year.

"Called 'sparling.'"

Probably the usual appellation here; but further south, round to the Mersey, the bird is called a "shrike," from its peculiarly harsh cry.

Lesser Tern.—"Five or six birds seen; three nests."

1863-4. A few birds; no eggs found, or nestings distinguished from last-named species.

Arctic Tern.—"Four nestings, all within the sand-hills."

1863-4. No certain nestings. My friend Mr. Alexander Cooke, who is well acquainted with the tern family, and has twice visited Walney, as well as the Fern Islands, during the breeding season, still strongly doubts either this or the following species breeding here: he regards the shooting of a bird in *mere proximity* to any nest by no means conclusive as to the parentage of the eggs, and that nothing short of capture upon the nest or eggs can be held conclusive, seeing that the eggs of the

three species, common, arctic and roseate, all run through precisely the same varieties, and when mingled are wholly undistinguishable.

Roseate Tern.—"Several birds seen; nests presumed."

1864. Two eggs were brought me, which may possibly belong to this species. They are of a much lighter ground colour than those of the arctic or common tern, and more like the snipe's in form.

Oystercatcher.—"Eggs 3—4, placed (small ends together) in hollows of the sand. Birds never near their eggs."

1863. Eggs 3—4, all in nests, or circular scoopings in level tops of pebbly bank, and out of reach of spring tides; partially lined with bits of large shells and fragments of wood or sea-weed. Several birds, disturbed from their nests by our approach, continued very near.

1864. Eggs chiefly placed as last season, but a few found in mere hollows of the sand, like those of ring dotterell. One pair disturbed from the nest.

Ringed Plover or *Ring Dotterell.*—"Eggs placed in sheltered position in hollows of the sand, for want of materials."

1863-4. Eggs placed in hollows scooped in the sand, upon small hillocks or banks within sheltered gullies running into the hills from the beach. In 1862, however, Mr. A. Cooke found a nest considerably outside the hills, and uncommonly exposed. Fragments of sea-weed and the fine roots of bent and other grasses abound here, as also abundance of broken shell and small pebbles, yet I have never found such used by this species either here or in other northern English breeding-places with which I am acquainted.

Shieldrake.—"Many birds seen; reported to breed in old rabbit-holes."

1863. Several birds seen and suspected to breed.

1864. At the north-west end of the island saw ten young birds (two miles from any house) running in single file from the hills to the beach. Upon seeing us they quickly diverged for the hills again. Several pairs of old birds were then feeding at low water.

Wheatear.—This species abounds (as throughout Lancashire) on sandy commons near the sea, more especially affecting old rabbit-warrens, the forsaken burrows being generally selected for incubation. The nests are frequently placed several feet down, and are consequently difficult of extraction: the eggs I find to differ considerably from examples procured further inland, being smaller in size, much paler in colour and also of more delicate texture.

Cuckoo.—Mr. Harting expresses surprise at meeting with this bird on Walney, but, like the wheatear, it is of very common occurrence

all round the sandy shores of Lancashire and Cheshire; and among the sand-hills near Formby, where it is particularly numerous, I have found *duplicate* eggs in more than one nest, and finding many other instances to have occurred for at least several years past, this fact must be acknowledged as a remarkable normal feature of the locality. Whether in most of these cases the pair of eggs are laid by one bird or two is a moot point: I incline to the former supposition, and find myself not singular herein, as Captain Thomas Brown, in his edition of White's 'Natural History of Selborne,' 1835, pp. 81—87, after quoting the observations of a brother naturalist on the habits of the cuckoo, alludes to the discovery of two of its eggs in one nest as proof of the bird laying more than one, which some had doubted. This remark would lose all effect, but for the writer's evident conviction that the eggs were the product of a single bird. We have all much to learn anent the breeding habits of this favourite visitant, and ought not to dogmatize on observations made in any single locality, which may be very far from presenting us with the whole truth.

Again, do not the discrepancies above noted in the breeding habits of several of our sea-birds prove great latitude to be necessary in any professed definition of those outward circumstances so remarkably altering the cases? Evidently the tides, the temperature and the amount of wind or wet of the season must always, to some extent, be taken into account.

H. Ecroyd Smith.

Egremont, Birkenhead, September, 1864.

The Decrease of Birds at Flamborough.—Every lover of Ornithology, when reading Colonel Newman's article, in the October number of the 'Zoologist (Zool. 9292) must deplore with him the rapidly diminishing numbers of birds on Flamborough Cliffs, and he only re-echoes the long-standing regrets of every intelligent person in the district; but the causes he assigns them to, lead to erroneous conclusions. Colonel Newman attributes the decrease of late years to the "taking of the eggs." Passing over the observation of the birds breeding in April and May as of course but a *lapsus calami*, as it is too well known the breeding season does not begin before June, it is a fact unquestioned by residents on the spot that this very partially arises "in consequence of the farmers allowing their eggs to be taken," but from the wanton destruction of the birds by the innumerable shooting parties (of which I regret to see Colonel Newman more than once a member), generally strangers to the district, and brought down in a great measure by the facilities offered of late years by cheap trains from the West Riding and manufacturing counties, and of which every member who fancies himself a sportsman considers a gun, for the express purpose of "shooting gulls at Flambro'," a necessary part of his enjoyment. These people, by the incessant popping of guns, keep birds of naturally shy habits in a constant state of alarm, and not alone

this, but for every bird they kill, they destroy a nest of eggs or young in the cliffs above, and this with an intensity of destruction, as in the watering season (commencing as early as June) excursion trains are already extensively patronized, and the destruction is thus committed upon parents of families, to which the taking of their first or second set of eggs is a comparative trifle. Col. Newman admits this, when he writes of having himself a "tolerable," and again "an excellent day's sport amongst the birds," and then observing that they are breeding "until late in July." As regards the taking of the eggs, the danger of obtaining them limits the climbers to a very small number,—this year, I believe, only four. These men, looking on it as a sort of monopoly, are as anxious for the preservation of the birds as any ornithologist can desire: they parcel out the line of cliffs amongst them at the opening of the season, each taking about a mile, and are as systematic in their mode of procedure as any Icelander in the collection of the eider-down. They limit their descents over the same ground to two in number, not baring the cliffs entirely, but leaving rallying points for the birds to collect around again, and it is well known they will a third time renew the process of incubation without the number of eggs being seriously impaired. In the face of these facts, any action on the part of the landowners in preventing the taking of the eggs would unfortunately serve the cause only in an extremely partial degree; the high seas would continue open to all, and the boatmen below—who look upon the shooting parties as a large item of the summer's profits and the birds as one of their vested interests—would remain as open to the allurement of half-a-sovereign as before, although they one and all admit they are killing the goose for the sake of the golden eggs. Uria lacrymans, I will add in conclusion, always was a scarce bird.—*N. F. Dobrée; Hull, October* 8, 1864.

Notes on the Ornithology of Flamborough.—Is not Colonel Newman mistaken when he speaks of the turnstone as common at Flamborough in July (Zool. 9292). The turnstone is only a winter visitant to the Yorkshire and Lincolnshire coast, and then only in small parties, and is by no means common. As far as my own experience goes, it does not arrive on our shores before the latter part of August or early in September. Colonel Newman also speaks of the ducks "which breed in May in these cliffs," and of the cormorants "which are numerous early in the season." From strict inquiries made during a visit in that neighbourhood in July last, respecting the birds which visit these rocks in the spring, I did not hear of ducks of any species breeding there; and, although the cormorants formerly frequented these stupendous sea-cliffs in considerable numbers in the spring, I am afraid I am but too correct in saying that from constant persecution they have now ceased to do so, the appearance of an odd bird or so being considered an unusual occurrence. All will agree with Colonel Newman in his regrets on the destruction of the eggs of the sea-fowl; but this is a question which must rest with the landed proprietors in the neighbourhood, as they have doubtless the power to prevent the plunder of the eggs in the spring. Certain it is that should the present system of robbing the nests, and the wholesale slaughter of the birds during the summer, be continued some years longer, it will end in the extinction or banishment of those feathered tribes which now gladden the eyes of many a true lover of nature, and afford an additional attraction to the romantic scenery of this coast.—*John Cordeaux; Great Cotes, Ulceby.*

Birds that sing as they Fly.—White, in his 'Natural History of Selborne' (letter 27), gives a list of birds that sing as they fly. This list comprises the sky lark, titlark, wood lark, blackbird, whitethroat, swallow and wren. To this list ought to be

added the missel thrush, who sings as it flies, to which I have often been both an ear and an eye witness. The missel thrush is a common bird in this neighbourhood. The common linnet is also another bird that I have heard frequently singing as it flies, especially when they visit the line folds in flocks, and also in the breeding season.—*John Ranson; York.*

Goshawk on Filey Brigg.—On Tuesday afternoon, whilst Mr. Richard Lorriman, feather preserver, was on Filey Brigg, he noticed a large hawk flying low and hovering about in search of prey. Crouching down he awaited its approach, levelled his gun, fired and it fell. Mr. Winson, bird-stuffer, in whose possession the bird now is, pronounces it to be a specimen of the goshawk in exceeding fine plumage.—*Sheffield Daily Telegraph, October* 8, 1864. [Communicated by Col. Newman.]

Fieldfare in July.—My friend Mr. R. M. Presland possesses a fieldfare, which he shot at Gravesend on the 3rd of July, 1864. Is this not very late for this bird of passage? He sent it to me to preserve, and on opening the bird I found three eggs formed, about the size of a horse-bean.—*J. A. Clarke;* 11, *Duncan Place, London Fields, Hackney, October* 6, 1864.

[The occurrence of the fieldfare in July is interesting; but is there no mistake about the eggs? I do not allude so much to the somewhat late period of the year as to the presence of three eggs of equal size, as the comparison to a horse-bean implies: eggs, prior to the period of oviposition, appear as clusters of minute objects, often not so large as the head of a very small pin; but, as the period of oviposition approaches, the most advanced egg has usually ten times the bulk of the second, the second ten times the bulk of the third. I have never seen three eggs of the size spoken of in any bird, as far as I recollect. The frequently repeated assertion that the sand grouse shot in 1863 contained two equally developed eggs was erroneous; such birds were unquestionably males.—*Edward Newman.*]

Light-coloured Robin.—Whilst out shooting this morning I had the good fortune of seeing and securing a very fine specimen of the albino robin: it was perfectly white, with here and there a slight tinge of cream-colour; the latter was very faint. I have never heard of one of these birds being shot or seen in the neighbourhood before.—*E. D. Hamel; Bole Hall, September* 27, 1864.

Curious Habit of the Robin.—During last winter and early spring I, on several occasions, observed a little habit of the robin which seemed to me somewhat peculiar. When two robins met, one of them would fly to within a few feet of the other, and, taking its stand on a branch, or sometimes on the ground, would raise its head in a vertical position, and sway its body from side to side without moving its legs, uttering at the time a quick energetic warble. The other would look on calmly and listen, making no counter-demonstration. Is this an address to a female, or a song of defiance to an enemy? I have not seen this habit alluded to in books.—*G. Roberts; Lotfhouse, Wakefield.*

Anthus campestris or A. rufescens at Brighton.—I send you a notice of the occurrence of the tawny pipit (*Anthus campestris* or *A. rufescens*). On the 30th of September, 1864, a boy caught in a clap-net one of this species near Brighton, and brought it alive to Mr. Swaysland, naturalist, living in the Queen's Road, Brighton, where I saw it alive about an hour afterwards. This is the third known British example. The two first were pointed out by me in the 'Ibis,' vol. v. No. 17, January, 1863, p. 37. Hitherto these birds had passed for Anthus Ricardi, and I very much wish that any gentleman possessing a supposed Richard's pipit, well authenticated as

killed in the British Isles, would examine it, and ascertain if he has not got a tawny pipit by mistake. The difference between the two species is so well known that I do not wish to take up your space by mentioning it here. However, I would only say if he has any doubt let him compare the hind claw of his bird with Yarrell's figure, p. 388, vol. i., 1st edition. If it does not correspond in length, he may conclude that he has not Richard's pipit, which is extremely rare in Great Britain, even if it has ever been killed here, of which I entertain strong doubts. My own belief, which is corroborated by the communications of several of our best ornithologists made to myself, is that Anthus rufescens may be met with pretty often on our south coast, and if public attention is turned to this bird, others will doubtless be discovered. The particular one now in Mr. Swaysland's possession had apparently been struck by a hawk, as there was a wound unhealed under the feathers, of such magnitude as to indicate a narrow escape. Yet the bird, which I consider is a male, was in good health and fine condition. And here I may remark how nearly the period of the year corresponds in each date belonging to the three examples. The first was shot August 17, 1858; the second taken September 24, 1862; and the third September 30, 1864: the two last in nets. It may be asked, why have none ever been obtained before? To this I reply that they probably have been overlooked, and also that of late years a new system has prevailed on these downs of catching larks by means of a decoy bird and clap-net—a plan long pursued with other kinds, but only recently adopted with larks, which were always either shot or taken in a drag-net.—*George Dawson Rowley; 5, Peel Terrace, Brighton, October* 15, 1864.

The Mountain Finch.—The mountain finch (*Fringilla montifringilla*) was seen in several flocks last winter in this neighbourhood. A youth, a neighbour of mine, shot ten at a shot. They were picking by an oat stack.—*J. Ranson; York.*

Swallows.—This year the first swallow was seen here (ten miles west of York) by six observers, on the 10th of April, and on the 11th a cat killed one in my neighbour's cow-house. Two were seen on the 13th, and on the 17th they made their appearance in the village in considerable numbers; on that day I saw two inspecting their last year's nest, in a deserted chimney, where there had been a nest for the last seven years. They have left us much earlier than usual, the 10th of October being about the time of their departure; but this year I have not seen one for above a week. A gentleman in the village, who gives them every encouragement, had a few years ago sixty nests on his hind's house; this year he has not one.—*Id.; October* 1, 1864.

Late stay of Swifts.—I received information yesterday from a friend, that two individuals of the common swift (*Cypselus apus*) were seen, during the course of last week, flying in an agitated manner over the parish of Brooke, which is situated about eight miles south-east of Norwich: one of them has since been shot by the gamekeeper residing in that district. This is, I believe, unusually late for the occurrence of this species. Two specimens of Hirundo riparia were obtained, in 1861, as late as the 11th of November, at Carrow Works, near Norwich: they were young birds of the year.—*T. E. Gunn; Norwich, October* 11, 1864.

Scarcity of Swifts and Snipes.—Swifts are certainly much scarcer than they were fifty years ago: this I attribute to the increase of young sportsmen, who constantly try to improve their aim by shooting these innocent birds during their stay in England. The greatest number I have seen lately were near Conway Castle, North Wales, where these birds have ample scope, and places to deposit their eggs, out of the reach of rats or boys. Taking the country generally, there is certainly a great decrease in

the numbers of these wonderful birds; and the same observation may be made respecting snipes, which were much more abundant formerly, even in parts of the country *not drained*, than they are now; but when you find that twenty persons in one parish take out game certificates, where formerly two or three did so of yore, is not the cause apparent?—*H. W. Newman; Hillside, Cheltenham.*

Martins congregating in August.—A writer in the October number of the 'Zoologist' (Zool. 9282), says he saw about two hundred martins on the 13th of August at Willesden, Middlesex. It is somewhat remarkable that on the same day I had made a note of their appearance here, having seen about one hundred hawking near the sea-cliffs, and occasionally settling on the roofs of the houses. The day was fine, and the thermometer, about noon, 70° in the shade, so that it was not cold that caused the gathering. Your correspondent does not say whether those observed by him were young or old birds, but I am inclined to believe they were the former, for those seen here were birds of the season; I observed them closely, and could not be mistaken. He inquires "whether it is not rather early for martins to prepare for their departure?" I think not, having frequently known them to congregate on this coast in August, which has been recorded, and I have stated it to be my belief that the young birds are the first to migrate, excepting a few of the later broods, which occasionally linger here until December. When living in the North, I never remarked this instinctive gathering of young birds,—a proof that it is only when migrating that they thus assemble. Though I have occasionally shot them, I now find no difficulty in distinguishing them on the wing, at a moderate distance, for they are generally smaller than the adults, the tail shorter, the plumage speckled, and the flight less rapid and sustained. A few days later, namely, on the 29th of August, a considerable flock of young swallows made their appearance: I will not state positively that there was not an old bird amongst them, but I think I should have noticed it if there had been, for I watched them narrowly, and to a practised eye the young of this species is as readily distinguished, as that of the former, for at this season (August) none of the young birds have the tail fully developed; it is generally but slightly forked, and not unfrequently quite even, and the plumage more or less speckled: they might be mistaken for the martin by the unscientific observer.—*Henry Hadfield; Ventnor, Isle of Wight, October*, 1864.

Food of Young Cuckoo.—Having just received the 'Zoologist' for this month I have been unable to reply sooner to your suggestion (Zool. 9282), as to the vegetable matter which I found in the stomach of a young cuckoo. I am quite certain that the mass did *not* consist of the hairs of caterpillars such as are frequently found in the stomach of this species, the fibres being of some length, and branching into finer filaments. But, to make sure, I dried some and found that they burned readily, without any animal smell. Since writing my first note, it has occurred to me that these fibres may have been part of the nest, the young bird having either swallowed them along with its food or devoured them in a fit of greediness. At least I can think of no more probable explanation.—*Edward R. Alston; Stockbriggs, Lesmahagow, October* 11, 1864.

Sanderling at Gravesend.—My friend Mr. R. M. Presland has a bird he shot at Gravesend this spring that I do not know the name of, and it is not in Morris's work. The bird is of the same size as a stint. The bill is one inch long; neck, chest and belly white; from the top of the head, back of neck and back light gray, with a black mark in the centre of each feather; long tapered wings, the longest feathers black,

the shorter ones dark gray, mottled with black; legs one inch long from the joint, and three toes one inch and a half; tail gray, longest feathers in the centre.—*J. A. Clarke*; 11, *Duncan Place, London Fields, Hackney, October* 6, 1864.

[The bird is doubtless a sanderling in winter plumage, the measurements and description agree very nearly, and the special mention of the toes makes it almost a matter of certainty. Morris only figures the summer dress, which accounts for my correspondent not recognising the bird.—*Edward Newman.*]

Note on the Appearance of the Ruff and Reeve in Lincolnshire.—On the 23rd of September I shot a young ruff out of a flock of twelve or fifteen of these birds. I had noticed them some days previously, in company with green plovers, feeding in some low grounds in this parish, and, curiously enough, within one hundred yards of a railway. They did not appear to be very wild, for although the peewits rose in a body and flew off, on the passage of a train, the ruffs merely flew for a short distance, and alighting commenced feeding again. When going any distance, they flew with great rapidity, and in the form of the letter V. They are the first I have seen during a residence of fifteen years in the county, and therefore register it as an interesting ornithological fact. Years since they were frequently seen and taken in the Lincolnshire marshes, but drainage and the fowler have long since driven them away, and we should now as soon expect to hear the "boom" of the bittern as to see a flock of ruffs and reeves.—*John Cordeaux; Great Cotes, Ulceby, Lincolnshire, October*, 1864.

Note on the Appearance of the Little Stint in the Humber.—I had a specimen of the little stint (*Tringa minuta*) brought to me this morning: it was shot on the Humber flats, and, as my informant told me, was the only one of its sort, and was feeding in company with some dunlins. It is the first specimen I have had from the Humber, although I believe the minute stint occasionally visits the mud flats in the spring and autumn. I have seen with my landscape-glass, in the former season, what I feel quite certain were minute stints feeding in company with dunlins, &c., but, owing to the general impassable nature of these mud flats, have never before been able to procure a specimen. The bird was in fine autumn plumage; the tail of twelve feathers, having the two middle and two outside longest, making it double forked. The two central feathers of the tail clove-brown, the remainder light gray. Forehead and a very distinct streak over the eye gray-white.—*Id.; September* 18, 1864.

Manx Shearwater at Flamborough and Filey.—In the October number of the 'Zoologist' (Zool. 9291) I reported the capture of a Manx shearwater, stating that I had never seen it before, and believed it to be a very rare bird on this portion of the east coast. My specimen appears to have been one of a flock of these shearwaters, for although it was alone when shot, it may have been separated from the rest by repeated attempts to secure it. I arrive at this conclusion because my friend Mr. T. Buckley shot no less than three specimens off Filey, only a few miles from the point where mine were shot between the 4th and 6th of July. Mine was shot on the 16th of the same month. I have seen all Mr. Buckley's specimens, two of which were mature and the other a bird of the year. Mr. Buckley told me that he badly wounded a fourth specimen, which escaped, and that he saw a fifth. Moreover, I purchased two mature specimens that had been shot also off Filey about the same date: these birds had, unfortunately, been skinned just previously to my receiving them, so that I was unable to determine the sex, as there do not appear to be any sexual distinctions in the plumage, &c. Still, however, I believe these birds to be extremely rare visitants to the east coast of Yorkshire. They are unknown to the oldest boatmen and collectors

to whom they have been named; and my own specimen, shot on the 16th of July last, is certainly the first I have seen shot in this locality.—*W. W. Boulton; Beverley, October* 11, 1864.

Note on the Mountain Linnet or Twite.—In the October number of the 'Zoologist' (Zool. 9280), Mr. Cordeaux, of Great Cotes, Ulceby, Lincolnshire, reports as an unusual circumstance the capture of a mountain linnet, so early in the season as the 16th of August, so far south as the locality named above. Until I read Mr. Cordeaux's note, it never occurred to me that it was unusual to meet with Fringilla montana at this time of the year, and I am under the impression that I have seen many specimens of this species quite as early in the season as the 16th of August in the neighbourhood of Beverley. The only instance I find recorded in my note-book, however, occurred in 1862, when a pair of twites, male and female, were shot in the Burton Bushes, close to Beverley, on the 7th of August. I saw these birds in the flesh, so that I cannot have the slightest doubt as to their species. They belong to a friend of mine, and I have no doubt that I could have them, should the period of their capture render them of sufficient interest. Both these birds were killed at one shot, and were evidently a pair. They were mature, and as they were frequenting low furze bushes at the time of their capture, I thought then, and do so still, that they had bred in the neighbourhood. Fringilla linaria, or the lesser redpole, breeds with us regularly. I have its nest and eggs, and could obtain several each season. It remains in this locality throughout the year, and is met with in every stage of plumage. I only once obtained a single specimen of Fringilla borealis, or the mealy redpole: it was shot out of a flock that visited the neighbourhood several years ago, in the early winter season.—*Id.; October* 19, 1864.

Habits of Spiders.—In an arbour in my garden I have nailed up a piece of old carpet against the trellised side, to keep the sun from my pupæ. In a fold of this carpet, which I daily inspect, as it makes a good trap for moths, I have observed for a fortnight past a Depressaria applana that has never moved all that time, being always on the same spot, with its head downwards. In the same fold, close to it, are several web-making spiders, apparently of more than one species, any of them large enough to tackle a Depressaria, but they have never touched it. This is not the first time that I have noticed the extreme sluggishness of that moth through the autumn, so that I was not surprised to see it; but the abstinence of the spiders set me thinking what could be the cause of it. I must premise that I know next to nothing about spiders, and it seems to me that those who are well acquainted with their habits do not, so frequently as they might, publish their observations in the 'Zoologist.' In the hope that my ignorant queries may stir up some arachnidist to give us an insight into the habits of these interesting creatures, I venture to conjecture, from the "happy family" in the fold of the old carpet:—*First.* That the spiders came there for the same purpose as the Depressaria,—to spend the winter in a torpid state, thus long before the time; and that their unusual gentleness was owing to loss of appetite at the approach of torpidity, or perhaps to the desire to be on good terms with their neighbours, which we all feel as Christmas draws near. This conjecture is inconsistent with the activity of the spiders when observed. *Secondly.* That they came there to prey upon the insects resorting thither for shelter; but that the Depressariæ were not their proper

food; and consequently that different species of spiders feed on different insects. *Thirdly.* That the instinct of web-making spiders is so narrow and confined, that they are only impelled by nature to seize those insects which fly against, or otherwise interfere with, their webs, and this the quiet Depressaria had never done. If you or any of your readers will kindly enlighten me in this matter I shall feel much obliged.—*E. Horton; Lower Wick, Worcester, October* 10, 1864.

PS. On unfolding the carpet this morning I missed my Depressaria, and saw a wing of the same species in one of the webs.—*E. H.; October* 11.

New Locality for Gastropacha ilicifolia, with Description of Larva.—The following is a description of a larva taken on the 3rd of August near Lynton, North Devon, in a wood abounding with bilberry:—A Bombyx larva, apparently full fed, length one inch and three-quarters. Head and body hairy, cream-coloured, dusted with black. Hairs on back dark, short; on sides in long white fascicles (a few darker interspersed) curving downwards. Head pale drab, the black atoms on it in longitudinal bands. On the second segment a reddish blotch, bordered with black atoms; a series of markings, something like the ace of clubs, down the centre of the back, embracing the dorsal line, formed of thicker black atoms, blackest on the fourth segment, into which run lateral stripes of black atoms, from each black spiracle directed backwards. An indistinct spiracular line of black atoms. Legs reddish, with black spots; claspers the colour of the body, with a black stripe on the upper surface, orange underneath. Along the ventral line a chain of black spots, very large and conspicuous, from commencement of the claspers to the anal segment, gradually smaller towards the head. The larva was sickly when taken, and is still in a bad way, probably ichneumoned. The above description agrees in the main with that of G. ilicifolia given in Stainton's 'Manual.' Its resemblance to a Gastropacha larva makes me think it must belong to that species. —*E. Horton.* PS.—I have just received a note from Mr. Buckler, in which, referring to the above, he says, "The larva skin, which I return to you, is undoubtedly that of G. ilicifolia."—*Rev. E. Horton, in 'Entomologist's Monthly Magazine' for October,* 1864.

Life-History of Liparis auriflua.—In a recent number of the 'Zoologist' (Zool. 8969), Mr. Clifford, of Chelsea, expressed his surprise at finding the larva of Liparis auriflua in October, and also at its "hybernating occasionally," and Mr. Newman asks "Is this fact new?" In the succeeding number, the Rev. H. Harpur Crewe expresses his astonishment at Mr. Clifford's surprise, and states that this larva always hybernates. Undoubtedly Mr. Crewe is correct, and I may add that there is not a month in the twelve in which it may not be found. The full-grown larvæ generally remain in some quantity until the middle of July, and the earlier portion of the succeeding brood hatch about the close of the month, and in August become abundant. Had Mr. Crewe added to his remarks a short life-history of this insect, which appears to be less known than that of many of our more rare Lepidoptera, it would have been acceptable to some of the readers of the 'Zoologist.' The eggs are laid during July on the under side of the leaf of many of our common trees and shrubs, especially the hawthorn, in batches of twenty to thirty, and are covered with down or fur by the parent moth: they hatch in about ten days, and the young larvæ feed in company until October, moulting twice, and then prepare their winter quarters; at this time

they are about half an inch long. A suitable retreat is chosen about the thicker stems of the food-plant, under loose or projecting pieces of bark, or in the concave surface of a curled leaf. An outer cocoon-like web is first spun; this finished, each larva forms for itself within the web a distinct little egg-shaped cocoon, flexible, of close texture, and very tough; the number of cocoons in each web varies. I have several lying before me: one contains five, another three, another two, and others have only one each. Within these little cocoons the larvæ lie coiled during the winter, leaving them in spring to feed on the newly-expanded foliage under which they shelter until the young shoots of the plant have progressed; they then seek the more juicy food which these supply, and being now nearly full grown and of bright colour, become conspicuous objects on the hawthorn hedges. From the end of June to the middle of July they retire for the purpose of pupation, spinning up among the surrounding foliage or other suitable places that may offer, and in a fortnight or three weeks the perfect insect appears.—*George Gascoyne; Newark, October*, 1864.

Description of the Larva of Thera coniferata.—At the beginning of the present year a few eggs were sent to me by a friend. Six hatched; of these only one, I am sorry to say, came to maturity. When full grown it was short and stumpy, extremely like the larvæ of some of the Eupitheciæ. Head pale brown. Ground colour grass-green. Dorsal line broad, pure bluish white; this is bordered on each side by a slender stripe of the same colour. Spiracular line the same. These stripes are all very clear and well defined. Segmental divisions yellow. Prolegs pink. There are no dots or marks. It is one of the most sluggish creatures I ever saw, lying for hours, even days, in the same place, just stretching itself to get at the food within reach. It remained a long time in the larval state, as it was hatched the third week in March, and did not spin up till June 6th. It effected this change between moss and the sprig of juniper on which it was feeding, so unwilling was it even then to move. The pupa is dark grass-green, abdominal segments lighter. The perfect insect appears in three weeks. —*Rev. J. Greene, in 'Entomologist's Monthly Magazine,'* p. 71.

Immense Swarms of Syrphus Pyrastri.—Any lover of Entomology could not fail to read with interest the various communications from your correspondents in the 'Zoologist' and 'Entomologist,' of the occurrence of multitudes of Syrphus Pyrastri, which has lately made its appearance in such incredible numbers, and over such an extent of coast; and your scientific comments on the history of the insect and the probable cause of its occurring in these countless myriads in the past season. Having witnessed a similar occurrence on the Sussex coast, which, being so widely separated from the localities in which the appearance of the insect in such profusion has been recorded, I thought it might be worth sending to you what I have myself observed. While staying at Eastbourne, in the month of August, I noticed large quantities of this fly settling on the various flowers; but on bathing on the 18th of August, while taking a swim out, about fifty yards from shore, I passed through a line of these insects, of *various sizes*, dead, and floating with the tide in an easterly direction. This line was about a foot in width, and, from the conformation of the coast at this part, I have no doubt it extended for many miles. A few days later, being on the shore near Seaford I saw a great number of the same insect, which settled on any flowers that might be at hand, on the beach, and many on my own clothes whilst sitting down to rest.—*James Dutton; Hammersmith, September*, 1864.

Proceedings of Societies.

Entomological Society.

October 3, 1864.—F. P. Pascoe, Esq., President, in the Chair.

Additions to the Library.

The following donations were announced, and thanks voted to the donors:—'Exotic Butterflies,' by W. C. Hewitson, Part 52; presented by W. Wilson Saunders, Esq. 'Journal of the Proceedings of the Linnean Society,' Vol. viii. Part 1; by the Society. 'Boston Journal of Natural History,' Vol. vii. No. iv.; 'Proceedings of the Boston Natural History Society,' Vol. ix. Sheets 12—20; by the Society. 'Notes on the Family Zygænidæ,' by A. S. Packard, jun.; by the Author. 'The Zoologist' and 'The Entomologist' for October; by the Editor. 'The Entomologist's Monthly Magazine,' No. 5; by the Editors. 'The Journal of the Society of Arts' for October; by the Society. 'The Reader' for October; by the Editor. 'Popular Natural History of Great Yarmouth,' by B. T. Lowne; by the Author.

The following addition by purchase was also announced:—'Genera des Coléoptères d'Europe,' Livr. 121—123.

Exhibitions, &c.

The Secretary announced the arrival of, and exhibited, a miscellaneous collection of insects from India, collected and presented to the Society by Lieut. R. C. Beavan, Bengal Revenue Survey. Probably the most interesting specimen was a small Mantis, which Prof. Westwood believed to be hitherto unique in his own collection.

Mr. Janson exhibited an extensive series of insects of all orders collected by Mr. Thomas Pullinger, R.N., chiefly in the vicinity of Rio Janeiro.

Major Parry sent for exhibition a box of beetles collected at Gibraltar by his son, Lieut. Parry, R.A.

Mr. S. Stevens exhibited a large Curculio, from the body of which a number of filamentous Fungi had grown. Prof. Westwood remarked upon the frequent occurrence of fungus-covered Curculionidæ, and suggested that it arose from those beetles dying amongst decayed wood and in damp situations conducive to fungoid growth. Prof. W. also alluded to the different kinds of "mould" found upon beetles, some of which were soft, like cotton-wool, whilst others were hard and required to be actually scrubbed off the specimen: he thought there were not less than six or eight kinds of mould to be found on insects.

Mr. Bond, after referring to the exhibition at the previous Meeting of larvæ of an Agrotis, which had proved very destructive to turnips, and giving corroborative testimony to the extent of the damage done by the insects, mentioned that, on opening a partridge which he recently shot, he found the crop full of the larvæ which infested the turnips.

Mr. David Sharp sent for exhibition three species of Coleoptera new to the British List, and one of them apparently undescribed: all three were recently captured by him in Scotland. The following description and notes were also communicated:—

" 1. Autalia punctipollis (*nov. spec.*).

Nigra, nitida, subtilius pubescens, antennarum articulo primo pedibusque piceis, prothorace abdomineque evidentius punctatis, illo medio obsolete canaliculato. Long. 1 lin.

With the facies of A. rivularis, but the size of A. impressa; from the former of these it differs by having its prothorax more evidently punctured, with the central channel only perceptible anteriorly; the lateral foveæ are not so deeply impressed, and those at the base of the elytra shorter. Apex of the abdomen concolorous. From A. impressa it is readily distinguished by its colour and punctured abdomen.

Four specimens from Rannoch, Perthshire; and one in Mr. Janson's collection, taken some years since in Shetland by the late Mr. Squire.

2. Tachinus proximus, *Kraatz*, *Stett. Ent. Zeit.* xvi. 25; *Ins. Deutschl.* 401.

Besides the characters pointed out by Kraatz as distinguishing this species from T. humeralis, there appears to be a constant difference in the length of the elytra, these being always relatively shorter in T. proximus.

Found by me in sheep's dung at Rannoch, and about half a dozen specimens under the same circumstances on Ben Lomond.

3. Lesteva monticola, *Kiesenw. Stett. Ent. Zeit.* viii. 77. *Redtenb. Faun. Austr.* ed. ii. 245. *Kraatz*, *Ins. Deutschl.* 933.

I have seen three British specimens of a Lesteva, which I believe should be referred to this species. Two taken by myself, one of them at Rannoch, the other in the Isle of Arran. The third is in Mr. Janson's collection, and was captured, I think, on the Cheviots."

The President exhibited a new Atractocerus and a new Cyphagogus, and read the following notes respecting them:—

" The genus Atractocerus is one of the most remarkable amongst the Coleoptera, and bears a greater resemblance to a Neuropteron than to anything in its own order; and yet we find this genus, one of the most specialized of its class, distributed over Africa, Madagascar, Java, the Malayan Islands, Australia and Brazil,—in fact, over almost all parts of the world, excepting Europe. In the Malayan Islands, Mr. Wallace discovered not less than twelve new species of this genus; Singapore and New Guinea (Dorey), the two extremes, produced each one; Borneo (Sarawak) five; the rest were scattered among the other islands. The only published species, A. morio, *Pasc.*, is the only one that appears to be common to three or four localities. If we adopt the derivative hypothesis of the origin of species, it will follow that a connexion must once have existed between the above-mentioned parts of the world, and this would pretty nearly lead to the conclusion that all lands were once connected. The Atractoceri would seem to possess a very low power of flight, and to be nocturnal. The Molucca species, A. morio, has certainly no appearance of being an intermediate form, as might have been expected. The Australian species now exhibited is new to Science; I am indebted for my specimen to Mrs. Kreusler, of Gawler, South Australia, a lady who, as I have previously testified, has been extremely fortunate in adding to our knowledge of the insect fauna of that colony, and to whom I have the pleasure of dedicating the species.

ATRACTOCERUS KREUSLERÆ.

A. brunneo-ferrugineus; capite brevi; oculis rotundatis, prominulis, antice fere contiguis; prothorace quadrato, subnitido, capite latiori; elytris oblongis, intus sinuatis; alis obscure griseis; abdomine castaneo, nitido; pedibus attenuatis, griseo-brunneis; pectore rufo-castaneo. Long. 12 lin. Hab. Gawler (Austral. merid.).

To Mr. Odewahn, also of Gawler, I owe, among many rare and interesting insects, a curious little Brentid belonging to the genus Cyphagogus of Major Parry, almost identical with a species from Natal described by me two or three years ago under the name of C. advena (Journ. of Entom. ii. 48). The type species is Indian, and has also been found by Mr. Wallace in Aru, but belongs to another category of the genus. I have dedicated the Australian species to Mr. Odewahn, and it may be thus characterized, merely premising that C. advena has a much larger head with a bilobed or emarginate muzzle, and this is almost all that distinguishes it:—

CYPHAGOGUS ODEWAHNII.

C. rufo-testaceus, nitidus; capite prothorace multo angustiore, rostro integro; elytris prothorace angustioribus, striato-punctatis; pedibus ut in *C. advena*. Hab. Gawler (Austral. merid.)."

Mr. A. R. Wallace remarked that he thought the Atractoceri were wood-borers; he had always captured them at night, at a lamp or light, and had found them to be rather quick flyers.

Paper read.

Mr. Baly read a paper intituled "Further Descriptions of New Genera and Species of Phytophaga." Two new genera, Charistena and Metaxycera are established, both belonging to the Hispidæ and nearly allied to Odontota. Of Charistena, C. ruficollis, *Fabr.*, is the type, and seven new species are described under the names of C. Lecontii (from North America), C. basalis (from the Amazons), C. Deyrollei (Upper Amazons, Columbia), C. bellula (Bogotà), C. elegantula (New Granada), C. Pilatei (Teapa), C. trilineata (Yucatan). Of the genus Metaxycera, M. purpurata, *Guér.*, is the type, and three new species from the Amazons are described under the names of M. rubroguttata, M. Amazona and M. sex-pustulata.

New Part of 'Transactions.'

A new part of the 'Transactions' (Third Series, Vol. iii. Part 1), containing the first portion of Mr. Pascoe's Longicornia Malayana, was on the table.—*J. W. D.*

Dasycampa rubiginea at Oatlands Park.—Mr. S. Stevens gives an interesting account, in the number of the 'Entomologist' for November, of the occurrence of this rarity in a new locality: it was captured at sugar the first week in October. Sugar has been marvellously productive during the last week or ten days.—*Edward Newman.*

Notes on the Aquarian Zoology of Aberystwith.

By W. R. Hughes, Esq., F.L.S.

I have selected the above title to this little paper rather than the more pretentious one of "Marine Zoology," because my explorations have hitherto been chiefly confined to the resorts of animals suitable for the aquarium. At the same time I do not neglect to record the capture of any marine animal interesting in other points of Natural History. The impetus which the writings of Mr. Gosse and other modern authors, discoursing pleasantly of Nature and Science, has given to excursionists interested in Marine Natural History, who take their annual fortnight's holiday at the sea side, to ransack every available part of the coast for specimens, has well-nigh exhausted every British locality. Doubtless there are many sheltered spots yet unexplored which would yield a rich harvest to a patient investigator, but these need to be discovered, and probably most of them are away from the conventional routes of tourist's monthly tickets. For lack of a better place, and from the circumstance of its well-known salubrious aspect, I selected Aberystwith, on the mid-Welsh coast, as a desirable spot to spend my last summer holiday, and as a likely locality to renew my aquaria with specimens in place of those given to friends or succumbed under the influence of confinement.

Beautifully situated in a bay of its own, at the bottom of the valley of the Rheidol, flanked with hills protecting it from the northern and eastern winds, and opening to a western sea unequalled for its boldness, Aberystwith (now that railway communication is secured to it direct) bids fair to become one of the most popular of British watering-places. I wish that I could say as much for the marine zoology of that place as I have on other occasions in your valuable serial in favour of Tenby, Torquay, &c.; but perhaps my experience has not been of sufficient extent to warrant me in pronouncing a definite opinion on it. The beach is of shingle of every imaginable size, regularly disposed from a pin's head to a man's head, and the descent to the sea abrupt. The depth near shore varies considerably, from five to eleven fathoms. There are bold rocks jutting out into the sea, at either extremity of the bay, to the extent of some hundred yards, on which are to be found numerous tide-pools not very well stocked with animal life.

However, three weeks of the latter end of July and beginning of August were passed most enjoyedly there in every other respect. The work of the naturalist at the sea side may be divided into four branches,

viz., shore-collecting, dredging, surface-dipping and home study, *i. e.* examination and identification of specimens, work with the microscope, &c. The first of these can only be well pursued at the spring tides. It is, perhaps, the easiest to follow, although sometimes the least productive, but it has the advantage of being economical (needing no guide, boat, &c.), and it admits of ladies joining in it who are "bad sailors." The shore-collecting of Aberystwith is not up to the average. Its species of Actinoida seem limited to four, *viz.*, Anthea Cereus, Bunodes crassicornis, Sagartia Troglodytes (very scarce) and Actinia Mesembryanthemum (as plentiful as blackberries). Of the last-mentioned species I secured a specimen with two disks,—a novel occurrence. Mollusca were rare, except Patella vulgaris, which vied with A. Mesembryanthemum for the possession of every conceivable bit of rock not previously occupied by Algæ; the said Algæ being well stocked with Littorinæ, which afforded a fine harvest to the adventurous youth of Aberystwith of that native genus which usually haunts the pier and quay of watering-places. I took a solitary specimen of the sand-boring Venus. Crustacea seemed limited to the genera Cancer, Carcinus, Portunus, Portumnus, Palæmon, Crangon, Pandalus, Talitrus, &c. Of Echinodermata I saw not a single specimen. The Annelida appeared rather plentiful under stones opposite the end of Pier Street, but I noticed none beyond common littoral species. Huge Chitons—the largest I have ever seen—were also found under these stones. Sponges were rare, and the specimens taken unworthy of note. It is not an easy matter to account for this paucity of animals, for I heard nothing of the ground having been rummaged by either amateur or trade collector. Indeed, on my first excursion to the rock-pools I had amusing evidence of the soil being virgin, for a young shrimp crept out of one of them, and took stock of me with the most provoking coolness, not at all offering to dart away, and actually nibbling at my finger for nearly a minute. The best reason I can suggest for this paucity is that the Rivers Ystwith and Rheidol empty themselves into the sea at one end of the town, and doubtless deteriorate the natural standard of the water. It may be, too, that the slate and shale rocks offer no secure resting-places for the soft bodies of most radiate animals.

The second branch of work at the sea-side—dredging—is more abstruse; it needs a good boat of tolerable size, too, one or more dredges suitable for different bottoms, some stout ropes, and, above all, an experienced boatman who knows something of the locality. Dredging is best pursued at the neap tides, with a breeze just sufficient

to drag the dredge,—not too much, as it may get unmanageable if there are "white horses" about, and not too little, because if there is not a moderate breeze, one may get becalmed, as I have done, for a whole day, and come home without a single specimen. The town of Aberystwith offers no facilities for dredging, but after much delay and difficulty I succeeded in making the acquaintance of a trawler, the only man in the place possessing suitable—or, in fact, any—dredges, and arranged for a sail with him, but the wind suddenly changing from N.W. to S.W. caused a heavy sea, and rendered it impossible to pass the harbour bar. Added to this my holiday having run to the end of its tether, precluded the possibility (for the present, at least) of attempting to dredge the Bay. I have often thought that it would be a capital plan for the marine naturalist having time at his command, and courage enough for the purpose, to take "pot luck" on board a trawler for three or four days, and overhaul the refuse. The suggestion is not new, but I have never heard of its being attempted. I feel confident it would amply repay one for the trifling abnegation of the comforts of home.

The third occupation—surface-dipping, for Medusæ and embryonic forms of marine life—should be followed in the after part of the day when the weather is warm and the sea as calm as a mill-pool. It is undoubtedly one of the most interesting and least difficult modes of pursuing the study of Marine Zoology. It was with the dipping-net that I obtained the greatest prizes. In addition to dozens of specimens of the crystal Cydippe and Beroe, with those of rarer genera, I was so fortunate as to take three or four of the Willsia stellata, of which rare and elegant Medusa the late Professor Forbes says ("Naked-eyed Medusæ," p. 20):—"It is so transparent that usually only the reproductive star and the marginal circle of brilliant ocelli—like a mimic sun with its surrounding planets—can be perceived by the naked eye. When placed in a watch-glass, however, the singular arrangement of its vessels and the other details of its structure may easily be made out without the use of a high magnifying power." The Professor, it seems, did not find Willsia stellata at Zetland, nor further west than the Lizard on the South Coast of England, so that this capture is novel. Geryonia appendiculata (brilliantly luminous in the dark), and several specimens of the genera Turris and Thaumantias were also taken. Polyxenia Alderi was also secured.

This last gave rise to an amusing joke on the part of the boatman who was with me when I took it. Looking, as I dare say he did, with considerable disgust at my sport, and wondering why I did not

follow his example in the more utilitarian object of mackerel-fishing, he asked, with some degreee of superciliousness, "And what might be the name of that jelly-fish, sir, that you've just took?" "It would not interest you very much, my friend," said I, "but, as you seem to take an interest in the specimen, I will tell you: it is Polyxenia Alderi." "Well, to be sure," replied he," "it do look summat like a X." He alluded to the cruciform appearance of the peduncle seen from below!

I will terminate this uninteresting paper with the hope that another year may carry me to a locality more rich in specimens than Aberystwith, although it cannot surpass it in other natural beauties. To it I will add what may be interesting to others pursuing the same studies as myself,—a description of an outfit necessary for sea-side explorations. It is somewhat different to that given in Mr. Lewis' 'Sea-side Studies.' Clothes and boots that are strong and will bear wetting. A Geologist's hammer, and several steel chisels of various dimensions. An oyster-knife, for removing specimens. A few feet of gutta percha tubing to act as a syphon for emptying tide-pools. A hand-net of coarse canvas, with a stout iron or brass ring, and long wooden staff, for surface-dipping. A nest of three or four glass pans, such as are used for Ferns, holding from half a gallon upwards, for the preservation of specimens while at the sea—temporary aquariums, in fact, when a handful or two of native shingle is placed at the bottom. A few wide-mouthed bottles for microscopic animalculæ, or for choice or rare specimens. A large, square, flat-bottomed zinc tank holding some gallons, with a perforated lid and the top edges prolonged a few inches to keep the water from splashing over; this for the conveyance of fishes, crustaceans, &c., requiring to be transmitted in water. Animals such as Actiniæ, Serpulæ, Echinoderms, Mollusca, &c., may be packed in a coarse canvas bag with sea-weed, and suspended in the tank. These and similar specimens will sustain injury if they are allowed to roll about loosely at the bottom of your tank.

Lastly, I have found a vasculum, which I have recently devised, a most valuable adjunct to those enumerated, either for shore or boat-collecting, or for transmitting very rare specimens, such as the Lepidogaster, rare Eolids, &c. It is of wrought iron, enamelled within and without, to prevent oxidization, and it holds nearly a gallon. It is of oblong shape, modelled in the base after a pie-dish, which has the advantage of possessing no crannies for animals to lurk in. Another advantage is that its convex bottom will allow of its being placed on any part of a rocky shore without fear of its being knocked over. The

sides of the vessel are carried up to a height of seven inches from the base, which is protected by four knobs. Within two inches of the top are four small projections, on which rests an inner lid perforated. It is surmounted by a second lid, which drops over the sides, between which and the first-named lid specimens can be packed in sea-weed, the bottom being filled with water up to within an inch of the inner lid. It is carried by means of a brass wire handle passing over the ends longitudinally. It is not expensive in cost, and with care (as the enamel is apt to chip off) will last a long while. I shall be very happy to give the name of the maker to any naturalist who may wish for such a handy little article as I have found it to be in my wanderings.

W. R. Hughes.

The General Hospital, Birmingham,
October 13, 1864.

Notices of New Books.

'*The Birds of India; being a Natural History of all the Birds known to inhabit Continental India.*' By T. C. Jerdon. In two Volumes. Vol. II.; Part 1. Royal 8vo.; 439 pp.

(Second notice of the work).

In the 'Zoologist' for 1863 (Zool. 8617) will be found a notice of the first volume of Jerdon's 'Birds of India,' and if my reader will excuse the egotism implied in my referring him to my own labours, I will beg of him to skim over, however lightly, what I have written of this valuable work, certainly one of the most important contributions to Natural History India has yet produced; and having so skimmed that first notice, to consider it as a prelude to a second and third: unless so regarded both that notice and the present one must be considered incomplete, inasmuch as the work of which it treats is incomplete also. The 'Birds of India' is now before us in its entirety, and it becomes necessary to continue, and I trust very shortly to complete, my notice also. The work itself bears witness to the profound research and unwearied industry of its author, and will be *the* authority on the Ornithology of India for years. I am little skilled in that set form of panegyric which constitutes the literary stock in trade of reviewers in general when writing on Natural History. Handsome volumes are placed in their hands, and handsome things must therefore

be said: this is considered the *quid pro quo*, and author and reviewer are alike satisfied. It is impossible to read such critiques without perceiving that the writer is too slow to understand, and too indolent to study, the work on which he is expected to give an opinion; he has no choice but to consult his common-place book for a selection of platitudes carefully worded to conceal his ignorance, and he copies from a store-house of common-places a favourable or adverse platitude as the case may require. My own task is widely different: I always read the book, and always endeavour to show by the passages selected for citation the real status and capabilities of the writer; at the same time I never intentionally allow pointed merits or pointed defects to pass unnoticed. And now to my task.

As regards systematic arrangement, the plan originally laid down is consistently carried out: whatever its advantages or disadvantages the author adheres to them in a conscientious manner that evinces no infirmity of purpose, and he thus preserves a unity of uniformity throughout that greatly assists the reader. This second volume also, like the first, contains numerous little errors of phraseology, orthography and punctuation, which the author will no doubt amend whenever a second edition shall be required. It will be idle to turn over 439 pages in search of these unimportant slips of the pen; the first page will illustrate my meaning, without turning it over at all. The Timalidæ are characterized as "some with short and thick *bills*, others with long and curved *beaks*; * * * we have here represented, as far as the *beak* is concerned, thrushes, shrikes, &c., * * * but their more characteristic features are strong legs and feet and a compressed *bill*;" we are next told that "their food is *both* insects, fruits and grain," and that "the sexes differ *rarely if at all*." By the slightest attention to correcting the press all this might be avoided, greatly to the comfort of the student.

The multiplication of genera, destined doubtless to continue until every species shall constitute a genus, though certainly the greatest stumbling-block ever laid in the pathway of Science, is not to be laid at our author's door: he merely adopts the names invented by his predecessors. On this subject it is quite useless to recommend or advise: as well might one attempt to persuade cook or housemaid to renounce her hoops, as the ornithologist to abandon his multitudinous genera. Both are the diseases of youth or vanity, and will rage among the weak-minded until they become intolerable.

In assigning an English name to every Indian bird Mr. Jerdon has certainly undertaken an Herculean labour, but I scarcely see the *cui*

bono. In giving two Latin names to each species, as Passer indicus, Passer montanus, &c., a rule is adopted which obtains the sanction of naturalists throughout the world,—like freemasonry this is a system of signs acknowledged throughout the world; but to whom, to what nation, to what district will such names as these be acceptable, "Black headed wren warbler," "White spotted laughing thrush," "Black crested yellow bulbul," "Rufous necked scimitar babbler," "Wynaud laughing thrush," Black gorgetted laughing thrush?" Are these names designed for Indian use? Only think of astonishing a native by telling him to bring you a "Rusty throated blue woodchat!" Are they for English ornithologists? if so, I opine they will meet with but slender favour, for not only do we dislike such cumbrous appellations, but we shall have to unlearn our former vocabulary, for this woodchat is no woodchat at all, but rather a redstart, for it belongs to the family Ruticillinæ. I wish to say nothing against the theory of establishing vernacular names for everything; what should we do without them? It is in practice that it must break down; the most sanguine advocate of the scheme cannot hope to see it carried out. I may be asked, Have we not established such names as "robin," "wren," "swallow," "sparrow," "crow," "magpie" and "starling?" I answer, "Certainly not! we naturalists have wisely availed ourselves of vernacular names long antecedent to the science of Natural History;" but Mr. Jerdon does just the reverse of this: thus he tells us the Erpornis xantholeuca has the vernacular name of "Dangpupho," but he rechristens it "the white bellied flower pecker." Even in those instances in which poets and novelists have conferred a kind of authority on a name, our author dissipates the illusion, and dissevers the connexion existing between name and object; thus we used to believe that a bulbul was a nightingale, but Mr. Jerdon makes a dozen genera of bulbuls, among the whole of which I can discover nothing like a nightingale. Mr. Jerdon seems to have entertained the design suggested in this country of giving English names to genera as well as species, but this is not carried out; for instance, the Latin genera Paradoxornis and Heteromorpha are both anglicized "Finch thrush;" Conostoma and Grammatoptila are both anglicized "Jay thrush;" but still more objectionable appears the plan of introducing the same English generic name a second and third time, with other genera intervening; as an example, Dumetia is anglicized "Babbler" at p. 26, then follow a host of "Laughing thrushes," "Barwings," &c., and then Acanthoptila and Malacocercus, and again anglicized "Babbler" at

p. 59: this is very confusing. "Babbler" may be a good distinctive name in either instance, but it cannot be so in all.

It is so agreeable to pen these little criticisms as I drink instruction from each page that I scarcely know how to leave off or when to wind up my commentary with a well-turned phrase or neat paragraph; I will not attempt it: I will not "study the order of going, but go," and leave my author alone with my reader, whom I am sure will be delighted with the extracts I have selected.

"*The White-headed Babbler* (Malacocercus griseus).—It is extremely common and abundant in the Carnatic, and is to be found in every hedge, avenue and garden. Like the others of its genus it always associates in families of six, seven, eight or more; even in the breeding season the parent birds feeding in company with their former companions. One may be seen suddenly dropping to the ground from some tree, and is followed in succession, though perhaps not immediately, by each of the flock. They hop about, turning over fallen leaves, and examining all the herbage around the base of trees, a very favourite spot, or on a hedge side, never venturing to any distance from cover, being aware of their tardy powers of flight. They are occasionally seen seeking insects or grain from heaps of dung, whence they have received their common denomination, as well from the French (fouille merde) as from the English (dirt bird), who are on this account prejudiced against them. They generally feed at some little distance apart from each other, but now and then, if a richer prize than usual is spied out, two or more will meet and struggle for it; and now and then one of them will make a clumsy flight after a grasshopper, seeking safety by its wings, and not unfrequently eluding its awkward pursuer. On being driven from the ground, or leaving it from choice, their hunger being satisfied, they fly up to the nearest tree, hopping and climbing up the larger branches, and if you happen to be watching them they do not stop till they have reached the top or the opposite side, whence they fly off in single and extended file as before. They often appear to pick insects off the branches of trees. They are familiar if undisturbed, feeding often close to houses, but if watched or followed they become circumspect, disperse and hide themselves. Their cry is a loud sibilous or whispering sort of chatter, which they repeat all at once, sometimes when feeding, or when any unusual sight attracts their attention, and often without any apparent object at all. They have no song. Their flight is slow and laborious, performed by a few rapid strokes of the wings, alternating with a sailing with outspread pinions. I have often found the nest of this bird, which is composed

of small twigs and roots, carelessly and loosely put together, in general at no great height from the ground; it lays three or four blue eggs. I have found them breeding at all times from January to July, and even later, but do not know if they ever have two broods in the year. The black and white crested cuckoo (*Coccystes melanoleucos*) appears to select this bird to act as foster parent to her own progeny, and she lays a greenish blue egg. They are readily caught by a spring trap baited with grain, with one of their kind put in the centre as a lure. The shikra or chipka (*Micronisus badius*) is sometimes flown at them, and causes a general consternation. After the first burst of alarm and gabbling, they cease their chattering, separate, and disperse, and do not, like the bolder Mahratta babbler (*M. Malcolmi*), come to the rescue of their unfortunate companion."—P. 60.

"*The Striated Bush-Babbler* (Chatarrhœa caudata).—This babbler is the most extensively spread of all the Indian members of this group, being found throughout the whole country from Assam to Sindh, and from the N. W. Provinces and Afghanistan to Cape Comorin. The only district in which I have not seen it is Malabar. In the south of India it is usually found away from houses and villages, in the open plains that are clad with a few low and scattered bushes, and indeed it is to be met with in low jungle throughout India; but towards the North, in Central India, and in some of the Gangetic provinces, it frequents cultivated grounds, entering gardens and compounds, and sheltering itself in hedgerows. In the South it is a shy bird, flying before you from bush to bush with a sibilant sort of whistle, or, as Mr. Philipps says, 'a low, undertoned, warbling whistle,' which it often repeats. It runs or rather hops along the ground at a great rate, and with its long tail held straight out and drooping on the ground, it looks more like a rat than a bird. This likeness is so striking that it has occurred to more than one observer. It flies low, from bush to bush, with a few rapid beats of the wing, alternating with a sailing motion and outstretched wings; and though, from the nature of the ground it frequents, it is obliged to take longer flights than the Malacocerci, yet its powers of wing are very feeble, and a person on horseback can easily overtake the flock. In such case they take refuge in the nearest bush, and are with great difficulty dislodged. I have frequently seen the nest and eggs, the former almost always in a thorny bush at no height, made of roots and grasses loosely put together, and with three or four verditer-blue eggs. Mr. Philipps says that 'they bear confinement well, feeding on grain, and that all day long they are

jumping from side to side of the aviary, responding to each other.'" —P. 67.

This is exactly what is wanted in British Ornithology: the dryer or museum department of the subject is performed to admiration; but that the bird once lived and breathed is almost entirely forgotten. But to proceed:—

"*The Common Madras Bulbul* (Pycnonotus hæmorhous).—It frequents gardens and cultivated ground, and low bushy jungle, but is never found in forests, and it ascends the Neilgherries to about 6000 feet only. It is usually seen in pairs or in small families, flying briskly about, restless and inquisitive, feeding chiefly on fruits, but occasionally descending to the ground, and even hopping a step or two and picking up insects. It destroys various buds and blossoms also, and is very destructive to peas, strawberries, Brazil cherries (*Physalis peruviana*), and other soft fruit. Its note, which it is frequently uttering, is an unmusical rather harsh chirrup. It has at times, however, a sweeter note, and it is said to be able to imitate the notes of other birds when caged. Its flight is direct, performed by a continued quick flapping of the wings. It breeds from June to September, according to the locality. The nest is rather neat, cup-shaped, made of roots and grass, lined with hair, fibres and spiders' webs, placed at no great height in a shrub or hedge. The eggs are pale pinkish, with spots of darker lake-red, most crowded at the thick end. Burgess describes them as rich madder-colour, spotted and blotched with gray and madder-brown; Layard as pale cream, with darker markings. The bulbul is very commonly caged in various parts of the country, and in the Carnatic it is kept for fighting, being held on the finger with a cord attached. They fight sometimes with great spirit, often, I am assured, seizing their antagonist by the red feathers and endeavouring to pull them out. When excited they often spread out these feathers laterally, so as to be seen even from above."—P. 95.

Truth is ever subversive of fiction, and this is no exception. Alas! that the bulbul, the very emblem of love, gentleness and melody, the affianced bride of the rose in the entire literature of the East, should be kept for fighting, and tethered by a packthread.

"*The Black-headed Green Bulbul* (Iora Zeylonica). It may be seen in almost every garden in the South of India. Its habits are more active and restless than those of any other member of this family, being much like those of the tits. It may be seen diligently and carefully searching the smaller branches and twigs of trees, climbing actively among them, poring under the leaves, and occasionally clinging like a

titmouse from a slender twig, all the while keeping up a loud warbling strain, or a low querulous sort of note, very different from each other. It is not confined to cultivated ground, but is also a denizen of the open spaces of jungles. Its flight is performed by a succession of quick vibrations of the wing, and causes a loud whirring sound. Its food consists of various insects and larvæ, spiders, &c. The male at the breeding season now and then takes a short flight from one tree to another, slowly and in a fluttering manner, with his black tail spread, and the white feathers of the flanks puffed outwards and upwards, so as to give the appearance of a pure white rump. I have seen the nest and eggs on several occasions. The nest is deep, cup-shaped, very neatly made with grass, various fibres, hairs and spiders' web; and the eggs, two or three in number, are reddish white, with numerous darker red spots, chiefly at the thicker end. It breeds in the South of India in August and September; perhaps, however, twice a year. Burgess, speaking of its notes, says, 'truly it has a wonderful power of voice; at one moment uttering a low plaintive cry, at the next a shrill whistle.' Layard, too, who observed it in Ceylon, states that 'the note is a clear bell-like whistle, which may be imitated on an octave flute.' One of its notes, the low, plaintive one, is not unlike the word 'chee-too,' the last syllable much lengthened out, which Horsfield gives as the note of its Malayan congener. It is said by the natives of the South of India to repeat the word 'shoubhiga, shoubhiga' before rain."—P. 102.

"*The Indian Oriole* (Oriolus kundoo).—I have seen the nest several times; it is cup-shaped, slightly made with fine grass and roots, and suspended from a rather high branch by a few long fibres of grass; these do not surround the nest, but only support it on two sides. It contains three eggs, white-spotted chiefly at the large end, with a very few large dark purple blotches. I procured a nest at Saugor from a high branch of a banian tree in cantonment. It was situated between the forks of a branch, made of fine roots and grass, with some hair and a feather or two internally, and suspended by a long roll of cloth, about $\frac{3}{4}$ inch wide, which it must have pilfered from the neighbouring verandah, where the tailor worked. This strip was wound round each fork, then passed round the nest beneath, fixed to the other fork and again brought round the nest to the opposite side; there were four or five of these supports on each side. It was indeed a most curious nest, and so securely fixed that it could not have been removed till the supporting bands had been cut or rotted away. The eggs were, as before

described, white, with a few dark claret-coloured spots. Burgess describes a nest made of grass, spiders' web, hemp and pieces of paper, placed in the fork of a tree, and two of the branches were bound together with the hemp. Theobald also found the nest, a neat cup of woven grass, attached by its side to the bough of a tree, and he describes the eggs as white, with black spots."—P. 108.

"*The Magpie-robin* (Copsychus saularis).—The magpie-robin is found throughout all India, from the Himalayas to Cape Comorin and Ceylon, and eastward to Arrakan and Tenasserim. Hutton says that at Mussooree it occurs up to 5000 feet. It is rare near Darjeeling, and I never saw it above 3000 feet. It affects chiefly wooded districts, but does not inhabit the deep jungles. Towards the South of India it is less familiar than it is in the North, for in Central India, Bengal, &c., it is often seen feeding close to houses. It is generally seen alone or in pairs, usually seeks its prey on the ground from a low perch, often hopping a few steps to pick up an insect. When it returns to its perch it generally elevates its tail, and often utters a pleasing warble. Though it frequently raises and depresses its tail, both when perched and on the ground, I cannot say that I have observed the wagtail-like flirtation of its tail noted by Hodgson, or that it throws its tail back till it nearly touches its head, as Layard has seen. Towards the evening it may often be seen near the top of some tolerably large tree or other elevated perch, pouring forth its song. I have always found its food to consist of insects of various kinds, small grasshoppers, beetles, worms, &c. Hodgson asserts that in winter they like unripe vetches and such like; but this is quite opposed to the usual habits of this group. It breeds generally in thick bushes or hedges; sometimes in a hole in a bank or tree, and occasionally in a hole in a wall or on the rafter of a house. The nest is made of roots and grass; and the eggs, four in number, are bluish white or pale bluish, with pale brown spots and blotches. Layard says that the eggs are bright blue, and Hutton that they are carneous cream-colour, but these observers must, I think, have been mistaken in the identity of the owner of the nest."—P. 115.

Here I must pause: my further extracts, together with the third and concluding part of this notice, shall appear as soon as space can be afforded.

'*On Poisoning by Diseased Pork; being an Essay on Trichinosis or Flesh-worn Disease, its Prevention and Cure.*' By JULIUS ALTHAUS, M.D., &c. London: John Churchill and Sons, New Burlington Street. 1864. Price Two Shillings.

"AND the swine, though he divide the hoof and be cloven footed, yet he cheweth not the cud; he is unclean to you. Of their flesh shall ye not eat, and their carcase shall ye not touch."—*Leviticus*, xi. 7, 8. Taking this for his text, and repeating it after the most approved fashion of our clergy, Dr. Althaus discourses long and learnedly on the fatal effects of swine's flesh, and on the worm domiciled in the muscles of the pig, which may be considered, like Pandora's box, the prison-house of the evil; its lid is lifted by an operation of Nature's own, and a host of evils liberated to run without control through the human frame. Now, whether we regard this question as anthropological on account of its intimate connexion with man; mammological on account of its dwelling-place, the bodies of Mammalia; or entozoological on account of its originating in an entozoon, matters but little; it is certainly zoological, and comes legitimately within the scope and objects of the 'Zoologist,' and now that Dr. Althaus has rendered it popular, it will certainly force itself on the attention of the readers of that journal whether they approve or not.

Since Acham's "Death in the Pot" no human calamity, with the exception of corpulence, has ever become so universally fashionable as Trichinosis; and Dr. Althaus is now dividing with the illustrious Banting the votaries of popular nosology. Both these distinguished writers have hit the right nail on the head; and, strange as it may appear, there is no kind of rivalry between them; like drum and fife they play in concert, however different the sound.

Trichinosis is a malady of the human frame which has probably raged with unremitting virulence for six thousand years, but of which man has unfortunately lived in profound ignorance; it has been working insidiously, concealed, underground I was about to say, but I only mean under-skin. How great has been our loss I need scarcely say; let us at once seek to repair it: six thousand years have been lost to us for ever. Ignorant of the existence of the disease, we have sought no cure; like the inhabitants of the Happy Valley we have not known of our misery; at last Dr. Althaus, to whose name be every honour, has not only detected the evil, but has provided a cure. A worm, a little insignificant worm, a microscopic worm, inhabits the bodies of

swine, pussy-cats, jackdaws and badgers, frogs and moles, crows, hedgehogs and hawks, and when man consumes the flesh of them he takes the living worms into his stomach, and thus offers his own body to them as a domicile.

The Christian portion of the English community delights in the flesh of swine, and utterly disregards the law of Moses which I have quoted, since in one of our largest and most popular schools swine's flesh is administered to the boys twice in the week, winter and summer, hot or cold. With regard to the other animals, the Englishman is not much addicted to their consumption, at least not wittingly; the flesh of cats is unknown amongst us as a viand, unless under the appetizing form of a sausage, a saveloy or a mutton-pie. The Frenchman, on the contrary, is said to revel in cat; Dr. Althaus tells us that "in Paris cat's flesh is notoriously served up in certain cabarets, and men may become infected with Trichinosis by eating such ragouts." But unhappily for this hypothesis, although perhaps happily for the Parisian, there is no authenticated case of Trichinosis in the capital of Europe. I can hardly however assert that our neighbours escape the deleterious effects of this feline food, since catalepsy is of frequent occurrence among them, and we know, or at least we ought to know, that the very name of this fearful disease is derived from *catus*, Lin., a cat, and *lepteos*, petendus, capiendus, sumendus, that is the hunting, capturing and devouring of cats. As for jackdaws, badgers, moles and crows, hedgehogs and hawks, we have little or no knowledge of them as comestibles. Let us dismiss this part of the inquiry, contenting ourselves with the reflection that when we provide swine's flesh for schools we are compelling the rising generation to give in their adhesion to a diet of worms.

Microscopists have been for years acquainted with the existence of a minute vermiform entozoon inhabiting the human body, and until lately it was regarded as a harmless animal, and rather a microscopic curiosity than a source of danger. Its origin, as well as its life-history, long remained a problem for which neither medical practitioners nor zoologists could offer a satisfactory solution; and the untenable hypothesis of spontaneous generation—that ever-present refuge of the ignorant—was freely resorted to by way of explanation. From experiments made by Virchow, Leuckart and Claus it has, however, been clearly established that if animals, as dogs and cats, be fed with flesh containing Trichinæ, that other Trichinæ are produced in the intestines, and that these produce eggs and living progeny, which latter penetrate the coats of the intestines and "migrate into the body, more

especially into the striated muscles, where, unless the animal in which they are contained should previously die, they are, after a time, encysted, and wait for the moment when they may be eaten by another man or animal to undergo the same changes as before." Thus writes our author, and probably with truth, but in how many instances must they wait in vain; for notwithstanding what I have already said of cats and pigs being consumed by man, surely with man himself the race must terminate, for what animal devours human flesh in these regions where sepulture is universal! Still this branch of the inquiry is scarcely worth pursuing, since other animals, as Musca vomitoria are known occasionally to perish by thousands in the coffin that contained their pabulum.

Flesh containing Trichinæ when once received into the stomach "is dissolved by the gastric juice, and the Trichinæ become freed from their cysts. * * * They begin to move about; they lose their spiral figure, and become stretched, so as to appear somewhat similar to Ascarides. They soon grow rapidly, * * and at the same time generative organs are developed." The males and females are readily distinguishable, and it seems to be ascertained that after the impregnation of the females the males die, for although at first the sexes are nearly equal in number, from ten to fourteen days after the infected meat has been eaten the males have entirely disappeared, females only remaining. "Six weeks after feeding [? after the infected flesh has been eaten] no trace of either males or females is to be discovered in the intestines." Each female contains from three hundred to five hundred ova, which, like those of a bird, are found in a state of successive development, so that many days elapse between the extrusion of the first and last of this large family; the embryo is born in an active and worm-like state, very considerably resembling its parent. "Soon after birth the [juvenile] Trichinæ leave the intestines and migrate into the peritoneal sac;" on their passage "they have to perforate the coats of the bowel, which, on account of their minute size, they probably accomplish without tearing the membranes, but merely driving them as it were asunder," a description which I do not precisely comprehend. "This process," continues the author, "is facilitated by the shape of their head, which may, under certain circumstances, become sharply pointed. From the peritoneal sac they proceed to all the striated muscles, excepting only the heart, in which they are scarcely ever found. They arrive in the muscles in about ten days after their parents have been eaten, and penetrate through the sarcolemma into the interior of the muscular substance, which is by their

invasion considerably altered." My reader will of course detect a discrepancy in date, which I am unable to explain, and which remains for a somewhat more methodical writer than our author hereafter to clear up. "In moving through the fibres the worms cause, according to the researches of Virchow and Colberg, an acute parenchymatous inflammation of the muscular tissue; the fibres lose their stripes and gain a homogeneous appearance, in others the substance is changed into fine granules, small cells are found in rapid proportion." "If men or animals thus trichinosed survive these multiple [?] inflammations, convalescence sets in towards the fourth week from the commencement of the disease." Without dwelling on the meaning of the word "multiple," which does not appear quite appropriate, I may here remark that the contingency of men or animals thus trichinosed surviving the attack does not appear very remote, as we shall immediately see. "Mr. Curling found Trichinæ in the muscles of two robust men who were killed while in the apparent enjoyment of good health; one by fracture of the skull, the other by fracture of nearly all the ribs." This, taken in conjunction with the fact that they also occur in the most delicate pork fed purposely for the table, seems to show that the disease is by no means constant in its lethal effects.

Indeed our author seems himself dissatisfied with the number and authenticity of the recorded cases of Trichinosis, and appeals for support to very apocryphal sources: he lays claim, and as it appears to me, very unwisely, to those human maladies of the origin of which we are in utter darkness; but I will let him speak for himself. "There are, in fact," writes this learned physician, "many cases on record in medical literature, which were at the time believed to be such, of gastric, rheumatic or typhoid fever, or in which even poisoning with criminal intent was suspected, but which we may now safely claim as instances of Trichina disease." If this view of the case be taken there will be a complete revolution in medical jurisprudence. The allopath will treat the victim with picronitrate of potash instead of trying the murderer at the Old Bailey; and the homœopath may perchance relieve kleptomania itself by the exhibition of an infinitesimal portion of measly pork. But Dr. Althaus shall himself give his own illustration of what he considers "may safely be claimed as an instance of Trichina disease." I will neither add nor subtract a word.

"In 1845 a company of eight gentlemen being engaged in the inspection of schools in Saxony, dined together at an inn, and partook, amongst other dishes, of ham and sausages. They all, with the exception of one, who merely drank a glass of claret, fell ill, and four

died. Suspicion fell upon the meal and the host. The wine from which they had drank was analysed, and, although no poison was found, the host continued to be suspected, and at last was obliged to emigrate."

I confess I read this case in the full expectation of finding a sequel that would establish the Doctor's "claim," but not a word of the kind is to be discovered; the ham was not measly, the sausages were not feline; and there is not a single reason assigned why the minute Trichina should be charged with this quadruple murder.

But I come to the "perfect cure;" the entomologist will be delighted to find it exists in that well-known fluid, benzine or benzole, with which he has for so many years ungreased his favourite Lepidoptera. "Professor Mosler has found as the result of careful experiments that benzine is a poison for Trichinæ. It rapidly kills lice and other vermin and seems to have the same effect upon Cysticercus and Trichina. But benzine is also a powerful poison for large animals and man; and if used in the treatment of Trichinosis should be employed with especial caution. A rabbit can take ten grains, a pig thirty grains, and a cow half an ounce of benzine per diem, without its producing alarming symptoms of poison." Very good! but why give it to a cow, which is not enumerated in the list of animals subject to Trichinosis. "Up to the present time benzine has not yet been employed in Trichinosis in man, but its use in the more severe forms of this affection seems justifiable." Of course it does! why not give it to man? why persecute the "pretty cow that made sweetest milk to soak your bread," running the risk of poisoning your little ones? why not give it to "gentlemen engaged in the inspection of schools?" It is certainly unusual in cases of human infirmity to administer the remedy to our cattle. What should we say to our family Æsculapius if he suggested our giving Dutch drops to our short-horns when we were afflicted with excruciating lumbago?

In conclusion, I can only repeat that Dr. Althaus has hit the right nail on the head in selecting Trichinosis as a theme for a fashionable audience; but I fancy he will make but slight impression on the hard-headed and argumentative zoologist, the man who has that disagreeable habit of inquiring into the why and the wherefore of every assertion. But this is of no consequence. Let the Doctor dismiss the dull sceptic, from whom he has been labouring to obtain some slight admission, with the grand and crushing burst of indignation launched by Sergeant Buzfuz at the humiliated Weller, "It's perfectly impossible,

my lord, attempting to get at any evidence through the impenetrable stupidity of this witness! Stand down, Sir."

EDWARD NEWMAN.

Further Natural History Notes from Norway.

By GEORGE NORMAN, Esq.

DURING the past summer I paid another visit to Norway, and venture to make a few extracts from my note-book. On this tour, instead of taking the Bergen district, as in 1863, I went to Christiansand, Christiana, up the Gudbrandsdal, and over the Dovrefjeld, to Bjerkager, near Trondjhem.

Fieldfare.—These birds are by no means so abundant in this neighbourhood as in the Bergen district. During my trip this summer, until I came to Dombaas, at the foot of the Dovrefjeld, I saw very few fieldfares, and it was only on descending to Nystuen and Bjerkager that they seemed more plentiful. Although I looked diligently I only found three or four nests with eggs, some of them quite fresh, while others were strongly incubated. Saw many young birds quite strong on the wing.

Redwing.—Did not succeed in taking the eggs of this bird, owing, I suppose, to its breeding earlier than the fieldfare. I found one nest with young ones; it was situated near the ground in a prostrate juniper-bush near Hjerkin. Remembering the circumstance that on leaving home the subject of the song of this bird was causing much correspondence in the 'Zoologist,' I was determined to pay particular attention to the subject when I had an opportunity. The conclusions I arrived at were, that the most earnest advocate in favour of the redwing singing in England would alter his views, could he only for a moment hear the bird *really* singing as he does in Norway. In comparison with the true song, the twittering and chattering, so often heard in England, can certainly not be called singing at all. On one calm, hot evening, while staying at Bjerkager, near Trondjhem, I was smoking my evening pipe, about half-past 11 o'clock, when I heard a dozen at least of these birds singing in the neighbouring pine forest. I made a note at the time in my memorandum book that the song much resembled that of the thrush, but was much more abrupt and shrill.

Great Black Woodpecker.—Shot one of these birds as he flew out of the hole of a tree at Nystuen. The hole was in the trunk of a large aspen poplar, and, thinking of my absent friend Dobrée, I made sure of securing eggs for his collection; consequently I went about a mile to borrow a ladder, which I carried this distance on my shoulders: this trouble was all in vain, the hole being evidently only used to sleep in. I believe these birds are not uncommon.

Northern Jay.—Shot only one specimen, and this a young one in immature plumage. This occurred also at Nystuen. I do not believe they are found south of the Dovre range. It has a strange outlandish appearance, with its bushy head and turned-up beak. During my search for others, my dog caught a young woodcock, and among the birds which I obtained were a godwit, solitary snipe and a sandpiper.

Sneehättan.—On the 14th of July I, with two friends, ascended Sneehättan. We took two guides with us, and five ponies to take us to the foot of the mountain, two Norwegian (fourteen English) miles from the station of Hjerkin. The day was intensely hot,—so hot, indeed, that the skin was completely blistered off our necks and faces. This great heat rendered the ascent the more fatiguing. For the two Norwegian miles we passed over extensive dreary tracts of moorland, covered with stunted dwarf birch, Salix herbacea, Azalea procumbens (in beautiful flower). Many streams had to be forded, the channels of some nearly filled up with the remains of enormous snow-drifts. Soon this changed, and we passed some large frozen lakes, and after this came upon a dreary steep expanse of terrible blocks of stone, varying in size from a man's head to that of a goodly sized house: these stones were all covered with a beautiful yellow lichen in small spots and patches on a dark ground, and reminded me constantly of the skins of the large tropical lizards. After a fatiguing climb of perhaps three hours, passing *en route* many large snow-fields, we arrived at the base of the snowy cone: this took perhaps twenty minutes to ascend, being quite hard frozen, and very slippery. Arrived at the top, I found the temperature 35°, on the snow 32°. A cold icy gale of wind soon drove us down again; the descent nothing near so fatiguing as the climb up. In climbing the mountain, before arriving at the permanent snow, we passed large masses of the beautiful Silene acaulis, Azalea procumbens, Ranunculus glacialis, Pedicularis lapponica. Immediately below the snow line, the only traces of vegetation were stunted plants of Salix herbacea, Betula nana and rein-deer moss. Hearing that some ladies who had made an ascent

some years before had disturbed many ptarmigan and two snowy owls, I and my companions on this occasion took up with us a breech-loading carbine and a double-barrel breech-loading shot gun. Thus fully prepared, we should have done good execution among any game we could possibly meet. Unfortunately we never saw anything nearer the object of our wishes than the droppings of apparently an alpine hare on the snow. Two large eagles were seen in the distance.

Blue-throated Robin.—While staying at Hjerkin, and rambling about the open fjell, opposite the station, my attention was called to the note of a bird quite unfamiliar to me. The birds seemed to be in some abundance in a clump of birch bushes. The note somewhat resembled that of the whinchat or wheatear, but instead of the final "tick, tick," the bird uttered a deep bass "tuck, tuck," very softly. Not being able to recognise the bird, I shot one, which I at once saw was a young specimen of the bluethroated robin (*Motacilla suecica*). This was a prize, for the bird and its habits alike were quite new to my experience. I afterwards shot nine specimens, some of them magnificent old males, with the azure-blue throats. In all but two specimens the patch in the centre of the blue was chestnut-brown: in the exceptional two we could just trace some white feathers in the margin; I failed, however, in seeing one with the white space fully developed, as in the British-shot specimen figured by Yarrell. I watched closely with my glass, and had any appeared with conspicuous white patches, I could scarcely have overlooked them. On my return to Christiana I spoke to Professor Essmark upon this subject. This gentleman seemed to think the Norwegian bird never had this patch otherwise coloured than chestnut-brown, while birds shot in Germany and France had the same space invariably white. This is a subject that requires further research. I looked in vain for a late nest with eggs. The birds when disturbed invariably alighted again near the roots of the bush, and crept about like wrens.

Adders.—Adders seem to be abundant in the higher parts of the Dovre, for during my stay at Hjerkin I saw two very large specimens, but owing to their quickness failed in catching either.

Ring Ouzel.—Ring ouzels seemed to be building in some rocks to the eastward of the station at Hjerkin, for on approaching the locality I was mobbed by a number of these birds, who were evidently alarmed at my invasion of their breeding-place.

Cuckoo.—Cuckoos were seen and heard on many occasions. They were almost invariably followed and mobbed by a crowd of small birds. Hearing the approach of such a mob, I dropped gently into

the bushes, and saw the cuckoo fly into a bush within twenty yards of me. Here he was set upon by a flock of small birds, and while defending himself, rather to my surprise, uttered his well-known note. There was no mistaking the note, which, being uttered so near me, appeared to sound more hollow, soft and flute-like than I ever remember to have noticed before.

Insects.—In driving over the Dovre, I noticed thousands of a small obscure, skipper-like insect settling on the road-side, but very nimble and difficult to catch; this turned out to be Psodos trepidaria. A small azure-blue Polyommatus Pheretes was very abundant indeed, along with other blues, which I did not succeed in capturing: whole boxes might have been filled with P. Pheretes in a few hours. I saw one magnificent specimen of Papilio Machaon near Oien, and some other large butterflies, as I drove along, but did not identify them. Of Fritillaries I saw an immense quantity, and these in great variety. Among these I recognised Melitæa Athalia, Argynnis Euphrosyne, A. Pales and A. Freyja. About Hjerkin and the higher fjell an exceedingly common insect was Erebia Manta, and occasionally I observed E. Ligea. Hipparchia Semele, a beautiful variety, was very abundant near Christiansand. Setina irrorella I frequently brushed off the low willow bushes on the fjell top.

Flowering and other Plants.—Several beautiful plants were noticed on the road-side in driving over the Dovrefjeld: Erigeron alpinum, Lychnis alpina, L. viscaria, Astragalus alpinus, A. glyciphyllos, Gentiana nivalis (a perfect little gem), Anemone pulsatilla, Salix herbacea, S. lanata, S. reticulata, Pedicularis lapponica, Viola biflora; also a little beauty, nestling among the under-growth, Papaver nudicaule, very handsome and growing in many-flowered tufts on the road-side and in the crevices of the rocks.

Ferns.—Ferns are quite absent from the higher fjells; I did not see even Lastrea oreopteris or Blechnum boreale. The day before the high ascent commenced I was passing through a paradise of ferns, and collected many plants of Struthiopteris germanica, Woodsia hyperborea, Botrychium lunaria, Asplenium septentrionale, &c. A large Aconitum, probably A. septentrionale, is abundant all over the country.

Whenever two large streams come together a large delta is formed by the detritus and boulders brought down during freshets. These spaces, often of large extent, are almost invariably covered with large bushes of Tamarix germanica. Speaking of detritus reminds me of the grand terrace-like masses of glacial detritus on either side of the

Gudbrandsdal ascending the Dovre, near Dombaas: entire hill-sides are composed of firm and compact masses of glistening white earth, entirely made up of the small abraded particles scraped from the rocks, such as one invariably sees discolouring the water running from the foot of a glacier. These ancient masses of ground rock have a greasy feel and fracture, which reminded me of French chalk: I am sure it might be turned to some use for polishing metals.

Drivstuen.—Here I stayed one night, and before retiring to rest went down to the Driva with my fly-rod: owing to the quantity of snow-water I could not move any decent fish, but soon filled my bag with small trout. In the farm-yard here is a deep draw-well, with the usual lever and bucket: on looking into the well, thinking of ferns, to my great surprise, I saw that, at about ten feet from the top, the sides were still encased with solid ice, a foot and a half thick: this little incident was enough to remind one of the rigorous winter experienced at this elevation.

Bjerkager.—Had some excellent trout here for supper: afterwards took my rod down to the lake, above the station, but the sides are too boggy to allow of a near enough approach. The upper end of the lake being very shallow, seemed quite alive with ducks and redshanks; the latter birds amused me much with their singular habit of perching on the tops of the spruce firs. In the evening was much delighted in listening to the song of the redwing. In the forest here I hear the hazel hen (*Tetrao bonasia*) and capercally are abundant enough in the winter time. In driving along the Gudbrandsdal, noticed the fields were in places quite purple with the beautiful Anchusa tinctoria, and in one particular place the fields were one mass of blue colour from the abundance of Dracocephalum Ruyschiana. The pine woods were deliciously scented with the beautiful Linnæa borealis.

Here I must bring these hasty notes to an end.

GEORGE NORMAN.

Hull, October 12, 1864.

Food of Quadrupeds.—As you recently requested your readers to make observations on "the life-histories" of our British sucklers (Zool. 9218), I venture to trouble you with the following notes on the food of one or two species:—

Common Shrew (Sorex tetragonurus).—I kept one of these pretty little animals for a few days in a box with moss. It would eat almost any animal substance, but seemed to prefer insects and earth-worms: the former it seized with a spring, and it would eat seven or eight house-flies at a time; if more were given it hid them in the moss. Small worms were caught by one end and munched slowly without being

bitten through. On giving it a large one (about four or five inches long) it gave it a sharp bite, then sprang back, then flew at it again, until the worm was half dead, when it ate about half and hid the rest. It slept during the middle of the day, rolled up among the moss, but always waked up at once if worms or flies were put into the box. I believe that, when pressed for food, shrews will kill and eat frogs, but when a large one was placed in the box the present specimen did not seem inclined to prey upon it, although it now and then gave it a slight bite on the hind leg; after they had been together for some hours the poor frog was taken away. The shrew seemed to be very cleanly, constantly dressing its fur and "washing" its face with its fore paws, as rabbits do. It soon died by an accident. A correspondent of the 'Field' newspaper stated ('Field,' 3rd October, 1863) that the water shrew (*Crossopus fodiens*) preys on small fish, both in a state of nature and in captivity, "pursuing and capturing them with all the grace and address" of the otter. It would be interesting if any of the correspondents of the 'Zoologist,' who have the opportunity, would further investigate this habit. Here the water shrew is unknown, although I have met with one or two examples of the rarer oared shrew (*C. remifer*).

Squirrel.—In autumn and winter the squirrel often feeds on the cones of the larch and other pines: holding the cone in its fore paws it tears off the scales and devours the seeds. According to Sir C. Lyell, the remains of cones eaten in this way are found in the Norfolk cliff forest bed ('Antiquity of Man,' p. 215). Squirrels also sometimes nibble the bark of young birches, and this summer I saw one feeding on bilberries (or "blaeberries," as we call them in Scotland); it sat on its haunches among the bushes, and gathered the fruit with its fore paws. A variety with the tail almost white is not uncommon in this neighbourhood, and in some parts of Germany black ones are often seen. During a severe winter, a few years ago, a squirrel was in the habit of entering a closet on the ground-floor of this house, eating the bread, &c., which was kept there. It entered through a small unglazed window about two feet from the ground, through which it escaped if any one came in to the closet during its visit. Surely such boldness is not common in this species.

Roedeer.—I lately examined the stomachs of a buck and doe, both in fine condition. In each case the paunch was full of food, which was of a very miscellaneous description, including grass, moss, blaeberry leaves, young heather, spruce-shoots, a little corn, and, what rather surprised me, a large quantity of fragments of various species of Fungi, some being of the common kinds of "toad-stool" and others apparently of those sorts which grow on the trunks of trees. Quantities of those Fungi grow in the woods where the deer were shot.—*Edward R. Alston; Stockbriggs, Lesmahagow, N.B.; October* 14, 1864.

Seals off the Coast of Yarmouth.—The seals I noticed the occurrence of (Zool. 9277) were specimens of the common seal (*Phoca vitulina*).—*T. E. Gunn.*

Whales in the Bristol Channel.—On the 11th instant four whales were observed in Swansea Bay: two were taken and the other two got away. I was from home at the time, and on my return found all traces swept away. My brother took an outline drawing of the one which was brought in here; it seems to have been singular for the abrupt termination of the forehead, and for possessing a well-marked snout about 15 inches long: its dimensions were 27 feet in length, 20 feet in circumference, and the fan of the tail 7 feet broad.—*David Williams; 56, Wind Street, Swansea, October* 25, 1864.

Redbacked Shrike, or Butcher Bird, in Forfarshire.—Mr. Macgillivray, in his 'British Birds,' vol. iii. p. 507, states that this bird, Lanius collurio, had not, when he wrote his history, been observed in any part of Scotland. Glancing over the indices (save 1863) of the 'Zoologist,' and some other ornithological lists, I find no record of its having been yet seen or caught on the north side of the Tweed. However, be this as it may, the only Scottish specimen I have seen was one shown to me at Broomlea, Bridge of Dun, near Montrose, in July last. I have since received the following particulars of its capture from Mr. Fraser, butler to the late Mr. John Gordon, of Charleton. Mr. Fraser, who has a good eye to detect and a hand to preserve ornithological rarities, while returning directly through the fields from Montrose to Charleton in June, 1862, observed a strange bird darting frequently from a tree to the ground and back again to its perch, and was satisfied that this was the mode of its feeding. About two hours thereafter he returned with his gun, found the bird in the same tree, and secured it. Its stomach was well stuffed with small beetles.—*G. Gordon; Birnie, Elgin.*

Moulting of the Bullfinch, and Remarks on its Food, &c.—Though loose feathers were first noticed about the cage early in September, my bird had, I believe, begun its moult towards the latter days of August. Owing to an accident, the cage having fallen on the 11th of September, it lost, in fluttering about, most of its loose feathers, including many of the quills; though this may have accelerated the moult, I observed about a week later that the inner quills were then only beginning to appear, but the exterior ones were already of considerable length. The tail-feathers seem to be more rapid in growth, as the four centre ones, by the 28th of the month, had well nigh attained their full size, though some of the lateral ones were barely perceptible, and the rest but half an inch or so long; it would therefore appear that the inner quills and outer tail-feathers are not shed till the rest are of sufficient length to sustain the bird. It is a male of last year, and the breast is now assuming its rosy hue, but has not attained the brilliant colouring of the adult, nor do I think it will acquire the mature plumage for another year, though being caged may perhaps partly account for the want of brightness. The new feathers of the head and tail are more glossy, and of a purer black than the old ones, and both the upper and under tail-coverts are of a snowy whiteness. Though ruffled and drooping during the early days of its moult, it has recovered its spirits, but as yet there has been no attempt at a song, nor did I hear its plaintive note till the 11th of October. Notwithstanding its short neck and stout beak it manages to preen its feathers with great ease; indeed the nape, chin and extremities of the quills are the only parts that its bill cannot reach, but here the claws are most effective, both in scratching and combing, the head being depressed and thrown back, and the foot thrust forward between the wing and the body: this operation is often repeated, the bird seemingly taking great delight in it. When preening the feathers I observe it frequently swallow pieces of the scaly or fleshy covering of the tubes. Though Macgillivray seems to have thought it likely that they feed on insects, I fear we have no sufficient proof of this; but to make amends the bullfinch consumes an incalculable quantity of seeds of thistles and other noxious weeds: to prove this I have only to state that having collected some spear-plume thistles (*Cnicus lanceolatus*), two hundred and thirty-eight of the seeds were placed in the cage, after taking away the hemp-seed on which it had fed up to two o'clock P. M.; though the husks had to be removed, the thistle-seeds were all consumed in about twenty minutes, the bird merely stopping once or twice to cleanse its beak and slake

its thirst. To show that it was by no means satiated, on the hemp-seed being replaced it began to feed again. On another occasion two hundred and seventy-five full-sized seeds of clary (*Salvia verbenaca*) were eaten in about an hour and a quarter, though it had been feeding as usual all the morning. Its frequent ablutions and fondness for water in a state of confinement may partly account for its haunt or habitat being the low secluded bushy tracts where springs abound. Having to-day narrowly inspected the plumage I think I may safely say that the moult is now completed.—*Henry Hadfield; Ventnor, Isle of Wight, October* 19, 1864.

[In reference to the food of the bullfinch, I have shown (Zool. 8699) that the young larva of Hybernia brumata, which feeds on the buds of plums and gooseberries, is the favourite food of this beautiful bird in spring, and therefore that the bird is a great benefactor to the gardener.—*Edward Newman.*]

The Hooded Crow near Moundsmere.—On the 7th instant Mr. G. Errington, of North Hall, Preston, Candover, shot a hooded crow at Bury Down, not far from Moundsmere: he kindly sent me the bird in the flesh. I had not previously met with a bird of this species in this locality, although I believe they are occasionally found here. On examining the gizzard, I found it contained several grains of barley, some small snail-shells, a great many pebbles and a quantity of half-digested matter, principally beetles.—*Anthony S. Bradby; Moundsmere, Hants, October* 27, 1864.

Hoopoes at Flamborough.—On the 21st of September, 1864, I received a note from Mr. Bailey, of Flamborough, in which he stated that on the same day he had stuffed a specimen of the hoopoe (*Upupa epops*), which had been shot by Mr. John Preston, of Flamborough, in one of his own fields. Since that date I have been informed, on good authority, that a second specimen has been captured in the same locality, but I have not yet received full details of the capture. This peculiar and foreign-looking bird has been shot several times within my own recollection in East Yorkshire, and on two occasions close to the town of Beverley.—*W. W. Boulton; Beverley, November* 1, 1864.

The Kingfisher kept as a Cage Bird.—When staying at Brecon, South Wales, a week or two ago, I went one morning to the shop of Mr. Pritchard, the well-known fishing-tackle maker and fisherman, and found there, in an ordinary bird-cage, a kingfisher, perfectly tame. Never before having seen this bird in a cage I enquired the particulars of its capture, and found that it was one of a nest of seven that were taken this spring in the neighbourhood, when partly fledged: the trouble of rearing it must have been immense. It is very healthy and in beautiful plumage. Mr. Pritchard showed me how the bird took its food; at the bottom of the cage was an ordinary saucer filled with water, into which a live minnow was put. The kingfisher, sitting on the topmost perch, eyed the fish very knowingly, and uttering its sharp, shrill cry, pounced on the fish. Mr. Pritchard then, with a twig, assisted the bird, with the fish in his mouth, to his perch, for he was unable to fly back to it without help. The bird soon "settled" the fish, by giving it two or three sharp blows against the perch, and, tossing it, swallowed it head first. I observed that, before taking its prey, the bird cast up a small white pellet, composed of small fish-bones, which crumbled to pieces when touched, like the ashes of a cigar. It strikes me that a kingfisher in a cage is a very unusual sight, and I think it may interest some of your readers to hear of it.—*Thomas Marshall; Northampton, October* 21, 1864.—*From the 'Field' Newspaper.*

Ring Dove or Wood Pigeon nesting in October.—On about the 20th of this month I observed a wood pigeon fly out of an oak tree in Inham's Coppice; the tree, I

observed, was partly covered with ivy, but as I was in a hurry at the time I did not notice it particularly; next day, however, a shepherd told me that he saw the bird fly off a nest which was built amongst the ivy on the same tree. I went and climbed the tree on the 23rd, where I found a newly-made nest, in which were two fresh-laid eggs, but the old bird was not on the nest when I went to the tree, so I am afraid there will be no chance of my seeing any young birds hatched from the eggs that have evidently been laid during the last fortnight.—*Anthony S. Bradby; Moundsmere, Hants, October* 27, 1864.

Pale Variety of the Common Partridge near Beverley.—Two days ago I received, in the flesh, a peculiarly beautiful variety of the common partridge (*Perdix cinerea*). It was shot within a few miles of Beverley, and had been observed for some time. Dissection proved it to be a male bird of the year. It was marked precisely the same as an ordinary bird, but the colouring was many shades paler throughout, and inclining to a buff or creamy tint. The general effect is most pleasing and striking. Varieties of the partridge, I am aware, are not uncommon, but I have never seen so beautiful a variety as the subject of my present report.—*W. W. Boulton; Beverley, November* 1, 1864.

Young Quail near Wakefield.—A young but full-feathered quail was captured here by a gamekeeper on the 10th of October. The quail is now a rare bird in this neighbourhood.—*G. Roberts; Lofthouse, Wakefield.*

Ruff and Reeve near Beverley.—On the 25th of August, 1864, Mr. Boyes, junior, of Beverley, shot a fine immature female of this species on the River Hull, near Beverley. It was one of a small flock that had been feeding on the "Pulfin," a marshy tract of land on the bank of the River Hull. On the 7th of October, 1864, Mr. Robert Stephenson, of Beverley, shot an immature specimen of the ruff not far from the same place where Mr. Boyes shot his specimen of the reeve in the month of August. It was alone. A gamekeeper who resides near to the river states that he has not only seen, but killed and eaten, several of these birds during the past summer. He believes that they were all of them birds of the year, and says that they were in excellent condition. In former days, antecedent to drainage and improved agriculture, the ruff was of frequent occurrence in this locality. Now, however, it is so seldom seen that we class it amongst our rarest visitants.—*W. W. Boulton.*

Knot and Bartailed Godwit, in Summer Plumage, at Filey.—On the 9th of August, 1864, a beautiful male specimen of the knot (*Tringa Canutus*), in summer plumage, was shot on Filey Brigg, by Mr. Featherstone, of Filey: the bird is now in my own collection. During the early part of the month of August last a male specimen of the bartailed godwit (*Limosa rufa*) was shot near to Filey: it was one of three birds that rose from the shore, on which they had been seeking food. This bird is in summer plumage, but the breast is not uniformly rufous. I have obtained it also for my collection. The bar-tailed godwit is by no means uncommon on the Humber banks, and more particularly on the sandy flats of Spurn, at the mouth of the Humber, during the winter months. I have never before, however, met with this bird in summer plumage.—*Id.*

Is the Turnstone near Flamborough and Filey in July?—Probably it may be an error of mine that the turnstone was shot at or near Filey in July last. The history of the bird designated as the turnstone I give the readers of the 'Zoologist' and Mr. Cordeaux in particular. In the month of July, 1862, my younger son, at Weston-super-Mare, shot an exceedingly pretty bird flying among a flock of sandpipers, or

"sea snipes," as they are called; it was brought to Cheltenham and stuffed very nicely by a Mr. White, of this town. The bird was of about the figure and size of the water ouzel, but with a much greater variety of plumage; it has a white breast, a pretty black ring round its neck, and the head and wings are of a brown colour. Mr. White, who "set it up," pronounced it to be a dotterell or ringnecked plover. At Filey, in July, 1864, my son shot a bird of the same species, and exactly like the one above described, but the shopkeeper, who stuffed several other birds, pronounced this one to be a real turnstone: in consequence of having an exactly similar bird at Cheltenham, I did not bring it with me. Probably Mr. White is right and Mr. Cordeaux also; to the latter gentleman I am exceedingly obliged for his observations on the Ornithology of Flamborough Cliffs. Mr. Cordeaux, on enquiry, will perhaps find that fifty years ago these cliffs were inhabited by ducks as well as cormorants; it is so stated in an old book which I read, whose date was nearly half a century back. I may be wrong about the sea-birds breeding in May, but an old inhabitant of Filey mentioned to me that, in consequence of the nests being robbed of their eggs in May, an immense number of sea-birds deserted the cliffs about the end of that month, and returned about the end of June. My thanks are also due to Mr. Dobrée for his remarks on the indefatigable porseverance of the birds in no less than thrice trying to rear their young in one summer after having their eggs destroyed.—*H. W. Newman; Hillside, Cheltenham, November* 5, 1864.

The Ruddy Shieldrake at Epworth.—Mr. Samuel Hudson has been good enough to forward me coloured sketches of the ducks, whose occurrence has been recorded by him in the 'Zoologist' (Zool. 9290) under the name of the ruddy shieldrake (*Tadorna rutila*, Pall.). Though these sketches are unfinished, it is manifest that the originals did not belong to that species, and I have little doubt, if any, that the drake was an example of the not unusual hybrid between the common wild duck (*Anas boschas*, Linn.) and the dusky duck (*Anas obscura*, Gmel.) of North America. I have in my possession at present a male specimen of this cross, which corresponds in all essential particulars with Mr. Hudson's drawing of the male bird killed at Ashby. My specimen was bred by myself at Elveden from a dusky drake, which, through Lord Lilford's kindness, I received some ten years ago from Mr. C. Domville, of Santry, near Dublin, its mother being a common wild duck. For several seasons I reared broods of these hybrids, the majority of which, being unpinioned, flew away at the ordinary time of migration. I do not wish it to be understood from what I now say that I lay any claim to the Ashby bird as being of my own breeding, for I know that several persons, the late Sir Robert Heron, for instance, have been successful in breeding the dusky duck, and it is only reasonable to suppose that the birds thus produced should have crossed with our common species, and have propagated other examples of this hybrid, which, according to M. de Selys-Longchamps (Bulletin de l'Académie Royale de Belgique, Tom. xxiii. 1856) is mentioned by Dr. Morton (Silliman's 'American Journal of Science and Arts,' March, 1847), as having been also observed in the United States. I must add that I am unable to perceive any great difference between the female bird represented in Mr. Hudson's sketch and the female of the common wild duck; this may, however, arise from the unfinished state of the drawing.—*Alfred Newton; Magdalene College, Cambridge, October* 22, 1864.

[Prior to Mr. Newton's examination of Mr. Hudson's very careful, though unfinished, drawings, they were in my possession, and I arrived at the conclusion that the male was Anas boschas, the common wild duck, in a transition state of plumage,

i. e., in that state which occurs twice every year, *first*, when assuming the livery of the female, and, *secondly*, when resuming the livery of the male. I failed to detect any sign of the hybridity which Mr. Newton suggests. With regard to the female, I quite concur in Mr. Newton's opinion as to its being the female of the common wild duck. Mr. Doubleday also saw the drawings, and concurred in this view of the case. I would not trouble my readers with this note had I not originated the doubt as to these birds being the ruddy shieldrake (Zool. 9121), and had not Mr. Hudson kindly sent the drawings for my opinion. I need scarcely add that neither of the drawings have any resemblance to the ruddy shieldrake, and I feel much obliged to Mr. Hudson for the pains he has taken to rectify an accidental error.—*Edward Newman.*]

Eider Duck at Filey.—Yesterday I received, in the flesh, a beautiful specimen of the eider duck (*Anas mollissima*). It is the first I have seen that has been shot on the coast of Yorkshire. The bird was a young male, a few creamy white feathers appearing on the neck, in front, and wing-coverts. It was sent me by Mr. D. Brown, of Filey, who says that it was shot on Filey Brigg the day before (November 3rd). It was accompanied by a female, which was also shot, and which I hope to secure for my collection, as well as the male bird, which is at present in the hands of Mr. Richard Richardson, of Beverley, for preservation.— *W. W. Boulton; Beverley, November* 5, 1864.

Longtailed Duck at Scilly.—A female, or immature male, specimen of this arctic duck was killed at Scilly in the past week.—*Edward Hearle Rodd; Penzance, November* 5, 1864.

The great Autumnal Migration of Birds.—The great migratory movement of our winter visitors seems to have taken place from Tuesday last to the end of the week, during the prevalence of the late easterly winds. Woodcocks, snipes, jack snipes, redwings, fieldfares and starlings have appeared in large numbers from the eastern part of the county to the Scilly Islands, and my nephew writes me word that on the 3rd instant he walked up in a short distance fifty snipes and thirty jack snipes at Trebartha, in the eastern part of the county, and that his keeper saw, in the morning dawn, woodcocks flying westward, which accounts for our market here being fully stocked on Thursday, and for the larder of the governor of the Scilly Isles having yesterday morning forty-one woodcocks hanging up.—*Id.*

Gannet at Filey.—On the 18th of August last a most perfect specimen of this bird was killed off Filey by a fisherman. It was an old male, in full plumage, and was very kindly presented to me, in the flesh, by Mr. T. Buckley, who was visiting Filey at the time of its capture. Two or three of these birds have been captured off Filey during the past summer, and one or more are generally to be met with on the East Coast of Yorkshire every year. I have an immature specimen in my collection that was taken alive by a farmer's boy in a field at Walkington, near Beverley, several years ago. This bird was kept alive by a man in Beverley, who, when he became tired of it, killed it for stuffing. The distance from the sea, at the point where it was taken, would be at least fourteen or fifteen miles, as the crow flies, but not more than seven or eight miles from the Humber. It is, I believe, very unusual to meet with the gannet so far inland. I have never before known one shot in this neighbourhood, although I have seen several cormorants (*Carbo cormoranus*) that had been shot near Beverley. Indeed three of these birds had been shot, at various intervals, actually perched on our beautiful Minster, whose lofty stone walls and towers they had probably mistaken for Nature's rocky pinnacles.—*W. W. Boulton; Beverley, November* 2, 1864.

Black Tern at Filey.—On the 3rd of September last Mr. T. Buckley shot an immature male specimen of the black tern (*Sterna nigra*) at Filey. This is a rare species on the East Coast of Yorkshire. I saw Mr. Buckley's specimen in the flesh.—*W. W. Boulton; Beverley, November* 1, 1864.

Little Gulls off Bridlington Quay.—I purchased, a few days ago, two very fine immature specimens of this rare gull from Mr. T. Jones, of Bridlington Quay. They had been shot by himself about the middle of September last. Mr. Jones tells me that he shot them close to Bridlington Quay. They were flying over the bay at the time, in company with a large number of terns. Mr. Jones also states that only a few days before he secured my two specimens he saw three of them, and shot one, which he sold to Mr. G. S. Foljambe, of Osberton, near Worksop, Nottinghamshire. He believes my birds to be those he saw on that occasion in company with the one first captured. They were flying amongst a large number of terns on both occasions.—*Id.; October* 28, 1864.

Common Skua at Flamborough Head.—On the 8th of September last Mr. Bailey, of Flamborough, sent me a fine specimen of the common skua. It had been shot by himself off the Flamborough Head, on the 7th of September. On dissection I found it was an immature female, as I had suspected from the pale colouring of the edges and tips of the feathers. This skua, although named the "common" skua (*Lestris catarractes*) is by no means a common bird on this portion of the East Coast of Yorkshire.—*Id.*

Richardson's Skuas off Bridlington Quay.—I have just received from Mr. Thomas Jones, bird-stuffer, of Bridlington Quay, two specimens of Richardson's skua (*Lestris Richardsoni*) that had been shot off that portion of the East Coast. One of these birds is in full adult plumage. Mr. Jones informs me that he shot it himself on the Quay of Bridlington, about the middle of September last. The other specimen is immature, and in the plumage of the first year. Mr. Jones does not know by whom it was shot, but he had it in the flesh, and it had been shot on the Bay of Bridlington.—*Id.; October* 22, 1864.

Buffon's Skua at Flamborough Head.—On the 8th of September last, Mr. Bailey, of Flamborough, sent me, in the flesh, a splendid specimen of this rare species. He had shot it himself off Flamborough the day before. On dissection I found it to be an immature male. The colour throughout was sooty black, with a slight shade of brown in some lights, and with the exception of the shafts of the primaries, which were pure white. Total length, from end of bill to tip of tail (*i. e.* to the end of the two central feathers, which extend several inches beyond the rest), 20 inches; wing, from the anterior bend to the end of the longest feather, 12 inches; tarsus $1\frac{1}{2}$ inch; middle toe, including claw, about $1\frac{3}{8}$ inch. Both tarsus and foot, *i. e.* toes, webs, claws and sole of foot were inky black.—*Id.; October* 28, 1864.

Fulmar Petrel near Flamborough Head.—On the 3rd instant I received, in the flesh, a fine mature specimen of the fulmar petrel (*Procellaria glacialis*). It was sent to me by Mr. D. Brown, of Filey, with the following history of its capture:—Mr. Brown states that it was killed, on the 29th of October, by Matthew Jenk, on board a fishing yawl near to Flamborough Head. On dissection I found it to be a mature male.—*Id.; November* 3, 1864.

Maigre off the Land's End.—On the 18th instant a "Sciæna" (*Couch*) or "maigre" (*Yarrell*) was taken off the Land's End. The fish was observed floating on the water, almost lifeless. A lump of sea-weed had got entangled in the gills, so that the fish could not close its gill-covers, and it was thus, in fact, drowned. It was captured by the fishermen who found it, with a gaff. It measured 5 feet 6 inches, all over, being, I believe the largest recorded British specimen. Its skin has been successfully saved, and is now in course of stuffing for the Penzance Museum. I have nothing to add to my former observations on this fish, except that, in this specimen, the membrane connecting the first and second dorsals was almost, but not altogether, obliterated, and that there was no trace of serration on the posterior edge of the preoperculum. The teeth in the gullet were most distinctly developed. I had a portion of the fish dressed, by stewing, and its flesh proved to be firm, white and flaky, but insipid, suggesting the idea that the fish was out of condition. I have now seen three specimens of this fish, and of very various sizes (5′ 6″, 4′ 6″ and 1′ 10″), and I find that, in all, the greatest depth, just under the first dorsal, is, to its length, over all, as one to five. Both Couch and Yarrell figure the fish as having a depth, to its length, of one to four, and, consequently, make it appear a stouter fish than it really is. It may be that my fish have all been out of condition, and that their figurings are correct, but the difference is worth notice.—*Thomas Cornish; October* 25, 1864.

New British Fishes. By Thomas Edward.

The first, so far as has been, and possibly can be, ascertained, until more specimens be procured, one only as yet having been got, is considered by the best authorities whom we have on these matters to be quite a new species, and hitherto unknown. One gentleman to whom the fish was submitted for examination says he has a figure of one something similar, but a good deal larger, and not exactly the same. The only other instance where anything at all like a near approach to it can be found is in Cuvier and Valenciennes's large and beautiful work, in which there are one or two plates bearing in some measure a pretty strong resemblance. But those represented here have spinous rays on the dorsal, ventral and anal fins. Our specimen has none of these. Besides, the fishes figured by Cuvier are said to be natives of New Guinea. Now, allowing that, and admitting for the time that there is nothing impossible, still we are very much inclined to think it as hardly probable that such small things as these could ever, under any circumstances, find their way from those distant seas and be found on the coast at Banff. Nay, we believe rather that its home is on our own coast, although not previously detected. We believe, also, from what we already know, and hesitate not to say so, for sure we are that none in the least way acquainted with the wonders and inexhaustible

nature of the great deep will for a single moment gainsay us, that there are yet others to be found. True, they may be, like the present, small, and on that account appear insignificant in the eyes of the community at large, but that would nevertheless neither affect nor lessen the interest of their discovery in the estimation of those who look to these things with interest. But to return: although it were the case that our fish was a native of New Guinea which had accidentally found its way here, still the want of the spinous rays of the fins already referred to, is a most important and distinctive mark, and quite sufficient of itself to prove that none of Cuvier's are, or can be, the same.

But it is not exactly agreed amongst ichthyologists whether our fish be really a mature specimen or one only approaching maturity. Although small, being scarcely an inch in length, still we must say that to us it has all the appearance of being an adult, or at least not far from that stage. We say this from the undeniable fact that it is one of the most complete and most perfectly formed creatures of the kind any one could wish to look at, every part being to all appearance fully developed, and nothing being in any way the least disproportionate, and thereby disagreeable as it were to look at. It is also of a most remarkably firm and compact texture, which is not the case with young animals generally, but more especially with those of the description now under notice, which are rather of a soft and flimsy nature, until they have at least attained some growth. In a word, it is, although in miniature, as complete a *fac simile* of perfect construction, if we may be allowed so to speak, as we ever saw, or indeed could see.

We may mention, for the sake of those more particularly interested in the matter, although we do not feel justified at present in calling the little stranger by any definite term, that it has all the characteristics of, and does in fact belong to, the Labridæ or wrasses; but, as already hinted, whether young or old, is quite distinct from any as yet known form of that numerous and widely distributed family.

The colour when alive was of a most beautiful yellowish green, thickly marked all over, but more so on the back and head, with very minute starry specks of a purplish hue, all the fins more or less partaking of the same, save the caudal, which was whitish. The pupil of the eye appeared to be pinkish, encircled with a narrow ring of white, which glistened like burnished silver, the iris being greenish, with a tinge of bluish purple. The dorsal, which has the anterior rays for about two-thirds of its length considerably lower than the other third, extends farther back than the anal; the pectorals are fan-shaped,

and placed close to the gill-openings; ventrals short and fleshy, and commencing nearly on a line with the pectorals; the anal, which commences close to the vent, has all the rays nearly of equal length; caudal or tail somewhat pointed. The head is rather obtuse, with the lips somewhat fleshy, which, as is well known to the ichthyologist, is common to the tribe.

Although we cannot say much of importance concerning the traits of our little friend, still there is one which we cannot pass over in silence. It is this. On coming out of the water after we took our prize we had occasion to lay it down on the sand until a bottle was prepared for its reception and exclusive use, as we were very anxious to get it home alive, so that we might see and learn as much of its habits as possible. Whilst thus employed we were rather surprised at seeing it leap frequently several inches at a time. Thinking that the damp sand might have in some way or other aided the operation, we placed it on a dry board when we got home to see how it would or could perform there. It did just the same. Away it jumped, jump after jump, until we were fully satisfied that there was no difference as to place, and put him again into his little aquarium. We now observed, however, that the tail, which is pretty large, was the chief and most important object used. The head and shoulders were first raised a little, and then, by a doubling of the tail, which acted as a kind of spring, the animal was, by a slight jerk, enabled to rise and propel itself forward, or to either side, and not unfrequently right over. In the water, too, when twitted with anything, instead of swimming away as fish generally do, it merely leaped or jerked to one side in order to avoid the annoyance. We are not exactly aware whether this gymnastic performance be a common propensity with this family of fishes or not, but so it was with this specimen.

The other species alluded to, also a small one, belongs to quite a different order, that of Malacopterygii Subbrachiati; and if not equally new the only other place where it has as yet been found is on the Irish coast, where something similar is said to have been obtained by a Mr. Thomson. But there is a difference of opinion, some considering the Irish fish and the species found here to be quite distinct, and in this we ourselves are inclined to concur. We have never seen Mr. Thomson's, nor yet had the good fortune to see a plate or to meet with any published notice of it; but the following extract from a letter we had from Mr. Couch, the well-known ichthyologist, to whom we sent one of ours for his opinion, will speak for itself:—

"Polperro, May 26, 1863.

"Dear Sir,—Believing you will be somewhat anxious to receive some account of your little fish, I write you now after a full day's examination of it, preferring to do so rather than wait to the time I may return it, which probably will not be for a week or so. The only account, so far as I know, of anything like it is in the fourth volume of Thomson's 'Natural History of Ireland,' where he describes one something similar, but supposes it to be the same as my 'mackerel midge.' From an attentive examination, however, of your specimen I am persuaded that this is a different fish, and consequently that yours is a new species, and even a new genus. It is true Thomson describes his as having the ventral fins in front of the pectorals, which is very different from what appears in yours; nor can I detect any ciliated membrane at the beginning of the back, nor yet any barbules in yours as in his. Thomson's fish also appears to be larger than yours. I do however, think they are the same, and shall introduce them as such in my 'Fishes,' with a figure which I have taken from your specimen, and under the name of Thomson's midge (*Couchia Thomsoni*).—Yours &c., J. Couch."

From the foregoing it will be at once apparent to all in any way acquainted with these things that there is a decided and marked difference betwixt the two fishes here alluded to, but whether generic, or a wrong description given by Thomson, remains to be seen. This we know, that as soon as the news of the discovery here reached the scientific world several individuals sent soliciting examples of what they were pleased to term the "new fish," and, amongst others, Dr. Gray, of London, sent for some specimens for the Home Department of the British Museum.

It was only in April of last year that these fishes were first detected here, and were observed to remain only a few weeks, when they again disappeared, and nothing more was seen of them till May this year. This time they only remained a few days, but reappeared again towards the end of August, and continued until the second week of the present month (September). As this was a lucky chance, and one not to lose, we took a considerable number, not with the intent of destroying the beautiful little creatures, as beautiful they truly are, but for the purpose of ascertaining how they now stood as to size. Having satisfied ourselves in this, we committed the most of them again to their native element, and right glad they appeared to be on being once more set at liberty. From this examination we found that, although late in

the season, they had in no way increased in bulk, as compared with those we took in the spring. From this most important and most opportune circumstance, too, it is now our firm and decided belief that their average length does not exceed an inch. We have taken specimens a little larger. It would seem that they are a deep water fish, and, herring-like, only visit the shore occasionally. Like that fish, too, they are gregarious, that is they go in small shoals, and, if we are allowed to speak from experience and from what we have seen, we must say that they are the fleetest, most active and most vigilant of all the finny tribes. Should any one be inclined to doubt this, they will perhaps give us a little more credit when we tell them that, besides what we observed in the sea itself, we kept a number of them alive beside us for some time, placed in the window before which we worked, so that we had the pleasure of observing their habits at our leisure, that is, so far as anything of that kind can be done within a limited compass, and were well repaid for our time and patience.

Our little fish has the back of a pea-green colour, diversified with numerous and very minute roundish spots, or rather specks, of a darker colour; sides and belly of a pure silvery white, and having a bright metallic lustre. The fins also are mostly white, save a portion of the pectoral at its base, which is of a greenish yellow, and a part of the ventral, which at its extremity is black. The head is short, flat above, and slightly compressed. The eye, which is large, partakes in a great measure of the colours of the fish itself, with this addition,—that in certain lights it has the appearance of having a tinge or shade of a purplish green, red and blue. The dorsal, which commences a little in advance of the end of the pectoral, stretches, along with the anal, to within a very little of the caudal, both ending on a line. The pectoral is broad, narrowing towards its tip, and, with the ventral, commences close to the head, and almost close to each other. This last fin, the ventral, is a most remarkable and peculiar one, being very long and narrow, equalling nearly half the length of the animal; when closed reaching beyond the vent, and consequently beyond the commencement of the anal. The caudal or tail fin is rather square. The lateral line, which consists of a slight depression, is straight. As to barbules or any cirrosities, we can see none.

Had the chin fin been here, the ventral been placed on the side, and the side fin, the pectoral, where it is, we would have had as fine a picture as possibly could have been of a flying fish in miniature. The semblance between that genus and this little thing, save the

position of these two fins, is remarkable; at least it struck us as being so when we first met with it, and we think so still.

We would here express our opinion, from some slight differences which we can perceive betwixt the true wrasses and our fish, that it may yet be deemed necessary, from future investigation, to place it in a new or sub genus. In that case a part of the name would of course require to be changed; but until that takes place, if it ever does happen, we hold it as Labrus microscopicus, or the microscopical wrasse of the Moray Firth.

THOMAS EDWARD.

On the Occurrence of Pieris Rapæ in Canada. By G. J. BOWLES, Sec. Ent. Soc. of Canada, Quebec Branch.

DURING the summer of 1863, my first collecting season, I captured in the vicinity of Quebec numerous specimens of a butterfly of which no description could be found in any work on American Entomology. Mr. Couper, to whom I applied for assistance, was equally at a loss to determine the species, considering it, as I did, to be indigenous to Canada. In order to solve the problem, however, he forwarded some specimens of the imago to Mr. William Saunders, of London, C.W., who pronounced them to be identical with Pieris Rapæ, the small white butterfly of England, one of the most common and injurious lepidopterous insects of that country. In the mean time I had enclosed a drawing of the butterfly, together with the wings, to Mr. S. H. Scudder, of Boston, Mass., from whom I received a reply, stating that, after comparing the drawing and wings with specimens of P. Rapæ in the Museum of Comparative Zoology at Cambridge, he saw no reason to consider them distinct; at the same time he desired further investigation to be made respecting the larva and pupa states of the insect. This investigation has been successfully carried out, and places beyond doubt the identity of the butterfly with the English P. Rapæ, thus establishing another instance of the transportation of a lepidopterous insect across a wide expanse of ocean, and its naturalization in a new country,—an instance which, when the evidence is considered, must be regarded as the most conclusive on record.

The identity of the English and Canadian species is thus proved by the exact similarity of the two insects in all their stages. That the imagines are alike in both sexes, I have on the authority of the gentlemen above named; for in Quebec I could have no opportunity of

comparing specimens taken in both countries. It is singular, too, that a curious variety of the male is common to both; in Canada, however (perhaps from the effect of a different climate), it is more frequently met with than in England. Two males of a bright canary colour, but with the usual markings of the species, were captured here last summer, one by Mr. Couper, the other by me; and this season I have already seen several similar individuals. On referring to a valuable work in the library of Parliament (Curtis's 'Farm Insects'), I was gratified to find that the author mentions having in his collection a male P. Rapæ, "taken near Oldham, in Lancashire, which had all the wings of a bright yellow colour." As to the pupa, in size, colour and markings, it exactly agrees with engravings and descriptions of the English chrysalis, and also in its usual place of deposition, &c. The last link in the chain is furnished by the similarity of the caterpillar, which also agrees with the best English descriptions. I took several of these larvæ from cabbage-plants in hot-beds on the 8th of June, and have reared four of them to maturity. When about half-grown they began to exhibit the characteristic markings of the species, these markings becoming more decided as they increased in size.

That this insect is not native to Canada is certain from two interesting circumstances connected with its history. A limit can be set to its existence in Canada, and the place where it first appeared can be specified. Until within a few years the butterfly was unknown in this country. No description of it is found in Kirby's 'Fauna Boreali-Americana,' nor in 'The Canadian Naturalist,' by Gosse, who visited Quebec, and collected here about 1839. The 'Synopsis' of the Smithsonian Institution is also wanting in this respect; and I have carefully examined the volumes of our Magazine of Natural History ('The Canadian Naturalist,' Montreal), without finding any notice of the species. This periodical contains two lists of Lepidoptera collected in Lower Canada; one by Mr. R. Bell, jun., of butterflies taken on the Lower St. Lawrence; the other by Mr. D'Urban, of those found in the vicinity of Montreal, in 1857, 1858 and 1859. The only Pieris mentioned in these lists is P. oleracea, a species which may be distinguished at a glance from P. Rapæ, the markings being altogether different. Mr. Couper captured a specimen of P. Rapæ within the city limits of Quebec, about five years ago, but did not investigate the subject, though considering the insect a rare one, his special study being Coleoptera. This is the earliest notice of the butterfly in Canada; and it evidently points out Quebec as the locality of introduction, and fixes the period at about seven or eight years ago.

With respect to the means by which it has been brought into the country, some plausible conjectures may be advanced. Of course the introduction took place during the season of navigation. The turnip, cabbage and other kindred vegetables constitute the principal food-plants of the insect; and, adhering to one of these, it must have been carried across the ocean, either in the egg, larva or chrysalis; the last being the most unlikely, as the larva always forsakes its food-plant, and becomes a pupa in some sheltered situation, usually under the coping of a wall, &c. The eggs are laid on the under side of cabbage and turnip leaves, where the larvæ, on emerging, find themselves in close proximity to their food. Perhaps the vegetable refuse thrown from one of our ocean steamers on her arrival has contained a few eggs or larvæ, which, under these unfavourable circumstances, have retained their vitality; and from those have sprung the imagines destined to become the parents of the species in Canada. The habitat of the insect is still very limited. After making inquiry, I do not think it has extended more than forty miles from Quebec as a centre, so that a circle of eighty miles diameter would include the present habitat. This may seem great progress during the short period of its naturalization, but, considering the fecundity and habits of the species, it is not surprising.

There is some importance connected with the introduction of this butterfly, apart from the scientific interest of the subject to entomologists. Hitherto Lower Canada has possessed but one species of the genus Pieris (P. oleracea, *Harris*, Pontia casta, *Kirby*), and this species so insignificant in numbers, at least in the Quebec region, that its depredations have passed unnoticed. The new importation, however, must be regarded in a different light. As the insect is now permanently settled in the country, is very prolific, and the larvæ extremely voracious, we may anticipate its becoming a great pest to farmers and gardeners, not only where it is now found, but ultimately in the whole of Canada and parts of the United States. And that it will, in the course of time, spread over these regions admits of no doubt. The food-plants of the species are cultivated in every part of the country, and besides the insect has the power of accommodating itself to altered circumstances. Mr. Curtis, in the work before mentioned, states that the caterpillars have been found feeding on the willow, and on mignionette, nasturtiums, &c. It is, therefore, probable that its progress westward will not be impeded by the scarcity of its favourite food in certain localities, but that it will overcome all difficulties of this nature by resorting to other plants, not confining itself to the Cruciferæ.

Last autumn, in the vicinity of Quebec, the ravages of these larvæ were very great. Large plots and even fields of cabbages, cauliflowers, &c., were completely destroyed, the caterpillars only rejecting the strong supporting ribs of the leaves. Serious loss was thus occasioned to market gardeners and others. One informed me that he had sustained a loss of more than 200 dollars by their depredations; another that nearly the whole of his crop of cabbages was destroyed, the small portion saved requiring to be carefully washed before being sent to market. A gentleman also told me that they had not only eaten up his garden produce, but had demolished a bed of mignionette, even to the stalks.

Nature has provided more than one means of checking the increase of the species. The chrysalis is attacked by a parasite (probably one of the Ichneumonidæ), as several collected by me this spring gave evidence. Large numbers of the pupæ are also killed by the frost, where they have been placed in exposed situations, and thus the spring brood of butterflies is materially lessened. I noticed a singular circumstance connected with these winter pupæ. Living chrysalids, brought into the warm house from the cold outside, invariably shrivelled and died in a few days. Out of many that I gathered during last winter not one produced a butterfly.

Last year the species was exceedingly abundant in the neighbourhood of Quebec, flying by hundreds over the fields and gardens, and even in the most crowded parts of the city; and this season it promises to be equally numerous. Early in March, the butterflies began to appear in houses, from pupæ which had been suspended on the walls during the previous autumn. On the 6th of April, at Laval, about fifteen miles from Quebec, several specimens were taken in the open air, and on the 26th of May I counted more than fifty individuals, met with on about a mile of road within a short distance of the city.

Considering their great abundance within their present habitat, and their prospective dissemination over the province, it is desirable that information respecting the appearance and habits of these insects should be given to the public, and means devised for their destruction. Farmers and gardeners should kill every caterpillar on their turnips, cabbages, &c., and be provided with nets to capture the perfect insects. The chrysalids should also be sought for on fences during the fall and winter, and destroyed. Unless these precautions be taken, the injury caused by this butterfly to the green crops in Canada may become very serious.*

* From 'The Canadian Naturalist,' New Series, Vol. i. No. 4, p. 258.

[There is something as unusual as it is praiseworthy in the manner in which Mr. Bowles has worked out this interesting subject: I lay no stress whatever on the theory suggested for the introduction of the species; nor do I regard, as worth much consideration, the fears expressed as to its increase to any injurious extent, since that has never been the case in this country; neither has its congener, Pieris Napi, ever ventured much beyond its natural food-plant, the water cress, and has never, to my knowledge, touched any of our cabbages. The interest attached to this paper is of a purely scientific character: we see an immense region in which the species is unknown; we see the species accidentally introduced, at first appearing sparingly, then increasing gradually, then rapidly, and eventually becoming so abundant as to excite fears for the crops. This, of course, suggests the idea of other introductions. That a species should have two or more centres from whence it originally diffused itself is highly improbable, unless it were assisted by some human agency. We have several species which present this *primâ facie* improbability; for instance, Vanessa Antiopa, V. Atalanta, Cynthia Cardui, Bombylius medius, B. minor, Allantus ater, Bombus Sylvarum, B. terrestris, &c., and the carefully elaborated history of Pieris Rapæ (now before us) certainly suggests the idea that all these may be also colonists, although colonists of an earlier date: the subject is one which requires and deserves the most careful investigation. It is a well-known fact that some plants, as well as insects, are cosmopolitan, and as the former are certainly in course of introduction into new localities, it is by no means improbable that insects accompany or follow their introduction. If this be so, we have as feasible an explanation of the presence of Pieris Rapæ and Vanessa Antiopa in Canada as of our commonest weeds in New Zealand and at Adelaide.

A second question of no less interest arises out of the first. Does any perceptible difference exist between the European and Canadian individuals? and if so, does the difference increase or diminish? The bearing of these questions is obvious; if a difference is originated and continued when a European species establishes itself in America, or an American species in Europe, and becomes something different from its progenitors, we have a first step towards the establishment of a new species; the value of the differences will be in accordance with their constancy rather than their amount.—*Edward Newman.*]

Proceedings of Societies.

Entomological Society.

November 7, 1864.—F. P. Pascoe, Esq., President, in the Chair.

Presentation to W. W. Saunders, Esq.

Prior to the scientific business of the Meeting, a handsome silver vase was presented by the President, on behalf of numerous Members of the Society, to W. Wilson Saunders, Esq., F.R.S.; &c., in acknowledgment of the generous aid which for years he has bestowed upon everything tending to advance the Science of Entomology, and in recognition of his unvarying kindness and the constant and liberal support which he has given to the Society.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—'The Journal of the Royal Agricultural Society,' Vol. xxv. Part ii.; presented by the Society. 'Mémoire sur le Pou à poche blanche;' by the Author, M. E. Icery, D.M.C.P. 'Corynodinorum Recensio;' by the Author, the Rev. T. A. Marshall, F.L.S. 'The Zoologist' and 'The Entomologist' for November; by the Editor. 'The Entomologist's Monthly Magazine,' No. 6; by the Editors. 'The Journal of the Society of Arts' for October; by the Society. 'The Reader' for October; by the Editor. 'The Athenæum' for October; by the Editor. 'Stettiner Entomologische Zeitung,' Vol. 25, Nos. 10—12; by the Entomological Society of Stettin. 'Amtlicher Bericht über die 38ste Versammlung deutscher Naturforscher in Stettin im September, 1863;' by Dr. C. A. Dohrn. 'Report of the Commission appointed to enquire into the causes of decay in Wood Carvings, and the means of preventing and remedying the effects of such decay;' by Professor Westwood.

Exhibitions, &c.

Mr. Janson exhibited four species of Coleoptera belonging to Mr. Joseph Sidebotham, of Manchester, and all new to the British list. They were (1) Ceuthorhynchideus Poweri, *Rye*; two specimens taken by Mr. Sidebotham in Silverdale, near Lancaster, between the 14th and 18th of May, 1864, most probably by sweeping on the borders of the woods near the shore; (2) Lixus filiformis, *Fabr.*; a single specimen (at first taken for L. bicolor) captured by Mr. Sidebotham by beating the oak or birch in a wood on the side of Roundney Hill, near Devizes, early in June, 1864; (3) Sybines canus, *Herbst*; two specimens taken by Mr. Sidebotham, by sweeping, in a lane between Devizes and Pottern, early in June, 1864; (4) Peritelus griseus, *Oliv.*; several specimens were collected at Ventnor in April, 1864, by Mr. Wainwright, probably by shaking herbage upon a sheet of paper, in which manner some bottles full of Coleoptera had been obtained by that gentleman.

Mr. F. Smith exhibited three males and a female of a Bombus new to Britain, the Bombus pomorum of Panzer: the males were captured some years ago, and had been placed in his collection as a variety of another species; the female was the specimen exhibited at the Meeting in June last (*ante* p. 26), and was captured at Deal.

Mr. Edwin Shepherd (on behalf of Mr. S. Carter, of Manchester, who was present as a visitor), exhibited three males and a female of Sesia spheciformis, *W.V.*, bred from pupæ found in the stems of alder-trees in the north of Staffordshire.

Mr. W. W. Saunders exhibited some galls which he had found in making an ex-

cavation at the foot of an oak about a month previously; the galls were attached to the root of the tree, but were not in clusters, and were at a depth of four feet below the surface; each gall contained two or three larvæ, and during the last few days five specimens of the perfect insect had gnawed their way out; at first a very small hole was visible, through which, when it had been made large enough, a mandible was pushed; the insect continued its gnawing, an antenna was soon protruded, and gradually a perfect Cynips emerged. The whole of the five specimens were females, and he believed that the whole brood would prove to be of that sex. These phenomena suggested several queries not capable of easy answer: in the first place, how does the Cynips make its way to the surface through the four feet of sand or earth which lies above it? Secondly, how does the parent manage to lay her eggs so deep in the ground? Thirdly, how long are the galls in process of formation? Fourthly, it would seem highly probable, from the observations of foreign entomologists on allied species, that in Cynips aptera (to which the exhibited specimens were very nearly related if not identical therewith) the male comes out in the spring, and in the spring only, whereas here was a brood of females emerging in October. Another peculiar circumstance was that the flies, since their escape from the galls, had made, in the box in which they were confined, a web of considerable tenacity, not unlike that formed by the larvæ of certain Lepidoptera.

Mr. F. Smith considered the specimens exhibited to be the Cynips aptera: in Bishop's Wood the galls might be obtained in any quantity, and he had himself reared hundreds of the fly, but all the specimens were females; he had collected them at all times of the year, and never saw a male: so far as he was aware, a male Cynips (*i. e.* of the true genus Cynips of Hartig) had never been observed.

Professor Westwood said that the males of Cynips were described by American authors; the occurrence of an autumn brood consisting of females only had also been noticed, and to the phenomenon of one sex in one brood and the other in another the term "dimorphism" had been applied. The spring brood, however, was said to yield both males and females; the theory was that the females of the autumn brood were agamous, but laid eggs,—that it was a case of parthenogenesis,—but that those of the spring brood were fertilized in the ordinary manner by contact with the male.

Mr. W. W. Saunders exhibited three other kinds of gall which he had found during a recent trip to Switzerland. The first was found on a glaucous-leaved willow, and occurred near the Lake of Brienz: it resembled a small fir-cone, or might even be likened to the flower of a Centaurea: no larvæ were discovered, but traces of their action were visible, and the cause of the excrescences was doubtless a Cynips. The second kind was found in July near Coire, where a dwarf and stunted species of willow was covered with red berries, looking like so many red currants; these also were doubtless due to a Cynips. The third kind was formed on the beech, and was an indurated conical gall, so hard as with difficulty to be cut with a knife, but nevertheless made on the leaf of the tree; it was hollow, with a large flat base in which the larva nestled, and was found at Ragatz and at Interlaken, and in other parts of Switzerland, in July and August.

Mr. Stainton exhibited a gall found on the oak near Bath, the exterior of which was of a woolly texture and of yellowish colour.

Mr. Stainton also exhibited copies of the twenty-one plates designed to illustrate Messrs. Douglas and Scott's forthcoming volume on the British Hemiptera-Heteroptera.

Mr. F. Smith (after mentioning that in a previous letter Mr. Stone had informed him that he had noticed a number of workers of the common wasp busily engaged in carrying young grubs out of the nest) read the following extracts from a letter addressed to him on the 4th of November, 1864, by Mr. Stone:—

"You ask why were the workers of Vespa vulgaris carrying out the young grubs? I have no doubt whatever that it was in consequence of the grubs having become from some cause or other in a diseased and sickly state; they appeared to be carried to a distance and then dropped, just as is the case at the close of the season when the communities break up. There was a nest of Vespa Germanica close by, and my first impression was that it was by the workers from this nest that the grubs of V. vulgaris were being removed, in order to feed their own larvæ upon them; but having caught several as they emerged, each laden with a grub, I found that that was not the case, but that they were unquestionably the legitimate occupiers of the nest at which they were captured. This nest became a ruin before the end of August, and that of V. Germanica shortly afterwards, thus proving that disease of some kind had attacked both communities.

"Of the sixteen nests of Vespa sylvestris which I obtained, one was situated in the thatch of an out-house, one was suspended from the roof of a temple dedicated to a certain goddess who shall be nameless, one was suspended just inside a rabbit burrow, and the rest were built in a variety of holes in the ground, mostly in banks by the side of ditches or streams of water; several were in holes I had myself formed in banks. Whatever hole they may select they invariably place their nest nearer to the entrance than the other species of underground wasps. In the majority of cases which have come under my observation the nest has in fact been exposed to view, without the trouble of digging for it.

"On opening some closed-up cells appropriated to queens or females in a nest of Vespa vulgaris, I found one larva and one pupa differing in nothing that I could perceive from those of Ripiphorus contained in the cells appropriated to workers, except that they were something like double the size, in fact about as much larger as a full-grown larva of a queen-wasp is larger than that of a worker. Are there two species of Ripiphorus, or a large and a small variety? or if only one, would the large specimens above-mentioned (which I have preserved in spirits) produce Ripiphorus as it ought to be, and are those found in the cells of worker-wasps only starved examples of the beetle?"

Professor Westwood replied that there was but one species of Ripiphorus, the well-known R. paradoxus; there was, however, considerable difference in the size of the sexes, and it would be a singular result if it should turn out that female wasps produced female Ripiphori, whilst the workers produced the males. Since the different food supplied to wasp-larvæ determined whether they should become females or workers, it seemed not impossible that the sex of the parasitic Ripiphorus should depend upon whether its larva fed on queen-larva or worker-larva. With respect to the disease amongst wasps mentioned by Mr. Stone, it was probably akin to the disease amongst bees known as "foul brood:" the cause of this malady was unknown, some supposing that it was attributable to the brood having become chilled, others regarding it as a sort of cholera. But whatever the cause, there was no doubt as to the malignity of the disease: if a hive once became infected, it attacked the honey therein, and bees fed on that honey during the winter became also diseased. The hives of so experienced a bee-keeper as Mr. Woodbury were not free from this plague.

The Secretary observed that it might not be uninteresting to the Society to hear from time to time of the welfare of the various provincial Societies which had been founded with an object identical or cognate with our own. He had recently had the pleasure of assisting at the opening of an Exhibition of Objects of Natural History, held under the auspices of the Huddersfield Naturalists' Society. Mammals, birds and their nests and eggs, reptiles, fishes, mollusks, insects, herbaria and geological specimens, were contributed by upwards of sixty local exhibitors, the majority of whom were persons gaining their livelihood by manual labour. The stuffed birds formed perhaps the most prominent feature. The insects consisted of eight cases of Coleoptera belonging to four exhibitors, seventy cases of Lepidoptera belonging to ten exhibitors, and ten cases of miscellaneous insects belonging to seven exhibitors; nearly all were indigenous species; one or two curious hermaphrodites were shown (a very complete one of Liparis dispar), and several of the cases contained singularly beautiful varieties of Arctia Caja, Abraxas Grossulariata, and others of the commoner Lepidoptera, which varieties had for the most part been bred by the exhibitors, from the larva. He was informed that the exhibition had been visited by hundreds daily, and had proved a success both financially and otherwise.

Mr. C. A. Wilson, Corresponding Member, under date of Adelaide, August 26, 1864, sent the following:—

Notes on South-Australian Entomology.

"The following is a statement of the comparative number of species of each order of insects found in the Colony of South Australia, and also of the principal families of Coleoptera. Additional species will be continually found in parts which are now for the first time becoming occupied. We are pressing forward both on the eastern and western sides of this continent. By public and private enterprise the country north of Champion Bay is now in the act of being made known. With the aid of the Queensland Government, that to the north of Rockhampton on the north-east coast, up to Rockingham, is also being colonized. Still further on the northernmost part, or Cape York, shooting far away towards the equator, a settlement is being formed by parties from England. And, lastly, by our own Government, the north-west coast near Arnheim's Land is now being surveyed for future occupation, in the neighbourhood of the spot where Stuart's small but adventurous band first saw the ocean after their passage through the till-then-unknown interior from Adelaide. This will still leave almost entirely untrodden the vast tract of country between Arnheim's Land and the Queensland territory, passing by the south shores of the Gulf of Carpentaria, in returning from which the lamented Burke and his party lost their lives; also the equally untried country between the boundaries of our province and that of Western Australia, the northern and central parts of which will probably long remain a sealed book, though the time doubtless *will* come when the unknown shall be so no longer either to the explorer or the naturalist.

"What all these vast tracts will present to us of animal life, in addition to what is already known, it is of course impossible to say, though pleasant to speculate upon. Already from the neighbourhood of the Darling River, north-east of Adelaide, and from Western Australia, various small and quite new species of the Marsupialia are being forwarded to the Curator of our Museum, and new birds, reptiles and insects will follow.

"In a rough but carefully-weighed estimate, after an acquaintance of many years with the insects of this colony, I have come to the following conclusions. Taking the

number 20 for the Coleoptera, which have more admirers and have been more carefully collected hitherto than any other order, the relative value of the seven principal orders of insects in South Australia is as under:—

	Relative number of species.
Coleoptera	20
Hymenoptera	11½
Lepidoptera	6½
Diptera	4½
Hemiptera and Heteroptera	2
Orthoptera	1
Neuroptera	½

"The remaining orders, Thysanoptera, Aphaniptera, &c., have as yet yielded so few species (of Strepsiptera, I believe, no species has yet been found) that I do not notice them here. The number of the Coleoptera would be more nearly attained by each of the three orders which immediately follow, if the latter were more looked after, as in a few of the families of each there are hundreds of minute insects. In the list just given, the Hymenoptera are principally supported by the families Ichneumonidæ and Apidæ; the Lepidoptera by the numerous small moths; the Diptera by the Muscidæ; the Homoptera by the Cercopidæ; and the Orthoptera by the Locustidæ. With the exception of the last, this seems much the same as in European countries.

"The collections of Coleoptera in the Adelaide Museum, in Mr. F. G. Waterhouse's private cabinets, and my own, include by far the greatest number of known South-Australian species. These, with several other small collections, give the following as (in round numbers) the now-known species of Coleoptera and of the seven most numerous families:—

Total number of South-Australian Coleoptera, (say) 5000 species.

These in a few years will probably be nearly doubled.

Principal Families.	Number in Collections.
Curculionidæ	About 600 species.
Chrysomelidæ	„ 450 „
Buprestidæ	„ 300 „
Cerambycidæ	„ 250 „
Carabidæ	„ 200 „
Melolonthidæ	„ 100 „
Helopidæ	„ 100 „
	2000"

The Secretary, after mentioning that the subject of Dr. Icéry's 'Mémoire sur le Pou à poche blanche' (of which a presentation copy was on the table) was identical with the sugar-cane-infesting Coccus of which specimens were exhibited at the June Meeting of the Society, read a translation of the 'Mémoire.' The following are abridged extracts therefrom:—

"*The Eggs and the Larvæ.*—When the insect, improperly called a 'louse,' is examined on the plant where it has fixed itself, two distinct parts may be remarked, different in consistency and in colour; one, somewhat flattened transversely, of oval form and of a brown shade, is the insect itself; the other, rounded, formed of a sort of silk or white wool, constitutes the envelope of the pouch which secretes a considerable quantity of very small yellowish grains, adhering together by means of a filamentous substance similar to that which forms the envelope of the pouch. This substance, to which a sugary taste has been attributed, seems, on the contrary, to be very irritating; placed on the mucous membranes it excites a violent inflammation. The small yellowish grains are the eggs, the number of which is variable, according to the more or

less favourable conditions attending their production. They are of oval shape and ·28 of a millimètre in their longer diameter. The mean quantity found in a pouch cannot be estimated at less than 100 to 125. The hatching of the eggs begins at the periphery of the pouch, the circumference of which is soon afterwards torn by the first larvæ which appear. The gnawing of the pouch by ants, which are greedy in pursuit of it, rapidly effects the exit of the young 'lice' and their dispersion over the surrounding parts. It is only at the end of several days that all the larvæ have burst through the filamentous matter, and abandoned the pouch which sheltered them. At this time, the mother is almost dried up and looks like a brownish scale. At the moment of detaching itself, the larva is still surrounded by a film of the filamentous substance, which by its lightness and the surface which it opposes to the breeze easily explains the carriage of the insect for great distances by means of currents of air. Its oblong body is from front to back ·4 millimètres in length; with three pairs of long and slender feet, the tarsus of which is formed of five joints, and ends in a sort of claw which issues from between two long hairs. The abdomen at the posterior and median part has a deep slit, which passes beyond two small tubercles, on which are implanted two long filaments directed horizontally backwards, and which have a slight curvature. The head has on either side a round and prominent eye, and is armed with two long antennæ bristling with short and slender hairs. This larva is scarcely perceptible to the naked eye; it requires a strong lens to see it distinctly. As soon as it leaves its mother's pouch, it seeks a place suitable for fixing itself. It is curious to see the activity which these small animals then display; as quick in their movements as ants, they run from side to side, and spread themselves over the neighbouring leaves, which they seem to study with care until they meet with the wished-for conditions for establishing their new abode.

"One remarkable circumstance peculiar to this insect is, that instead of improving as it is developed, as takes place for the most part with other larvæ, it on the contrary gradually loses its primitive qualities, and at the end of some days transforms itself in a manner not easy to be known again. Its tail and antennæ fall off, its feet waste away, its head becomes less distinct, its body grows round; and soon, incapable of performing the slightest motion, it presents itself under the guise of a small whitish and transparent body adhering closely to the leaf on which it has fastened itself. This transformation, at one time slow, at another rapid, is dependent on the greater or less facility which the larva meets with in finding a favourable locality, the object of its active search. Thus withered leaves, exposure of the plant to a current of air, are causes which retard the transformation; whilst a suitable exposure, tender and green leaves, on the contrary, have the effect of making it more rapid. But, in any case, it is only at the end of several days that the larva begins to undergo the modifications of which we have just spoken.

"Another particularity worthy of remark, and which is of paramount interest to us, is the resistance which this larva offers to the ordinary means of destruction likely to reach it. I have plunged it in water for twenty to thirty minutes, and at different times, without being able to kill it. As soon as it had freed itself from all moisture it resumed its habitual mode of procedure, and seemed to have lost none of its agility. And what is astonishing, acetic acid (concentrated vinegar) and ammoniac acid are equally powerless over it. Alcohol, on the contrary, acts on the insect with fatal promptness. To kill it, it is sufficient to touch it with the tip of a point which carries a small drop of spirits of wine. This property might be made use of in opposing the insect, by employing, to wet the leaves of the young canes which are attacked, the fermented

liquids which it is so easy to obtain in every manufactory. Strongly odoriferous substances and oil of naphtha, mixed in small quantities with liquids of inferior quality, may also be utilized in the same manner, and render excellent service. The sulphurous solution, which is obtained when a mixture of sulphur and lime is boiled in water, would likewise produce a favourable result in destroying the 'louse,' if it were applied on a large scale. These are different substances, all injurious to the insect, capable of easy employment, and to which it is sufficient for me to call attention.

"I was unwilling to speak of the larva without indicating summarily the means which have appeared to me the most suitable for opposing it; because it is at this period of its existence that it can be profitably and easily got at; later on, the remedy will have lost its chief quality, that of preventing the adherence of the insect to the leaf, and the mischief will have already been done.

"*The Female.*—The female is the 'white-pouched louse,' in the most general and common acceptation of the term; it is she, in fact, that has been so designated, and it is she only with which the planters are acquainted. She appears ar first on the leaves of the sugar-cane like a white dot, of a size and transparency such that she escapes a rapid examination, even by persons accustomed to recognise her. The hinder half of the body is surrounded by a white circle formed by the secretion of the filamentous wool which always precedes oviposition and accumulates as the eggs are laid.

"Three weeks are generally sufficient for the accomplishment of the laying of the eggs. The hatching soon follows; and the young 'lice,' before quitting their nest for good, often return under the roof offered them by their mother, whose body, even after death, still shelters and protects them. The feet of the female insect disappear or wither away, and later on dry up in contact with the abdomen, where they may be found for a long time in the form of yellow and tough fragments. No trace exists of the antennæ and tail, and the eggs are indicated only by two very small black dots placed on either side the head, which merges in the body. The general form of the insect is then elliptic, flattened on the abdominal side, and projecting from front to rear on the median dorsal line. At its circumference the body, except in the rear, where there is a deep slit, is thin and armed with filaments which serve to make it adhere firmly to the leaf of the plant. In front these filamentous appendages, to the number of four or five, often acquire a considerable length, and are doubtless designed to facilitate suction. The mouth is a snout (*une trompe*), which extends beyond the head and bends downwards; I have not been able to analyse the different elements of which this snout is formed. The digestive tube, which runs from the mouth, ends in front of the posterior abdominal slit in a sort of *cloaca*, a vast cavity which affords an outlet for the excrementatious matters and the eggs. The abdomen is covered with transverse folds, which become very manifest, and execute concentric intermittent movements during the whole duration of the egg-laying. The whole abdominal tegument is furnished with glandular follicles, designed for the secretion of the white matter; that of the back is, on the contrary, perfectly smooth. On each side of the anterior part of the body may be seen a pair of orifices communicating with some transverse conduits, which inside divide themselves into branches; these are the stigmata and air-bearing canals, which constitute the respiratory apparatus of the insect. The small round bodies disposed in pairs on the lateral parts of the abdomen show the nervous ganglions, of which three very distinct pairs may ordinarily be recognized. The female is apterous.

"It may be remarked that the female, however different its aspect from that of the

larva, does not undergo what is conventionally called a complete transformation; it is quite different with the male, which after the first modification experiences a complete metamorphosis. As soon as the female has adhered to a leaf, plunging into it its sucker and its filamentous appendages, she provokes in the nutritive functions of the plant a disturbance which is the more manifest as the vegetation is less active. Thus, as I have said above, the best remedy will be that which reaches the larva, or at least the female, before the latter is closely fastened to the plant upon which she has established herself.

"*The Male.*—The larva from which the male proceeds is not distinguishable from that of the female on its exit from the cottony down which forms the mother's nest. The similitude of all the young ones has always appeared to me to be perfect up to the moment when the fall of the antennæ and of the tail indicated the beginning of the modifications which the insect was about to undergo. In this stage, the male larva is denoted by the slightly brown coloration which it puts on, and the rigidity which contracts its teguments. Whilst the female grows rapidly, preserving for a long time its primitive white colour and its transparency, the male seems to progress less quickly, and in some days becomes hard and blackish. It is then found fixed at intervals on the leaves, looking like a dot whose very decided colour at once reveals its presence. Examined with the microscope, it exhibits the structure already described as that of the female, but the whole of its tegumentary envelope is nothing more than a shell, which harbours in its median part a small gelatinous and transparent body, whose rings, head and tail recall the larva of the Lepidoptera; this is the larva of the male 'louse,' which soon veils itself (*se voile*), increases in consistency, becomes of a deep brown and changes to the nymph. When the male has undergone its metamorphosis, it pierces the shell and emerges from it by a hole contrived about the centre of the envelope. It is a very small winged insect, 1½ millimètre long, of thin and elegant form, with rapid and abrupt movements; its body is of a beautiful metallic black, its thorax has a large green disk, and its wings present brilliant red and violet reflexions when the light of a lens is projected obliquely upon them. Its head is adorned with facetted eyes, and with two antennæ, which are relatively long and stout, formed of seven joints. It has three pairs of feet, whose tarsi are surmounted by a sort of slender spur. The tarsi are formed of five joints, and the first of these joints is as long as the four others taken together. Its wings, which are membranous throughout their whole extent, are four in number, and overlap each other laterally. The wings of the first pair are much larger than those of the second pair, which they overlie on all sides. The posterior part of the abdomen presents an orifice with whitish edges, and by the side of it is found a retractile projection surrounded by some long and rigid hairs. This little insect ordinarily remains on the plant where the females have fastened themselves, and uses its wings only to skip short distances. Scarcely has it quitted the shell in which its metamorphosis has been produced than it runs rapidly over the leaves which bear the females, and, passing them in review successively, approaches each of them, performing each time regular and uniform movements. With head erect, wings half spread, and abdomen bent down behind, he hastily mounts the back of the first female he meets, and after stopping there an instant, he faces about, and with equal ardour rushes upon each of the females who may be nigh. The number of males is much less than that of females; I believe that the males do not form more than the tenth part of a whole brood.

"The characters enumerated above induce me to arrange this insect in the order

Hemiptera, and to place it amongst the Homoptera in a genus of the family of Gall-insects. I would propose to call it Gasteralphe, a name which perfectly designates the most prominent peculiarity of its external form."

Professor Westwood remarked that it was perfectly clear, from the description and from the plates, that the insect which Dr. Icéry supposed to be the male of the Coccus was not a Coccus at all; it was a species of Coccophagus, a Hymenopterous (Chalciditic) parasite upon Coccus. The female described was doubtless a true Coccus, the male of which was, he presumed, still unknown. The action which the author had mistaken for the impregnation of the female Coccus was, in fact, the deposition of the eggs of the female Coccophagus in the body of the Coccus. Dr. Icéry's observations on the effect of different fluids on the larvæ were very interesting, particularly as to the powerlessness of water and the rapid action of spirits of wine, which might be explained by the fact that the downy matter surrounding the larvæ, being of the nature of lac, was insoluble in water and soluble in spirit.

Mr. W. W. Saunders mentioned that for some years he had used spirits of wine in his greenhouses for cleansing plants and clearing them from insects; he mixed the rectified spirits and pure water in equal proportions, and this mixture, which was found to answer better than undiluted spirit, was applied with a brush. It was very efficacious in the destruction of the common mealy bug (especially when young) and other common pests, and he recommended it as worthy of application in the greenhouse generally.

Professor Westwood called attention to the Report of a Commission which had been appointed by the Committee of Council for Education to enquire into the causes of decay in wood carvings, and the means of preventing and remedying the same. The insects which in this country were found to be the most injurious, from their habit of burrowing into the wood of furniture, were three beetles of the family Ptinidæ, *viz.*, Ptilinus pectinicornis, Anobium striatum and A. tessellatum. Numerous experiments had been made with carbolic acid, chloroform and benzine, specimens of furniture attacked by the worm being submitted to the action of the vapour of these different substances; other specimens were saturated with corrosive sublimate dissolved in methylated spirits of wine. The conclusions at which the Commission arrived were (1), that the action of the worm may be arrested and the worm itself destroyed by vaporization, more especially by the vapour of benzine; (2), that carved work may be completely restored by an injection of vegetable gum and gelatine, in order to fill up the worm holes and strengthen the fabric of the carvings; and (3), that after the worm has been destroyed, further attacks from it can be prevented by treating the carved work with a solution of corrosive sublimate, either in methylated spirits of wine or parchment size, according to the character of the surface of the wood-work; the strength of the solution being sixty grains of chloride of mercury to a pint of fluid, whether methylated spirit or parchment size.

Paper read.

Mr. J. S. Baly read a paper entitled "Descriptions of new Genera and Species of Phytophaga," in which sixteen new species were described, and four new genera established under the names of Euphæne, Sophræna, Nisotra and Glycernia.—*J. W. D.*

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