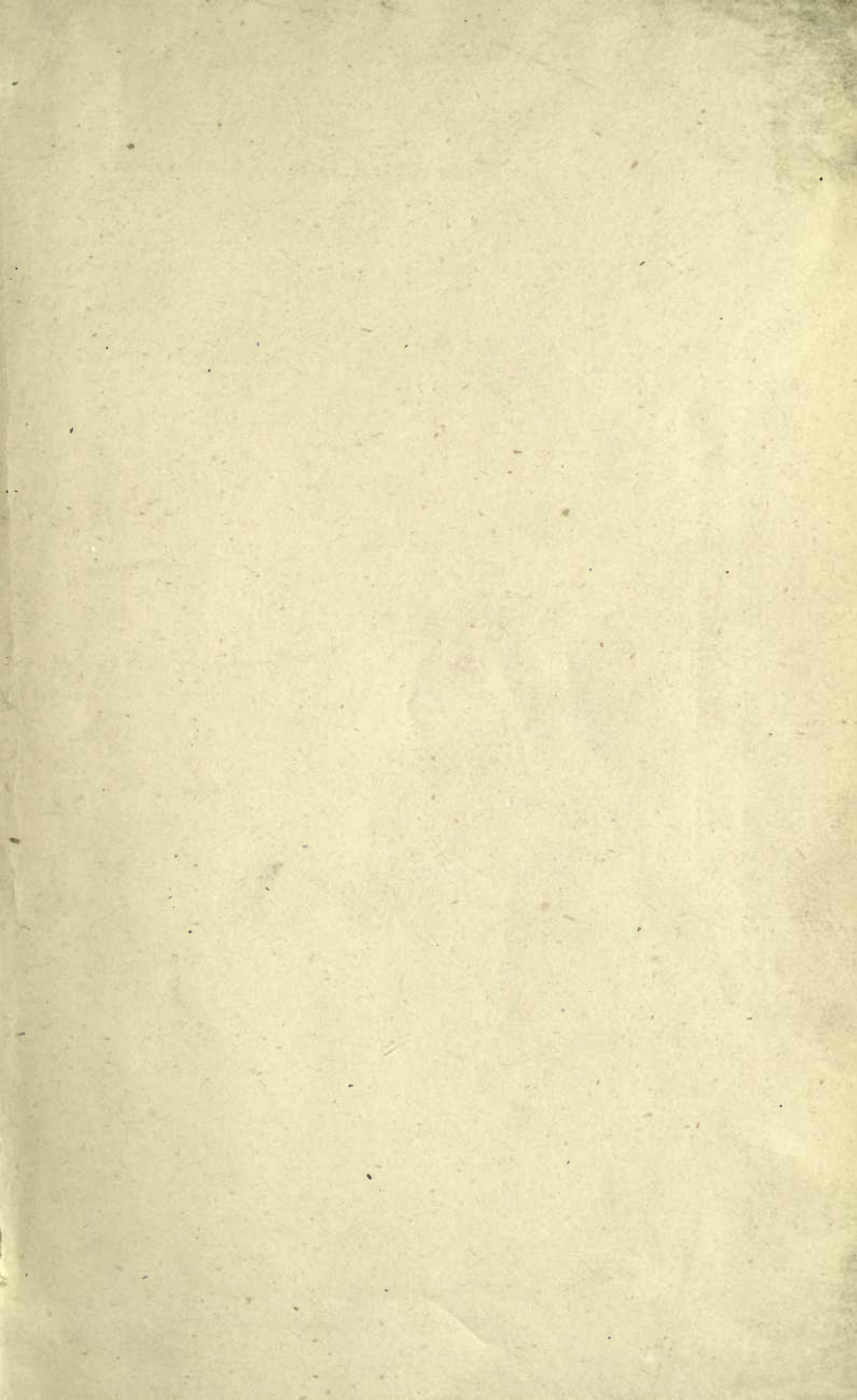
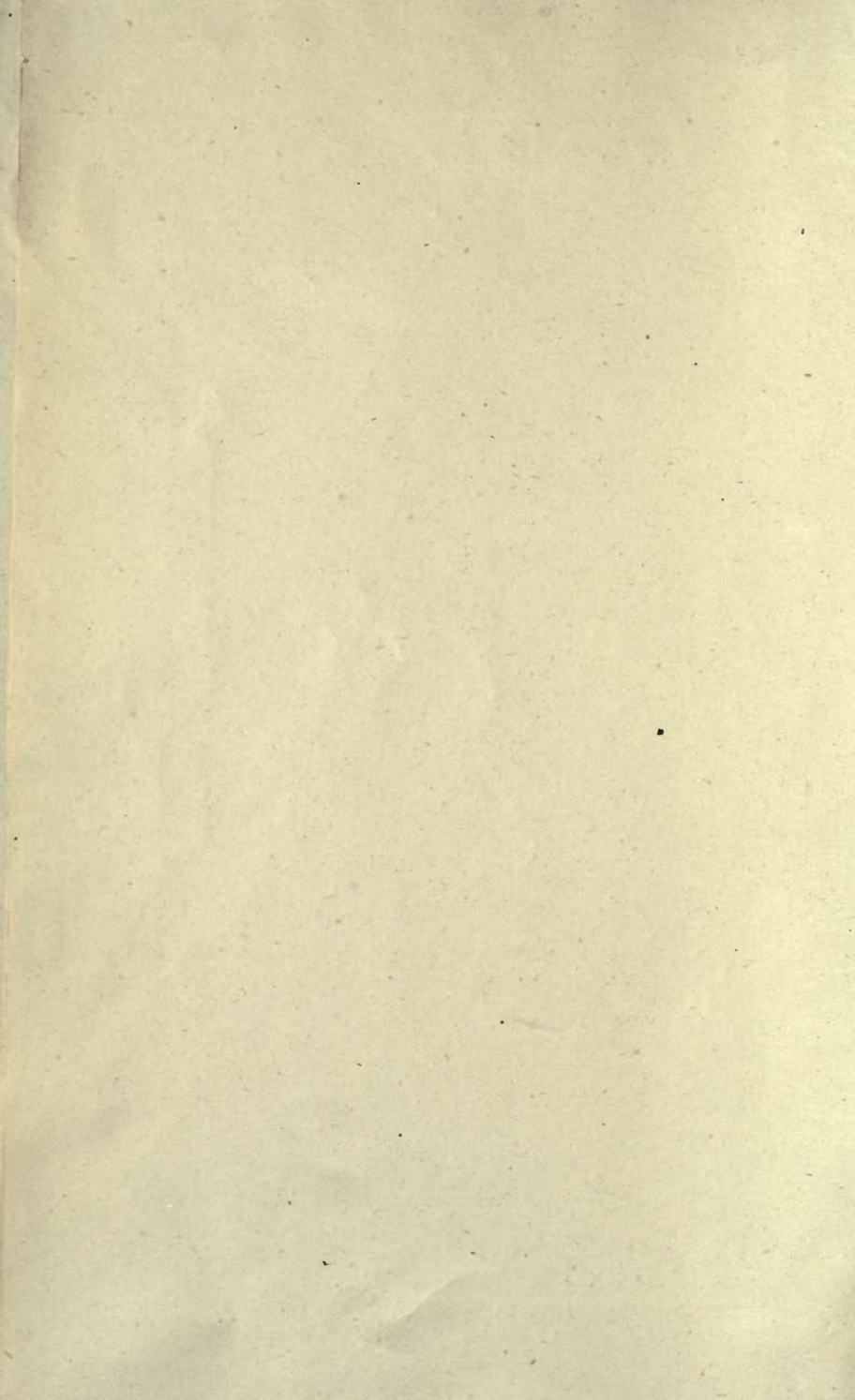




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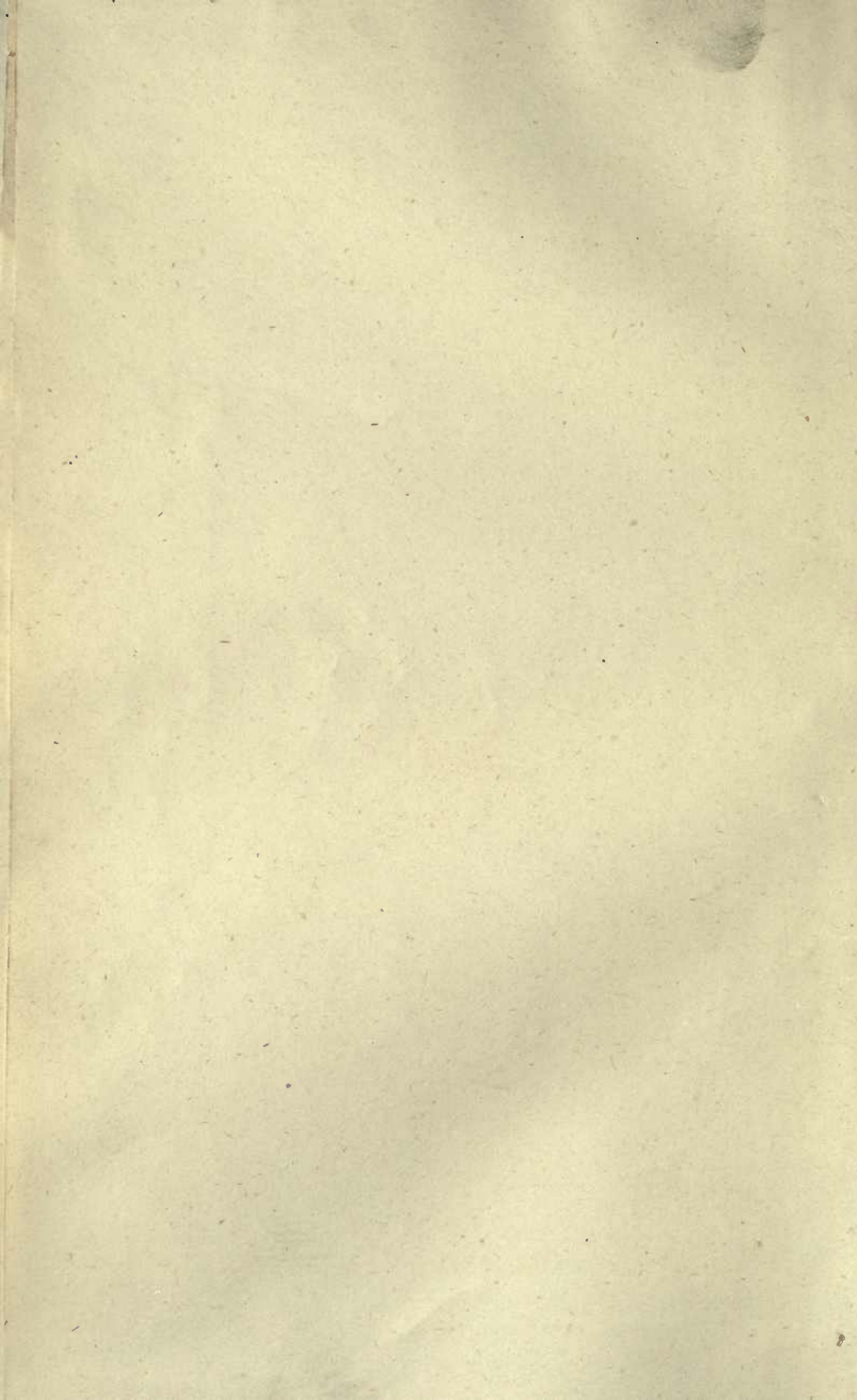


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A
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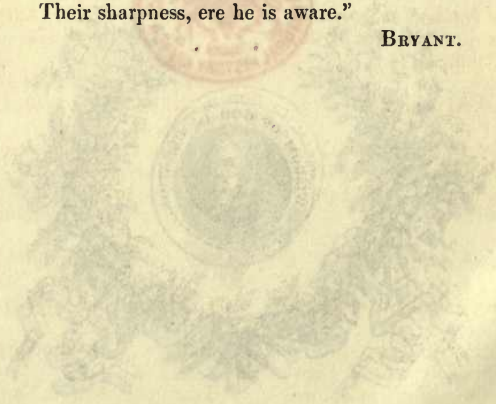


LONDON:
JOHN VAN VOORST, PATERNOSTER ROW.

M.DCCC.LIII.

“ To him who in the love of Nature holds
Communion with her visible forms, she speaks
A various language ; for his gayer hours
She has a voice of gladness, and a smile
And eloquence of beauty, and she glides
Into his darker musings, with a mild
And healing sympathy, that steals away
Their sharpness, ere he is aware.”

BRYANT.



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ADVERTISEMENT.

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THE ZOOLOGIST

FOR 1853.

Subscription for Professor Nees von Esenbeck.

Addressed to the Readers of the 'Zoologist.' By the EDITOR.

THE following circular has been printed, and sent to many of our most distinguished naturalists. The receiver of this will please to regard it as addressed to himself:—

“ 9, Devonshire St., Bishopsgate,

“ January 1, 1853.

“ That eminent and truly philosophical naturalist, Nees von Esenbeck, having been reduced to circumstances of great distress, through being deprived of his Professorship in the University of Breslau, I have the honour to inform you that, with a view to affording him some temporary relief, a subscription has been set on foot, to which I very respectfully and earnestly solicit the addition of your name.

“ The following sums have been received ; and it is requested that further contributions may be sent, either in cash payment, Post-office order, or postage-stamps, to my address, as above ; and the receipt will be acknowledged on the wrappers of the next published numbers of the 'Zoologist' and 'Phytologist,' or in any other way the donor may require. “ EDWARD NEWMAN.”

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The following letter has been received from Professor Nees von Esenbeck :—

“ Breslau.

“ Respected Sir,

“ I have received, with heartfelt thanks, the present which, nobly sympathizing with my misfortunes, and influenced by feelings akin to my own, you have enclosed in your letter.

“ This truly acceptable present not only supplies the pressing necessities of the outward man, but at the same time administers consolation to the spirit within, and gives it assurance that, although lonely and deserted in the land of its birth, and looking around in vain for sympathy there, it yet receives that sympathy from the home of freedom in the human race.

“ I experience a feeling of deep shame in the neglect I have suffered in my own country, as contrasted with the kindness evinced by yours, since it argues that ours is a less noble race, less forward to assist the distressed, less powerful in freedom.

“ When, however, the free man, in the spirit of a brother, offers us his hand, we press it to the heart, as I now, in thought, do yours,

thanking and blessing you. Be pleased to convey these sentiments to those who have, through you, afforded me this consolation and assistance.

“ I am, with sincere respect,

“ Yours most devotedly,

“NEES VON ESENBECK.”

“ To Edward Newman, Esq.,

“ &c., &c., &c.”

Proceedings of Natural-History Collectors in Foreign Countries.

MR. N. PLANT.*—“ San Leopoldo, long. 51° W., lat. 30° S., June, 1852.—Finding that nothing was to be collected from the sandy and treeless neighbourhood of the city of Rio Grande, I embarked on board a boat which was going up the Lagoa dos Patos to the city of Porto Alégre. The sail up the lake was both tedious and devoid of interest for the first day ; but after sunrise the next morning we entered the broad river Guayba, and could see both the banks clothed with vivid green. On the north shore there rolled away into the distance a country of rounded grassy hills ; but on the south side was a broad belt of shifting sand-hummocks, and beyond these a hilly country with scattered trees. I reached the city at the end of December, and after a short stay went upwards to this German colonists' village of San Leopoldo, where I remained till April. It was here that I made the greater part of the collection which has been sent to Mr. Stevens.

“ San Leopoldo lies on the north shore of the little river Sinos (the Bells). It consists of three rows of houses, stretching from the river about 800 yards ; the inhabitants are nearly all Germans, and very few speak Portuguese. Soon after entering this river large trees make their appearance, and a line of wood extends along either bank : beautiful creepers with variegated flowers hang gracefully from the branches of the trees down to the water's edge ; and a dead silence prevails, only broken at intervals by the plunge of a capybara into the gently flowing stream, or the wild song of the boatmen.

“ At San Leopoldo I staid at the house of a kind-hearted Englishman, who taught me how to manage the half-wild horses upon whose backs much of the lives of the native Brazilians seems to be spent. No

* Communicated by his brother, Mr. John Plant.

one cares to walk, even on the most trivial journeys, and I soon discovered that much more could be done in collecting on horseback than on foot, for the difficulties in collecting here require great endurance and strength to keep up under their exhausting nature. One must be up an hour before sun-rise, and after a hasty breakfast of farinha mixed in coffee, saddle the horse and mount him for a ride to the nearest point of the forest, to be on the ground for the early insects. My clothing consisted of a pair of cotton trowsers, a shirt, hat and belt,—nothing more,—no shoes or stockings. I have heard some incredulous people express a doubt about Mr. Waterton's statement that he walked barefooted through the forests of Demerara; but one day's experience in these forests would be enough to confirm full belief in that gentleman's statements. Strapped to my back is a double-barrelled gun, with a pair of pistols in my belt,—according to the reports of robbers and murderers. On one side of my horse hangs the net and stick, and on the other the collecting-box. In this light costume I ride out for nine miles to the forests; dismounting and hobbling the horse so as to allow him to feed, I make my way up a 'picardo,' a road cut through the forest so as to admit three horsemen abreast: and now one soon discovers how impossible it would be to walk with shoes on. Here is a rivulet to get over, and there being no little wooden bridge across it, one must walk through it. Soon after one meets with a swamp, then a bog, and so on all day. No leather, except that sun-tanned hide which Nature has fitted so tightly over our feet, would last an hour of such wear and tear.

“Insects are not to be met with in swarms about the forests; they are as scarce to the sight as in England, and much more difficult to capture: for should you miss securing it by the first stroke of the net, the butterfly is gone out of sight in a moment. It is but rarely that an insect is observed settling upon the ground or on the trees, and Coleopterous insects do not,—as is the case with numbers of species in England,—harbour under stones, moss, or bark; they are only seen on the wing, darting by with great rapidity. The sides of the 'picardo' are a dense mass of foliage, interwoven with a net-work of creeping plants, through which a way must be cut, so that frequently when I have had the chance of a shot at a rare bird, it will take an hour to cut into the 'mato' to the spot where it seemed to fall. I am sure that specimens of birds sell much below their value in England, considering the danger and difficulty there is in shooting them and preparing the skins. The toil in a burning sun, with the thermometer at 96°, even in the shade,—the wearying march through mud

and bog, over ground strewed with thorny shrubs and dead trunks of large trees, which, as you climb over them, sink beneath you in a mass of rotten wood, displaying the nest of a spider as large as your hand (some of which I now send),—the hours of gloomy wandering in the dark forest, where you cannot see ten yards before you for creepers, —and the danger of being lost for days and weeks, as has been my own case, —are enough to enhance the price of the hard-earned specimens.

“Whilst staying at an ‘Estrancia,’ in the hilly country on the south side of the river Guayba, I had an opportunity of seeing numbers of the Rhea, (*Rhea Americana*); but I was surprised to find how small they looked, running along with raised wings over the campos. In the neighbourhood of the villages they are not often met with, and at all times are captured with difficulty. The Brazilian captures them with the ‘bolas,’ riding at full speed until he is near enough to throw it securely round the legs or neck.

“I have been a great deal annoyed, and yet amused, with a singular bird which frequents the swampy plains on each side of the rivers. From its peculiar cry the natives call it the ‘Cary Cary;’ I think it the *Charadrius Cayanus* of Latham. It is almost impossible to shoot any birds wherever this noisy sentinel is found. I was riding one day along the marshy plain, and saw a small flock of rose-coloured spoon-bills quietly standing on a bank of sand about a quarter of a mile off. I dismounted, and scrambled along on my hands and knees, with my gun slung on my back, in hopes of getting within shot unobserved by them or the ‘Cary Cary;’ but I no sooner lifted my head above the long grass for a sight, than a whole legion of them started up, with one universal cry of Cary Cary, which sounds like ‘take care, take care!’ and frightened away the spoonbills. Sometimes this bird associates with a species of *Saurophagus*, a common inhabitant of the cleared land about San Leopoldo, and they go together in flocks. The cry of this bird is peculiar, and equally warning of danger; it is ‘Bem te ve,—I see thee well! They will often proceed with you throughout the whole day, and keeping in advance, just out of shot, will warn everything of your approach.

“Upon the highest branch of some dead tree, in the thickest parts of the forest, sits a species of shrike, of a perfectly white colour, with the bill and near the eyes of a bright green: the colonists call it the blacksmith or ‘Kling fels,’—voice of the rock. It will be heard hammering and filing away, so much like a smith working on an anvil, that I have often been deceived into a belief that it was a colonist at

work in the forest. After giving one or two clear metallic clangs, it imitates filing so disagreeably true, as to set one's teeth on-edge. I shot one, but could not secure it for preservation.

"Amongst others which are worthy of a hurried notice, is a species of which I send two specimens. It is found only in the dense forest, where I have often, when creeping noiselessly along, been startled by a clear voice, asking me abruptly, 'Well, what now?'—and before one can prepare to reply to the inquiry, it is repeated over and over again several times in quick succession. This bird is very tame, and not alarmed at the report of a gun.

"N. PLANT."

MR. H. W. BATES.* — "Santarem, Amazons, April 12, 1852. — I now send you the result of three months' pretty close work at this place and neighbourhood. I sent you a box also with 1095 insects and 152 shells (January 12), valued at £30, which I have reason to believe left Pará on the 25th of February in the 'Windsor,' so it will, I hope, be in hand by this time. The present collection I cannot think a very fine lot, wanting the fine series of Diurnes which I generally send; but you must recollect it is a 'winter' collection, that is, work of the wet season, which has been very severe here, and in no locality are there many Diurnes in the wet season. You will however find some beautiful Erycinidæ, and a fine series of Sapphira, which I shall send no more of now. The greater part of these fine specimens are *bred*, I having hit upon a few broods of larvæ and chrysalides: at the present time scarcely one is to be seen,—either butterfly or larva. You will also see many new Coleoptera, but small; unfortunately the virgin forest is far from here. What I think the best part is the large series of Hymenoptera &c., which I have collected well, being only found readily in the wet season. There are very few of any new species, so I suppose they will go off well; also many small species: most are perfect. I have taken four trips already to the banks of a rivulet which flows into Tapajos, five miles from here: the forest is glorious, and teems with new and rare things. At present these are unique, and reserved in my private collection, which I do not send this time; I also have some twenty species of Hesperia, all unique, and about ten or twelve of other families, one of which is a new Catagramma, male and female. I hope to get a few more of these before I leave here, so as to send one box the last thing. In woods the main

* Communicated by Mr. S. Stevens.

difficulty is the flowers ; as to getting any quantity of different kinds, it would oblige me to alter my plans very much : I should have to hire two good Indians, and go to other expenses, entailing £80 or £100 a-year extra expense : but what few I can get *en passant*, I will send. I have about twenty specimens of medicines, woods and roots now waiting for the flowers. Mr. Hawxwell I hear sells most of his birds to passing travellers, and in Pará, perhaps the reason why you have not heard of him in London. I saw some excessively lovely things (I am sure some very rare) which he sold to Lieut. Horndon an American, passing through here from Lima. He gets better prices than in London. I have about fifty specimens of reptiles &c., but not enough to fill a small barrel which I wish to forward them in.

“As I said, I am ready to proceed on the Tapajos voyage. I intend to go for eight months or a year, and in my own vessel, with all things as convenient on board as I can arrange, so as to be able to work, write, and sleep on board. This latter is a great thing in these rivers, where sleeping ashore is almost sure to lead to fever and ague. The glorious river stretches away southward from Santarem, with its high banks, blue hills, and white sandy shores seeming to invite its exploration. Every one from there speaks in raptures of the scenery, and the novelty of the birds and animals, and I consider myself lucky in getting hands to row me up, a matter of great difficulty in the Amazon branch rivers.”

“May 8.—I left the letter unfinished until the last thing, according to custom ; when in the mean time an accident happened to the vessel by which it should go, it sprung a leak, and had to be unloaded and caulked. My collection was all ready papered and packed, so I send it, just as it was ready a month ago ; since then, of course, I have collected as usual, and added enough new or rare things perhaps to fill another box, but think it better to wait until the last day before I leave for the Tapajos, so as to send all, and finish with Santarem once and for all. The weather has continued drenching wet, and the river has risen much with a tearing current. Now is near the end of the wet season, and the current will soon slacken. I have a canoe very convenient either to purchase or hire, not yet decided, and two good Indian oarsmen at 9d. a-day, besides their food, and have already made acquaintance here with residents at various places up the river. If I find a good station I shall stop six or eight months at it, sleeping on board if unhealthy. The same men with two others will

hunt and fish, and not be more than 4s. or 5s. a-day expense altogether. You will see a pill-box with curious small Coleoptera &c."

"Santarem, May 17, 1852.—The vessel which takes this leaves tomorrow, so I have no time to put up another box of insects. It is eight days since my collection left here, with copious letters and notes, which will be answers to your letters of December last; I now reply to yours of January 31. Santarem is not a good locality for Diurnes, not being surrounded by virgin forest: in the same period that I have been here, I could have done better in this family at Ega, as I have no doubt I did not accomplish a fourth part of what is to be done on the Upper Amazons, it is so productive a country. I am now rearing many Lepidoptera, but have failed in drawing and preserving many larvæ. In reference to the Mysceliæ being the females of Epicalia, there are in my private collection of these Epicaliæ alone three or four species thus paired, some bagged *in copulâ*, leaving no mistake about it. Having my books &c., I am now ready to be off to the Tapajos, and long to get to a good locality for butterflies again."

"Santarem, June 4, 1852.—I now forward the last box that I shall send from this place; my private collection, consisting of single specimens, amounts to about 800 species: as they keep well, and I wish to compare them with the Tapajos species, I shall not send these at present. The minute Coleoptera in pill-boxes will not keep in this climate; the plan won't answer; although I dry them in the sun for a week before boxing, they are subject to mould and mites. I now see by the books sent, how little is known of Diurnes, &c. Besides the notes sent, I find I can add a great deal of information from memory; thus you see it is important that I should find my collection complete, with all the Nos. attached, when I return. I have now taken, with this pair of hands, 1000 species of butterflies! I have now about 50 specimens of small reptiles, about 30 of woods and medicines, 50 shells, &c.: the reptiles will not yet make a parcel worth sending; the woods &c. are waiting for the flowers; and the shells (species already sent) I keep until I can fill a box equal in size to the insect-box, for the convenience of packing. I am only sorry not to have the means of taking heights of mountains, position of rivers, &c. I am likely to meet with; for the thermometers, barometers, quadrants, theodolites, and tables of formulæ which are necessary, are all quite beyond the means of a poor man like myself. What I have found very useful, are the continental annual reports on Zoology,

published by the Ray Society ; they fill up by the notices of new species the voids there are in other works, and by discriminating between allied species, make one very attentive not to mistake allied species for the same in collecting. Erichson is the reporter for Entomology ; and you cannot imagine the pleasure afforded by his acute criticisms and discriminations ; it is delightful to have such a guide. You will probably not hear from me again for several months, when I hope to send you a collection far superior to anything I have sent you from Santarem. I should have been on my voyage at present, had not an accident happened to the vessel. Yesterday I took two new Diurnes, and three new Coleoptera. Some flowers have appeared on the borders of a wood, where for months I never saw a good insect ; the last few days I have taken about twenty species at them which I never saw before *anywhere*. The numbers of *Celænis Dido* and other *Celænes*, *Eucides*, *Thecla Marsyas*, and other beautiful but common butterflies at the spot is extraordinary, and would form an astonishing picture. One of the new things I took there yesterday is a new *Thecla*, far surpassing in silky brilliancy the beautiful blue ones I sent from Pará ; there is a band of deeper blue traversing the wings, forming a startling and unexpected style of *Thecla* beauty.

“ H. W. BATES.”

Remarks on Scolopax Delamotti. By the Rev. A. MATTHEWS, M.A.

WHILE snipe-shooting on Pet Marsh, near Hastings, in the beginning of last December, I was fortunate enough to procure a specimen of *Scolopax Delamotti*. As I have not seen any previous notice of the occurrence of this bird in the British Islands, and as the specimen itself is strikingly dissimilar to any of its congeners which I have met with, I hope the following remarks will not be thought superfluous.

Many consider this bird, as well as *S. Brehmi*, to be merely varieties of *S. Gallinago* ; but whether this is really the case, I cannot, upon the evidence of a single specimen, venture an opinion.

The principal distinction dwelt upon by those who advocate a separation of species, seems to consist in the number of the feathers in the tail. These, in the common snipe, they say amount to fourteen ; and it is therefore a point worth our consideration, to determine whether this can be considered a permanent specific character. If upon a careful examination such proves to be the fact, any deviation from

this rule becomes a point of considerable importance, though alone perhaps hardly sufficient to justify a specific separation. In this part of Oxfordshire, snipes are usually very plentiful; during the last few seasons many hundreds have passed through my own hands, or those of my brothers: and it has almost invariably been our custom, since we first heard of the occurrence of *S. Brehmi*, to count the feathers in the tail of each fresh victim; but of the numbers thus counted, not one, save the subject of the present notice, has presented any variation from the typical number (14). Occasionally indeed a feather or two may have been missing, but the reason for this has always been apparent, sometimes from natural causes, at other times from the effect of the shot; in all cases quite sufficient proof remained that fourteen would have been the legitimate complement of each tail.

It is hardly necessary to observe, that the feathers on one side of the tail correspond in shape and colour with those on the other side; thus in a tail composed of fourteen feathers, we find seven pair, each pair being precisely similar in themselves; the outermost feathers on each side forming the last pair, and the two middle feathers the first of the series. By this rule, when a tail has been examined presenting an abnormal number of feathers, the absence of one or more has been readily accounted for, even where no vestige of the plume itself remained. If then the tail-feathers of the snipe are variable in number, it appears singular that no such variation should have occurred to ourselves in the course of so long an investigation; if, on the other hand, the number of the tail-feathers be a permanent character of the common snipe, then surely a difference in this particular becomes important in distinguishing an allied species, especially if accompanied by other dissimilarities. In the specimen before us several other differences do present themselves, which it will be well to examine in detail.

Though different individuals of the common snipe vary much in the markings of the back and back of the head, yet in the plumage of all the lower parts of the body they constantly resemble each other. From the base of the lower mandible, for the space of about half an inch, the feathers are of a plain buff colour, from thence to the commencement of the breast-bone they are mottled with various shades of brown, near the latter point these markings terminate, the whole of the remaining plumage being of a pure white, with the exception of the long feathers supporting the wings when folded, which last are more or less transversely barred with black. Here the difference between this bird and its congeners would strike the most casual observer.

The mottled part of its plumage is not only much darker, and of a very different colour from any specimen of the common snipe with which it has been compared, but also *commences close to the base of the under mandible, and is continued without intermission over the breast-bone, leaving the belly alone white*; each of the breast-feathers is marked with two transverse bars of black on a white ground, extending through the whole breadth of the plume; the white part of the belly is also of an ashy tinge, exhibiting none of that brilliant purity so conspicuous in the common snipe. The plumage of the back and wings also differs widely from the ordinary varieties of the common snipe. The scapular feathers are deep black, mottled with narrow markings of dark red: they possess the usual longitudinal buff stripe, but *towards the wings are narrowly margined with ashy white*, in lieu of the wide buff-coloured marks generally seen. In this part of its plumage, however, the snipe is so liable to vary as to offer no distinctive characters. The bare portion of the tibia in this bird is much shorter than in any specimen of the common snipe which I have measured, as may be seen by the subjoined dimensions of three specimens of the latter bird in our collection.

The chief point of distinction lies, of course in the tail, and here, also, the difference is greater than has yet been noticed; not only is the number of these feathers less by two than in the common snipe, but the feathers themselves differ both in shape and size from the corresponding plumes of that species. In *S. Delamotti* the *first* tail-feather is nearly half an inch shorter than the shortest of the corresponding feathers in the specimens of the common snipe before mentioned: the same difference prevails throughout the tail, the feathers are also broader and much rounder at the point.

The following table will show more plainly the differences in the parts I have alluded to.

	Common Snipe, three specimens.						<i>S. Delamotti.</i>				
	<i>in.</i>	<i>lin.</i>		<i>in.</i>	<i>lin.</i>		<i>in.</i>	<i>lin.</i>			
Length of wing from the carpal joint } to the point of the 1st quill-feather, }	5	3	...	5	2½	...	5	1	...	4	11
Bill from base	3	0	...	2	11½	...	2	4	...	2	7½
First tail-feather	2	4	...	2	2	...	2	1½	...	1	8½
Bare part of tibia	„	7½	...	„	6¾	...	„	6¾	...	„	4¾

I have thus carefully examined this bird, not with any predetermination to convince myself of its distinctness as a species, but with the simple intention of sifting the matter thoroughly in order to attain as nearly as might be to a true conclusion. Though I have all along made use of the term "species," for lack of a more appropriate word, I am

yet far from feeling satisfied, and can only hope that these observations may induce older and more experienced naturalists to turn their attention to the subject. A matter of such difficulty cannot be settled without a more thorough knowledge of it than we appear at present to possess. The points of difference are far too many and too obvious to permit a careless amalgamation of the species, while as yet they are too few to decide hastily on their separation. Time and research alone will enable us to form any correct opinion, and to them the question must be left.

In the 'Birds of Ireland' Mr. Thompson, though giving a long and very interesting account of the habits of the snipe, does not appear to have noticed these striking varieties, if indeed they may be so termed. This is much to be regretted, as few naturalists have ever enjoyed more abundant opportunities of acquiring knowledge on this head. The author, in one paragraph, mentions a fact which, properly investigated, might have furnished us with much valuable information. In the second volume of that work, at p. 271, we find this remark:—"With reference to plumage, the following note was made. 'November 16, 1833. — On directing the attention of an ornithological friend to-day to the very dark colour of two snipes received from Coleraine, he remarked that most probably they were birds bred in more northern counties; as he well recollected that all which were shot out of the multitudinous numbers which appeared in the bog-meadows in August, 1828, were peculiarly dark in plumage.' It would be singular if we could thus distinguish a foreign from a native-bred snipe."

No one who has seen *Scolopax Delamotti* can read the foregoing passage without the recurrence of this bird to his mind. If other specimens at all resemble the one before us in colour, the dark hue of its plumage would distinguish it among a thousand. And again, the more northern breeding-haunts alluded to suggest the inquiry,—Can this be the usual habit of *S. Delamotti*? But here Mr. Thompson's observations end, and his readers are left unaided to form their own conclusions.

The present rainy autumn promises a fertile field for prosecuting inquiries on this subject. Snipes made their appearance in this neighbourhood towards the end of July, and, although numbers have already come under my inspection, no variation in the tail-feathers has yet occurred.

I therefore send you the foregoing remarks, in the hope of exciting others to investigate the matter. To any who may have already done so, I would suggest that they kindly make known the result of their

observations ; those who have not, I would urge to take advantage of the present opportunity, and to remember the advice of the poet,—
 “Carpe diem, quam minimum credula postero.”

A. MATTHEWS.

Weston-on-the-Green, September, 1852.

Reply to Mr. Doubleday's "Notes on Mr. Stephens' 'Catalogue of Lepidopterous Insects in the Cabinet of the British Museum, (Tortrices).'" By J. F. STEPHENS, Esq., F.L.S., &c.

IN your number for September (Zool. 3580) appear some Notes on my Catalogue of the Tortrices in the British Museum Collection, to which I feel it an imperative though painful duty to reply ; it being evident that my friend Mr. Doubleday has, from misapprehension, “jumped to an erroneous conclusion” as to my object ; and has consequently raised a series of charges against me, which having traversed “the length and breadth of the land,” leaves me *no alternative* but to repel them by a thorough analysis of the points in question, which necessarily leads to the introduction of matters in connexion therewith, which would otherwise have been buried in oblivion.

I am accused, in the onset, of making “an unfair attack” therein upon M. Guenée's work on the Noctuæ, an accusation *I* most emphatically and *utterly deny*, not only *de facto*, but as wholly beyond my intention, as I state in the last paragraph of the Introduction, that my “remarks are introduced solely with a view to point out the palpable inconvenience of the proposed system,”—that deprecated in the preceding pages thereof,—“and not from any captious spirit.” I have yet to learn that the quotation of examples to illustrate a subject under consideration, is indicative of any opinion of the work quoted ; and regarding Guenée's, I have expressed no other than terming it “an elaborate one,” which, according to my ideas, *implies commendation* ; my sole object in noticing it being, as above and elsewhere shown, to furnish additional proofs in regard to my views, and thus further endeavour to resist the prevailing innovation on the nomenclature by the adoption of a new rule in one department of Zoology, “at the present time,” (p. xi.) :—for surely the only proper period to change the name of an animal is, when it is found to belong to the same genus as another, to which the same name had been applied, and not to anticipate an inconvenience, *which may never arise* in some groups,

and can *never be remedied* by the system now attempted to be carried out ; as any person conversant with zoological literature may readily perceive.

Again, had I chosen any other vehicle (the ‘Zoologist,’ for example) than that to which they naturally formed an appendage, my remarks might have been considered uncalled for ; as it appears “the head and front” of my offence is based upon the fact of their having been introduced into a work—the nomenclature of which I was defending—“published by authority ;” the interests of science being considered of minor importance !

I only received Guenée’s work at the time when the Introduction was actually in type (to the extent originally proposed, namely, so far as the remarks on the Tortricidæ alone), and would have been worked off, but for an accidental delay, as your office books, Mr. Editor, can corroborate. But having noticed, during the process of cutting open the volumes, several generic names, familiar to me “as household words,” applied to *new genera*, and various changes in the nomenclature of our indigenous species, as well as the wholesale alteration of the twenty-one doubly-employed names, in p. 199, vol. iii. ; I availed myself of the delay in the printing, and determined to add to my Introduction, for the reason therein stated (p. viii.), that is, as “bearing upon the point under discussion :” and I feel assured that any reflecting person will allow, that I have not exceeded the legitimate bounds of propriety in so doing ; for I certainly possess as much right to oppose what seem to me incorrect views, as others have to propose them, without being accused of *unfairness* in so doing : — and this right Mr. Doubleday has not failed to exercise, by adding some strictures on my ‘Illustrations’ to his “Notes.”

Time was pressing ; and I proceeded, with perhaps too much haste for minute accuracy, as it appears I made an error in omitting to observe the ? after the reference to [Phytometra] rufa,—which stands thus in Guenée’s book, “= rufa Haw. Phyt. 16 ?”—the ? in the type employed being so like the figure 2, as to be readily overlooked — and called it *Noctua rufa*, Haw. (This species I prefixed to the number of examples, because Guenée had referred, *four lines above*, to my genus *Cænobia* in the ‘Museum Catalogue,’ and the references there given would have supplied him with the dates, figures, &c., of the insect : two of my specimens of which were taken in company with Haworth’s originals. I selected, at hazard, *several* other names also, although it would appear by the “Notes” that *two* only were brought

forward, viz., “*gemmaipuncta* of Hatcher and *anomala* of Haworth;” but of these hereafter).

The oversight, owing to my cacography, of employing the term homonymic—not however in the original MSS.—instead of mononymic,* although a nominal error, has nothing to do with the point at issue, except obscuring the sense where used, and serving to *accuse those persons who prejudge* the question without adhering to the wholesome maxim of “*audi alteram partem*” first!

As among the thousand purchasers of the ‘*Zoologist*,’—and I am happy to find that it is supported by so large a number—there must necessarily be many who may not see the *Mus. Cat.*, I insert, in justice to all parties, the list, complete, both of species and genera, to which I have referred, namely:—

Names adopted by Guenée.

- “*Nonagria despecta*, *Treit.* 1825, = *Noctua*† *rufa*, *Haw.* 1810.
Nonagria paludicola, *Hüb.* 1816, = *Noctua geminipuncta*, *Hatch.* 1810.
Hydræcia vindelicica, *Frey.* 1849, = *Gortyna Petasitis*, *Doub.* 1847.
Noctua bella, *Bork.* 1792, = *Noctua Rubi*, *View.* 1790.
 Genus *Hoporinia*, *Boisd.* 1840, = *Jodia*, *Hüb.* 1816, = *Xantholeuca*, *Step.* 1831.
 Genus *Gonoptera*, *Lat.* 1825, = *Scoliopteryx*, *Germ.* 1811.
Stilbia hybridata, *Hüb.* 1814, = *Phytometra anomala*, *Haw.* 1812.”

GENERA.

- “*Phorocera* *Phorocera*, *Desv.* 1830.
Charidæa † *Charidea*, *Dalm.* 1816.
Leptosia *Leptosia*, *Hüb.* 1816.
Eriocera *Eriocera*, *Macq.* 1834.
Syntomopus *Syntomopus*, *Wal.* 1833.
Dicycla *Dicyclus*, *Walk.* 1833.
Euterpia *Euterpe*, *Swains.* 1831.
Thyria..... *Thyra*, *Dej.* 1834.
Hemiceras *Hemicera*, *Lap.* 1832.
 **Achantodes*..... *Acanthodes*, *Serv.* 1831.
Barydia *Baridius*, *Schön.* 1826.”

* Vide ‘*Zoologist*,’ ix. p. 3163, line 8.—*J. F. S.*

† Should have been *Phytometra rufa*: (*vide supra*).

‡ *Charidæa*, a typographical error in the *Mus. Cat.*; Guenée has it *Charidea*, which ought to have been ascertained before impugning my statement.

Mr. Doubleday, — to use his own expression, — is “particularly unfortunate” in the selection of the *two* names before alluded to in his voluntary defence of Guenée; and the typography of the first may show him — irrespective of what may hereafter appear on that point — how readily *such* mistakes arise and become overlooked, and of the consequent care which should be employed before raising a superstructure upon *them*. He observes (Zool. 3580) that I give in my ‘Illustrations’ “the *hybridata* of Hübner as the *anomalata* of Haworth;” and then, without noticing my correction of the error of termination in the Mus. Cat., he introduces an episode, concluding with the belief that the name *anomala* was “first applied to this species (*hybridata*) in his Catalogue.” A collation of the references given to the insect in question in my Syst. Cat. with that emanating from the Brit. Mus. would have shown him that the syllable *ta* was a typographical error, or *lapsus calami* rather. In my Syst. Cat. (ii. p. 111) I refer to “Ph. *anomalata*: the Anomalous: *Ent. Trans. (Haworth)* i. 336;” and in my Illustr. from the Syst. Cat. without “the book (the E. T.) before” me to *Phy. anomalata, Haw.*, and not to *Phalæna anomalata, Haw.* (wanting an English name), E. T. p. 337 — which last will be found in my S. Cat. ii. p. 141, No. 6622, as a synonyme to *Geometra Hippocastanaria, Hüb.*, and in the Mus. Cat. p. 206. It will also appear by my Syst. Cat. ii. 111, that I refer to *Op. ? anomala, (Ing. Ins. 91)*. The information in the work last cited having been furnished by me to Mr. Ingpen, in 1827, and then acknowledged by him. At all events, Guenée might have ascertained the point, since he quotes, as before stated, the genus *Cænobia* from p. 134 of my Mus. Cat., and *Stilbia anomala* appears in p. 133!

Again, had an equally searching examination been made as to the origin of the name applied by me to *Nonagria geminipuncta*, it would have been found that Guenée himself has referred to Haworth, 45 (p. 176, 1810) as a synonyme to *N. paludicola, Hüb. (1816)!!*

What therefore becomes of the *unfairness* charged against me, and attempted to be proved by the three instances in question?

Thus far as to the species; any alleged or real errors of mine on that or other points prove neither for nor against the position I advocate; and I admit that three out of the seven instances referred to (Zool. 3581) as “abrogations of the law,” are so, and have long since been corrected in my copy of the ‘Catalogue;’ the other Haworthian names having been previously used, except perhaps the last (*margaritana*), — though not shown in a local Catalogue; but Hübner and

Haworth having both proposed that name for two species of *Argyridia* in 1812, and the former having figured a second species (the indigenous one) subsequently under the name *dipoltella*, I adopted this last as the most proper course to pursue.

A graver accusation is brought forward in regard to the generic names, namely, that I have referred to *pretended** duplicate generic names, and that "only four are really" duplicates. I beg therefore to draw attention to the list above given, wherein it will be found that five are *literally* identical, and a sixth (marked *) is etymologically so, though incorrectly spelt by Guenée; Serville having given the correct orthography, and employed the name as referred to in the 'Catalogue.' If "Baridia and Barydius cannot be considered identical," surely *Aporophyla* (uncertain Tribe) and *Aporophila* (uncertain Love) cannot be; consequently the *Aporophila australis* of Doubleday's 'List,' p. 13 and 27, thrice repeated, is not identical with *Aporophyla australis* — neither can *Cirrædia* or *Cirredia* be identical with *Cirrædia*, the correct name, &c. &c. These examples—of pure *typographical* errors — render manifest the difficulty that exists in detecting all such errors, especially when it is stated that those above referred to are in large capitals, and several of the names have been three or four times recomposed: notwithstanding which, a charge has been made against me, in reference to my remarks in my second 'Catalogue,' that my first was full of errors, and such as the following are pointed out in corroboration thereof: —

Page 7. *Pyronia*, *Hüb. V.* 55, instead of 58.

„ 92. *Septis*, *Hüb. V.* 167, „ 243.

„ 120. *Polyphora*, *Hüb. V.* 273, „ 237.

Page 231. *Pechipogon*, *Hüb. V.* 344, instead of *Pechipogo*, &c.

Some of the errors alluded to not existing in the original MSS. from which the work was printed, now in my possession.

Furthermore, it is alleged that as I have in a great measure adopted Guenée's arrangement of the Tortricidæ, and availed myself of the 'Synonymic List,' I had but little comparative trouble in working up the second 'Catalogue.' To the first point I reply by stating that I have in my library a printed Catalogue, dated the 7th of July, 1820

* The employment of this objectionable word has induced me to carefully collate the genera, and I find there are 65 duplicates — only 20 per cent. — of which no less than 45 are employed in Entomology; 34 are *literal duplicates*, and the majority of the remainder differ only in gender: and in addition there is the obviously inadmissible word "Homoptera" applied to a genus!

(thirty-two years ago), drawn up by myself, almost identical, so far as the groups are concerned, with the one recently published! And as regards the second point, the following statistics will test whether the detraction be true or not:—

	British, or reputed British Species.	Named Synonymes, about
In Guenée's 'Catalogue of Tortrices' are	235	545
Added in Doubleday's 'List,'	35	187*
	—————	—————
	270	732
Added in Mus. Cat.	73	674
	—————	—————
Total	343	1406
	—————	—————

As the conclusions to be drawn from these tables are so self-evident, I shall merely observe that I was occupied, and sedulously too, for nearly six months in working up the Tortricidæ, and above three years in completing the former Catalogue:—that during this period I collated every reference, with but few exceptions, as indicated in the list of books quoted;—and arranged the Brit. Mus. and my own collections to accord therewith, introducing with the last every name, whether generic, subgeneric, specific, sexual or synonymical, so as to identify, as far as practicable, the type of each species, sex and variety intended by the respective authors: that in addition to gratuitously arranging the Brit. Mus. collection, I gave the MSS. of my Catalogue to the Trustees, and superintended their progress through the press, for which services they directed a special letter of thanks to be sent to me, expressive of "their sense of the liberality and zeal evinced in gratuitously undertaking the works," of which they requested I would "be pleased to accept fifty copies, as well as a complete set of their Zoological Catalogues." My experience teaches me that few persons would voluntarily have devoted so long a period of exertion, at considerable expense and inconvenience, my residence being nearly four miles from the Museum, to the public, and but for the attempted detraction I should not have alluded thereto, as it was truly "a labour of love."

Towards the end of the "Notes," Mr. Doubleday says, "With very few exceptions, Mr. Stephens has adopted my views as to species and varieties," &c. An undeniable fact; arising from a three-fold cause.

* Most of these in my Syst. Cat.

First, twenty years' additional experience on my part, with increased attention to the Lepidoptera: secondly, from the circumstance that the original MS. of the 'Synonymic List' was sent to me by degrees, for my opinion in regard to references, &c., and our concordance or discordance adjusted accordingly, to our mutual benefit: and lastly, from having obtained, at great cost, nearly all the works procurable on the subject, for the purpose of testing the references &c. previously given (almost wholly on the authority of Haworth, who at the time my Syst. Cat. appeared, was the only person who possessed a copy of Hübner — and that an imperfect one). And I feel assured that Mr. Doubleday, with his known sense of justice, will admit the truth of my statement, and relieve me from the charge which has been made, of having "shamefully" published his List as my Catalogue. He, as well as many other of my friends — you, Mr. Editor, among the number — was fully aware that I was preparing a corrected Catalogue of our Lepidoptera, years before his was projected; hence the cause of my obtaining the expensive works alluded to, to enable me to carry out the task which I commenced in 1832, and outlived to the end; but from circumstances could not proceed with, until 1843; when I entirely remodelled the arrangement, and commenced a second Catalogue — referred to in the Address to the supplementary volume of my 'Illustrations,' in September, 1846 — which eventually laid the foundation of the one published: all these MSS. (with the successive corrections) are in my library (always, with my collections, open to the free use of entomologists), and in each convincing proof can be shown of the date of production.

Mankind are too prone to reject the ladder by which they have mounted; and perhaps I am not guiltless of doing so, inasmuch as I have availed myself of a few rundles added by my successors, in return for assistance, mostly unacknowledged, afforded by my previous labours to them. In my sixteenth year (the figures of which are *now* exactly reversed, being a sexagenarian this day — notwithstanding which I have had the temerity to undertake the task of endeavouring to arrange and catalogue the truly magnificent collection of Linnean Phalænæ in the British Museum, probably 7000 species), I prepared my first 'Catalogue of British Animals,' by which it appears that only 3673 indigenous species of insects were known at that period (1808 — 12), including, with the (sub-) species of Haworth &c. *then recognized*, 1367 Lepidoptera. Time progressed; and although I was wholly occupied during the day in business, and engaged in the evening in preparing the twelve first volumes of the 'General Zoology' for

publication, as well as deeply immersed in studying the mysteries of Electricity, &c., I advanced so rapidly with my collections of British shells and insects, that I had more than doubled the number of the latter by 1822, and I contrived nevertheless to gradually work up the 'Catalogue of Insects,' until, on its publication in 1829, I actually registered no less than 10,116 species, — two-thirds, at least, captured by myself,—although at this time there were not half-a-dozen collections named in England, and those only partially so; and as I had no transmarine or other assistants to clear up doubtful points, possessed but a trifling entomological library, and had to ferret out the names as best I could, frequently from works in the Teutonic and other European languages,—it is not to be wondered at, that with all these disadvantages and engagements—personal and domestic illnesses, &c.—I was occasionally at fault, especially when we find that individuals who devote the greater portion of their lives to one order, group, or family of insects &c., are equally, if not, in proportion to their limited researches and better opportunities, more so.

I am at a loss to divine why the long extract from Guenée respecting my 'Illustrations' is introduced; unless to exhibit (among other things) his neglect of the numerous remarks made by me in regard to many of the supposed species (vide the genus *Caradrina*, Ill. (Haust.) ii. 154, and Syst. Cat. ii. 75, 76, &c., as instances), and his utter disregard of the fact that *the synonymes were to be found in the Syst. Cat.* Had Guenée however consulted Wood's 'Index Entomologicus,' he would have found *original* figures—and moreover correct ones in the main—of all the *assumed* species of *that day*, together with those of many undoubted species, to which, if described at all by him, he has given new names, although previously described by Haworth and myself.

Once more: Guenée states (Intr. lxxx.) that *the synonymy* in the Mus. Cat. accords "*en tous points*" with that established between himself and Mr. Doubleday: to show that this is not the case, the following additional instances of disagreement in the names of species alone, exclusive of synonymes,* will suffice, and at the same time add some useful information as to the synonymy, to this unavoidably lengthy paper; and also exhibit a few additional "abrogations of the law of priority," nearly coincident in number with the discrepancies

* The proportions are about the same as in the Tortrices, p. 3737: whence therefore accrue the hundreds of additional names in the Mus. Cat. pt. i.? Which manifestly proves that Guenée made the assertion *without examination!*

between my 'Illustrations' and Mus. Cat.: and the majority being errors, I might justly reciprocate the charge of being "very careless" against M. Guenée, who has been twenty years a writer on Lepidoptera alone (*vide ante*), his first publication being dated 1832. Again; there are 111 deviations between the Noctuæ of the Mus. Cat. and the Syn. List, arising from the fact that the Catalogue of Boisduval (1840) formed the foundation of the latter, instead of the names being (as they ought properly to have been) traced to their original authors: — these are nevertheless ? coincidents "*en tous points*" !!

SPECIES.

<i>Guenée.</i>	<i>Stephens.</i>
81. <i>Acronycta Myricæ</i> , n. s.	= Acron. <i>Euphorbiæ</i> .
158. <i>Nonagria concolor</i> , ext. var. ?	= <i>Nonagria extrema</i> .
177. „ <i>lutosa</i> ,	= „ <i>crassicornis</i> .
306. <i>Mamestra abjecta</i> , <i>Hüb.</i> 1813,	= Mam. <i>St. nigricans</i> , <i>View.</i> 1790.
309. „ <i>anceps</i> , <i>Hüb.</i> 1811,	= „ <i>sordida</i> , <i>Bork.</i> 1790.
332. <i>Apamea fibrosa</i> , <i>Hüb.</i> t. 385,	= <i>Hydræ leucostigma</i> , <i>Hüb.</i> f. 375.
333. „ <i>oculea</i> ,	= Ap. <i>didyma</i> .
339. <i>Miana erratricula</i> , <i>Hüb.</i> 1813,	= Mi. <i>literosa</i> , <i>Haw.</i> 1810.
379. <i>Grammesia trilinea</i> , <i>Schiff.</i> 1776,	= Gr. <i>Quercus</i> , <i>Fab.</i> 1775.
408. <i>Rusina tenebrosa</i> , <i>Hüb.</i> 1799,	= Ru. <i>ferruginea</i> , <i>Esp.</i> 1784.
417. <i>Agrotis jaculifera</i> , <i>Gu.</i> 1852,	= Ag. <i>subgothica</i> , <i>Haw.</i> 1812.
506. „ <i>lucerneæ</i> , <i>L.</i>	= Gra. <i>cataleuca</i> , <i>St.</i>
532. <i>Noctua margaritacea</i> , *	= „ <i>I-intactum</i> .
572. <i>Pachnobia carnica</i> , †	= Orth. ? <i>hyperborea</i> ?
601. <i>Orthosia suspecta</i> ,	= „ ? <i>congener</i> .
635. <i>Cerastis spadicea</i> , <i>Hüb.</i> 1799,	= Glæa <i>Ligula</i> , <i>Esp.</i> 1789.
649. <i>Xanthia silago</i> , <i>Hüb.</i> 1799,	= Xant. <i>flavago</i> , <i>Fab.</i> 1787.
651. <i>Cirrædia aurantiago</i> , <i>Gu.</i> 1832,	= Aleth. <i>fimbriago</i> , <i>St.</i> 1829.
662. „ <i>xerampelina</i> , <i>Hüb.</i> † 1806,	= „ <i>centrago</i> , <i>Haw.</i> 1810.
687. <i>Dianthæcia Carpophaga</i> . <i>Bork.</i> 1792,	= Dian. <i>perplexa</i> , <i>Schiff.</i> 1776.
731. <i>Epunda nigra</i> , <i>Gu.</i> 1852,	= Charæas <i>Æthiops</i> , <i>St.</i>
822. <i>Hadena W-Latinum</i> ,	= Had. <i>Genistæ</i> .
925. <i>Tamila nundina</i> , <i>Dry.</i>	= Acont. <i>nigrireana</i> , <i>Haw.</i>
984. <i>Agrophila candefacta</i> , <i>Hüb.</i> 1820,	= Erast. <i>minuta</i> ? <i>Haw.</i> 1812.
995. <i>Acontia albicollis</i> , <i>Fab.</i> 1781,	= Acont. <i>Solaris</i> , <i>Schiff.</i> 1776.
1014. <i>Bankia argentula</i> , <i>Hüb.</i> 1786,	= <i>Hyela Bankiana</i> , <i>Fab.</i> 1775.
1016. <i>Hydrelia unca</i> , <i>Schiff.</i> 1776,	= „ <i>uncana</i> , <i>Lin.</i> 1761.

* In Guenée's Index in the Annales, x. p. 239, this species is called *glareosa*, *Esp.* the true *glareosa*, *Esp.* being called *Hebraica*, *Hüb.*, an error that is followed in the Syn. Cat.: — but in the Noctuérites, i. 324, he has properly adopted the name *glareosa*, giving *Hebraica*, *Hüb.*, as a synonyme, after my Mus. Cat. pt. i. 78.

† *Agrotis alpina*, *West. & H.* 1842.

‡ Not *xerampelina*, *Esp.* 1786, which belongs to the same genus.

<i>Guenée.</i>	<i>Stephens.</i>
1161. <i>Plusia V-aureum</i> , * <i>Gu.</i> 1852,	= <i>Plu. pulchrina</i> , <i>Haw.</i> 1812.
1163. „ <i>U-brevis</i> , <i>Gu.</i> 1852,	= „ <i>bimaculata</i> , <i>St.</i> 1829.
1173. „ <i>gutta</i> , <i>Gu.</i> 1852,	= „ <i>confusa</i> , <i>St.</i> 1850.
1028. <i>Micra candidana</i> , <i>Fab.</i>	= <i>Troth. minuta</i> .

GENERA.

<i>Guenée.</i>	<i>Stephens.</i>
<i>Synia</i> , <i>Dup.</i> 1846,	= <i>Oria</i> , <i>Hüb.</i> 1816.
<i>Laphygrina</i> , <i>Guen.</i> 1852,	= <i>Telma</i> , <i>Hüb.</i> 1816.
<i>Cerigo</i> , <i>Steph.</i> 1829,	= <i>Thalpophila</i> , <i>Hüb.</i> 1816.
<i>Grammesia</i> , <i>Steph.</i> 1829,	= <i>Meristis</i> , <i>Hüb.</i> 1816.
<i>Glottula</i> , <i>Guen.</i> 1837,	= <i>Brisbys</i> , <i>Hüb.</i> 1816.
<i>Trachea</i> , <i>Gu.</i> 1852, not <i>Hüb.</i>	= <i>Panolis</i> , <i>Hüb.</i> 1816.
<i>Cerastis</i> , <i>Och.</i> 1816,	= <i>Orrhodia</i> , <i>Hüb.</i> 1816.
<i>Scopelosoma</i> , <i>Curt.</i> 1837,	= <i>Eupecilia</i> , <i>Hüb.</i> 1816.
<i>Cirrædia</i> , <i>Guen.</i> 1839,	= <i>Alethuria</i> , <i>Hüb.</i> 1816.
<i>Tethea</i> , <i>Hüb.</i> 1816, not typical,	= <i>Ipimorpha</i> , <i>Hüb.</i> 1816.
<i>Ilarus</i> , <i>Boisd.</i> 1840,	= <i>Eremobia</i> , <i>Steph.</i> 1829.
<i>Jaspidia</i> , <i>Boisd.</i> 1840,	= <i>Diacope</i> , <i>Hüb.</i> 1816.
<i>Heliodes</i> , <i>Guen.</i> 1841,	= <i>Panemeria</i> , <i>Hüb.</i> 1816.
<i>Agrophila</i> , <i>Boisd.</i> 1840,	= <i>Eumelia</i> , <i>Hüb.</i> 1816.
<i>Mania</i> , <i>Och.</i> 1816, not typical,	= <i>Nænia</i> , <i>Steph.</i> 1829.
<i>Phytometra</i> , <i>Haw.</i> 1810, not typ.	= <i>Prothymia</i> , <i>Hüb.</i> 1816.

It does not appear to me that the Hübnerian generic names above quoted are more barbarous or less euphonious than their synonymes. With the above exceptions, and the location of a few of the species,* the genera adopted by Guenée compared with those proposed and employed by me, though they are somewhat differently arranged in parts, — in fact, his arrangement seems based on that of the Wiener Verzeichniss.

It is beyond my province, here, to remark upon the foreign genera and species, but as evidence that similar changes occur in them, I shall merely draw attention to the first new species, *Thyatyra* (as it is called, not *Thyatira*, *vide Zool.*) *abrasa*, *Gu.* No. 2, i. 12,—an insect long known and figured in England (1840) by the name *T. scripta*, but which is not alluded to by Guenée.

Having thus replied to the “Notes,” so far as relates to the Noctélites, — a task unwillingly and with regret forced upon me, in justification of my own character, as well as in deference to the credit of

* Guenée refers to the names in *Italics*.

one's own country,—I have but one other paragraph connected therewith to take into consideration; namely, the opening one, in conjunction with the eulogistic review of the work, (Zool. 3532). In the first it is stated that “no work at all approaching it has ever appeared in England;” and in the review that it “is in all respects a model for future labourers in the same field,”—the context implying *as a monograph*.

Whether it eclipses the fame of the world-wide celebrated ‘*Monographia Apum Angliæ*,’ with all its erudition, the care bestowed upon the descriptions of the several sections, species, &c., I leave to the candour of the reader to decide, after his perusal of the following notes, which will also tend to controvert, or modify, the opinion expressed in the review.

1. The absence of specific characters; or of any clew for readily ascertaining the species.

2. The substitution of millemètres for the usual scientific measures of length.

3. The numerous subdivisions of genera into groupes, &c.—the greater part of which are uncharacterized: *e. g.* the genus *Agrotis* into 13 groupes and 23 subordinate divisions, only three or four of which are alluded to by Guenée!!

4. The old species for the most part only referred to, and no descriptions annexed,—247 out of 669 in the first volume alone. (This most serious defect in a monograph, imposes upon the student the necessity of a large outlay to obtain the books requisite to ascertain the species omitted: *e. g.*, the works of Hübner alone, with their continuation, costing ninety guineas, and, except by a favourable chance, not to be procured at a lower rate!)

5. An indefensible innovation in the nomenclature: *e. g.*, in vol. i. 389, “*Hoporina croceago, Albin*”; vol. ii. 339, “*Plusia V-aureum, Ingr.*”; vol. i. 43, “*Acronycta tridens, Roes.*”; none of these names to be found in the authors quoted; some of whom *wrote before* the invention of the binomial nomenclature by Linné, whose authority is quoted for *Acronycta Psi*, although *Albin* and *Roesel* are both referred to by Guenée:—there are dozens of such instances.

6. The omission to notice at least one-third of the works published on the Noctuæ during the past twenty-five years: of Zetterstedt—one of the most important writers—all we learn is, “*M. Zetterstedt dres-*

* The genus *Epunda* seems to be as heterogeneous an assemblage of species as any of Hübner's depreciated groups.

sait le Catalogue des espèces de la Laponie," (Intr. lxxxvii). Of this work, so curtly despatched, it may be observed, that it is a folio volume of 570 pages, closely printed in double columns, and containing carefully drawn up descriptions in Latin of nearly 4000 Lapland insects — amongst which are 73 Noctuæ, 25 of which *are new species*, entirely unnoticed, unless by new names, by Guenée — interspersed are remarks upon at least 2000 Swedish species; — the work was published in 1840, and in the Preface, dated April, 1839, reference is made to the then recent European works (Parisian among the rest) to December, 1838. And moreover, the work itself is the *sole instance* in which all the known insects of any country have been described according to modern views, during the present century: and since its conclusion, its indefatigable author has supplied us with a still more complete work on the Scandinavian Diptera, in eleven volumes, 8vo., containing full descriptions of 3388 species!

7. The omission of the majority of the synonymes in the Index.

Reader! procure Guenée's Noctuélites, and judge for yourself whether I have stated a single point "unfairly"!

J. F. STEPHENS.

Eltham Cottage, Foxley Road, Brixton,
September 16, 1852.

P.S. — A concluding question, if not an "unfair" one. In what part of Scotland do *Cænophila subrosea* and *Agrotis lunigera*, *Mus. Cat.* occur? Guenée says "Angleterre et Ecosse, en Juillet" (i. 333) for the former, and Ecosse (i. 280) for the latter. — J. F. S.

[Since the proof of this paper was sent to its author, that gifted entomologist has breathed his last: it is therefore published without that revision and careful correction which it would no doubt have received from his experienced hand. I have never seen a paper from the pen of Mr. Stephens in which this revising process was so essential, since it abounds with assertions as to simple facts which must either have been penned from memory, and without reference to the authorities cited, or the writer's meaning must have been misunderstood in the printing-room. I allude to such passages as this: —

"Guenée.

"Stephens.

"995. *Acontia albicollis* *Fab.* 1781, = *Acontia solaris*, *Schiff.* 1776."

On reference to Guenée, it appears that that author gives these as distinct species without doubt or hesitation, and that he occupies nearly two pages in elaborately describing their differences. From the line quoted, as well as from the context, it would appear that the names are synonymous, but that Guenée has not adopted the earlier one: it is evident that Mr. Stephens overlooked the second species and the long diagnosis, an oversight which, in common with the rest, it is now unfortunately too late to remedy. It is scarcely necessary to say that the pages of the 'Zoologist' are closed for ever against a continuation of the discussion of which this paper forms a part. I have not the slightest idea that any will be attempted, but I think it desirable to give this early decision on the subject, lest any of my correspondents should incline to controvert the statements of one no longer able to defend or explain them. Mr. James Francis Stephens died at his residence, Eltham Cottage, Foxley Road, Brixton, on Wednesday morning, the 21st of December, in the sixty-first year of his age, after a short but very severe illness. He was a Fellow of the Linnean and Zoological Societies, and a Member of the Entomological Society and Entomological Club: he was also the author of a large portion of Shaw's 'British Zoology,' of the well-known 'Illustrations of British Entomology,' of a 'Systematic Catalogue of British Insects,' a 'Manual of British Lepidoptera,' 'A List of the Specimens of Lepidoptera in the British Museum,' Parts I. and II. (the third part still in the press), and various minor papers scattered through our periodicals, but chiefly in the 'Zoologist.' He will however be most favorably known to the large circle of British entomologists who enjoyed his acquaintance, by the unbounded and long-continued liberality with which his enormous collections and extensive entomological library were placed at their disposal, and by the untiring courtesy and attention with which he imparted his great knowledge of Entomology, and assisted every seeker for information in the extensive science in which he had become so proficient. This trait in the character of the departed entomologist, is worthy of our warmest admiration and gratitude, and must be lastingly impressed upon the memory of all who, during the last thirty years, had occasion to seek instruction at his hands.—*Edward Newman.*]

On "Robber-bees:" the Phenomenon thus denominated attributed to the Presence of the Honey-moth. By OCTAVIUS PICKARD-CAMBRIDGE, Esq.

ON the 15th of last September, our gardener came to me, in great tribulation, to say that "the robbers" were attacking one of my beehives. I immediately went to see the state of affairs, and found a great commotion at the mouth of the hive, bees hurrying in and out, crowding and tumbling over one another, some fighting, and a few, dead, lying on the ground (this was a wooden box-hive); and on drawing back the shutter of the window the same state of commotion and excitement prevailed within. A very few minutes' observation showed me that the cells were being opened, and the honey extracted; and also that the young bees were being brought out of the hive, and carried off. So my first operation was to stop the entrance entirely, with a zinc slide; and, this done, the bees now congregated in clusters, trying every crevice and corner to effect an entrance; (this was about 5 p.m.) The commotion inside still continued; and, wishing to see what would become of the swarms of bees collected outside the hive, I remained watching till it grew dusk, when they began to fly away, mostly, as far as I could see, *in one direction*, until, by dark, not one remained. I left the entrance still stopped by the slide; and by daylight next morning the bees began to return, making furious efforts to get inside, tumbling and fighting as before; and by 8 a.m. the front of the hive was crowded as on the previous evening, the bees inside seeming as anxious to get out as those outside to get in. This state of things existed the whole day; and just before dark, when the last of the bees outside had taken their departure, in the same manner, and apparently in the same direction as before, I drew back the zinc slide, which was no sooner removed than the inhabitants poured out, as thick and fast as the aperture (two inches wide) would admit, and flew straight away, in exactly the same direction as all those outside had previously taken. Not knowing what to make of this, and while they were still pouring out, I again inserted the slide, and left them for the night.

The next morning, by daylight, the same scene of riot and confusion was enacted, and continued throughout the day, the bees outside all departing, just before dusk, as on the previous evening; and on my again pulling out the slide (which had been in the whole day), immediately the bees issued out again, flying off as before, until quite dark, when I re-inserted the slide.

Having in the mean time consulted all the parish authorities on bee-keeping, their opinion (the prevalent one here) was, that the hive was attacked by strange bees, or "robbers," who would continue to return and renew their attacks as long as the hive remained in its place with a bit of honey in it; and that probably the bees that left the hive every night on my withdrawing the zinc slide from the entrance, were some of the robbers who had got inside previous to my discovering the state of the hive, on the 15th, and they, having been sorely ill-treated by the lawful inhabitants, were glad to make their exit and escape on the first opportunity. All this seemed plausible enough, especially as the hive became quieter and quieter after each efflux, and, as far as I could see through the windows, no more cells had been tapped; but the combs were full, and so far as perfect as at the end of the first day's row; though, outside, the bees seemed more numerous, and as eager to get in as ever.

This explanation did not satisfy me, for on a close examination there did not appear to be more than a hundred or two bees left in the hive; so I resolved to put it to the test, by killing, the next morning, as they arrived, *every bee* that came to renew the attack, all of which, according to the popular opinion, were the "robbers," and which, being got rid of, the usual work of the hive would of course proceed without molestation. So the next morning, by day-break, I commenced the slaughter, and in the course of a few hours had killed thousands, the ground becoming black with the slain, and so continued to kill them until they ceased coming. By this time the slain must have amounted to nearly as many in number as is contained in an ordinary swarm. However, the next day a few still came, and were also killed; and I determined that when evening came the hive should be fumigated with fungus-smoke, and the state of the hive, and number of inhabitants, ascertained. This being done, by inserting the nose of a pair of fumigating bellows into the entrance of the hive, so as to preclude the possibility of any bees escaping, and having removed the hive, I found my conjectures correct, for there were not nearly 200 bees in it, and no queen among them. As in this state of things it was useless to restore it to its place, I killed these few bees; and, with the exception of the bottoms of the combs being a good deal gnawed (the dust and crumbs of which were strewed about the floor-board), I found very little honey gone, and the combs apparently sound and good, the hive, as it stood, weighing 40 lbs., of which the hive itself was 12 lbs. weight.

Now, the question is, Where were all the lawful inhabitants of the

hive? The "robbers" were certainly all dead; but they had not killed the inhabitants, as when the first alarm was given, though there *was* fighting, yet there were not probably more than one hundred or so dead ones lying about; and the nature and habits of bees in defence of their property precluded the idea of their having been previously expelled by the robbers without a severe struggle, which must have caused the death of myriads on both sides. In fact, the parish bee-keepers could make nothing of it!

This "Eating out of hives by robber-bees," as it is here called, is by no means of rare occurrence; and a cottager with fourteen or fifteen hives, full and in good condition, at the beginning of September, thinks himself well off to escape with the loss of two of his hives. When thoroughly eaten out, the very comb is often gnawed to pieces, and strewed about in front of the hive. I have known *one* cottager lose four out of ten hives in the course of a few days; and I have myself lost one or two out of about the same number every year since I have kept bees; and what I saw last year on the occasion of losing a box-hive, thoroughly ransacked and eaten out *in one day*, between the hours of 11 and 5, made me suspect the commonly received notion of "robber, or stranger, bees," and induced me to watch the process closely at the first opportunity. This hive (lost last year) was perfectly quiet, to all appearance, at 10 a.m. By 11, exactly the same scene of riot and disorder that I have detailed above prevailed; and when I came to examine it at 5 p.m. (not having been able to be on the spot during the interval), the hive was completely deserted, with not a bee or drop of honey in it, and the whole fabric of combs a complete wreck, and a few, perhaps 200, dead bees lying round. As it happened, all my hives had been weighed a night or two before; and this one was upwards of 45 lbs. weight, and, being only of one year's standing, I have no doubt contained $24\frac{1}{2}$ lbs. of pure honey. A large bell-glass on the top of the hive, also nearly full of honey, was completely pillaged, and the comb, being fine and tender, literally reduced to powder. Thus, here was this great quantity of honey carried off, and all the damage done, during the short space of a few hours. The aperture in this hive was nearly five inches wide, which would afford additional facility for carrying off the honey, and so may account for the very short space of time in which it was done, though I have heard of several other instances in which the operation has been equally short and decisive. I have never heard of a case in which, after this commotion had commenced at the entrance of a hive, and nothing done until all was quiet again,

there has ever been an atom of honey saved, or a bee left in the hive, nor more killed than the few I have described. The common practice among the cottagers is, the moment the "sound" of robbers is heard, and a commotion and fighting is observed at the entrance, to cover the whole hive completely, with cloths, and, having killed all the bees collecting round it, *burn in* the hive, the same evening; and accordingly, as the row has been discovered earlier or later after its commencement, more or less honey is generally saved; and as, among the lower classes of bee-keepers, there is seldom, if ever, the means or ability to make close observations on the process of "robbing a hive," this opinion of "robbers" has always been, and still is, implicitly believed among them. The sound just spoken of is very peculiar. Instead of the busy hum commonly heard near the bee-garden, you may see numerous bees shooting backwards and forwards, with great velocity, to the extent of sometimes one or two hundred yards distance, with a sharp, ringing hum, which, once heard, can never be mistaken, but is difficult to describe.

Now, my own idea, and the only way in which I can account for most of the circumstances I have related, is, that, for some reason or other, the bees find it necessary to quit the hive, and having left it, and found out a new and more suitable abode, return, to transfer to it the stores of honey in the objectionable hive. The smell of the honey, which, when the cells are opened, is extremely strong, would be sure to attract other bees from neighbouring hives, and possibly from those immediately contiguous; and hence what small degree of fighting and slaughter there *actually is* would be accounted for; and on this supposition the only difficulty is, to find out why the bees should leave an apparently sound and comfortable abode.

Now, in the autumn of 1849, I had a hive eaten out in this manner; and on cleaning out the empty comb it was thrown by, into a box, and forgotten, being of no apparent use or value. However, in the spring following, wanting to make use of the box, I was proceeding to turn out the contents, when I found it alive with the larvæ of the honey-moth (*Achroia alvearia*), which by August produced myriads of the perfect insects. These, depositing their eggs, gave birth to thousands more larvæ, which, increasing both in size and number, had by the summer of 1851 completely consumed the whole of the comb. There was a peculiar smell attached to this comb, which I observed both at the time it was "eaten out" and until consumed by the honey-moth; and I have observed the same smell in all the hives I have since had "eaten out;" but unfortunately all the comb, except

that of the hive of which I have given the above detail of the process of "eating out," was destroyed without my knowledge; so I was unable to ascertain whether it also produced these insects. However, having, this year, saved the empty comb, I shall carefully watch whether it produces them or not; and if this should be the result it will go some way towards proving that the bees were aware of the attack of this insidious and formidable enemy, and had evacuated the premises before all the fruits of their labour should be destroyed, and themselves starved out; and this may prove one of the numberless striking instances of the wonderful instinct with which bees, in common with all the rest of the unintelligent creation, are endowed, for their safety and preservation, as man is endowed with reason, *i. e.*, the ability to compare, judge, and act upon the evidences of his senses, for his preservation.

I should feel under great obligation to any of your correspondents or readers who may be able either to confirm or the contrary my theory of "robbers," and whether the facts I have detailed are prevalent all over the country, and what are *their* conclusions from those facts, and if there is any remedy against being "eaten out;" in short, anything they may have observed in the matter.

The old bee-keepers here say that no such things as "robber-bees," in this way, were known twenty-five or thirty years ago, but that it is quite of recent date (though I am unable to find out precisely what that date is). If my theory of the honey-moth is correct, its recency would be accounted for, by the fact that this insect has been, until within a few years, accounted rare by entomologists, and, being so, would hardly have had much effect in bee-hives; but for some few years past it has become very common, and consequently would be proportionably destructive. I have never yet detected, in this neighbourhood, the honeycomb-moth (*Galleria cereana*), which has, I believe, in some places been found to be very destructive among bees, and was bred in large numbers by Mr. Doubleday, of Epping, some nine or ten years ago. It would be interesting, and a great gratification to me particularly, if any of your correspondents or readers could inform me of the manner in which the attacks of this last insect on bee-hives are conducted, and how they are received by the bees; and this might possibly throw some light on the present case.

OCTAVIUS PICKARD-CAMBRIDGE.

Bloxworth House, Blandford, Dorset,

November 27, 1852.

P.S.—I omitted to state, in the above account, a curious circumstance, *viz.*, that throughout the whole operation of watching the hive, and killing all the bees (the aromatic smell of whose bodies was peculiarly strong and disagreeable), not a single bee *gave any sign of irascibility*, their *whole aim and attention being to get into the hive*. Now, under ordinary circumstances, as I have frequently found, to my cost, the slightest meddling with the hive, and sometimes even standing close to it, much less *killing the inhabitants*, is sufficient to bring numbers of angry bees dashing about you, with that peculiar sharp-sounding flight called by the villagers here “coming at you spitishly.”—O. P.-C.

Proceedings of the Zoological Society.

November 23, 1852.—DR. GRAY, Vice-President, in the chair.

The Secretary exhibited a series of skulls of the gouwa (*Bos frontalis*), commonly called “the bison” by the English in India. These skulls had been presented to the Society by Capt. Wycliffe Thompson, 10th Royal Hussars, who had himself collected them in the Western Ghauts, or Sukyadri Mountains, expressly for this purpose. The skulls represented an adult bull, a cow, and a younger animal. They formed the subject of a very interesting communication, addressed by Capt. Thompson to the Secretary, in which he narrated the result of his hunting reminiscences while in pursuit of several herds, in the hope of obtaining a pair of living calves, which he had, at the request of Colonel Perronet Thompson, been desirous of capturing and adding as a gift to the Society’s collection. The range of the gouwa appears to be exclusively confined to the Western Ghauts, a narrow belt of wild, broken, and thickly wooded country, dividing the highlands of the Deccan from the lowlands which border the margin of the sea. The gouwa attains an enormous size, old bulls being currently estimated as measuring nineteen hands at the shoulder, with a corresponding weight, notwithstanding which they crash through the jungle when fairly alarmed, at a very rapid pace, making their progress visible by a long track of waving branches tossing above them like the wake of a ship at sea.

Mr. Cuming communicated the description of a new species of Hyrax, discovered in Fernando Po, by Mr. L. Fraser, H.M. Vice Consul at Whidah, and named by him *Hyrax dorsalis*.

M. Deshayes presented to the meeting the description of twenty new species of Cardita, from the collection of Mr. Cuming.

Among the objects placed on the table for exhibition, was a magnificent head of *Ovis Vignei*, from Persia, the property of Mr. Burckhart Barker.—D. W. M.

Proceedings of the Entomological Society.

December 6, 1852.—J. O. WESTWOOD, Esq., President, in the chair.

The following donations were announced, and thanks ordered to be given to the

donors:—The 'Zoologist' for December; by the Editor. The 'Athenæum' for November; by the Editor. The 'Literary Gazette' for November; by the Editor. 'Proceedings of the Royal Society,' Vol. vi. No. 88—90; by the Society. 'Journal of the Society of Arts,' No. 2, and 'List of Subjects for Premiums;' by the Society. 'Description of a new Hemipterous Insect, *Atelides centrolineatus*, forming the Type of a new Genus,' by W. S. Dallas, Esq., F.L.S.; by the Author. Specimens of *Pytho depressus* (3), *Cetonia ænea* (4), *Libellula arctica* (2), *Ctenophora atrata* (2); by Mr. Weaver. A box of British Lepidoptera; by Mr. Douglas. Specimens in illustration of the metamorphoses of six species of Strepsiptera from Albania; by Mr. S. S. Saunders.

Henry Tompkins, Esq., of Lewes, was elected a Subscriber to the Society.

The President exhibited some new Coleoptera from Ceylon and China, from the collection of Major Champion.

Mr. F. Grant exhibited a male *Lucanus Cervus*, of which the right hind leg was much smaller than the left one; a remarkable variety of *Triphæna janthina*; and a long series of *Peronea rufana*, illustrating the variation of the species.

Mr. Douglas, on behalf of Mr. H. Cooke, exhibited a remarkably dark red variety of *Hypochalcia ahenella*, taken at Hastings.

Mr. Edward Sheppard exhibited some English ship-biscuit that had been a voyage to America and back, infested with *Stene ferruginea* and a species of *Apate*.

Mr. S. Stevens exhibited a remarkable variety of *Vanessa Urticæ*, bred from a larva taken near London; a specimen of *Pieris Daplidice*, taken by E. C. Buxton, Esq., at Holme Fen; and an example of *Notodonta tritophus*, captured in Scotland, from the collection of the same gentleman. He also exhibited a specimen of *Monochamus Sutor*, found on the banks of the Regent's Canal; one of *Pogonocherus fasciculatus*, bred from the hoop of a cask; and a selection of Coleoptera and Lepidoptera from a collection just received from Mundo Nova, Rio Grande, where they were captured by Mr. Plant. Many were rare or new, and all were in fine condition.

Mr. Waterhouse observed that many of the species were also found at Rio Janeiro, about 500 miles north of this locality, but there was a perceptible variation, although not amounting to specific distinction, between the insects of the two places.

The first part of an interesting and valuable memoir by S. S. Saunders, Esq., was read, entitled "Notices of some new Species of Strepsipterous Insects from Albania, with further Observations on the Habits and Transformations of these Parasites," in which several unknown points in the economy of these insects are elucidated.

Mr. Douglas read a continuation of his "Memoir on the Natural History of British Micro-Lepidoptera," the genera *Gracillaria* and *Lithocolletis* being illustrated by descriptions of the larvæ and their economy of three species of each genus, accompanied by coloured drawings by Mr. Wing.

The Secretary read the following remarks from a note accompanying Mr. Weaver's donation:—"The *Ctenophora pectinicornis* I procured from hard undecayed stumps of trees, in which the larvæ make deep round holes, working quickly up and down them at their pleasure, and taking care to form an opening for the imago to emerge."

The President read a letter from Mr. James Crook, Turton, near Bolton, Lancashire, offering certain northern Lepidoptera in exchange for southern species.

The next part of the Society's 'Transactions,' it was announced, would be ready in a few days.—*J. W. D.*

The Osprey (*Falco Haliæetus*) in *Surrey*.—One of these rare birds was shot on the 18th of October in the grounds of Milford House, near Godalming. It had just captured a fish of nearly a pound weight. Another was seen in the neighbourhood about the same time.—*G. J. Webb*; *Brasenose College, Oxford, November 15, 1852.*

Occurrence of the Long-eared Owl (*Strix Otus*) and *Fire-crested Regulus* (*Regulus ignicapillus*) near *Penzance*.—A specimen of the first-mentioned species occurred a day or two since at Trevayler, and proved to be a male in fine plumage, with the tufts well developed. The fire-crested *Regulus* appears to visit us in greater or less numbers about this time every year; one was observed near Marazion a few days since by Mr. Vingoe.—*Edward Hearle Rodd*; *Penzance, December 8, 1852.*

Occurrence of the Black Redstart (*Sylvia Tithys*) at *Bembridge*.—On the 9th of December last I met with a single individual of this species, on the sea-shore here, in company with several rock pipts. This is quite confirmatory of the bird being an accidental winter visitor to our southern coast.—*A. G. More*; *Bembridge, Isle of Wight, January 10, 1853.*

Note on the late Occurrence of the Blackcap Warbler.—On the 22nd of December a gentleman in this county, while walking in his garden, knocked down with his stick a male blackcap warbler, in full plumage: the bird was fat, but the stomach empty.—*J. H. Gurney*; *Easton, Norfolk, January 4, 1853.*

Note on the Cole Titmouse (*Parus ater*).—This summer I have had many clumps of sun-flowers about the place, which have of late been a great attraction to several species of titmouse, and thus a source of much pleasure to myself. The cole titmouse especially, which I had seen little of until I came here, has been so abundant that I have seen two or three at a time digging away with their bills at the head of the same flower, and now that they have left them like an empty honey-comb, they are in numbers under the beech-trees, feeding on the fallen mast.—*William C. Hewitson*; *Oatlands, November 21, 1852.*

Supposed Occurrence of the Rufous Swallow (*Hirundo rufula*) near *Penzance*.—A circumstance was mentioned to me yesterday, which may be regarded as interesting and worth a place in the 'Zoologist,' as coming from a naturalist whose general accuracy may be depended upon implicitly. Mr. Vingoe, of this place, whose name has before frequently appeared in your pages, introduced the subject by remarking that he had a strong suspicion that he had discovered, in the later months of the past summer, the rufous swallow. His attention was for some time directed to an individual amongst several others, that exhibited an uniform copper colour over the whole of the under parts. At the time he had not seen a figure of the bird in Gould's work, but having occasion afterwards to refer to one of the numbers, he accidentally saw the figure of the rufous swallow, and at once recognized it as the new bird he had seen. At a subsequent period I may have to refer to this subject again, and it will then be probably when the bird is captured, and the authority of Mr. Vingoe supported by the fact.—*Edward Hearle Rodd*; *Penzance, November 27, 1852.*

Swallows in November.—I have never before this year had the pleasure of seeing swallows in November, and had therefore, with the last days of October, most reluctantly wished them farewell, not expecting to see them again before the sunny days of spring; they are however yet here, and to-day (November 21) I have had four house-martins about the house. On the 18th I saw two chimney-swallows at Esher.—*W. C. Hewitson*; *Oatlands, November 21, 1852.*

The Chukar Partridge, (*Caccabis chukar*).—“About the same time [the middle of March, 1848], I was invited by the Thannadar of Iskardo to be present at a hunting party, which he had arranged for the capture of the *chakor*, or painted partridge, by surrounding a spot of ground, in which these birds are numerous, with a ring of men, who, approaching from all directions, gradually form a dense circle of perhaps a hundred yards in diameter. When the partridges are disturbed by a horseman in this inclosure, they naturally fly towards the living wall by which they are surrounded. Loud shouts and the beating of drums and waving of caps and cloaks, turn them back, and they are driven from side to side, till at last, exhausted with fatigue, and stupid from the noise and confusion, they sink to the ground, and allow themselves to be caught by hand. The scene was a very striking one. The spot selected was a deep dell, full of rocks, but without trees. The sport, however, did not seem so successful as usual, six or eight birds only being captured. The *chakor* is an extremely common bird in all parts of the valley of the Indus, and indeed throughout Tibet. In winter, when the hills are covered with snow, they are to be found in great numbers close to the river, even in the immediate neighbourhood of the villages; and in general, when approached, they lie very close among the crevices of the stones.”—*From Dr. Thomas Thomson's 'Western Himalaya and Tibet,' p. 261.*

Woodcock breeding in England.—My number of the ‘*Zoologist*’ for September last having been mislaid, it was only a day or two since that I saw articles in it respecting the “Breeding of the Woodcock in England.” As the fact seems to be considered of *rare* occurrence, I think it may be acceptable to your correspondents to record, that during a residence of eight years in the neighbourhood of Usk, in Monmouthshire, I knew the woodcock to breed annually in several woods not far from my house. On the 1st of May, 1845, a young bird, nearly full grown, was brought to me by one of my men, proving how early it must have been hatched. I believe this bird to remain with us in every suitable situation for the purpose of breeding; but large, quiet, and deep woods are indispensably necessary to a bird of such shy and retired habits.—*William Knapp; Harts Cottage, Alveston, Bristol, December 10, 1852.*

Unusually large Woodcock.—A woodcock was sent to me a short time since, killed at Trengwainton, near this place, which, from its size and weight, I was induced to place in the scales. It proved to weigh exactly 16 oz., which is a fact perhaps worth communicating.—*Edward Hearle Rodd; Penzance, December 22, 1852.*

Note on the supposed Abundance of Woodcocks (Scolopax rusticola) in Norfolk.—The great number of woodcocks which have been met with this season at some places in Norfolk, is perhaps worthy of notice, and the more so as it would be, I think, desirable to ascertain, whether a corresponding increase has been observed in other parts of the kingdom. But at the same time I have heard of so many instances in which the number seen or killed during a day's shooting has fallen far short of what was expected, that I hardly think now, though at first I was of the contrary opinion, that the country *generally* has been this season visited by a greater number than usual. I could cite many instances, but as they would possess little beyond local interest, I will confine myself to some extreme examples. In the first week in December, 30 and 33 were respectively killed, on two successive days, at Melton Constable near Holt; and on the next day, the same shooting party bagged 93 in the Great Wood, in the adjoining parish of Swanton Novers. I have been informed on good authority, that no such number as this last has been seen there for twenty years; and further, that at least 110 might have been killed if the other game had been disregarded; but this

place is supposed to be the best ground for woodcocks in Norfolk. Felbrigg near Cromer, and Holkham also, have a high reputation for the number of woodcocks usually killed there, and this year their character has not forsaken them; for at the former place 27, 30, 15, and 21 respectively were killed on four days in the second and third weeks of December; and at the latter 29 in one day, about the same time. Now, on the other hand, Fakenham Wood, considered the most favourable locality in this part of Suffolk for these birds, was beaten at the end of October, with a slaughter of *three* only, while often 15 or 20, and on more than one occasion 30, have been killed there in years by no means extraordinary. Nor can it, I think, be urged that this shortcoming was only in consequence of the wood having been shot through early in the season, for I was told by an eye-witness that when the wood was drawn by the hounds only a week ago, he did not see a single bird, although he was on the look-out all the time. Here, at Elveden, the number of woodcocks killed has certainly been above the annual average for the preceding ten years, but at the same time it has fallen still shorter of the returns for the seasons ending in 1850 and 1844. I should observe that the places in Norfolk that I have mentioned above as having been frequented this season by a great number of these birds, are at no great distance from the sea, and the same may be said of the other localities to which report has assigned a like visitation; it may therefore be that owing to so much of the country being under water, to the very mild weather, or to some other such reason, the woodcocks have been either constrained to haunt the places at which they first landed, or else have had no inducement, in the shape of scarcity of food, to quit them. These suggestions, and the true solution, I leave to the readers of the 'Zoologist.'—*Alfred Newton; Elveden Hall, January 7, 1853.*

Occurrence of the Little Auk (Uria Alle) in the City of Durham.—The late gales have brought to our coast many rare northern visitors, but I think the circumstance of the little auk (*Uria Alle*) being taken so far inland as the heart of the city of Durham, is almost unprecedented. A fine specimen was discovered by some workmen on Friday fortnight, the 26th ult., in the garden of E. Shipperdson, Esq., in the South Bailey, not far from the banks of the river Wear. It had apparently been just killed by a cat, as it was quite warm, and torn in the breast. The specimen is in the hands of Mr. Proctor, of the University Museum.—*H. B. Tristram; Castle Eden Parsonage, December 9, 1852.*

Occurrence of the Puffin (Fratercula arctica) in Winter off the Isle of Wight.—A dead puffin was picked up on the 4th of this month in Whitecliff Bay, perhaps a victim to the late stormy weather.—*A. G. More; Bembridge, Isle of Wight, January 10, 1853.*

Occurrence of the Sooty Tern (Sterna fuliginosa) in England.—I have the pleasure to record the occurrence of a bird near Burton-on-Trent, new, not only to the Fauna of Britain, but also to that of Europe. About four months ago it was reported to me that a strange bird had been killed at Tutbury, near this town, which, as my informant said, was a gull-billed tern. Being at the time very much engaged in business, and knowing that the specimen was not leaving the neighbourhood, I did not hurry to visit and examine it; in the mean time the bird was purchased by H. W. Des Vœux, Esq., of Drakelow Hall, and added to his collection of indigenous specimens. On seeing it there a few days ago, I at once saw that it was no previously recorded British species; and on referring to Wilson, Latham, &c., it became evident that it was the sooty tern, (*Sterna fuliginosa*). Considering that this species is so

widely dispersed over the globe, that it is abundant in Australia and in some of the South Sea Islands, and is also found on nearly the whole length of the American coasts, the only wonder is that it has not frequently wandered to Europe. The specimen is in fine condition, and if you think it desirable to have a representation of it, I shall be happy to send you a drawing, as Mr. Des Vœux has kindly consented to lend me the specimen for the purpose. In this instance at least there can be no question as to whether the individual was truly a wild specimen, or had been kept in captivity, as I believe no successful efforts have ever been made to confine the terns. — *Edwin Brown ; Burton-on-Trent, December 20, 1852.*

Occurrence of the Fork-tailed Petrel (Procellaria Leachii) near Penzance.—A specimen of this bird was picked up dead at Fleming, near this town, a few days since, in an emaciated state. Its occurrence on this coast is rare. — *Edward Hearle Rodd ; Penzance, November 27, 1852.*

The Great Sea Serpent.—I have lately received the following account from my brother, Capt. Steele, 9th Lancers, who, on his way out to India in the *Barham*, saw the sea-serpent. Thinking it might be interesting to you, as corroborating the account of the *Dædalus*, I have taken the liberty of sending you the extract from my brother's letter. "On the 28th of August, in long. 40° E., lat. 37° 16' S., about half past 2, we had all gone down below to get ready for dinner, when the first mate called us on deck to see a most extraordinary sight. About 500 yards from the ship there was the head and neck of an enormous snake; we saw about 14 or 20 feet out of the water, and he spouted a long way from his head; down his back he had a crest like a cock's comb, and was going very slowly through the water, but left a wake of about 50 or 60 feet, as if dragging a long body after him. The captain put the ship off her course to run down to him; but as we approached him he went down. His colour was green, with light spots. *He was seen by every one on board.*" My brother is no naturalist, and I think this is the first time the monster has been ever seen to spout. — *Thos. Steele, Lt. Col. Coldstream Guards ; 21, Upper Brook St., December 13, 1852.*

The Sea Serpent.—I am told by a gentleman whose brother was on board the ship (the *Barham*) referred to in the following extract from 'The *Times*' newspaper of November 17, 1852, that the occurrence there related took place between 35° and 40° S. lat. and 40° and 45° E. long., being about 650 miles due south of Madagascar. I understand that the particulars of the event as there stated closely agree with those furnished to my informant, and further, which is perhaps the most interesting part of the whole circumstance, that the animal was observed to "blow" or "spout" in the same manner that a whale does.—*Alfred Newton.*

"*Extract from an Officer's Letter written between the Cape and Madras.*—You will be surprised to hear that we have actually seen the great sea serpent, about which there has been so much discussion. Information was given by a sailor to the captain just as we were going to dinner. I was in my cabin at the time, and from the noise and excitement I thought the ship was on fire. I rushed on deck, and on looking over the side of the vessel I saw a most wonderful sight, which I shall recollect as long as I live. His head appeared to be about 16 feet above the water, and he kept moving it up and down, sometimes showing his enormous neck, which was surmounted with

a huge crest in the shape of a saw. It was surrounded by hundreds of birds, and we at first thought it was a dead whale. He left a track in the water like the wake of a boat, and from what we could see of his head and part of his body we were led to think he must be about 60 feet in length, but he might be more. The captain kept the vessel away to get nearer to him, and when we were within a hundred yards he slowly sank into the depths of the sea. While we were at dinner he was seen again, and a midshipman took a sketch of him, of which I will send you a copy.—*The Times*.

Note on the "Yellow Boa," (*Chilabothrus inornatus*).—About three months ago a female yellow snake was presented to us, which was brought from the Forest Estate, Trelawny, in the island of Jamaica. For some time after its arrival it appeared sluggish and unhealthy, but this we attributed to the low temperature it experienced during the passage, and fancied that after casting its skin it would feed and do well, but on the 6th of November last the keeper discovered fourteen young ones in the den, of which seven were dead and seven alive; of the latter five are still alive and doing well, and the old one has since cast her skin, and now seems in good health. Mr. Gosse, in his charming book on Jamaica, describes and figures this snake, which he calls the "Yellow Boa" (*Chilabothrus inornatus*), and on the whole seems to think that it is oviparous; and he appears to have arrived at this opinion from the circumstance of some eggs having been brought to him, when he was in Jamaica, from a place there called Belmont, and which were stated to be those of the yellow snake, and also from the fact of "Sam," his boy, having found a boa lying on a nest of trash made between the spurs of a fig-tree, where however no eggs were found. Mr. Gosse afterwards mentions that on killing the female yellow snake, young ones have often been found in her belly; that some labourers in the Pedro mountains killed one having twelve "grown" young ones in her, varying from 8 to 10 inches in length (the young ones in our menagerie were about the same length on the first day); and he concludes his notice by saying that his friend, Mr. Hill, thinks the yellow snake is viviparous, a young friend of his having caught a gravid female of this species, which after some days brought forth eleven young ones; and on this he remarks, that if there was no error in the observation of this case, it must be considered as an "aberration of habit," that the generation of the *Boadæ* is well known to be oviparous, and that the fact he has before mentioned as having fallen under his own observation, proves that "sometimes at least the *Chilabothrus* produces eggs;" and he then asks this question,— "Is it possible that a serpent, normally oviparous, might retain its eggs within the oviduct until the birth of the young, when circumstances were not propitious for their deposition?" In answer to this, one is tempted to ask whether it is quite certain that the eggs brought from Belmont were really those of the yellow snake, and whether the instances of the snake caught by Mr. Hill's friend, and the one in our menagerie, are not stronger proofs of its being viviparous, and especially as we do not hear of other instances where eggs have been found? Would it be considered a fair argument to ask why an oviparous snake should have the power of retaining her eggs any more than a hen?—the latter, it is certain, could not do so beyond a certain time, whether she had a nest prepared or not, and why should the reptile? The snake in our collection was brought over in a large box, and after her arrival was kept in a good roomy den, and it seems difficult to account for her not having, under the circumstances, dropped her eggs if she be indeed oviparous. It appears from the books that, so far as it is known, all poisonous snakes are viviparous. The yellow snake in our menagerie certainly has poison-fangs, Mr. Etheridge, of our Institution, and other

scientific gentlemen, having repeatedly examined her ; she has, besides, other characteristics of the viper tribe, and this I consider to be a very strong argument in favour of her being viviparous. I should mention that the young ones, the day they were discovered, exhibited the peculiarity mentioned by Mr. Gosse, — that of rearing their bodies until they appeared to rest on the tip of the tail ; they moreover will dart open-mouthed at anything put near them, which act I have never observed in the young of the Boa constrictor, of which we have reared many here. I hope these remarks will elicit from some of your readers fuller accounts of this beautiful reptile, and that the question of its being viviparous or the contrary may be set at rest.—*Robert Coles, Hon. Sec. Bristol and West of England Zoological Society ; December 13, 1852.*

On the Artificial Introduction of a Breed of Salmon into the River Swale, and a tributary Stream in Yorkshire. Communicated
By JOHN HOGG, Esq., F.L.S.*

MR. HOGG communicated a letter with the above title, which appeared in the 'Durham Advertiser' for April 16, in the present year [1852], under the signature of Isaac Fisher, together with an unpublished letter from the same gentleman, in answer to a request from Mr. Hogg for further information ; and added some observations of his own upon the same subject. From the letter published in the 'Durham Advertiser,' it appeared that Mr. Richard Harrison of Richmond had procured from the river Tees a brood of spawn, taken and milted from the living fish, which he deposited on the 29th of December last in a small tributary of the river Swale. On the 21st of March two of the ova were brought to the house of Mr. Fisher, and placed in a vessel of water, the foetal signs were clearly distinguished, and in two days more they became living fish ; he is consequently satisfied that the salmon is now restored to the river Swale,* from which it has of late years been banished. In answer to Mr. Hogg's inquiries, Mr. Fisher states further that the ova and milt were obtained in the Tees, according to the directions given by Boccius, Shaw, and "Ephemer," in his 'Book of the Salmon.' They were taken from three female and two male fishes on the night of the 27th of December, and not deposited in the gravel of a small rivulet until the 29th of the same month. Part of the ova were also placed in a gravel-bed in the river Swale ; but of the result of this part of the experiment Mr. Fisher has no present information. In one part the ova were placed too deep in the gravel, and on examination were found to be addled ; while there

* From the 'Proceedings of the Linnean Society,' May 4, 1852.

is every reason to believe that those which were placed about 3 inches in the gravel have all been hatched. A live fish brought from the spawning-bed leaped out of the vessel in which it was kept and speedily died, and the two mentioned in the published letter also died in the course of about ten days, probably in consequence of the disturbance to which they were exposed from the curiosity of those who came to see them, and who were desirous of observing the extreme velocity with which they moved round the vessel, even while the vitelline bag was still attached to the abdomen. The spawning-bed was formed in a small run of spring water, which is never affected by the frost; it was cleared of minnows, young trout, &c., and at each end of a space of about 20 yards, whins were placed of a good height, kept down with stones, to prevent the entrance into it of other fish. After some observations respecting minnows, Mr. Fisher adds: — “We have proved the fact that the river Swale may be again stocked with salmon, provided we can make arrangements with the proprietor of a mill-wear, twenty-five miles from this place, to let the fish, on coming up from the sea, have ‘free gap’ from time to time.”

On these letters Mr. Hogg observes that it seems to him there can be little (if any) doubt that, with the precautions indicated, a vast increase of salmon might be obtained, and a sure and valuable source of wealth be secured in many suitable streams in which no salmon are at present found; and the same artificial process of breeding might likewise be applied to trout with an equally advantageous result. He suggests that the breeding might also be carried on in large wooden boxes or cases, having a layer of gravel at the bottom 4 or 5 inches deep, in which the ova and milt, or impregnated ova, might be buried, and the cases filled with pure water, which might be kept constantly fresh by allowing a small stream to run into them. When the fry had grown sufficiently strong, they might be conveyed to any distance in tubs filled water (which might be occasionally renewed), and having their tops perforated with holes. On the subject of the distribution of the species of fresh-water fishes, Mr. Hogg refers to the presence of trout and other fishes in mountain streams and alpine lakes, for which it seems difficult to account; but he suggests that as the presence of unusual plants in similar circumstances is only to be accounted for by the seeds having been dropped by birds, the problem with regard to fishes might be naturally solved in an analogous manner, their fry having been conveyed to these distant localities by means of water-birds.

Note on Gasterosteus leiurus, or probably G. trachurus.—I was much pleased with the observations of Mr. Warington in your last number (Zool. 3633), on the stickle-back (*Gasterosteus leiurus*), as confirmatory of some remarks on that fish when kept in confinement, made by me in Loudon's 'Magazine of Natural History,' (iii. 329). It is some time since I had an opportunity of observing the habits of this very interesting fish; but I can add my testimony to almost all that Mr. Warington has written. Their pugnacious propensities appear to last only during the season of spawning, and the extreme brilliancy and beauty of the male fish ceases with this amatory period. Mr. Yarrell says that at this period both sexes exhibit "more than usual brilliancy;" but I have never observed any difference in the appearance of the female, except when full of spawn. Their ferocity, and tyranny over their vanquished fellow-prisoners, must be witnessed to be credited. Mr. Warington might have related how skilfully and often fatally they use their lateral spines in their combats. Previously to an encounter it is a most pleasing sight to witness the attitudes of the two combatants,—sparring as it were, and watching for an unguarded part in the opponent, and then darting upon him with surprising velocity. They swim round and round each other, with their spines projected, before the assault is made. I once had in confinement, with some of the other species, the *Gasterosteus pungitius*, which becomes coal black during the spawning season. This species is usually smaller, and their sides less bony and hard than the other species. An encounter took place between this black fellow and a fine and beautiful specimen of another species; and, after an unusually protracted fight, the black hero was overcome and sank to the bottom of the tub, literally ripped open by one of the spines of his opponent, and shortly after died. This I myself witnessed. When one has been beaten and driven from the position he had appropriated to himself in his place of confinement,—which he seldom yields without a struggle, generally occasioned by one invading the territory of the other,—his gay colours fade, and he unites himself with some other brethren who have either been similarly conquered, or, for some other reason, have not assumed the gay colours and fighting propensities of the others. This unfortunate squad is generally driven into an unoccupied corner of their prison, where they are wantonly and continually persecuted by their congeners. The mouths of these fish are armed with rows of exceedingly minute and sharp-pointed teeth, and a wound inflicted by these on the tail is often followed by death. The wounded part at first becomes white, then increases in extent, until the whole fish is covered with a furry-looking fungus; and as the fish sickens in death, the beautiful colours which had faded, as they always do after the fish are vanquished, re-appear, but not with their original brightness, and without that glowing and animated appearance which they exhibited when in health and vigour. I have never had an opportunity of witnessing their nest-building operations, but have frequently seen the male fish swimming about with a piece of ligneous fibre in his mouth, as Mr. Warington mentions. The eggs are hatched in March or April, as I have taken the young fry about June, entangled in the green silky weed found in all ponds. The adult fish will greedily devour their own fry, which they seize and swallow after the manner and with the voracity of the pike. They are said to survive three years, but I never could ascertain the correctness of this conjecture. It is so long since I kept these fish in confinement, and never having examined them scientifically, that I am unable to say with certainty to which species my remarks apply, but most likely to more than one. I only know that my specimens were caught in two ponds at the back of the Hackney road, called "Bunker's Ponds," and well known to

botanists as containing in profusion the fringed yellow water-lily (*Villarsia nymphaeoides*) and the sweet-smelling flag (*Acorus Calamus*). — R. Wakefield; Sussex Place, Regent's Park, November 26, 1852.

Land and Fresh-water Mollusca of Oxford and its Neighbourhood.

By ALFRED MERLE NORMAN, Esq.

THE following list has been drawn up from specimens which I have myself found in the neighbourhood of Oxford during the last eighteen months. The range of many of the species which it contains is very limited, and consequently this locality for them may be acceptable to some of your readers. I believe that the list of water species is nearly if not quite complete; but as regards the land shells, I cannot help thinking that more are to be found somewhere or other, although I have searched the immediate neighbourhood pretty closely for them.

The study of our inland Conchology has of late years met with many votaries, and deservedly so, for it is in itself a most interesting pursuit, and can be most conveniently followed in conjunction with Entomology; in fact no one ought to study the one without the other. The entomologist, while collecting water-beetles, must necessarily at the same time obtain many shells in his net; when examining rocks and stones, he must meet with many *Helices*, *Zonites*, *Bulimi*, &c.; and when he brings home his bags of moss, and searches for *Staphylinidæ* and other minute *Coleoptera*, he will at the same time probably find many *Clausiliæ*, *Pupæ*, *Vertigines*, &c.: and so on in numerous other instances. Thus by having both objects in view, the collector will very often have the advantage of procuring rarities in one or other of his pursuits to reward him for his trouble; whereas had Entomology or Conchology alone been his object, he might have returned home empty-handed and disappointed.

The nomenclature used is that of Turton's excellent little 'Manual of Land and Freshwater Shells.'

Neritina fluviatilis. Very abundant in the Cherwell, on *Confervæ*, stones, and dead shells of *Anodon cygneus*.

Paludina vivipara. Common in many of the ditches round Oxford, particularly near West Hinksey.

„ *achatina*. River Cherwell. I have not found it in any of the ditches.

Bithinia tentaculata. Very common both in streams and ditches.

Bithinia ventricosa. In a ditch at the foot of Bullingdon Common, rare.

Valvata piscinalis. By no means common; West Hinksey, Port Meadow.

Arion ater. Common in the wet meadows, but I have only met with the black variety.

Limax flavus. One specimen.

„ *agrestis*. Abundant everywhere.

Helix aspersa. Very abundant.

„ *hortensis*. Common.

„ *nemoralis*. Very abundant and exceedingly varied.

„ *pomatia*. Stonesfield.

„ *arbustorum*. In many of the hedges, particularly at Somers-town.

„ *pulchella*. Banks of the river Isis.

„ *Cantiana*. Abundant, but local; Heddington and Shotover Hills.

„ *granulata*. Marshy ground at the foot of Bullingdon.

„ *hispida*. Common.

„ *concinna*. Not common; Magdalen walks.

„ *rufescens*. Very common in hedges.

„ *virgata*. On the dry hills around Bullingdon, Heddington, Shotover and Bagley.

„ *caperata*. Not so common as the last; Bullingdon and Heddington.

„ *ericetorum*. Not common; Heddington and Bullingdon.

Zonites radiatulus. I have a shell which I found in Magdalen walks, and which I cannot name, unless as a variety of this species. It differs from the usual type in being altogether larger, the whorls more rounded, and of slower increase, the colour deeper, and the shell opaque; the *striæ*, *umbilicus*, &c., are the same as usual.

Zonites lucidus. Banks of the river Isis.

Succinea putris. Common; Isis and Cherwell.

„ *Pfeifferi*. Rare; in a ditch running along the side of Cowley Marsh. I cannot help regarding this as merely a variety of the last.

Zua lubrica. Common; Magdalen walks, &c.

Pupa marginata. Rare; Heddington.

Clausilia nigricans. Bagley and Shotover.

Limnæus auricularis. Found in many of the ditches round Oxford, very common in the Cherwell.

- Limnæus pereger*. Very common.
- „ „ var. *ovatus*, Drap. A ditch near West Hinksey.
- „ „ var. *acutus*, Jeffreys. In the ditch running along the side of Cowley Marsh.
- „ *stagnalis*. Very abundant and large.
- „ „ var. *fragilis*, Mont. In ditches at West Hinksey.
- „ *palustris*. Common in ditches, West Hinksey and Port Meadow.
- „ *truncatulus*. On the mud of the banks of the Isis.
- Ancylus fluviatilis*. Not common; in the Cherwell, on stones and on shells of *Anodon cygneus* and *Unio tumidus*.
- Velletia lacustris*. I have found this species only in one ditch, — that on the right hand side of the foot-path leading from Oxford to West Hinksey, on submerged leaves of *Nuphar lutea*. It is curious that I did not find a single specimen on the leaves of *Nymphæa alba*, which was growing in the same ditch; was this merely accidental?
- Physa fontinalis*. In many of the ditches in the neighbourhood; particularly fine in the same ditch with *Velletia lacustris*.
- Aplexus hypnorum*. Very local; ditch at the foot of Bullingdon.
- Planorbis corneus*. Very abundant; very fine in the Cherwell, where it passes St. Clement's.
- „ *albus*. Not common; ditches at West Hinksey and the river Cherwell.
- „ *carinatus*. Rather common; Hinksey, Port Meadow and Christchurch Meadow.
- „ *marginatus*. Very common.
- „ *vortex*. Very common.
- „ *spirorbis*. Ditch at the side of Cowley Marsh.
- „ *nitidus*. Two or three specimens in a ditch in Christchurch Meadow.
- Cyclas rivicola*. Very common in the river Cherwell.
- „ *cornea*. Found in most of the ditches.
- Pisidium pusillum*. Ditch at the foot of Bullingdon.
- „ *Henslowianum*. Very rare; two specimens in the river Cherwell.
- „ *amicum*. Cherwell, and ditch in Christchurch Meadow.
- Anodon cygneus*. Common; the Cherwell and many of the ditches.
- „ „ var. *rostrata*, Kokeil. One specimen in the river opposite Port Meadow.
- Unio tumidus*. Abundant in the Cherwell.
- Dreissena polymorpha*. A few specimens in the Cherwell.

All the above species are found in the *immediate* neighbourhood, except *Helix pomatia*, which is found at Stonesfield, about ten miles distant.

ALFRED MERLE NORMAN.

Clevedon, Somerset, December 11, 1852.

Discovery of Helix obvoluta in Hampshire.—Last winter, while superintending the marking of trees for thinning, in the beech-hangers which cover Stoner Hill, I poked about in the moss and dead leaves with a small prong, which I usually carry on such occasions to assist me in my search after chrysalids, shells, &c., when I turned up a dead shell of *Helix obvoluta*. Being a shell-collector, this of course instantly set me looking for more, and I succeeded in finding four or five, all dead. The next few days I devoted to the search, and discovered living specimens; and with the aid of a couple of the gamekeeper's children, whom I chartered for the occasion, I obtained altogether about a hundred dead and about eighty living specimens. On the first day of my search there was a rather hard frost, and all the living specimens I found were buried in the moss or decayed stems. There was afterwards a thaw, and some rain, and then they were to be found, towards evening, coming out to enjoy themselves and creeping over the moss. The locality mentioned in Turton's Shells (Gray's edition) as the habitat of *H. obvoluta* is misprinted in my copy; it should be "Ditcham Wood, *Buriton*, Hants," and not "Brenton." Ditcham Wood is about six miles from here, but is on a ridge of the chalk downs nearer the sea than that on which Stoner Hill stands. The two ridges are here quite distinct, and the intervening country is low and flat; therefore I do not think it possible that *H. obvoluta* could have spread or wandered to the Ashford woods from Ditcham. I make this remark with reference to the supposition expressed in Turton that it has probably been introduced and naturalized from abroad. Some time ago I obtained a few specimens of *H. obvoluta* from Ditcham Wood, and I have been lately informed that some have been taken in the large beechwoods of Uppark, which joins Ditcham, but I have not yet seen any of them. I obtained all my Ashford specimens within a few hundred yards of the spot where I discovered the first shell, and have not yet searched the other woods near, but have no doubt that it is to be found in similar localities, and this I shall endeavour to ascertain, for I firmly believe it to be a true native of England, though local in its distribution. The number (though only obtained by a most persevering search, as they were in winter quarters), and the fine growth of the specimens I collected, also incline me to this opinion. I have not observed its habits in summer, but mean to do so if I can, and shall be curious to ascertain if it prefers a northern aspect; the hill on which I got mine faced about E.N.E. I have not yet seen that volume of Forbes and Hanley's 'Mollusca' which contains the description of *H. obvoluta*, and therefore know not whether the following circumstance is mentioned there, but as it is not alluded to in Turton, will run the risk of communicating a fact which may be already well known, and state that all the living specimens I found had the shell thickly covered with very fine hairs, similar to those on *Helix hispida*, and which are so extremely brittle as to render it a matter of great difficulty to get the animal out without rubbing them off.

A few of those I collected were young specimens, about half grown, and these had no sign of the triangular mouth, or the reflexed lip, which characterize the species when full grown. — *William Henry Hawker ; Ashford Lodge, Petersfield, Hants, December 24, 1852.*

Description of a Young Lobster measuring only nine lines.—*Generic character* :— External antennæ not so long as the body: arm longer than the hand; inner margin toothed: anterior legs long, slender, equal; fingers long, slender, toothed; second and third pairs of legs didactyle, fourth and fifth monodactyle: rostrum wide, deeply grooved, armed on each side with four teeth, the sides parallel for two thirds of its length, and then tapering off to an acute angle, the apex trifid: carapace more nearly cylindrical, the segments terminating laterally in an acute triangular process produced to a spine. *Specific character* :—Body thick and rounded: cephalothorax deeper than broad, compressed at the sides; a furrow separates the gastric from the posterior regions; the latero-posterior portion is slightly punctuated: rostrum projecting beyond the peduncle of the external antennæ, wide and deeply grooved throughout, of even width through half its length and then running to an acute trifid apex; the carina on each side formed by the groove is toothed with three spines; that portion of each carina which extends on to the cephalothorax bears about a dozen teeth: rostrum straight, recurved at the extremity: eyes large, forward, completely protected by the rostrum: a small tooth on each side of and even with the base of the rostrum: external antennæ about two thirds as long as the body: abdomen semicylindrical, segments smooth, terminating on each side in a flattened triangular plate, which ends with an acute spine; the margins of the plate are toothed with very fine and numerous teeth; the three posterior segments are more spread than the others, thus giving a semi-oval appearance to that portion of the carapace: tail broad; the exterior laminae strongly divided at their anterior third; the margin of their posterior portion dentated; two round carinae start from a point at the base of the centre lamina, and, diverging, end at its extremity in a tooth at each corner, thus forming a triangular space between them: anterior legs large, equal, quite smooth, with the exception of the inner margin of the arm, which is toothed: arm as long as the hand; wrist one-third as long as the arm; hand about four times longer than broad; fingers almost as long as the hand, straight, and having numerous small teeth: the remaining legs filiform and weak; the second and third pairs didactyle, the fourth and fifth pairs monodactyle. Extreme length 9 lines: arm and wrist united $6\frac{1}{4}$ lines; hand 3 lines. The colour is straw (drying much darker), dotted in some parts with pink and in others with orange. I caught this individual on the 18th of August, 1852, in from 5 to 7 fathoms water, off Redcliffe Head, in Weymouth Bay, on a bed of *Cystoseira fibrosa*. The most apparent difference between it and the adult *Homarus vulgaris* consists in the much shorter antennæ, the more slender and more equal anterior legs, the wider rostrum, and the more acutely triangular plates of the segments.—*William Thompson ; Weymouth, January 1, 1853.*

Abstinence of a Spider.—In the ‘St. James’s Chronicle’ of October 26, I see an account, copied from the ‘Banffshire Journal,’ of a spider having lived for a year without food; and it is curious enough that I have recorded a very similar circumstance which happened under my own personal observation, the only difference being that *my* spider is now dead. “Some time during the winter of 1850-51, I had a case (containing a stuffed water-rail) sent home from the bird-stuffer’s, glazed, papered, and all complete: the case is about 10 inches by 8, and 5 inches deep. Shortly after it arrived, I observed a *very small* spider traversing backwards and forwards on its web, which it had spun from side to side of the case underneath the bird. All I did was mentally to abuse the bird-stuffer for his carelessness in omitting to put camphor in the case before glazing it; and also I resolved to take out the glass and eject the spider. However, in a multiplicity of occupations, I soon forgot all about the matter, until the autumn of 1851, when my attention was drawn to it by seeing the bird completely surrounded underneath by a strong web, and stationed in the midst of it, a spider of at least ten times the bulk of the small one I had seen there the previous winter, and looking fat and well, though with no signs of any other living creature in the case, nor any appearance of anything having been entangled in the web. From this time, feeling curious as to how the spider could live, thrive, and grow under such circumstances, I watched it from time to time, but never from that day until it died, about four months ago (some time at the end of last June), could I discover any trace of its having obtained anything to eat. It continued to increase in size up to about six months before its death; after which time, although looking perfectly plump and healthy, it became stationary in one particular part of the web, in which position it died and still remains hung up, though now considerably shrivelled. I am not aware of the species, but in colour it was nearly black.” The case, as far as I can see, is perfectly air-tight, there not being the slightest aperture visible. From the time when I first saw the spider until it died, was a space of eighteen months. The above note may possibly be of interest to some of your readers, and worth recording as a tittle of evidence towards a more complete knowledge of the habits, ability of endurance without food, or organization, whereby some creatures can exist and even thrive without material sustenance: should this be the case, I shall consider myself most fortunate in having been able to add that tittle to the great mass of curious and useful information contained in the pages of the ‘Zoologist.’—*Octavius Pickard-Cambridge; Bloxworth House, near Blandford, Dorset, November 8, 1852.*

On “Robber Bees,” as described by O. Pickard-Cambridge, Esq.
By H. W. NEWMAN, Esq.

I HAVE attentively read the account by Mr. Cambridge, of the robbers which attacked his hives on the 15th of September last (Zool. 3746), and as I have had a good deal of experience in the same way, I am of opinion that no one could have acted with more promptitude and decision on that occasion. As Mr. C. wishes to have opinions

on the subject, I will give him mine. The hive in question had probably lost its queen at a time when she could not be easily replaced, in this case the bees would become dispirited and desert the hive, and probably some strong stock finding this out, sent their scouts — corsair bees, as that patriarch of apiarians, Dr. Bevan, calls them — to attack the hive in its weak state. I have had many instances of robbery, but not exactly similar to that recorded by Mr. Cambridge, for in the cases where so large a collection of honey exists, the resistance of the bees is very fierce, and they do not in general give up without a slaughter of several thousands on each side.

The extent of these robberies generally agrees with the number of stocks kept in a small compass; when a country is overstocked, continual robberies will always take place; and Mr. Butler, in his book entitled the 'Feminine Monarchy,' described them most minutely a hundred years ago. The fact is, that more bees are kept now-a-days than in the time mentioned by the bee-keepers alluded to by Mr. Cambridge.

I knew an instance of a worthy Kentish baronet, who kept bees and multiplied his stocks, in ten or twelve years, to nearly a hundred, in a bad bee-country too; in the end he got no honey, as the bees literally "ate each other up," as he termed it.

The bees which plundered Mr. Cambridge's hive were evidently not the natives of the hive, but most likely hereditary thieves from some stray stock not very far off.

Desertions most frequently take place in the spring; it is generally a sort of effort made in despair, and unless the bees overpower some very weak stock they always perish: mouldy or musty combs, occasioned by the wet soaking into them, will also cause the bees to desert. I had a fine stock desert a hive on the 4th of April, some years ago; they had been deprived of full seven-eighths of their combs in the autumn.

About ten years ago a Bristol newspaper announced a swarm of bees on the 30th of March! I immediately wrote to the owner to inquire particulars of this extraordinary event; he wrote me a polite note, informing me that the announcement of a swarm was a mistake, — that it was a desertion; and added that the hive in question was examined by a friend and neighbour of his, more conversant in these matters than himself, who found that the combs were completely riddled by a small moth, which had caused the bees to desert.

I have frequently seen the same furious attack made upon a hive containing comb only (in July and August), and no bees or honey, as

that described by Mr. Cambridge; there must be something which these robber bees carry to their own hives from these old combs. I had at one time twenty-six stocks of bees, but never yet discovered the moth mentioned, nor the death's-head moth described by Huber; the latter is certainly not to be met with in England.*

I keep my bees as far apart as my garden will permit; and when I observe the bees of one stock in my garden attacking another, I immediately remove the stock that is attacked, or kill the robber bees; for I am convinced they are like dogs that take to killing sheep,—when they once begin they never give it up.

It is a great mistake to say that the robber bees are of modern date; the fact is, the increase of numbers in bees has in some measure kept pace with the population, and where a country is much overstocked, a series of wet seasons causes a proportionate increase of corsair bees. The detestable plan also of placing sometimes from twelve to twenty hives in a row, touching one another, is another great cause of confusion and plunder.

Ever since I first kept bees I have considered the plundering as the “besetting sin” of these curious insects, and it is quite plain from the ancient writers that it has existed from time immemorial.

I know of no remedy but the adoption of the “separate system” as much as possible; the flight of robbers in the same garden may then be watched by a quick eye. In the year 1848 I removed one poor persecuted stock 400 yards from my garden, but this did not prevent a partial robbery.

I confess that unless, as I have surmised, the queen died, Mr. Cambridge's case is a poser to apiarians, on two accounts:—1. *The large quantity of honey*; and 2. *The small number of dead bees near his hive*. If the moth had attacked the hive, its ravages would have been seen to commence at the outside of the combs. I now exceedingly regret that I did not visit the gentleman at the Golden Valley, in the parish of St. George, near Bristol, when he wrote to me about the desertion I have mentioned. I have no doubt that Mr. Cambridge will have several replies to his communication.

H. W. NEWMAN.

New House, near Stroud,
January 10, 1853.

* My correspondent is, I think, in error here: the death's-head moth spoken of by Huber appears to be our *Acherontia Atropos*, and this certainly occurs in England, although its attacks on our bee-hives are not frequent.—E. N.

Note on "Robber Bees." — Mr. Cambridge's communication "On the Phenomenon denominated 'Robber Bees'" (Zool. 3746), may probably receive some confirmation from Dr. Bevan's account of the wax-moth (*Tinea mellonella*), whose depredations appear similar to those of the honey-moth, (*Achroia alvearia*); and I would beg to refer him to Dr. Bevan's admirable work on the 'Honey Bee,' chapter 21, on "Enemies of Bees."—*R. Wakefield; Sussex Place, Regent's Park, January 11, 1853.*

Notice of the Habits of Myrmica domestica, Shuck., together with some Account of a means of turning the Industry of this minute Ant to account in the preparation of Skeletons of small Animals. By GEORGE DANIELL, Esq.*

MR. DANIELL states that his attention was first attracted to this species of ant some years ago, by observing several individuals engaged, in the window of a house in Edwards Street, Portman Square, in dragging to the edge of the casement a large fly, which they finally succeeded in conveying through an opening in the wall. He found by repeated observations that, like the other species of ants, they uniformly followed the same track, passing and repassing, but never deviating from the beaten route. There appeared to be a regular chain of correspondence kept up throughout the track; and one of the ants, while travelling at its usual rapid rate, was frequently observed to be stopped by another, a communication passing between them by means of their antennæ, after which each would return in the opposite direction from that in which they were previously travelling. The track was found to terminate on the ground floor, where it disappeared in the party wall, the adjoining house being occupied by a baker, who stated that in the summer months these ants were a perfect nuisance to him, spreading themselves over all his goods, and especially the sweet cakes and sugar, of which they carried off incredible quantities. He indicated on his premises numerous tracks, traversed by myriads of these minute insects, each engaged in carrying off a grain of sugar or some other description of food to their dwelling-place, which appeared to be in the wall of the cellar, by the side of the oven, whence

* From the 'Proceedings of the Linnean Society,' March 16, 1852.

he found it impossible to dislodge them. To diminish their numbers he was in the habit of hanging against the wall a boiled sheep's liver, which they speedily covered, and then plunging it into boiling water; but even this wholesale destruction had very little apparent effect in thinning their ranks. In the same vault there were also multitudes of crickets (*Gryllus domesticus*) and black beetles (*Blatta orientalis*, L.), in every stage of growth and variety of colour, from the deep black to the pale albino; all of which appeared to entertain the greatest dread of these apparently insignificant creatures, retreating precipitately when they found themselves in the vicinity of a track, while several of the ants would immediately rush out of the line to chastise their intrusion.

It now occurred to Mr. Daniell that he might make the laborious habits and fondness for animal food evinced by these ants serviceable to himself in the preparation of skeletons. With this view he placed some mice and small birds in boxes against the wall, but although the ants immediately attacked them, so great was the heat of the oven that the subjects were dried hard, and generally abandoned after the brains had been eaten out. Several other attempts in different parts of the cellar also failed, the skeletons being frequently destroyed by the crickets and beetles after the ants had abandoned them, until which time no other insect could approach without undergoing the punishment of death. Mr. Daniell then determined to endeavour to establish a colony in a cellar adjoining the oven and parallel with it, in consequence of which proximity the wall gave out a certain degree of warmth when the oven was heated. He first placed the most inviting food in the warmest corner, to which he had fitted a box with holes in it on the side next the wall, large enough to admit the ants, but not the larger insects; and this failing to attract them, he caught a great number from a piece of liver placed as a trap, and shook them into a box from which they had no means of escape, in which he closed them with abundance of food, but after seeking in vain for an outlet they congregated in one corner of the box and eventually died. His next expedient was to catch them in great numbers and turn them loose in the cellar; and repeating this process for several evenings, he had at length the satisfaction to see a track established extending from a small hole in the wall to the box in which their food was deposited. After some time another track was formed to another corner of the box at right angles with the first; and these tracks were never abandoned while he continued to avail himself of their services, which he did not cease to employ until he had completed by their means upwards of

a hundred beautiful skeletons of small quadrupeds and birds, reptiles and fishes, the greater part of which are now in the collection of the British Museum. In the course of these experiments he made the following further observations on their habits.

They will not touch anything tainted, and prefer animals in the blood to such as have been previously cleaned. The plan which Mr. Daniell found to answer best was to take the object quite fresh, to skin it, extract the viscera, and cut off as much as possible of the flesh, and then to place it in the box. It is seldom that a skeleton is so entirely cleaned as to require no further preparation; but the smaller skeletons when taken quite fresh require only a very little subsequent maceration to complete the process, the more delicate and difficult portions, such as the cranium and vertebræ, being almost always cleaned in preference to the ribs and limbs; and even those portions of muscle which are not removed by the ants are generally so much detached by them, that a slight brushing or two after well soaking the object suffices to remove them. One of the great advantages of this mode of preparing small skeletons was found to consist in their perfectly preserving their natural size, the ants seldom destroying the ligaments, and the bones consequently not requiring wires for their attachment, which in some of the more minute skeletons it would be difficult if not impossible to apply. The labourers require, however, careful watching, as after having eaten the muscles, they occasionally destroy the ligaments, and even commence carrying off the smaller bones; a smart tap on the box is sufficient to drive them away from the object, on which they all immediately move off in a regular line to whichever opening they have entered at, leaving the skeleton free. When the objects are too large, they quit them suddenly after devouring what they think proper, so that sometimes where overnight thousands might have been seen at work, in the morning not one is to be found in the box; and nothing is gained by re-moistening the object, for they appear never again to touch anything which they have once abandoned. In the summer their vitality is great; from the cavities of a skeleton that had been three days immersed in water and afterwards placed in the sun, several ants were seen to emerge, and to become as lively as ever. But in winter, exposure to cold air, or immersion in water, when the thermometer is below the freezing-point, produces instant death, subsequent exposure to warmth failing, in these circumstances, to revive them. Their sense of smell appears to be very acute; if the finger be drawn across one of their tracks, multitudes rapidly congregate about the spot,

examining it, and sending out runners to explore the vicinity. But if one of them be crushed by the finger and quickly removed, the next comer is instantly arrested in his progress, encircles the spot, ascertains the death, and communicates the intelligence with such inconceivable rapidity, that the whole line falls into confusion, numbers rush to the place, parties set off in pursuit of the offender, and woe to the unfortunate cricket that happens to be found in the vicinity of the track. By degrees the tumult subsides; for some time afterwards, however, every ant that passes makes a halt, but without quitting the line. Light does not appear to have any effect on their operations; they are not disturbed by the approach of a candle, although the slightest touch of the box instantaneously effects their complete dispersion; and the alternations of night and day appear to make no difference in their numbers, perceptions, or labour.

Mr. Daniell was never able positively to ascertain the place of their retreat; he believes it, however, to have been in the earth below the oven, and is inclined to think that they form a nest, inasmuch as they frequently carry off portions of vegetable fibre, and even the smaller bones, probably for the purpose of building, as they were always carried off entire, and he could never observe that any portion of a bone was eaten. In consequence of this latter propensity, he was never able to procure the skeletons of the small species of *Gasterosteus*, for example, entire, notwithstanding the closest watching. A single ant will carry away a rib of these small fishes; but in removing a larger bone they act simultaneously, some dragging it forwards and others pushing it on with their heads from behind. If, in ascending the side of the box, the bone fell to the bottom, they returned and recommenced their labour, never abandoning an attempt in which they had once engaged. The largest portion of bone which Mr. Daniell has seen them remove, consisted of the ulna and radius of *Mus messorius*, with the carpus attached. They appeared more eager in carrying off portions of bone in the months of January and February than at any other period of the year; but they worked most rapidly in the summer months, and it is astonishing with what celerity and perseverance they continued their labours, the most rapidly cleaned skeletons being always the best and whitest, the periosteum being entirely removed. With such pertinacity do they penetrate every cavity, that, minute as they are, they are frequently victims to the ardour of their attack, becoming fixed, for example, between the plates of the cranium, in the cellular texture of which they may be seen entangled and dead. Al-

though, as before observed, very susceptible of cold, they appear also to be affected by heat; for in the summer months they were seen to bring forth their pupæ, when the oven was heated, from the various apertures in the wall, and place them in a box by the side, in which a supply of provision was always provided for them, and to return with them when the oven was cooled. Myriads of them might in this way be seen heaped together, but a tap on the side of the box caused a general rush towards the objects of their solicitude, which were carried off with inconceivable rapidity. The pupæ are white, and the whole duty of transporting them devolves upon the males or workers, of whom each female always has several attendant upon her. Young females are first observed towards the end of January, when the abdomen begins to be enlarged and of a whitish colour; they continue to increase in size until June, at which time the females appear to be most numerous. They progress more slowly than the workers, and deposit their eggs as they move along, which are instantly carried off by the attendants. The greatest number of pupæ are seen between June and September; but the eggs (which are white and have the appearance of grains of sand) are carried to and fro during the whole of the summer. Mr. Daniell noticed that skeletons cleaned by the ants were rapidly dissolved in a solution of chloride of lime; while others prepared by maceration remained for some time in a similar solution without injury, and were much improved in whiteness.

What has been done for Entomology in Scotland? — A Plan suggested to promote it, and another to assist the Student.—When we look at the labours of our entomological brethren in England, and compare the number of votaries of Entomology in that country with those of Scotland, we cannot but feel sorry to see such a great balance against us. But few, and only very few, have lent themselves to the task of investigating the wondrous race of insects; yet these few have been very diligent. The gay colours of the butterflies as they have flitted past; the metallic hues of the beetles as they have crawled across the pathways, or basked themselves in the shade of some overhanging stone; the humble-bees, which ever as they sip the sweets from the flowers, keep up an incessant tune, as if in thanksgiving to the Great Maker of all, who has so abundantly provided for them; the laborious ants, which have raised a dome so curiously chambered beneath; the spiders, with their strongly woven webs hung in a thousand alluring ways to entrap poor flies; the cunning ichneumon, the fop of insects, with his keen eye and jaunty manner, as he rambles with wonderful celerity all over the branch on which he has alighted, now giving another and another deadly thrust through the back of some unfortunate caterpillar which he has chanced upon;—all and any of these may, for the moment, have attracted the attention of the passer by, but this was all: no thought was spent on, inquiry made, or wonder raised, as to

whence they came, why they were created, or whither they went. In many districts of Scotland the foot-print of the naturalist, in this branch of study, has been seldom noticed, — seldom has it been impressed by the foot of one of her own sons. In some districts there are those who have never dreamt of the

“Infinite shapes of creatures there are bred,
And uncouth forms, which none yet ever knew,
And every sort is in a sondry bed
Sett by itselfe, and ranckt in comely rew;” *
and how

“Daily they grow, and daily forth are sent
Into the world, it to replenish more.” †

It is not because such persons consider the study of insects beneath them that it is not pursued, but because their minds have not been turned into the proper channel. Were this once accomplished, how many an hour now spent idly in the streets or elsewhere, might be improved, and the mind carried from the creature to the Creator! Perhaps the best and easiest way to give the young some knowledge of the wonders with which they are surrounded, would be to make Entomology a branch of education in every school. No difficulty would attend this; and certain it is that there are many who would willingly contribute very largely to the formation of a collection to be attached to each school for the use of the scholars. Or if even a collection were placed in some public institution in each town which boasts one, many might be induced to profit thereby. Books on the subject are necessarily very expensive, from the labour required in getting them up, and from the small number of readers; but might not such a laudable object as we are advocating lead to a reduction in their price? — for where one copy was formerly sold, the number would perhaps be trebled. Scotland is full of grand haunts for these creatures. Her lofty towering hills, some rugged and stony, others mantled with the purple heather interspersed with woods; her large glens, adown which run many a stream; her moors and her mosses, — all have their own peculiar tenants. Her remains of large forests, of which those that have been partially explored present proofs of their richness, and lead us to infer that the like might reasonably be expected of the others; her lakes, too, enjoy their novelties. Indeed, every variety of ground is to be met with, from hills like Alps to the sweetest pastoral. The very scenery itself is enchanting, and sufficient to entice the thoughts from their ordinary course. I remember that when ascending Ben Lomond for the first time, I paused half way up the elevation, in order to breathe awhile and look around me. The sun had been obscured for some time, but suddenly burst forth in all his splendour; and never can I forget the grandeur of the surrounding scenery. Not a bird skimmed along, not a leaf moved, not a breath of air interrupted the quiet, but all was breathless silence. At my feet lay the huge lake, like molten lead, so calm that you might have fancied it afraid to move, lest it should disturb the sleep which had fallen on all around. Its numerous islands, too, clad in the rich luxuriance of summer, and set

* Spenser's 'Faerie Queen,' Book 3, Can. 6. † Idem.

down here and there, gave it a double charm. After I had gazed awhile I turned my face eastward. The sunlight fell full on the broad valley, and there was the river Teith, stretching away in tortuous windings towards Stirling, here and there encircling small islets, like liquid silver inclosing emeralds. For the time I forgot where I stood. I felt the blood run coldly through my veins, and "each particular hair to stand on end." Involuntarily I exclaimed,—"Wonderful! How wonderful are thy works, O God!" Often have I gazed from greater heights, and looked down on many scenes both before and since; but none of them have ever struck me so forcibly as did this one. Another thing also seems to be much wanted, which would greatly facilitate the progress of the beginner; and that is, a description of the meanings of the generic names applied to each family. All are not linguists, and any one might naturally wonder, and ask why to such a thing has been given such a strange-sounding name. And to hear a man calling them by their scientific names, mouthing words without knowing the reason why, also appears ridiculous. If all the names were explained, a key would be given whereby the learner could detect allied species, and be wonderfully assisted in describing anything he might possess; the door which before held fast the mystery would be unlocked, and there would the student stand, as if relieved from the weight of some burden beneath which he had been sinking. Perhaps the "Poser for Papa," which appeared in 'Punch' a few weeks ago, may be cited as as strong an argument in favour of such a thing as could well be hit upon. It is a cumbering of the mind without enlightening it. As a further proof of this, and in conclusion, I may add an anecdote which occurred to myself this last summer. At the little house where I lodged, about a mile from Loch Rannoch, the guidwife, well known for her kindness to one or two who have staid there, was very desirous to tell me about some one insect in particular which had been taken there the year before, and which I was to look for. She puzzled herself for a long time, and at last came into my room in a great hurry to say that "the *beast* was ca'd *Colia pulter*," (meaning *Polia occulta*). I looked astonished, not expecting to hear such an attempt, and she saw it; so, with a good-natured smile on her honest face, she added,—"Bless me! Surely they could find English for the beast, wi'out a' that nonsense! But maybe it was the fashion to puzzle folk."—*John Scott; London Works, Renfrew, October, 1852.*

Inquiry respecting certain appendages to the Haustellum of Diurnal Lepidoptera.—Perhaps some contributor to the 'Zoologist' can explain the cause and use of certain little yellow excrescences which I have more than once observed on the haustella of our diurnal Lepidoptera, but which, so far as I can learn, have not hitherto been described in the principal works on insect physiology. At first sight they might be taken for some extraneous substances adhering accidentally, but on endeavouring to remove them, I have found them so firmly fixed as to make me suppose that they really formed part of the haustellum. Last summer I captured at Charlton a female specimen of *Hipparchia Janira*, with no less than six of these excrescences attached; their colour at the base was yellow and somewhat transparent, and at the larger extremity whitish, there were also a few hairs growing from the same part of the haustellum: but one or two other specimens of this species taken at the same time were free from anything of the kind. As the subjects are somewhat akin, I inclose a sketch of the Lepidopterous larva with fungus-like excrescences exhibited at the July meeting of the Entomological Society, (Zool. 3564); and to the facts there mentioned I may add that during the time it remained concealed in the moss, the latter was occasionally moistened for the benefit of the chrysalides lying in the clay underneath; a circumstance that no

doubt aided the development of these curious formations.—*Arthur R. Hogan ; Charlton, Dundrum, near Dublin, December, 1852.*

Captures of Lepidoptera in the neighbourhood of Birkenhead during the past year.—

Chærocampa Porcellus, three reared from larvæ, three captured at New Brighton.

Pœcilocampa Populi, November 15—23, twenty-three at light.

Lasiocampa Trifolii, July, reared from larvæ taken in May at New Brighton.

Leucania crassicornis, September, not scarce on reed-blossoms after dark.

Luperina cespitis, August 26, at light.

„ *abjecta*, July 21, two, at sugar.

„ *albicolon*, end of May, in plenty, by raking the banks at New Brighton.

Spælotis præcox. I have taken this beautiful insect during the past season, at sugar, on ragwort-flowers, and by raking; but it is far from being plentiful.

Heliophobus popularis, September 18—29, at light.

Xanthia citrigo, silago and cerago, September 6 to the end of the month, on ragwort-flowers, reeds, and at sugar.

Epunda lichenea, September 13—26, not scarce, sitting upon dead sticks in the hedges.

Hadena lutulenta, September 19, at sugar.

Hypenodes costæstrigalis, middle of July, in great plenty, flying at dusk amongst heath and furze, in a fir-wood near Birkenhead.

Ennomos Tiliaria. I took upwards of thirty of this insect at lights, during the month of September.

Crambus latistrius, end of August, twenty-eight, flying at dusk, and at rest upon stems of grass.

—*G. A. Almond ; Oliver Street, Birkenhead, Cheshire, January 4, 1853.*

Notes respecting Acherontia Atropos.—The two communications under this title (*Zool.* 3716), seem to require a few remarks. Mr. Norman says,—"It does not appear to me to be difficult to account for the periodical plenty and scarcity of this insect. In warm seasons, similar to the one just past, the larvæ arrive at maturity and undergo their change into the pupa state in August, the moth appearing in the following month: their eggs would consequently perish from the low temperature of the ensuing winter." This latter assertion is not supported by facts, for we know that Spallanzani has recorded that he exposed the eggs of silk-worms to cold 23° below zero, and yet they all produced caterpillars. We know, too, that in the Arctic regions, during the brief summer, Culices abound to such an extent as to be an intolerable pest, and yet the intense cold of winter, which would not permit one of them to live, does no harm to their eggs. Yet Mr. Norman thinks that the cold of winter which would destroy the eggs of *A. Atropos*, would not prove fatal to the pupæ. I also think that they would not be injured thereby. Sir John Ross in one of his northern voyages exposed larvæ of *Laria Rossii* to a temperature of 40° below zero, thawed and froze them again several times, and still some went into pupæ, and arrived at the perfect state, (*Zool.* 3366). There seems no reason to doubt that had the experiment ceased after once thawing them, they would all have survived; and from this and other circumstances I am induced to believe that a frequent change of temperature, and, above all, long exposure to wet, is more hurtful to insect life than cold alone. The other remark I have to make is with respect to the luminosity of *A. Atropos* observed by Mr. J. H. Gurney. The same beautiful opalescent light may be seen in the eyes

of all nocturnal Lepidoptera when in the dark, and a flowering ivy-bush full of *Noctuæ* seeking their food in an autumn night, seems to glow with countless little stars, and is a beautiful sight. Mr. Gurney will find a saturated solution of oxalic acid much more effectual in killing Spingings and moths than Prussic acid.—*J. W. Douglas; Lee, Kent, December 16, 1852.*

Occurrence of Charocampa Celerio in Staffordshire.—I obtained a specimen of this rare moth on the 25th of September last; it was taken in a house on the outskirts of the town. It probably was slightly worn before its capture, but its appearance was certainly not improved by its treatment afterwards. Without doubt the high temperature of the late summer will cause the development of many rare species with us should the winter prove propitious.—*R. W. Hawkins; Rugeley, Staffordshire, November 17, 1852.*

Occurrence of Chrymodes Templi near Huddersfield.—Perhaps some of our entomological friends may be pleased to learn that I have taken two specimens of *Chrymodes Templi*. I trust that it will again turn up next year in such numbers as that it may be useful to others as well as myself.—*J. Johnson; Denby Parsonage, near Huddersfield, November 15, 1852.*

Capture of Agrotis subgothica in Nottinghamshire.—I have recently obtained a fine specimen of *Agrotis subgothica*, taken in October last in Nottinghamshire.—*Edwin Brown; Burton-on-Trent, December 20, 1852.*

*Occurrence of Agrotis lunigera in Scotland.**—The insect to which I propose for a few minutes to direct the attention of the Society, is interesting both on account of its rarity, and from its having only hitherto occurred in the British Islands, where it seems to be widely distributed, though the localities in which it has actually been observed are “few and far between,” being limited to one in Ireland, one in England, and one in Scotland. It is now more than twenty years since Stephens first described it in his ‘Illustrations’ from specimens found near Cork, in Ireland; and since that period it had not been seen for a series of years. In the summer of 1848 it was again taken near Ventnor, in the Isle of Wight, by Mr. Maitland; but previously to this, on the 8th of August, 1844, while examining a spruce fir at Duddingston, which had proved very attractive to the *Noctuæ* throughout the season, in consequence of being covered with Aphides and honey-dew, I took a very singular *Agrotis* which I could make nothing of, but fancied might be *lunigera*. In the following year I sent it to London to receive the fiat of the English entomologists, who said it was a remarkable variety of *A. exclamatoris*. Not satisfied with this, however, I sent it to Mr. Doubleday, who forwarded it to M. Guenée. That entomologist has recently returned the insect, having described it in his work on *Noctuæ*, forming part of the ‘Suites à Buffon,’ as *Agrotis lunigera* var. A; so that we have now a third, and a Scotch locality, for this interesting species, which is still further confirmed by a wing that I picked up on Arthur’s Seat, which is undoubtedly that of the same insect. There is a rather singular circumstance, worthy of notice, connected with the insect, which is that both in the Isle of Wight and on Arthur’s Seat, it is accompanied by another species of *Agrotis* not found in the intervening districts,—the *A. Obelisca* of the ‘Wiener Verzeichniss:’ showing the intimate connexion there is between a locality and the species which inhabit it, occasionally, as in the present instance, irrespec-

* Read before the Royal Physical Society of Edinburgh, April, 1852.

tive of difference of latitude; and that where we find a particular species, we may generally look for those with which it is associated in other districts where it occurs.—*R. F. Logan; Duddingston, near Edinburgh.*

New Locality for Eudorea lineola, and Note on the Larvæ.—On the 27th of last June I took several larvæ of the above rare *Eudorea* feeding under the yellow canker-moss on old blackthorns, growing on the sea-shore, on the south side of the Hill of Howth, a description of which may not be uninteresting to the readers of the 'Zoologist,' as the insect has hitherto been taken only near Doncaster, and that in the imago state. Length nearly 1 inch: ground-colour a pale dingy green, with three rows of olive-brown or brownish black square-shaped spots, those along the back being the largest; the intensity of the colours varies greatly, some being much darker than others. The larvæ were full fed when I took them, as they were all in pupæ by the beginning of July, and the first insects came out on the 16th of the same month.—*Richard Shield; 6, Fleet St., Dublin, December 8, 1852.*

Food and Transformation of the Larva of Elachista locupletella.—I am very glad to be able to give my brother entomologists an opportunity of rearing for themselves one of the most beautiful of our Micro-Lepidoptera. The larva of *Elachista locupletella* feeds on *Epilobium alsinifolium*, and perhaps, as has been suggested to me, may also feed on any plants of that order. This plant I find pretty abundant here at the bottoms of walls in marshy situations, and I have not unfrequently found as many as three or four larvæ feeding upon one plant, but never more. They are easily detected from being miners; the leaf becomes discoloured, and thus the habitation of the larva is at once made known. I have also had two mining the same leaf, but this I set down as a matter of necessity, from my breeding-cages being small, and the plants few in number in each. The larvæ are to be found in May, in a tolerably advanced state. They are of a dirty greenish brown colour, and when full grown are about three eighths of an inch in length. In my breeding-cages I had the insect in all its stages of larva, pupa, and imago at the same time. When about to undergo its transformation, which is about the first week in June, the larva quits the interior of the leaf, and either crawls away to the bud of some plant near at hand, which it draws together with beautiful white silken threads, or it rolls the edge of one of the leaves of the plant on which it has fed half round, and then constructs a snow-white covering, in which it changes to a brown pupa. The perfect insect appears in from fourteen to eighteen days after the transformation.—*John Scott; London Works, Renfrew, December 7, 1852.*

Economy of Crabro cetratus.—In February, 1851, observing several excavated brambles in a hedge which had been cut over, I felt curious to know the excavator, and carried home a few of them. On cutting open some of the stems, I found they were tenanted by three or four orange-coloured larvæ or pupæ; some of the larvæ were quite small, others apparently full grown; and the pupæ varied in colour from orange to jet black, many having the head and thorax black, with the abdomen orange. The nidi had been provisioned with a green Aphis. On the 16th of July following the perfect insects began to appear, and proved to be the *Crabro cetratus* of Shuckard. Some half-dozen ichneumons, with a shortish ovipositor, were developed about a fortnight before the *Crabros*. When I pinned the latter, they emitted a powerful perfume, somewhat resembling that of roses. A day or two previously to the appearance of the above, I met with an excavated raspberry-stem in our garden, and captured the female of the same species while in the act of fabricating her cells: she had excavated to the depth of nine inches, had formed three cells, and was busy with the fourth.

Each cell contained a single egg, of a pale pink colour, and was filled with a green wingless Aphis. The egg in the lowest cell was much larger than the others. In August last I dug another female out of a stump of whitethorn; in this instance the nest was provisioned with the black Aphis which infests the bean, and which had apparently been used as a matter of convenience, the adjoining field bearing a crop of beans, which were much infested with the Aphis. — *Thos. John Bold; Long Benton, Newcastle-on-Tyne, December 2, 1852.*

Hive Bees in want of a Queen. — In your October number (Zool. 3627) are some remarks by Mr. Filleul on the subject of “Bees welcoming a new Queen.” I can fully corroborate my worthy apiarian friend’s statement on this head. About seven years ago, in the month of June, I had a strong stock of bees which showed symptoms of being in want of a queen, by at least half a peck of them hanging under the alighting-board; and this continued for a fortnight. My attention was at this time turned to a very weak stock, in fact, almost dying. I turned up this unlucky stock, and found only about a hundred bees in the crown of the hive. The queen, apparently a lively beautiful bee, seemed to differ entirely from the workers, for they appeared dispirited and without energy. I seized the queen, took her to the outlying strong stock, and placed her on the only vacant place near the entrance; the guards rushed out and surrounded her, but after a few seconds of seeming consultation, they began to show strong indications of friendship; they made way for her, and she was gradually conducted into the dense population of bees: this was about noon. On the next day, at 11 a.m., an immense swarm came away from the hive, and was safely housed. Huber, the great apiarian, differs from Reaumur on the subject; but we need not wonder at this, when we consider that Huber was blind, and trusted to his servant, Francis Barends, for a great deal of his practical knowledge.

“Aliquando dormitat bonus Homerus;”

and the same may be said of many great writers, — they most of them have their crotchets. I will mention another attempt to introduce a fresh queen. A swarm went off and was hived: about an hour afterwards I discovered a bunch of bees on the ground, and on disturbing them I found a queen. I attempted to introduce her to another hanging-out swarm, but although the bees offered her no violence, they would not admit her, and she was literally “bowed out” until she fell off the board to the ground. Probably she may have had defects which the bees discovered. Bees, as Mr. Filleul says, are not confined by strict rules; they are most capricious insects at best. As he is a persevering experimentalist he finds it so; but I wish him every success: one so hearty in the cause is sure to succeed in the main. In the simple experiment mentioned by me, it is plain that even bees with one queen at swarming time will not reject a second; and it is a strange thing that some stocks will go on two or even three years and never throw off a swarm; the cause can be only a matter of conjecture to the apiarian. — *H. W. Newman; New House, Stroud, December 15, 1852.*

Do Bees look out at Swarming-time for a Place to go to? — I am of opinion that they do, but have never been able to ascertain that every swarm went off without first settling at a short distance from the hive, thus showing their dependance upon man in their state of domestication. The illustrious French naturalist, Reaumur, ridicules the idea of hive-bees looking out for a place to go to; although he was a great observer, particularly among the Bombinatrices, I believe he was wrong in his conjecture

about this habit of the hive-bee. I will mention a few instances from amongst many. A swarm settled in a hot day on an espalier in my garden ; before I had time to commence hiving them, they took flight in a straight direction to Thornbury Castle, and entered a crevice of the old wall on the south-east aspect. At night, after sunset, with the help of a ladder, they were hived in safety and commenced working directly. On another occasion, a swarm unperceived settled away among some peas late in the afternoon, where they remained all night. I discovered them early next morning, and told my man to get a hive for them, but before he arrived with it the bees were aroused by the hot sun and went off with great velocity, no doubt having a young and skittish queen. They flew 1200 yards in a direct westerly course, and settled in a hollow tree, where they remained unmolested. On another occasion I had a hive with some old combs in my garden in June. "Scouts and quarter-masters" were seen every day entering this hive ; at last a prime swarm came off one of my old stocks, and after two or three minutes' flight in the usual way, they settled under the alighting-board of the hive with old combs, and hung in an immense bunch. I was obliged to dislodge them from the board after waiting a long time to see if they would enter the hive, and then hived them in the usual way. A fourth instance of a long flight of a cast is as follows. A cast containing about 5000 bees took possession of a vermin-trap by the sea-side, in a very remote part of Somersetshire. I saw these bees working from the trap ; they had made combs a foot long, and had honey. The owner told me that he had scoured the country and discovered that there were no bees kept within four miles of the place, evidently showing what a prodigious flight they had taken. In the last instance the owner had neglected to watch his bees ; but it is quite plain that some parties must have visited the wooden trap and communicated the locality in their own way to the swarm. Many inexperienced persons have mistaken a desertion for a swarm. In cases of desertion, which generally happen early in the spring, the bees get dissatisfied with something, and set off in a few days in a direct line, generally taking possession of the roof of some house, or a chimney, where they always perish : it is a sort of desperate effort, but at last ends in their destruction ; the bees at these times having neither numbers nor materials sufficient to make new combs. I allude of course to desertions from the old stock.—*Id.*

Note on the scarcer Species of Andrena being found on the Catkins of the Willow.—For several years past I have captured from off the catkins of two willows (male and female trees) several specimens of *Andrena spinigera* and *A. apicata* ; and last year a specimen of *A. eximia*. And a friend has also captured off a willow in the neighbourhood of Cambridge, a female of *Andrena Smithella*, with three or four males, which he considered as belonging to the same species. I give this information, thinking it may lead collectors to be on the look-out as early as the first week in March, about which time I have each year captured the above species. The cleanest are taken from off the female tree, but bees loaded with pollen are easily freed from it by being placed in a bottle lightly filled with grass, the mouth being covered with net to keep them in until they have freed themselves from the pollen. I may add that I have a few spare duplicates of *Andrena distincta*, taken last year, a specimen or two of which I shall have pleasure in giving to any collector who may be in want of them. — *W. H. L. Walcott ; Clifton, Bristol, December, 1852.*

Voracity of the Larva of a Beetle. — One afternoon in July last, I noticed a large earth-worm, about six inches long, crawling across the pathway in a field, with some object attached to it which it appeared anxious to get rid of, as it kept writhing about

as if in pain. On closer inspection I found that its unwelcome attendant was a Coleopterous larva, nearly an inch in length, which was firmly attached to the worm by its powerful jaws, at about two inches from the extremity of its tail, where it had nearly eaten through the worm. On examination, the insect closely resembled the figure of the larva of either *Steropus madidus* or *Omaseus melanarius*, as given by Mr. Westwood in his 'Introduction to the Modern Classification of Insects,' (i. pl. 2, fig. 4). The circumstance of this larva attacking a large worm may not be uncommon, but it was new to me; and the only allusion I find to such a propensity among the larvæ of beetles, is made by Swammerdam; who, speaking of the larva of *Staphylinus*, says it can very quickly kill earth-worms with its powerful teeth, and afterwards suck them." (Hill's edit. p. 125).—*R. H. Meade; Bradford, Yorkshire, November 8, 1852.*

Note on the Perforation of a Cistern by Anobium striatum.—At a meeting of the Linnean Society on November 18, 1852, "Mr. Adam White, F.L.S., exhibited, on the part of J. H. Gilbert, Esq., Ph.D., of Harpenden, near St. Albans, a portion of a wooden cistern lined with lead, and perforated with numerous holes by the *Anobium striatum*, in relation to which he entered into a detailed account of the circumstances in which it had occurred. In this case the cistern, which belonged to Mr. Cnrtis, a brewer of Harpenden, was made from an old fermenting tub, which had become much worm-eaten on the outside. In 1838 it was lined with thin lead (of 5 lbs. to the square foot); but in little more than three years it began to leak, when some small holes were discovered in the lead and were soldered over. In 1842, however, the leakage had increased to such an extent that the leaden lining was removed, and a thicker one (of 18 lbs. to the square foot) was substituted. Five or six years afterwards, however, the leakage again commenced; and in 1850 it had proceeded to such an extent that the cistern was entirely removed to make room for one of iron. On taking out the lining it was clearly ascertained that the perforations from which the leakage arose were the work of an insect, which, after boring through the wood, had made its way also through the leaden lining. A specimen sent by Dr. Gilbert to the British Museum was determined by Mr. White to be the *Anobium striatum*; and similar instances of injury to wooden cisterns lined with lead were referred to, as detailed in Mr. Westwood's 'Introduction to the Modern Classification of Insects,' in the 'Zoologist,' and in the 'Proceedings of the Entomological Society.'—*From the 'Proceedings of the Linnean Society,' No. 47, p. 153.*

*List of the Echinodermata hitherto met with in the Moray Firth.**

By the Rev. GEORGE GORDON.

THE late Laird of Brodie solaced the decline of life by the interest he took in collecting and transmitting to those more highly versed in such matters, whatever in the animal or vegetable kingdom appeared to him either rare or curious in the northern locality in which he re-

*In continuation of the 'Fauna of Moray,' see Zool. 421, 502, 551, 3454, 3480, 3678.

sided. He was thus the means of introducing to the scientific world, in the beginning of the century, several new species. From among the creelfuls of sea-weed which old Bell Innes, hired for the purpose by the late Dr. Gordon of Drainie, carried after a gale from the shores of Stotfield to Brodie House, the Laird was enabled to detect and pick out Algæ new to the eye of Smith, and fitted to try the iconographic skill of Sowerby. His name still lives in Calithamnion Brodiaei, and in the species of Polysiphonia and Chondrus that are also named in honour of him. Two of the most beautiful of the Echinodermata—the purple star and knotty cushion-star—were first figured as British in Sowerby's 'Miscellany,' from specimens procured from the Moray Firth by "James Brodie of Brodie, Esq."

It were needless to say that the order and nomenclature in the present list are taken from the 'History of British Star-fishes' by Professor Forbes, — incomparably the best work extant upon the British Echinoderms; and the present generation has but little chance of ever getting a better guide to the study of these animals.

Rosy Feather-star, *Comatula rosacea*. A very mutilated specimen from the stomach of a haddock, killed in the Moray Firth. in 1850, is all that has been obtained, but enough to show the existence of the species in this locality.

Common Sand-star, *Ophiura texturata*. Common in the Firth. Fine specimens are occasionally to be found on the fishermen's lines. "Frequent in Burghead Bay," Mr. M'Donald. Mr. Weir has procured some large and complete individuals at Lossiemouth.

Lesser Sand-star, *Ophiura albida*. Common.

Ball's Brittle Star, *Ophiocoma Ballii*. A few specimens only have been found, in the stomach of a haddock.

Long-armed Brittle Star, *Ophiocoma brachiata*. Very common. A favourite element of the food of the haddock at all seasons of the year.

Granulated Brittle Star, *Ophiocoma granulata*. Banffshire coast, Mr. Harris; by whom specimens have been presented to the Elgin Museum.

Daisy Brittle Star, *Ophiocoma Bellis*. Frequent; as at the Skerries of Covesea, &c.

"Gamrie Head," the locality of the "new British Star-fish," described by the Rev. Mr. Smith (Zool. App. cix.) under the name of *O. parmularia*, is within the limits of the Moray Firth, the district comprehended in this list.

Common Brittle Star, *Ophiocoma rosula*. Much oftener to be met

with between water-marks than any of the genus. One found with six rays.

Common Cross-fish, *Uraster rubens*. "Craw-feet" or "Cosfit," as the fishermen call them. Most abundant, and from its vast numbers most destructive to the bait of the fishermen, who look on it as their chief bane in their labours. The *U. glacialis* has not been met with and identified on this part of the coast; but it is highly probable that it, as well as the less distinct species, *U. violacea* and *hispida*, would be detected here, were authentic specimens, so superior to the best figures, at hand to compare them with.

Eyed Cribella, *Cribella oculata*. Frequent.

Rosy Cribella, *Cribella rosea*. Found some years ago on the Elginshire coast, by Alexander Robertson, Esq., Woodside. Mr. Harris also meets with it at Gamrie, Banffshire, and has sent two fine specimens to the Elgin Museum.

Purple Sun-star, *Solaster endeca*. Not rare at any of the fishing stations of the Firth, being often brought ashore on the lines. First recorded as British by Sowerby as "found by James Brodie, Esq., on the Nairn coast, in the Moray Firth."

Common Sun-star, *Solaster papposa*. More frequent than *S. endeca*. In a parcel sent from Stotfield in 1850, there were twenty-five specimens of *S. papposa* and six of *S. endeca*.

Birds'-foot Sea-star, *Palmipes membranaceus*. Several specimens of this rare species have been obtained of late years by the Lossiemouth fishermen. Gamrie (Zool. 3307), Cullen, and Portmahomack, are also places where it is known to have been brought ashore. The Cullen specimen had a uniform tint of pinkish red over the whole dorsal surface; margin of the under surface deep red, centre white.

Although Professor Forbes says of the next species, the Gibbous Starlet (*Asterina gibbosa*), "In Scotland I have found it on the gneiss rocks of Ross-shire," it is not intended to include it in this list, as in all probability the part of Ross-shire referred to is that which is washed by the waters of "The Minch" on the north-west, and not the eastern part of the county which is bounded by the Moray Firth.

Another star-fish also found near, but not in, the Moray Firth, is Templeton's Cushion-star, (*Goniaster Templetoni*). "Dr. Pollexfen found it on the shores of Orkney," and hence it may soon be met with on the south-eastern shores of Caithness or Sutherland.

Knotty Cushion-star, *Goniaster equestris*. This beautiful star-fish strikes the eye of the fisherman as something worthy of being brought to land, and hence it is oftener to be seen preserved by them than

others that are equally if not more rare. "It was first figured as British by Mr. Sowerby, in the 'British Miscellany,' from a specimen 'found by James Brodie, Esq., in February, 1806, on the coast near Brodie House,' in the North of Scotland."

The Butthorn, *Asterias aurantiaca*. Frequent. The fishermen say that this star-fish is commonly found on "hard" ground, that is free from shifting sands or mud.

The Lingthorn, *Luidia fragilissima*. Both varieties have been met with by the Rev. Jas. Weir, at Lossiemouth, when brought from the fishing-ground by the boats. Perhaps no two varieties of any of the Echinodermata at first sight look so like distinct species. They differ in the number of the rays, and, so far as has been observed in this district, in size and colour. This species has been found by Dr. Fleming at Cromarty; *Alex. Robertson, Esq.*, Woodside. Both varieties have been obtained at Gamrie by Mr. Harris, (Zool. 3307).

Common Egg Urchin, or Sea Egg, *Echinus sphaera*. Occasionally found on the sea-rocks at low-water, as at the Stotfield Skerries, &c. A frequent ornament on the mantel-piece.

Purple-tipped Egg Urchin, *Echinus miliaris*. Abundant wherever the shore is rocky.

Green Pea Urchin, *Echinocyamus pusillus*. Frequent in the stomachs of haddocks, and occasionally found among shells on the sea-beach.

Purple Heart Urchin, *Spatangus purpureus*. Occasionally found in the stomach of the haddock, but always in fragments.

Common Heart Urchin, *Amphidotus cordatus*. "Skate's Eggs." Frequently found on the beach; and often filling the stomach of the haddock, which seems to be partial to it in feeding.

Rosy Heart Urchin, *Amphidotus roseus*. Rare.

Angular Sea Cucumber, *Cucumaria pentactes*. Occasionally met with.

The Tailed Priapulid, *Priapulid caudatus*. Seems not uncommon from the number seen in some fish, cod and haddock. The size and some other particulars, not being the same in all; seem to indicate more than one species of Priapulid in the Moray Firth.

The two last species must be but a very small proportion of the Holothuridæ and Sipunculidæ that inhabit the broad and deep waters of this arm of the German Ocean. To be able to enumerate no more from such a field, shows at least that little attention has as yet been here paid to these tribes. In order, then, to assist in identifying such forms as may afterwards come under notice, specimens of these two

tribes, of the other Echinodermata, and of such of the Crustaceans as are not included in these Lists, but which are likely to be found thus far North, are earnestly solicited; in exchange for which duplicates of several of the rarer species of Crustaceans and star-fishes already found in the Moray Firth will be readily given.

G. GORDON.

Birnie, by Elgin, November, 1852.

Proceedings of the Entomological Society.

January 3, 1853.—J. O. WESTWOOD, Esq., President, in the chair.

The following donations were announced, and thanks ordered to be given to the donors:—The 'Zoologist' and the 'Phytologist' for January; by the Editor. The 'Literary Gazette' for December; by the Editor. The 'Athenæum' for December; by the Editor. The 'Annals of the Lyceum of Natural History of New York,' Vol. v. Nos. 9—14, 1852; by the Lyceum. 'Second Report of the Commissioners for the Exhibition of 1851;' by the Commissioners. Hewitson's 'Exotic Butterflies,' Part 5; by the Author. 'Monographie des Guêpes Solitaires, ou de la Tribu des Euméniens,' par H. F. de Saussure; by the Author.

The following gentlemen were balloted for and elected Members of the Society: William Thomson, Esq., Westow Hill, Norwood, and E. C. Buxton, Esq., Spikeland, Liverpool: also the following as Subscribers to the Society:—Mons. Victor Signoret, Paris; H. V. Tebbs, Esq., Southwood Hall, Highgate, John Scott, Esq., Ferry Road, Renfrew, and F. Moore, Esq., 4, Molesworth Place, Kentish Town.

The President, having appointed Auditors of the Treasurer's Accounts for the past year, and announced the changes recommended by the Council to be made in the Officers and Council at the Anniversary Meeting on the 24th of January, informed the Members of the death of J. F. Stephens, Esq., one of the Vice-Presidents of the Society, on the 21st of December, after a short but severe illness; and stating that he should allude to his life and labours in the Anniversary Address, proposed as a tribute of respect to his memory that the Meeting should forthwith adjourn; which was unanimously agreed to.

Resolved further, that a letter of condolence on her melancholy bereavement, be sent to the widow of Mr. Stephens in the name of the Society.

Anniversary Meeting, January 24, 1853.—J. O. WESTWOOD, Esq., President, in the chair.

The Secretary read the chapter of the Bye-laws pertaining to the Annual General Meeting, also the Report of the Library and Cabinet Committee made to and adopted by the Council.

One of the Auditors read an abstract of the Treasurer's Accounts for 1852, from which it appeared that there was a deficiency of Assets compared with Liabilities of

£18; to which should be added £7 for Subscriptions due, which must be deemed to be bad debts, making a total deficiency of £25.

In drawing attention to this matter, the President stated that the Council saw no reason for despondency, for the excess of expenditure over income was due in a great measure to the unavoidable outlay in removing from Bond Street, and fitting up the Library, Museum, &c., in the new rooms; the removal itself being forced upon the Society by circumstances over which it had no control, and they therefore recommended that as the adverse balance was the result of accidental events, it should be met by a general and special subscription among the Members, in order that the operations of the Society might not be impeded.

The President having appointed two Scrutineers, the ballots took place, when it appeared that Messrs. E. Newman, W. W. Saunders, A. F. Sheppard, and S. Waring, were elected into the Council, in the room of Messrs. F. Smith, H. T. Stainton, J. J. Weir, and W. Yarrell; also, that the following were elected to the respective offices: — Edward Newman, Esq., F.L.S., Z.S. &c., President; S. Stevens, Esq., F.L.S., Treasurer; J. W. Douglas and W. Wing, Secretaries.

The President delivered an Address on the state of the Society, and the progress of Entomology generally during the past year; for which, and his services to the Society, the Members passed an unanimous vote of thanks, and he was requested to allow his Address to be printed.

Votes of thanks were also passed to the Treasurer, Secretaries, and retiring Members of the Council.

The President announced that the Council had received three essays, in competition for the prize of £5 offered by the Society for the best essay on the duration of life in the male, female, and worker of the honey-bee; that they had adopted the report of the Committee to which they had been referred, namely, that the essay bearing the motto, "In tenui labor, at tenuis non gloria" was very able and worthy of the prize; and upon the accompanying note being opened, the author was found to be Mr. Desborough, of Stamford. Mr. Desborough being in attendance, was then presented with the amount of the prize.

The unsuccessful essays will be delivered to the authors, upon the presentation of their order to do so, accompanied by a copy of the motto adopted by them, the envelopes containing their names not having been opened.—*J. W. D.*

Proceedings of the Microscopical Society.

June 23, 1852.—*GEO. JACKSON*, Esq., in the chair.

A paper by Professor Williamson, entitled "Further Contributions to the Structure of *Volvox globator*," was read.

The author's views with respect to the cellular nature of certain appearances in *Volvox globator*, as detailed by him in the 'Transactions of the Philosophical Society of Manchester,' having been controverted by Mr. Busk in a paper lately read to this Society, and as subsequent researches have, in Mr. Williamson's opinion, confirmed his former statements as to the cellular structure of that organism; he considered it necessary to lay before the Society the present paper, containing some account of the

observations by which he considers he has established the correctness of his former assertions. The object of the paper was therefore to adduce proofs, not of the vegetable nature of *Volvox globator*, for on that point both gentlemen agree, but of the cellular nature of certain appearances in that body. The author described the hexagonal cells which form a peripheral stratum in the *Volvox* as being exceedingly difficult to detect in the living organism, and gave an account of their various appearances under different circumstances, stating also that difference of locality alone is sufficient to produce very varied appearances, as well as differences in the time of the year. The radiating threads which connect the cells were described at great length and minutely detailed, and the conclusion arrived at was that these threads consist partly of the ductile mucilaginous membrane of the protoplasm, and partly of its contents, the latter being present in various proportions. He also instituted a comparison between the cells in certain Ulvaceous plants and those of *Volvox*, and stated that he considered the vesicles of the latter to be of precisely the same character as those of the former, and consequently that they are, in every sense of the word, real cells. The author next investigated the origin of the superficial pellicle of *Volvox*, which he considers as formed by the consolidation of the cell-walls; and then proceeded to endeavour to determine the relative periods at which the cells, the superficial pellicle, and the cilia are developed, and expressed his opinion that the cilia are the first to make their appearance, the cells and outer pellicle being subsequent growths. The nature of the fluid within the *Volvox* formed the next subject for discussion; this he considers not to be water, but apparently mucilage. He then pointed out the close analogy that exists in the development of *Volvox globator*, and that exhibited by many of the lower Algæ and Confervæ; and concluded by expressing his opinion that every fact brought to light by this inquiry tended to confirm his previous conclusions, namely, that the affinities of the *Volvox* are with the vegetable rather than with the animal kingdom.

October 27, 1852.—GEORGE BUSK, Esq., in the chair.

A paper by Joseph Delves, Esq., "On the Application of Photography to the Representation of Microscopic Objects," was read. After some preliminary observations the author stated that the only arrangement necessary for the purposes of photography is the addition to the microscope of a dark chamber, similar to that of the camera obscura, having at one end an aperture for the insertion of the eye-piece, and at the other a groove for carrying the ground glass plate. This dark chamber should not exceed 18 inches in length, as, if longer, the pencil of light transmitted by the object-glass is diffused over too large a surface, and a faint and unsatisfactory picture is the result. Another advantage is that pictures at this distance are in size very nearly equal to the object as seen in the microscope. The time of producing the picture varies from 5 to 15 seconds. The author also made some remarks upon the mode of manipulating, and concluded by calling attention to some very beautiful specimens that were afterwards presented to the Society.—J. W.

Proceedings of the Royal Physical Society of Edinburgh.

THE first meeting of the eighty-second session of the Royal Physical Society was held on Saturday, November 13, at two o'clock, at 6, York Place, when there was a very full attendance of members and visitors.

DR. COLDSTREAM, on taking the chair, delivered the following opening address, for which the cordial thanks of the Society were tendered to him:—

“There has been of late a great increase in the numbers of earnest and successful students of nature. In all parts of the three kingdoms we find accomplished naturalists; here solitary, there in groups. Go where you will, you meet with, or you hear of some industrious geologist or zoologist. In the most remote localities you are presented with the proofs of youthful zeal in collecting, or of laborious earnestness in examining: the scalpel and the microscope, the pencil and the pen, are all diligently employed in situations and circumstances in which they were, till lately, almost unknown. I believe that the many admirable papers and monographs which are published almost daily in our scientific journals, and transactions of societies, supply imperfect indications of the amount of natural history research constantly carried on. There is a large body of sincere lovers of nature who have learned to search out the wonderful works of God for their own sakes,—to gaze upon their beauty, as expressive of the ineffable attributes of the Divine mind,—and to realize in their own souls those healthful emotions which the contemplation of creation in a proper spirit never fails to inspire. Doubtless all now present agree with me in regarding this state of matters as in a high degree satisfactory and encouraging; for most of us have felt how good a thing it is to consider the admirable forms, structures, and functions of the created objects that surround us; and we desire nothing more than to have this good, of which we have tasted, shared in by others. The constitution of our nature does not admit of *all men* becoming naturalists, but we are sure that it would be greatly for the advantage of society at large were the taste for natural history still more widely diffused than it is even now. And it is to promote such diffusion that this and kindred societies have been instituted and are maintained. The earnest spirit of research, once fully roused, generally impels those actuated by it to seek for the society of persons like-minded, to impart to them their discoveries and their theories, and to exchange expressions of mutual sympathy. Hence it is that associations of naturalists have existed in all places and in all times, in which true philosophy held sway. At no time, however, were they more needed than at present, when the sciences of observation have been so greatly enlarged that it is hardly possible for any one mind to grasp the whole range of them. There is neither capacity deep enough, nor life long enough, to enable any man to possess himself of the recorded results of modern scientific research. And yet a general knowledge of the progress of discovery, in all the fields cultivated, is essential to the satisfactory working of any one of them. Every naturalist worthy of the name feels the desirableness of watching the advance of others in the domains beyond his own. To get on well in his own field, he must at least occasionally ascend a hill, and observe what is doing in his neighbour's fields. And just such posts of observation are societies like this. We come together for mutual improvement in the knowledge of nature, and, by the expression of that sympathy which all naturalists love to cherish, to cheer one another onwards in our respective paths. The prime object at which we aim is the increase of our acquaintance with creation, which ought

to lead us to praise the Creator; and the second is, the increase of our interest in each other's welfare. And how vast the field is over which we are called to expatiate! Although we have agreed to limit our attention, as a Society, chiefly to zoology, palæontology, and microscopy, we find a great range of subjects, with the whole of which a few only amongst us are acquainted; but we agree to learn from one another; and we believe that the very youngest amongst us may furnish something that may increase our common stock of knowledge. Even in the fields of natural science which we have marked out for our proper cultivation, we believe that there are riches inexhaustible,—food for the mind in unimagined quantity. Doubtless, it is a common idea amongst young naturalists, that in a short time, through the united labours of so great a body of zealous observers as now exists, the science of natural history is likely to be so perfect that there will be no room for the researches of future observers. It seems not at all an impracticable thing to assemble specimens of every animal, plant, and mineral species that exists on the surface of our globe, to describe their structure, and to learn their habits; and supposing this to be done, there would apparently be an end put to the calling of the scientific naturalist. But wonderful it is how the charm of novelty is unceasingly supplied to those who give themselves to the work of searching out the secrets of creation. Even amongst the smallest, and apparently simplest, organisms, the longer and more minutely we scrutinize, the more do we get to wonder at and admire. Here, truly, we are taught, in some measure, and according to the feebleness of our comprehension, to appreciate the reality of the attributes of Infinite Power, co-operating with Infinite Goodness and Wisdom. I believe most of us are now disposed to agree with that keen-witted thinker of a former age, Sir Thomas Brown, when he says, “in the most imperfect creatures, and such as were not preserved in the ark, but having their seeds and principles in the womb of nature, are everywhere where the power of the sun is,—in these is the wisdom of God's hand discovered; out of this rank Solomon chose the object of his admiration; indeed, what reason may not go to school to the wisdom of bees, ants, and spiders? What wise hand teacheth them to do what reason cannot teach 'us? Ruder heads stand amazed at those prodigious pieces of nature, whales, elephants, and camels; these, I confess, are the colossus and majestic pieces of her hand; but in those narrow engines there is more curious mathematics, and the civility of those little citizens more neatly set forth the wisdom of their Maker.” The extensive use of the microscope in modern times enables us most cordially to homologate the sentiments of Brown, and that with a degree of intelligence which he could not, with all his sagacity, have attained to. What Brown and his predecessors imagined, we see clearly; so that the merest tyro in the observation of nature now starts from a vantage ground which in former days was reached by but a few of the wisest of men. And assuredly, the results of the labours of the last century, in the course of which natural history has immensely extended its domain, tend to assure us that, however accurately men may retain the existing amount of natural knowledge, and however diligently they may continue their researches and observations for ages to come, there will still remain abundance of subjects for inquiry, to exercise the faculties, and to gratify the affections, even of the most remote of our descendants.

“Still seems the thought enormous? Think again:—

Experience' self shall aid thy lame belief;

Glasses (that revelation to the sight!).

Have they not led us deep in the disclose
 Of fine-spinn nature, exquisitely small,
 And, though demonstrated, still ill-conceived?
 If, then, on the reverse the mind would mount
 In magnitude, what mind can mount too far,
 To keep the balance, and creation poise?"—*Young.*

Thus it is that, so long as reason holds her seat, the right-hearted naturalist wearies not in his work. The longer he lives, the more he sees to admire, and the more enlarged do his ideas become of the glory of the Great Fountain of life, and light, and peace. I take the liberty of reminding you of these things, for the purpose of stirring you up to take a lively and active interest in the working of this Society, the existence and prosperity of which depend upon the combined efforts of its members to contribute each his quota to its proceedings. It appears to me that, by a few years of earnest labours, this Society may be instrumental in doing a great amount of good, the fruits of which will long endure. I now refer particularly to the influence which we (as the only active associated body of naturalists in the metropolis of Scotland) may very legitimately endeavour to bring to bear in favour of that movement now in progress, which has for its object the introduction of natural history, as an ordinary branch of elementary education, into all our schools. Forty or fifty years have elapsed since this movement began, and, doubtless, some progress has been made; but I presume that I speak the mind of most of those now present who are conversant with the subject, when I say, that there is great room for improvement in both the style and the matter of the natural-history lessons at present given in schools. Now, it appears to me that the consideration of the *what* and the *how* in this matter may very properly be taken up and discussed here. I cannot but regard this as an important subject; and I earnestly hope that some one amongst us, able to do justice to it, will bring it in a proper shape before the Society. Doubtless, it is in a great measure owing to the commercial prosperity of the nation, that there has been, of late, so great an increase in the numbers of students of natural history. Men whose affluent circumstances give them abundance of leisure and of means for the prosecution of science, begin to be wise enough to learn that the pursuit of natural history is both delightful and healthful. It is certainly not because our Government has taken science much more fully under its protection than formerly that its votaries have increased. Yet, what has been begun without the aid of Government, may in future owe much to that aid: and I feel assured that associations such as ours may do a great deal towards bringing about this. If it be shown—as you well know it can be shown—that the study of nature in a proper spirit exerts the most wholesome effects on the moral and intellectual, as well as upon the physical nature of man, may it not be confidently expected that our rulers will yet come to see the desirableness of making proper provision for the more general initiation of youth in natural science? To be in any measure instrumental in obtaining such a boon for the nation, is surely an object well worthy of the attention and best endeavours of our Society. And again, it appears likely that, not only in education, but in therapeutics, a more exact acquaintance with natural history is henceforth to be regarded as a *sine qua non*. You require not to be told that the contemplation of the objects of nature around us, in mass or superficially, is very inferior in power to minister successfully to the mind diseased, to the earnest scrutiny which science teaches. The soothing effects of the discovery of beauty, order,

harmony, and fitness, are far greater and more lasting than the vague impressions derived from general views and brief glimpses of the æsthetic in nature. We accordingly find that modern medical psychologists have been led to see that, in prescribing for certain classes of their patients, it is of no small importance to advise something more specific than a walk into the country, or a visit to some fine scenery, or a ramble by the sea-side. They recommend the adoption of some particular department of natural history as a field for research; and, sending some to the mountains in search of Alpine plants; others to the woods to acquaint themselves with the habits of beetles and spiders; and yet others to the shores of the sea to gather and to observe the infinite variety of its inhabitants—they have the satisfaction of seeing, not only a restoration to health of body brought about, but great pleasure expressed in the discovery of new and unfailing sources of happiness. In a remarkable work, lately published by Dr. Feuchtersleben of Vienna, entitled ‘*The Dietetics of the Soul*’ (of which an English translation has just appeared), this is brought out very fully. He places the “contemplation of nature at the head of his system of mental dietetics,”—to use his own words; that is to say, that he (one of the most experienced psychologists of the day) has discovered no better means for the preservation and restoration of mental health than the study of natural history. And, doubtless, many physicians hold by the same opinion. Such considerations may perhaps have some effect in inducing you to take, if possible, a more intelligently active interest in the business of this Society, seeing that through it we may not only benefit one another, but be instrumental in doing much good to others. You are aware that we now enter upon the eighty-second session of this Society. But so far as it represents the Chirurgico-Medical Society, which existed four years prior to the institution of the Physical, we are now about eighty-six years of age. Originally founded by students of medicine, the Physical Society for a long time was composed chiefly of such. But the subjects discussed were not merely medical—the whole range of physical science was embraced. Not a few of the many eminent men who received their professional education at this University were active members. It has been a remarkable feature in the history of the Society, that it has received into its own membership several other Societies, which became amalgamated with it. Besides the Chirurgico-Medical, already mentioned, the American Physical was incorporated with it in 1795; the Hibernian Medical Society in 1799; the Chemical Society in 1803; the Natural History Society in 1812; the Didactic Society in 1813. Thus, you see, we have had many progenitors. Nevertheless (as is probably known to most of those present) in spite of these numerous accessions of tributary streams, some years ago the main stream became almost dry. A great drought there was, so that the channel was laid bare. It is now four years since it was revived, chiefly through the exertions of Professor Fleming, in the hope that it might be made a sufficiently attractive point of union for the working naturalists of this city. And that hope has not been disappointed. Almost all who love the study of nature are either with us, or friendly to our position; and the proceedings of the last three or four sessions have been sufficient to prove the growing interest felt in the object of our meetings. During last session, there were twenty-seven papers and communications produced at the eight meetings; and you are well aware that some of these were of great interest and importance. Allow me, in conclusion, to advert to the good examples of earnest diligence as naturalists, which were set before us by those distinguished men who have been removed from amongst us by death within the last year or two. I refer to the late Sir John Graham

Dalyell, Dr. Patrick Neill, and Professor M'Gillivray of Aberdeen, each of whom has left a blank not soon to be filled up. Scotland has had few, if any, such accomplished naturalists. It well becomes this Society affectionately and respectfully to cherish the memory of these excellent men. Sir John Dalyell was appointed first President after the revival of the Society; and although his bodily infirmities prevented him from attending our meetings, we received many proofs of his interest in us, and of his constant desire to promote our object. Of the singleness of aim, indomitable perseverance, profound sagacity, and wonderful success with which Sir John, throughout the course of his long life, gave his days and nights to the searching out of the most obscure parts of the great plan of creation, we may be thankful that so admirable and valuable a monument is preserved to us, as appears in his 'History of Rare and Remarkable Animals of Scotland,' the completion of the publication of which has been entrusted to our distinguished associate Dr. Fleming. To go through that wonderful work is, indeed, to sit at the feet of a great master, in whom we rejoice to see not only an extraordinary amount of knowledge, but a deep veneration for Him whose works he would attempt to unravel. We shall all expect with interest a full biography of Sir John from Dr. Fleming, when he shall have completed the publication of his posthumous works. Dr. Neill also was a member of this Society. He entered it from the Natural History Society in 1812. Few men of his day knew so much from personal observation of the Zoology and Botany of Scotland, as did Dr. Neill. Those who knew him personally (and these were indeed many) will long remember his modesty, simplicity, and acuteness as an observer, and his kindness, steadfastness, and sincerity as a friend. His public spirit was ever active; and to it we are indebted for the institution of the Caledonian Horticultural Society, and of the Zoological Gardens, as well as for abundant and self-denying labours in connexion with many other scientific and charitable institutions. His wondrous little treasury of plants and animals at Canonmills was indeed an earthly paradise to those who could appreciate the moral excellencies of the possessor, as well as the riches of the spot. Professor M'Gillivray was a native of the Hebrides, but resided in Edinburgh for many years before his removal to the Chair of Natural History in Aberdeen. Here he filled in succession, and with great credit, the offices of Assistant-Keeper of the College Museum, and of Conservator of the Museum of the Royal College of Surgeons. He was a most laborious student and exact observer. His published works prove how well acquainted he was with a large range of subjects in natural history. Doubtless, had his life been prolonged, he would have done much to extend the science and to foster a taste for the study of natural history."

Mr. Hugh Miller then read a paper on the ancient Grauwacke Rocks of Scotland, with a historical sketch of the progress of geologic discovery among them during the last sixty years, and a brief description of what is at present known regarding their place, character, and organisms. The paper was illustrated with a fine collection of Scoto-Silurian fossils. On the motion of Professor Fleming, the thanks of the Society were unanimously voted to Mr. Miller for his valuable and interesting paper.

Saturday, December 11, 1852.—MR. HUGH MILLER, President, in the chair.

The following donations to the library were laid on the table, and thanks voted to their respective donors:—'The Transactions of the China Branch of the Royal Asiatic Society' for 1848—50; per Dr. Coldstream. 'Dr. Johnstone's Flora of Berwick-upon-Tweed;' from the author, per R. F. Logan, Esq.

The following communications were read:—

I. Notice of the Bridled Guillemot (*Uria lachrymans*, Temm.), shot near North Berwick; by John Alexander Smith, M.D. The bridled or ringed guillemot, Dr. Smith said, derived its name, and apparently its principal distinctive character, from a ring of white feathers which encircles its eyes, and from which a white band extends backwards, in this specimen, for an inch and a half along the usual dividing line which exists here in the guillemot. On a closer comparison, however, between the *Uria troile*, Linn., and this bird, we find the bill of the *U. lachrymans* to be smaller, and more slender, and the bird to be apparently altogether rather less in size. These distinctions, however, he observed, are by no means well marked or decided in their character. Dr. Smith stated that this *U. lachrymans* was one of three specimens which were shot off North Berwick, in the end of June last year, each being along with a flock of the common guillemot; and that Mr. John Richardson, Pencaitland (by whose kindness he was enabled to exhibit it), informed him they generally occurred in company with small flocks of the common species, and only in very small numbers; and that he never saw a flock of them by themselves: he stated also, that they seemed very averse to take wing, always remaining on the water after the common guillemot takes flight, and when fired at they generally attempted to escape by diving frequently, and swimming a great distance under water. Mr. Richardson has been in the habit of shooting over the Firth near North Berwick, more or less regularly, from March to September, for the last fifteen or twenty years; and although he has shot great numbers of the *U. troile*, it was only within the last two or three years that he observed the difference between it and the *U. lachrymans*, and since that time he has occasionally noticed the latter bird during all these various months. Mr. Gould states that the *U. lachrymans* occurs on various parts of the coast of Britain, particularly those of Wales. Mr. Yarrell mentions its occurrence on the coasts of Yorkshire and Durham. The late Professor M'Gillivray refers, in his *British Birds*, to a specimen shot in the Firth of Forth in April, 1824, and another, a young bird, shot in winter with the same distinguishing white ring round the eye: he says he always looked upon them as mere varieties of the *U. troile*, and thereupon paid little attention to them; and he considers the question of its being a distinct species as still very doubtful. Sir W. Jardine, in the 'Naturalist's Library,' says, "We have never had the good fortune to meet the bridled guillemot in Scotland, nor do the fishermen, or inhabitants near the trading places,—almost always very correct in their distinctions of the creatures frequenting their vicinity,—know it." The permanency of the white markings already alluded to, both in winter and summer, in male and female, and apparently in young as well as old birds; and the statements of naturalists of its breeding places being distinct from the *U. troile*, as at the island of Grimsey, north of Iceland, visited by Mr. Procter, as well as the fact stated by him, that the inhabitants always set apart these birds, and selected their eggs as distinct from the common guillemot; all give an additional interest to any details of its habits, and tend to strengthen the belief of its being possibly a distinct species. Dr. Smith also stated, that, from the careless way in which some of our sportsmen noticed the birds which they shot, he was almost inclined to think the young of the razorbill (*Alca torda*), which has a white line running from the eye forwards to the bill, may have been mistaken for this rarer bird; and, by rather a strange oversight, he found this white marking of the *Alca torda* described as belonging to the *U. lachrymans*, in the notes added to the 8vo edition of Cuvier's 'Animal Kingdom,' recently published by Orr & Co., London. The *U. lachrymans*, Dr. Smith

stated, seemed to be by no means a common bird in this district, or it had been strangely overlooked; as, with the exception of Mr. Small, George Street, who prepared this specimen, none of our bird-stuffers ever saw an individual which had been captured in our neighbouring seas.

Mr. Logan remarked that he had brought with him a very interesting paper on this bird, published by Mr. John Wolley, which was diametrically opposed to the opinions of Mr. Procter, and stating that he believed the bird to be merely the young of the *U. troile*, although in this case the changes in the white ring would be the very reverse of what takes place in the *Alca torda*, in which the white line on the head becomes more distinct as the bird approaches maturity. Still it bred in the same localities as the *U. troile*, and seemed in all other respects exactly to correspond. Dr. Fleming doubted the propriety of a white ring or streak being looked upon as a distinctive character, considering how much the black and white colours vary in the winter and summer plumage of many of these birds. He stated he had always been in the habit of looking upon it as a mere variety of the *U. troile*.

II. The Rev. John Fleming, D.D., next exhibited a recent specimen of the little auk, or common roche (*Alca alle*, Linn.), in its winter plumage, which had been kindly sent to him by the Rev. Mr. Cunningham of Prestonpans, near which place it had been taken in an exhausted state by some fishermen. Dr. John Alexander Smith mentioned that another specimen of this bird had been shot in the Firth off Dalmeny Park during the severe frosty weather we had about a month ago.

III. A number of interesting specimens of snakes, insects, &c., which had been collected by the Rev. H. M. Waddell, at the Mission of Old Calabar, was next exhibited. Mr. Waddell had for some time been stationed there as a missionary for the United Presbyterian Church, and on his recent return to this country he had brought with him the specimens in question. These he had liberally divided among some of the naturalists in this city, in order that they might be examined, identified, and exhibited to the Society.

Among the objects shown, Mr. James Cunningham, W. S. (on behalf of Dr. Coldstream, who was unavoidably absent), exhibited a specimen of the very curious Arachnidan *Phrynus lunatus* of Olivier, Latreille, &c. It belongs to the tribe of Solifugæ (*Tarentulidæ*) and is supposed to be very poisonous. Mr. Waddell stated that this was the only specimen of the kind he had ever met with, and that it had been found in an outhouse among some lumber.

Dr. Lowe next reported on one or two species of Myriapoda—one of which was a very large species of *Iulus*, in which, from its size, the peculiar characters of the genus were very distinctly seen. In connexion with this he gave some very interesting information as to the habits of one of the British species which he had himself watched.

Mr. Andrew Murray, W. S., to whom the beetles had mostly fallen, exhibited them, and reported that the principal species were *Augosoma Centaurus*, *Fab.*, male and female, *Oryctes Monoceros*, *Oliv.*, and *Diplognatha Gagates*, *Fab.* There was also a species of *Oryctes*, which was probably undescribed, and which at least was not in the collection of the British Museum, to which he had sent it for identification. The beetles shown were all of large size and sombre colours.

Mr. R. F. Logan described eight of the insects; two gigantic spiders, one of them belonging to the family *Mygalidæ*; and, after alluding to the fabled bird-catching propensities of the genus *Mygale*, completely disproved by their habits, read an extract

from the 'Proceedings of the Entomological Society,' which went very far to prove that there actually exists in India a bird-catching spider, little inferior in dimensions to the *Mygale Avicularia*, but belonging to another division of the order, and probably a gigantic species of *Epeira*. Among the other insects was a beautiful Mantis, and a Coleopterous Lamellicorn larva, three inches in length, and one in breadth, of a dark olive colour, clothed anteriorly with reddish brown hairs, and with very distinct black spiracles.

It was then mentioned that the snakes were in the course of being examined by Professor Traill, and would probably form the subject of a future communication.

The cordial thanks of the Society were given to Mr. Waddell for the interest he thus exhibited in the promotion of science, and for the kind and handsome manner in which he had presented his collection to the members.

IV. A variety of living land-shells were then shown. They had been collected by Dr. Knapp last summer, during an excursion in Switzerland, and he had brought them home and kept them since alive in the glass globe in which they were exhibited. Dr. Greville enumerated the species which were shown, and gave some interesting details relating to them. The thanks of the Society were voted to Dr. Knapp for the exhibition.

V. A serpent from the Amatola, Kaffirland, and supposed to be identical with the Egyptian cobra or asp, was exhibited through the kindness of the Rev. A. Somerville, and excited much interest, the fangs being fully displayed, and having the poison condensed around their orifices.

VI. An interesting paper was then read on the Injurious Effects of Cedar-wood Drawers, by Professor Fleming.

VII. Note on the *Helix aspersa*, by Mr. Hugh Miller.

In a conversation which followed the reading of Dr. Fleming's paper, for which he received the thanks of the Society, it was stated by Mr. John Stewart, in confirmation of the view taken regarding the pernicious effects of cedar-wood on natural history specimens, and works of art and vertu, that, having committed to the keeping of a cedar-wood drawer a set of delicate photographs, he found, on examining them after the lapse of some time, that they had almost all suffered, and that from most of them the images were wholly effaced.

At the conclusion of the meeting, James Wilson, Esq., Woodville; William Brown, Esq., F.R.C.S.E., Dublin Street; and John William Hadden, Esq., from Van Dieman's Land; were elected members of the Society; and the following gentlemen were unanimously chosen office-bearers for the ensuing year:—

Presidents.—John Coldstream, Esq., M.D., F.R.C.P.; Hugh Miller, Esq.; Rev. John Fleming, D.D., Professor of Natural Science, New College, Edinburgh.

Council.—James Cunningham, Esq., W.S.; Robert K. Greville, LL.D.; Robert Chambers, Esq.; William H. Lowe, Esq., M.D.; Charles Maclaren, Esq.; and Andrew Murray, Esq., W.S.

Treasurer.—William Oliphant, Esq.

Secretary.—John Alexander Smith, Esq., M.D.

Assistant Secretary.—George Lawson, Esq.

Honorary Librarian.—Robert F. Logan, Esq.

Library Committee.—William Rhind, Esq.; John Murray, Esq., M.D.; and Patrick Dalmahoy, Esq., W.S.

Proceedings of the Zoological Society.

Tuesday, January 11, 1853. — DR. GRAY, Vice-President, in the chair.

Mr. Waterhouse described a new species of rodent from South America, remarkable for having a very short tail, and strong fore-feet, furnished with large and nearly straight claws. It was from the province of Mendoza, having recently been sent by Mr. Bridges, after whom it was named by Mr. Waterhouse, *Hesperomys Bridgesii*.

M. G. P. Deshayes described thirty-seven new species of shells from the collection of Mr. Cuming, including several very interesting types.

Dr. Gray described a new salamander from California, under the name of *Ambystoma Californiensis*; and a gigantic tortoise from the Galapagos, under the name of *Testudo platycephalus*. The latter species is established on a skull only.

Tuesday, January 25, 1853. — DR. GRAY, Vice-President, in the chair.

The Secretary read a letter from Mr. L. Fraser, H.M. Vice-Consul at Whidah, written from Clarence, Fernando Po, and addressed to Mr. Cuming. It contained some notice of the existence of a large Quadrumanous animal in the interior, called by the natives *Tap-par-po-har*, which is supposed by them to be a chimpanzee, but which is considered by Mr. Fraser to be most probably a *Cynocephalus*. Mr. Fraser has not yet succeeded in obtaining a specimen. He describes two new birds obtained in June and July last, at Fernando Po, under the names of *Bubo poensis*, and *Buceros poensis*.

M. Deshayes read a paper on the animals of *Camostrea*, *Clementia*, and *Glaucanome*; and in the course of it he took occasion to describe fourteen new species of the genus *Mactra*, and two of *Clementia*.

Dr. Gray read a paper on the division of Stenobranchiate Gasteropodous Mollusca, in which he made use of the character afforded by the mouth, which he considers to establish the distinction of two great groups in a much more natural manner than the presence or absence of a siphon in the mantle, and to be more consistent with the habits of the animals, and much less liable to exceptions. The character upon which Dr. Gray chiefly relies, is the form, disposition, and number of the teeth on the lingual membrane. His arrangement is as follows: —

Suborder I.—PROBOSCIDIFERA.

Fam. 1. Muricidæ.

2. Buccinidæ.

3. Olividæ.

4. Lamellariadæ.

5. Fasciolaridæ.

6. Volutidæ.

7. Pleurotonidæ.

8. Doliidæ.

9. Tritoniadæ.

10. Scytotypidæ.

11. Volutonidæ.

12. Naticidæ.

13. Cassididæ.

14. Scalariadæ.

15. Acteonidæ.

16. Acusidæ.

17. Pyramidellidæ.

18. Architectomidæ.

Suborder II.—ROSTRIFERA.

Fam. 1. Cancellariadæ.

2. Conidæ.

3. Amphiperasidæ.

4. Cypræadæ.

5. Pediculariadæ.

6. Aporrhaidæ.

7. Strombidæ.

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| 8. Phoridaæ. | 15. Vermetidæ. |
| 9. Ampullariadæ. | 16. Vanicoridæ. |
| 10. Viviparidæ. | 17. Valvatidæ. |
| 11. Rissoellidæ. | 18. Cæcidæ. |
| 12. Littorinidæ. | 19. Truncatellidæ. |
| 13. Planaxidæ. | 20. Capulidæ. |
| 14. Melaniadæ. | 21. Calyptridæ. |

M. Deshayes made some observations upon the manner in which the animals of these groups take their prey.—*D. W. M.*

Proceedings of the Society of British Entomologists.

January 4, 1853.—Mr. HARDING, President, in the chair.

The President exhibited some living specimens of *Phragmatobia papyratia*, bred within doors, and said he could have brought several more, as they still continued to come out of the chrysalides.

The President then addressed the Members; and having made some observations on the prosperous state of the Society, concluded with comments upon the pleasing results of entomological researches during the past year. He instanced the labours of Mr. Weaver in Scotland, whereby our cabinets have been enriched by several valuable acquisitions. In other parts of the country also many rare insects have been found in considerable abundance; among which he mentioned *Agrotis lunigera*, *Aporophila australis*, and *Plusia orichalcea*, besides many rare or new Micro-Lepidoptera; and he had no doubt that another year of perseverance would produce still more gratifying results. But amidst all these causes of congratulation, the President remarked that there were still many motives for sorrow. A sad loss had been experienced in the decease of one of the best and most independent writers on Entomology,—Mr. J. F. Stephens. It appeared as if every year were to be taken from us some of our best teachers. A short time since we had to deplore the loss of Mr. E. Doubleday, then of the Rev. W. Kirby; and in Scotland, Sir John Graham Dalyell, Dr. Patrick Neill, and Professor MacGillivray had recently been removed by death. But these losses should not be allowed to depress the energies of the naturalist; they should rather incite him to renewed exertions. The President was happy to say that the ranks of this Society had not been thinned by death; they nevertheless felt the temporary loss of several of their members who have gone abroad, and whose company they might again hope to enjoy, although they could not profit by their labours, the Society's cabinets being exclusively devoted to the reception of British insects.

A letter was then read from Mr. Oxley, who is in Australia, containing observations on the number of insects he had met with. He had been particularly struck with the beauty of some of the Lepidoptera, of which he said he should make a point of forming a collection.

A vote of thanks to the President and Secretary having been passed, the meeting adjourned.—*J. T. N.*

Proceedings of the Isle of Wight Philosophical and Scientific Society.

December 20, 1852.—Several new members were proposed for admission, to be balloted for at the next meeting.

Donations of numerous geological specimens were announced from C. Cramer, Esq., Rev. C. U. Barry, and C. Pearson, Esq.

Professor E. Forbes, of London, who has been for some time engaged in this locality upon the Geological Survey of Great Britain, exhibited some living specimens of remarkable Limaces, taken in the Isle of Wight, by Mr. Gibbs, including the black caricated slug (*Limax Gagates*), which had never been noticed but once before in England.

Professor Forbes then proceeded to give an account of the freshwater tertiary formations of which the greater part of the northern portion of the Isle of Wight is made. Hitherto it has been supposed by all geologists who have written upon the district, that the well-known Headon Hill, upper and lower freshwater formation, constituted most of the country to the north of the chalk range. Mr. Prestwich alone suggested that the cliffs of Hempstead, near Yarmouth, were composed of higher beds. In reality, however, the Headon-hill beds, properly so called, constitute but a very narrow strip of the island; and certain strata that rest upon them, including the limestones and marls of Bembridge, Binstead, Cowes, Gurnet Bay, Hempstead Ledge, and Sconce, form a large tract of country of an entirely different geological age, and distinguished by distinct and peculiar fossil remains. These beds have hitherto been mistaken, both by British and foreign geologists, for Headon-hill beds, and in most instances for beds at the bottom of the Headon-hill series. Above them, lies another, and equally distinct, formation, of which Hempstead Hill, and probably Parkhurst, are composed. The fossils in this highest group are also distinct. These upper tertiaries form a series of rolls, constituting the undulated country between the eastern and western extremities of the island. These rolls, dependant on lateral compression, are also to be seen, as lately observed by Mr. Bristow and Mr. Aveline, during the course of their researches, affecting the older marine tertiaries, and the chalk itself. Altogether, there is a thickness of more than 500 feet of freshwater strata, above the Headon-hill series, unrecorded in works on British geology. Osborne House stands upon a formation hitherto undefined, and not mentioned in geological manuals.

Professor Forbes proposes to divide these additional groups into three series:—1st, The St. Helen's and Nettlestone beds; 2ndly, the Bembridge beds; and 3rdly, the Hempstead-cliff beds. Full accounts of them will be published by the Geological Survey of Great Britain, under the direction of Sir Henry de la Beche, who has, during the last two years, been actively engaged in personally exploring and superintending researches in the Isle of Wight, and at whose suggestion the inquiries were made which led to the discoveries now announced. An animated discussion ensued upon the subject of Professor Forbes' communication. For this most interesting account, as well as for his courtesy, in having made this Society (established especially for scientific researches) the medium through which first to make a great fact public,—a fact so peculiarly interesting to the island,—an unanimous and hearty expression of thanks was passed to the discoverer of these new geological series.

The Society then adjourned until Monday, January 3, on which evening it was announced that Dr. Drew would favour the Society with a paper on the causes which led to the discovery of the new planets.

We are enabled to announce that Professor Forbes will, as soon as time allows, enrich the Society's museum by as complete a series as possible of fossils found in the new beds.

Proposition for the formation of a Kirby Society.

Stricklands, Stowmarket,

November 12, 1852.

SIR,

The notice in your November number (Zool. 3661) of a suggestion made by me to the Entomological Society, in reference to the publication of monographs of British insects, with coloured illustrations of each species, does not convey my meaning so clearly as I wished it to be understood.

My proposition was, to establish a Society, to be called the "Kirby Society," which should follow in the useful steps of the Palæontographical Society. The subscription should be One Guinea a-year; and according to the number of subscribers there should be a yearly issue of 'Coloured Illustrations of British Insects and their Transformations.' I would not interfere in the least with any other Society.

When the Diptera, for instance, were to be illustrated, the cost of description would be saved, as that part has already been done, and well done, by Mr. Walker: and so of any other branch in which *really good descriptions* are already to be found. Such a work as this would greatly extend a knowledge of British Entomology, as it would be supported by many who were not entomologists. I hope you will consent to receive the names of those who wish to subscribe; if not, please to insert this, and say that I will.

Yours very truly,

C. R. BREE.

To the Editor of the 'Zoologist.'

P.S.—I take the liberty of adding a few words more to my remarks upon the formation of a "Kirby Society." It has been suggested to me that it would be advisable by such a Society to illustrate the 'Insecta Britannica' now in course of publication. I think the suggestion a good one; and if Mr. Stainton's volume of Micro-Lepidoptera were illustrated in the same beautiful style as Mr. Douglas's papers on the Gracillariæ and Coleophoræ in the 'Transactions of the Entomological Society' of the past year by Mr. Wing, I have no hesitation in saying that a great advance would be made in this hitherto neglected branch of Lepidopterology. They say it would be incomplete, because very few of the larvæ are known; but this arises principally from there being comparatively so very little known of the perfect insects. How much time is now wasted in working out the designation of species from the many wretchedly imperfect works for which we have been called upon to pay so largely! The credit of the science is affected, and nothing can set it right but a noble effort to have perfect portraits of our British insects and their transformations. A vast number of British entomologists have no time for studying exotic Entomology, or working up species from Panzer or Roeslerstamm; they wish to have works that they can understand, and illustrations that are faithful portraits of what they profess to represent.

A double advantage would thus be gained. Not only would much and often valuable time be saved to the real student, so as to enable him to perfect his collections

and extend his inquiries to other branches of science, but many would be attracted to the study who now, for the reasons I have hinted at, shrink from a task surrounded by almost insurmountable difficulties.—*C. R. B.* ; *January 12, 1853.*

[I shall be most happy not only to receive the names of subscribers to such a Society, but to subscribe to it myself, and do all in my power to promote so laudable an object: at the same time I must be excused from expressing any opinion in favour of its practicability.—*E. Newman.*]

Note on a Variety of the Green Woodpecker.—An old male green woodpecker was shot during the last week in December, 1852, at Hedenham, in this county, by a gentleman, who very kindly presented it to me, which exhibits some remarkable variations from the usual colouring of this species, especially on the rump, the feathers of which (including the upper tail-coverts) are, in this specimen, all margined and tipped with a beautiful flame-coloured red, instead of with the usual edging of yellow. The feathers at the lower part of the back of the neck are also similarly tipped with red; while those on the back are pointed with the beautiful golden-yellow edgings which usually characterize the feathers of the rump; and a similar yellow pointing is to be observed on the ends of the feathers forming the three lower rows of the wing-coverts. The other parts of the plumage do not differ from ordinary specimens.—*J. H. Gurney*; *Easton, Norfolk, January 24, 1853.*

Diseases produced by Coccidæ on the Olive, &c.—*M. Robineau Desvoidy* lately proceeded to the South of France, with the view of ascertaining the cause of a malady which had long been prevalent on the above trees in that part of the country, and which it was supposed had made its appearance in the central and northern departments. This disease, called *morfée* by the Italians, and *fumagine* in the North of France, consists in a thick black crust, which covers the trunks, branches, &c. of the trees, sometimes over a considerable extent of country. The trees become arrested in their growth, languid, and barren. According to historical accounts, this disease has not appeared more than a century. It is said to have first occurred near Rome, and to have spread thence through the whole of Italy, and into France. Every year it makes fresh progress, and no means of arresting it have yet been found. The Italians are not agreed as to whether this disease be a special malady, or merely the result of the attacks of *Coccidæ*. The author supports the latter opinion, stating that the disease never occurs except upon trees attacked by those insects. Of these, he says that the *Coccus adonidum*, a native of Senegal, attacks especially the citron and lemon trees; the *Coccus hesperidum*, a native of America and Africa, prefers the orange, rose-bay, and peach trees; the *Coccus anidum*, a native of the Indian Archipelago, attacks the Lauraceous trees; the *Coccus Oleæ* commits the greatest ravages upon the olive-trees, but also attacks the oranges and a number of other trees; this is the most destructive of all. Rich, moist, well cultivated localities are most favourable to the development of these insects, and it is in such localities that they commit the greatest ravages.—*From the 'Comptes Rendus,' August 2, 1852, p. 183.*

[The crust should be melted, and would probably produce wax: the crust deposited by a Chinese *Coccus* in a similar manner on trees, produces wax of excellent quality.—*E. N.*]

Proceedings of Natural-History Collectors in Foreign Countries.

MR. H. W. BATES.* — “Aveyros, Rio Tapajos, August 1, 1852. — Although there is no conveyance from here safe enough to forward my collection, I profit by the opportunity of a small boat going to Santarem to write you an account of my proceedings, especially as I am in a rather out-of-the-way country now, and do not know when I shall have another opportunity to send a letter. I left Santarem, as in mine of the 6th of June I informed you I should, on the 8th of that month, and after a few hours' sail with a brisk wind, began to form something like a correct idea of this river. It is the most extensive and magnificent stretch of water I have seen in the whole river system of the Amazons. Like most of the other affluents, the Tapajos forms a delta of islands, alluvial and marsh lands, on its junction with the main river, by which the main channel flowing by Santarem is much contracted. I suppose there it is not more than 1 or 2 miles wide, but passing upwards, it expands into a breadth of from 8 to 10 miles, perhaps more, and continues thus for nearly a hundred miles, clear of islands; in fact, to a little below Aveyros. Both shores are marked by a line of hills, some isolated, others in long ridges, some conical, others truncated. This high country, generally covered with a uniform sombre forest, forms a picture very different from that of the alluvial flats and vivid green foliage of the banks of the Amazons. The winds here are strong and irregular, and the swell at times fearful. Sometimes a narrow margin of alluvial land skirts the banks, with beaches of white sand, forming lovely bays and harbours; but a great part consists of rock-bound coasts and precipices, at the foot of which the swell breaks with threatening roar. In fact, the voyage, instead of being a quiet slow excursion, like those we generally have on the Amazons, turned out a serious affair, full of peril and anxiety. I started in rather a critical season; the month of June being a transition season between the wet and the dry periods, the waters had not yet sunk many inches, and squalls, with thunder and lightning, occurred daily; at times, violent gusts came suddenly from the hills before sudden showers. In arranging my voyage, I found the usual difficulty in finding men. Indians only understand the management of canoes; and these are so few in number in comparison to the demand for them, that they are not to be found. The authorities only

* Communicated by Mr. S. Stevens,

can assist a stranger, but these parties in Santarem are not at all obliging, and I was compelled to hire two mulattoes,—one, a coarse specimen from the South of Brazil, the other, a harmless young fellow of very little use to me. The bigger one proved a great annoyance. I soon found that he understood less of navigation than myself; but he was insolent, and would have his own way. Our first day's voyage was very inauspicious. We weighed anchor at Santarem at 8, A.M., after a good deal of trouble with the police-officers, who would not let this same fellow go until I had paid his debts. At about 2, P.M., the wind freshened, and the cable by which our small boat was secured, broke; the boat of course fell astern, and we put in-shore towards a small bay, between two cliffs, in order to cast anchor and wait until the boat came up with the wind. Into this bay rolled a tremendous swell, our vessel dragged its anchor, and we went ashore. It was a critical situation, but we kept the boat from bumping much by the aid of poles. The vessel is a stout-built one, and we were able to move out of the harbour about two hours afterwards, by the aid of our jib-sail, rounding a jutting ledge of rocks, with the wind nearly a-head. This was only one of the dilemmas we got into through bad seamanship; and on reaching Aveiros, where I had previously arranged to stop, I of course dismissed the men, and resolved not to move a step further without two or three good Indians.

“After our troubles on the first day's voyage, I stopped at a little village called Altar do Chaô, about 20 miles above Santarem, to prepare for a better start. Here we mended the sails, fixed new cords and ropes, arranged the cargo more conveniently, &c. There was excellent collecting-ground, and I stayed till the 17th. Although so near Santarem, the Entomology of this station was totally different, from the different nature of the forest and other local circumstances. The place is wonderfully picturesque; a small bay with white sandy shores, isolated hills about 800 feet high, of a truncated pyramidal shape, a winding creek running inland, a sloping grassy plain, upon which are placed the 80 or 100 palm-thatched huts forming the village, and a lofty varied forest, overrunning equally undulating plains and swelling hills in the back-ground. The Callithecæ, and the peculiar Erycinidæ of Santarem were absent; but there appeared a very great abundance and diversity of Erycinidæ of other groups, especially Mesosemiæ, Calospilus and Nymphidium, and of Satyri. I added some three or four new species to my list, besides half-a-dozen new Longicornes, and many new species of other groups of Coleo-

ptera, especially of the genus *Canthon*, of which the prevailing species were quite new to me.

“I reached this town, Aveyros, on the 23rd of June, and have remained here busily occupied to the present time. It consists of only fourteen houses, but is the residence of the commandant of the district, whom I previously knew. The river here is strewn with islands, which divide its breadth into several channels; this breaks the force of the swell and the winds, and renders travelling about in small boats pleasant. The town is situated on a tract of low land, and the forest offers nothing peculiar in the prevailing trees &c. from other districts. From this cause, the great majority of the diurnal *Lepidoptera* are the same as those I have met with in other places: but the diversity of species, and profusion of insects generally, is greater than I have observed elsewhere. Some of the species are old Pará friends, such as *Papilio Vertumnus* and *Sesostris*, *Epicalia ancea*, *Nymphalis Sthenelles*, two species of *Heterochroa*, one of *Paphia*, four of *Ithomia*, *Leptalis locula*, and a great number of the rarer Pará *Erycinidæ*. Others are the same as the Tocantins species, particularly the beautiful sharp-winged *Papilio* I had not yet met with except on the Tocantins. Many are the same as those of Obydos, particularly the *Eurygonæ* and *Heliconia Melpomene*. Two only are Ega species, — one, the *Callithea Batesii* (of which I have secured only one, a female, very perfect), and one of the rarest of the Ega *Cybdeles*. I have enumerated nearly 300 distinct species of diurnal *Lepidoptera* seen here, including of course those numerous species common everywhere. The new species are in *Leptalis*, *Heliconia*, *Eresia*, *Heterochroa*, &c., and in *Eurygona*, *Calospilus*, and other groups of *Erycinidæ*. In all the other orders the diversity is equally great, and the number of species new to me far greater than in butterflies.

“As to the blue and orange *Megastomas*, I never saw them *in copulâ* nor *in amoribus*. All I can say is, that they are in equal abundance in the same places, flying with vast rapidity, and settling upon old logs, edges of canoes, &c., by the water-side. I think they are male and female, especially as the blue appeared about fifteen days before the red; and I would recommend Mr. Westwood to look again and see if he cannot detect a few pairs of minute spines at the apical joints of the fore-tarsi in the red and not in the blue. I have no specimens here, and cannot therefore decide the question. The difference in the fore-legs of the sexes in *Nymphalidæ* I found out myself, several months ago, and have a long series of sketches made; it exists

throughout the Heliconiæ and Satyri, of course the Erycinæ, and I think the Polyommati, from one species I have examined here.

“The large Morpho allied to Hecuba is found in most places, but everywhere excessively rare. It only appears in certain states of the weather, — gleamy weather in January, February, June and July, — and then only in places in the forest where trees have fallen, and rarely descends from its usual height of 15 to 20 feet. Here I have watched it till tired; a long pole won't do, you cannot strike with sufficient force and precision. Perhaps there are more than one species,—I have seen it at Pará, Satarem, Obydos, Ega, &c.

“I have been very busy here, as I collect everything that does not interfere with insect collecting. The commandant here has procured for me two good Indians, who are now making a palm thatch to my canoe, and in two days I am off to the river Cuparé, a branch river, which I hear is very rich; two dead shells of the Anastoma have been brought me from there. The country is everywhere hilly, but the elevation not more than 800 or 1000 feet. The season is approaching, too, of abundance in turtle, fish, &c., and I hope to meet with the Cybdeles, Callianiræ, Timetes, Papilios, Diorhinæ and Megastomas of the Ega district on margins of rivers, as now is the season. Here I have found only one Cybdelis, one common Timetis, the common brown Charaxes? and Papilio Protesilaus, amongst the cloud of yellows on the river margin.

“H. W. BATES.”

Occurrence of the Reddish-gray Bat (Vespertilio Nattereri) in Suffolk.—As the Editor of the ‘Zoologist’ some time ago requested from his correspondents communications respecting the bats of this country—a request, by the way, which has not been productive of any great visible effect, since for the last two years they seem to have totally ignored the existence of such animals,—I make no apology for saying that an adult male specimen of the reddish-gray bat (*Vespertilio Nattereri*) was obtained by one of my brothers from a hole in a wall here, on the 5th of July last. I had never to my knowledge seen this species here previously, nor am I aware that its occurrence in Suffolk has hitherto been recorded, although it might have been almost safely presumed, from the circumstance of its having been met with in all the other eastern counties, in which alone, singularly enough, it seems to have appeared.—*Alfred Newton; Elveden Hall, Thetford, February 15, 1853.*

Captures of various Birds in Oxfordshire.—An immature specimen of the gray phalarope was killed on Port Meadow, close to Oxford, early in last September, and another in fine adult winter plumage in the latter part of December, 1852. A specimen of Temminck's stint was killed on Port Meadow in September, 1852. Whilst snipe-shooting near Abingdon in November, we flushed a specimen of the spotted crake (*Crex Porzana*), which my companion shot, and gave to me. Another specimen of this bird was killed a few days afterwards by a friend of mine, not far from the place where we found the first. I have seen two or three peregrine falcons in the neighbourhood of Oxford lately. I shot a specimen of the green sandpiper (by no means a common bird about here) in Port Meadow, on Wednesday last, the 2nd of this month.—*T. L. Powys; Christ Church, Oxford, February 4, 1853.*

“On the present season in relation to the Migration of Birds, and other Natural Phenomena.”*—Dr. Forster commences a letter to the Linnean Society, bearing the above title, by referring to a passage in White's ‘Natural History of Selborne,’ where it is remarked that the swallow-tribe, and particularly the martins, must suffer great devastation in the course of their winter migrations, inasmuch as, in certain seasons “the numbers of single birds which return in the spring bear no manner of proportion to those who retire in autumn.” Dr. Forster's Journal, now of forty years' standing, shows that this disproportion is greatest in late springs, particularly when accompanied with much wet and windy weather. The present season has been especially remarkable. After a winter, the mildest ever remembered in Belgium, the spring was cold and showery, and nearly all the periodical phænomena were later than usual; while many tribes of plants suffered severely from some obscure atmospherical influence, apparently referable to the same class of causes which produce epidemics in the human subject and epizooties among animals. The *Hyacinthus plumosus* died off in most gardens, and also the *Muscari racemosus*. As soon as the flowers showed themselves the stock began to wither and in a few days died away, whole beds going off in the same way. Great numbers of tulips perished in the ground; the leafing of trees was very late; and the mulberry had not at the date of the letter shown any signs of budding. The swallow (*Hirundo rustica*) arrived on the 18th of April, and had become pretty numerous. The swift (*Hirundo Apus*) came on the 7th of May, in less numbers than usual. Dr. Forster had not yet (on the 21st of May) seen the sandmartin (*Hirundo riparia*), which is usually found in April; and even of the martin (*Hirundo urbica*), usually plentiful at Bruges in the first week of May, the most careful search had not enabled him to detect a single bird. The nightingale and blackcap came to their time, but the gray wag-tail was not seen until the day of the date of the letter. The remarkable scarcity of flying insects, the usual food of the swallows, caused them to seek for other species, and a naturalist of the neighbourhood had assured Dr. Forster that he saw them hunting for their prey on walls and trunks of trees, like the creeper, a fact which Dr. Forster considers as tending to support his opinion of the reasoning powers of animals. Up to this time the cockchafer (*Melolontha vulgaris*), although usually abundant, had not made its appearance; nor had another constant inhabitant of the gardens, *Buprestis nitens*, yet been seen. The large black cockroach had increased to an alarming extent in many of the old houses and on the

* In a Letter from Thomas Forster, Esq., M.B., F.L.S., dated from Bruges, May 21st, 1851.

premises of the bakers. Some foreign newspapers had erroneously spoken of the weather as fine in Belgium, but there had been only three tolerably fine days since the 21st of March, and the average temperature since the 25th of that month had been 8° Fahr. below the mean.—*From the Proceedings of the Linnean Society, May 21, 1851.*

Swallows in November.—On the 10th of last November I saw about twenty house-martins (*Hirundo urbica*) under the cliff above Kemptown, Brighton—the day warm and wind S.E. They were sporting about as if it had been the middle of summer. Vast numbers of flies are generated in the decaying sea-weed on the beach, which would afford plenty of food. Previously to the departure of the great body of the swallows, about the end of September or beginning of October, the roofs of the houses in Arundel Terrace, the last houses east of Brighton, are covered with them, but I have never met with any one (and I have asked many of the men on the Coast Service), who has actually seen them take their departure. They are said never to leave when the wind blows in the direction of their flight, but that they select a light wind blowing against them, to avoid the ruffling of their feathers.—*R. Wakefield; 11, Sussex Place, Regent's Park, February 5, 1852.*

Supposed occurrence of a specimen of the Severn Swallow (Hirundo bicolor, Vieill.), at Derby, in 1850.—The notice of the supposed occurrence of the rufous swallow at Penzance (Zool. 3753), reminds me that I ought not any longer to delay recording in your pages, the supposed appearance of an individual of an American species of swallow at Derby, in 1850. I say *supposed* appearance, because, though I have not much doubt that the bird was really shot at Derby, there is nevertheless quite a possibility of mistake. Some months ago, my friend, Mr. John Evans of Darley Abbey, sent for my inspection, and afterwards kindly presented to me, the skin of a sort of swallow whose name he had not been able to ascertain, of which he gave me the following account:—One day that he called at the shop of Mr. Cooke, a bird-stuffer and museum-keeper in Derby, in the summer of the year 1850, he was shown the skin of a bird which had lately been shot at the Siddals (the name of some common land, I believe, in the suburbs of Derby), with eleven sand-martins, with which this had been considered to make a twelfth; in skinning them, Mr. Cooke had remarked that it was not like the others, and he thought it a variety, but asked Mr. John Evans his opinion about it. That gentleman did not know what it was, but he bought the skin for one shilling, and has had it in his possession from that time till he gave it to me some months ago, as I mentioned before. Mr. Cooke is since dead. The circumstance of his having skinned the birds himself, makes it appear improbable that he should have made a mistake, and Mr. John Evans assures me that he does not think there were any foreign skins about. I should add, that I believe there is no possibility of error since the skin came into Mr. John Evans' possession. The bird now before me is very like the house-martin, and not much like the sand-martins in whose company it was said to have been found. When compared with the former bird, the only difference seen at first is the continuous dark colour of the back, instead of there being white over the tail. On a further examination, the legs are found to be quite naked below the knees, instead of downy, as in our martin. These characters are I believe sufficient to refer it to the well-known American species called *Hirundo* (or *Chelidon*) *bicolor*, and I find my skin to agree with the several specimens of it in the British Museum. It is useless to give a particular description unless in comparison with a skin of the house-martin, one of which I do not happen to have at hand. It is enough to say

that the whole of the upper surface has a deep metallic green gloss, approaching to purple in some lights, except the tail and the flight feathers, which are dull black; the whole under surface is white except the tail and wings, which are of an ordinary neutral tint, whilst on this aspect the greater part of the shafts of the primaries is white. The occurrence of a specimen of a second species of American swallow in England is no more than any one, who had satisfied himself of the reality of the former event (the occurrence of the purple martin), would be prepared to expect. No kinds of land bird once driven out to sea seem better qualified for arriving safe at this side the Atlantic than the swallows; but it is a question whether even these could accomplish it without the assistance of ships, of which land birds at sea are so often seen by sailors to make use. Also they probably require strong and long continued west winds to lessen the duration of their exertion and their fast; and still it appears likely that they have a chance of surviving only when their misfortune happens at the time of their migrations, when doubtless nature has prepared them for extraordinary endurance of hunger and fatigue. And after all, what a very few are lucky or unlucky enough to reach our inhospitable shores!—*John Wolley*; 11, *Park Place Terrace*, *February 5, 1853.*

Note on the abundance of Woodcocks in particular Localities.—In reference to Mr. Newton's communication about the partiality of the unusual numbers of woodcocks observed this season (*Zool.* 3754), I may observe that in this neighbourhood they were never known to be so plentiful, and a friend who has just been in Wales, informs me they have appeared there in extraordinary numbers.—*C. R. Bree*; *Stowmarket*, *February, 1853.*

Occurrence of the Green Sandpiper (Totanus ochropus) near Lynn.—An individual of this species was shot here a day or two since. Although this bird is pretty frequent in some parts of Norfolk, its appearance in this neighbourhood is rare.—*E. L. King*; *Lynn*, *January 12, 1853.*

Occurrence of the Ivory Gull, &c. at Torquay.—The gull was shot on the 18th; it was first seen in and about our pier, evidently very much distressed, as it kept settling on the pier walls and on the vessels; it was stoned from this by the boys and followed to Livermead, about half a mile from here, and shot whilst sitting on one of the cliffs. The markings of the bird correspond exactly with those mentioned by Captain Sabine in Yarrell's second edition. The black redstart has been so frequently mentioned by myself and others that it can hardly be set down as a rare bird; I have six specimens by me at this moment, five of which were shot this winter, and others seen. These birds visit our shores between the months of September and February, and I have not the slightest doubt their migratory flight is to no great distance. Perhaps on our moors their times of coming and going correspond with those of the gray wagtail; the latter bird is to be found singly, or not more than a pair together, all through the winter, around our shores, and leaves us at the end of February, if a mild season, for their summer haunts. I have found them during the summer months in the neighbourhood of Chudleigh, &c., a distance of twelve or thirteen miles from here. A flight of bramblings made their appearance here during this week, a rare occurrence in this locality. I had eight specimens brought me for preserving. I knew of one pair only being shot a few winters back when snow was on the ground, similar to this season.—*E. Burt*; *Torquay*, *February 14, 1853.*

Note on the conveyance of Fish-spawn to New Zealand.—You are aware that I have been successful the last four or five years in the artificial breeding of trout in the river Wandle. About two years ago, a gentleman applied to me for some spawn to take with him to New Zealand, for the purpose of stocking the rivers there. I am glad to say that the experiment has succeeded, and that he has applied to Government for the reward offered for the introduction of fish into that country. I believe the spawn was taken out in tanks with *Valisneria*, according to Mr. Warington's system.—*S. Gurney, jun. ; Carshalton, February 10, 1853.*

Occurrence of Toads in Stone.—One may well feel surprise to find another of these marvellous relations in the pages of the 'Zoologist' (3632), especially as it is one that supplies not a fraction of additional proof of the fact, or of the possibility of such occurrences against the well known laws of Nature. I generally find these second-hand relations all of a kind, and taking place under a pretty similar routine of circumstances. There is the same "simple tale" from the guileless miners, who show the broken stone with the hole in the centre, and talk about the toad or frog, with its lively sense of self-preservation as soon as it is liberated, so lively, in fact, that he always escapes, or is unfortunately smashed; then, they never think of preserving it; and so runs their "simple tale." Now, I am a total unbeliever in these "simple tales," for in my geological rambles I have never lost an opportunity of searching for cases amongst the very men who pretend to have witnessed them, and the result of my several examinations has been, in many cases, I am sorry to say, to find an amount of downright imposition among the miners, or a mere repetition of hearsay accounts of how Mikey, who has always left for some distant quarry, once was breaking a stone, and found a toad; and then follow the usual particulars. I can relate one of my experiences, which the readers of the 'Zoologist' may perhaps consider sufficient to establish my disbelief in the tales of "toads in blocks of stone," quite independently of any scientific consideration on the subject. A few years ago I was geologizing in the neighbourhood of Chesterfield, and came upon a quarryman, who related to me, while we drank a bottle of porter, that toads were plentiful in the stone thereabout. He said he had often found them, and that he knew a stone before it was broken that would contain a toad; giving me long and circumstantial accounts of the whole phenomenon: and to convince me of the truth of his statement, he took me to the quarry (a carboniferous sandstone) that I might see the stones out of which he said the toads had been released. I examined the stones and the whole quarry very attentively, and listened to the emphatic testimony of other miners present. After complying in an agreeable manner to their remark that the day was warm, and the water of the quarry not much in favour, I made a simple proposal of this nature:—I promised to pay to any one of them the sum of twenty shillings for the next stone in which they found a frog or toad when the stone was broken in two. They should catch the frog if he bolted out of the hole, replace him, and fit the stones together again, afterwards despatching it to me in that condition. I further promised to pay the sum of forty shillings to any one of them who should procure me a stone, unbroken, in which he considered a toad or frog was imprisoned, if, on breaking it myself, such turned out to be the case. These conditions were to remain in force for twelve months; and as the means of conveyance to my

address, which I gave them, would occasion little or no trouble, the offer was readily accepted by the miners; who also, to express their confidence in soon being able to supply the order, proposed that it would be all safe if I advanced a little cash on account, which however I resolutely declined doing. And now, what will the credulous believers in these "toads in stone" who read the 'Zoologist' say, when they learn that I visited that quarry twice during the twelve months, in order to fetch the toads which never came by rail? I always found the men there blasting tons of new rock, splitting stones for every building purpose, yet dry-throated and sullen; for, alas! most unaccountably during that long twelve months they found plenty of holes—not toad-holes—in the sandstone, but the reptiles had been banished as effectually as ever they were from the Emerald Isle.—*John Plant; Salford Museum, October 21, 1852.*

Skin of a Large Snake.—I beg to forward the dimensions of a snake's skin which I found this afternoon on the heath, in the position in which it was cast; it measured 4 feet 2 inches in length, and from the depth of the skin, the snake must have been nearly 6 inches in circumference at the thickest part of the body, being by far the largest I ever saw or heard of.—*Octavius Pickard-Cambridge; Bloxworth House, near Blandford, Dorset, November 8, 1852.*

Note on the "Singular Abstinence of a Spider."—I have been much interested by Mr. Pickard-Cambridge's account of the spider which lived for eighteen months in his bird-case, as it is assumed, without food. (Zool. 3766). It is, however, perfectly certain from Mr. C.'s account, that the spider by some means got food, although how it did so escaped his observation. Although some animals can exist for a very considerable time without food, it is equally certain that none can increase in size without it. The growth of all living things is essentially due to a proper supply of aliment, and no increase of matter can take place in any living thing unless the material is supplied from without. *Ex nihilo nihil fit* is as true as the existence of matter itself. An opposite view can only be supported upon the assumption of a special miracle, or supernatural interference, by which matter is created; but this assumption in a case like the present is unphilosophical and cannot be supported. It is much easier to believe that other insects besides the spider were enclosed with the skin, upon which it fed as long as they continued to exist, than to believe that a special creation of matter took place in this individual case. The probability, however, was, that the skin was soft when cased, and continued, when excluded from the air, to retain sufficient nutriment to support the spider for most of the time mentioned. So long as this source of food existed, the spider lived and thrived, when it was withdrawn, it shrivelled away and died.—*C. R. Bree; Stowmarket, February, 1853.*

Inquiry respecting certain appendages to the Haustellum of Diurnal Lepidoptera.—Under this head (Zool. 3775), Mr. A. R. Hogan records that he has more than once observed "certain little yellow excrescences on the haustella of Diurnal Lepidoptera," and asks for an explanation. In the second volume of the 'Transactions of the Entomological Society,' I find recorded that at the meeting, August 7, 1847, Mr. Bainbridge

exhibited "a specimen of *Polia nebulosa*, from the left eye of which a fungus-like excrescence had been produced, of a slender filiform appearance at the base, but bifid and clavate at the tip; it was about the length of the head. The moth had been taken alive with this excrescence attached to it, by Mr. Shipman." At the following meeting Mr. Ingpen stated, that "this supposed fungus had been examined by Mr. Sowerby, who ascertained it to be the anther of a species of *Ophrys*, which had become accidentally attached to the eye." In the course of my collecting I have several times seen similar attachments to the heads of *Lepidoptera*, and have considered them to be, as in the above instance, parts of flowers to which the insects had been attracted, and which had accidentally adhered to them. The examples mentioned by Mr. Hogan I should think referrible to the same cause.—*J. W. Douglas; Lee, Kent, February 7, 1853.*

Duplicates of Lepidoptera.—I have duplicate specimens of *Depressaria pallorella*, *D. rotundella*, *D. Alstræmeriana*, and *D. Ulicitella*, which I shall be happy to give to any entomologist who may be in want of those species.—*Thomas Boyd; 17, Clapton Square, December 13, 1852.*

Myrmica domestica.—Mr. Daniell's paper on the *Myrmica domestica* of Shuckard, printed in your last number (*Zool.* 3769), from the Linnean 'Proceedings,' I heard read at that Society; but it did not then occur to me to ask if anybody had ever seen the male and female of this ant with their wings; for of course, like the rest of their congeners, they appear at pairing time with these aerial appendages. The lower part of this house is much infested by these little plagues, indeed to such an extent as to make it almost impossible to keep preserves *et id genus omne* below. Their head quarters are the neighbourhood of the kitchen fire and the oven, where a stream of them may be observed at almost any time from January to December. I have watched them closely, but have never been able to detect them in the winged state. When the ants of the woods and gardens escape from their guards at pairing time, their departure is accompanied with such a hubbub and confusion as to arrest the attention of the most incurious; and from analogous reasoning, when the males and females of the ant in question leave their nests, you would expect the house to be swarming with them. Their nests are evidently in the foundation of the houses, which makes it almost impossible to extirpate them. I have tried various methods, but all without effect. Soft soap pressed into the crevices to which they may be traced appears to be of some service, but it probably only drives them to some other locality. It has been thought that the Regent's Park and its neighbourhood are the only places where this ant is found, and that they were imported into this country with the timber contained in the houses; but years since (in 1846), I saw them in thousands in one of the principal hotels at Winchester, the cups and saucers, and even the teapot came up swarming with them. Twenty years ago a house in Upper Bedford Place, then occupied by the late Dr. Bostock, was scarcely habitable in consequence of the myriads of these diminutive plagues. The Doctor took infinite pains to remedy the evil, and literally had cart-loads of earth removed from below the kitchen and cellars but without much abating the nuisance; and the ants, like Virgil's harpies—

"Diripiuntque dapes, contactuque omnia fœdant
Immundo."

You, or some of your correspondents may have seen these ants in their winged

state; and others, as well as myself, would doubtless be pleased for any further history of them. When were they first observed in this country?—*R. Wakefield*; 11, *Sussex Place, Regent's Park, February 5, 1852.*

Occurrence of the Larva of Diglossa mersa at Baldoyle, Ireland.—The discovery of the larva of so singular and local an insect as *Diglossa mersa*, will probably be interesting to some of the readers of the 'Zoologist,' and I therefore wish to make known the following facts. On the 10th of August last, having proceeded to Baldoyle in search of the perfect insect, which had been very abundant there a few weeks before, I was surprised to find that it had almost entirely disappeared; but in its place, under the stones half imbedded in the sand, were numerous larvæ moving about in exactly the same peculiar way as the beetles themselves do when disturbed. With the exception of a dorsal stripe of a dark colour, their bodies and legs were perfectly white, and in size, they were at that time about the same as the imago. Mr. Haliday, though he has never taken them himself, agrees with me in thinking that these insects must be the true larvæ of *Diglossa mersa*.—*Arthur R. Hogan*; *Charlton, Dundrum, near Dublin, February 12, 1853.*

Catalogue of the Echinodermata of Orkney. By WILLIAM BALFOUR
BAIKIE, Esq., M.D.

My friend Mr. R. Heddle and myself, being prevented by numerous pressing avocations, from continuing at present, in a separate form, an account of the Natural History of Orkney, are nevertheless anxious to have one or two of our lists of species published, in order to show what has been done hitherto in that locality, and also to preserve our claim to priority of publication. I therefore beg to forward our "Catalogue of Echinoderms," for insertion in the pages of the 'Zoologist.'

Order I.—PINNIGRADA.

Family 1.—*Pentacrinitidæ.*

Rosy Feather-star, *Antedon decameros*, (*Comatula rosea*). Tolerably frequent.

Order II.—SPINIGRADA.

Family 1.—*Euryalidæ.*

Zetland Argus, *Astrophyton arborescens*. Two or three specimens in Orkney, less rare in Zetland.

Family 2.—*Ophiuridæ.*

Common Sand-star, *Ophiolepis ciliata*, (*Ophiura texturata*). Very abundant.

Lesser Sand-star, *O. albida*, (*Ophiura albida*). Less abundant.

Gray Brittle Star, *O. elegans*, (*Ophiocoma neglecta*). Tolerably common.

Daisy Brittle Star, *Ophiopholis aculeata*, (*Ophiocoma Bellis*). Abundant.

Goodsir's Brittle Star, *O. Goodsiri*, (*Ophiocoma Goodsiri*). One obtained in Zetland by Forbes and Goodsir, from deep water.

Granulated Brittle Star, *Ophiocoma nigra*, (*O. granulata*). Common.

Common Brittle Star, *Ophiothrix fragilis*, (*Ophiocoma rosula*). Very common.

Order III.—CIRRHIGRADA.

Family 1.—*Asteriidæ*.

Common Cross-fish, *Asterias rubens*, (*Uraster rubens*). Very frequent.

Violet Cross-fish, *A. violaceus*, (*U. violaceus*). Not frequent.

Spiny Cross-fish, *A. glacialis*, (*U. glacialis*). Rare; one dredged by Mr. R. Heddle.

Family 2.—*Astropectenidæ*.

Butthorn, *Astropecten irregularis*, (*Asterias aurantiaca*). Occasional.

Lingthorn, *Luidia Savignii*, (*L. fragilissima*). Not frequent.

Purple Sun-star, *Solaster endeca*. Not uncommon.

Common Sun-star, *S. papposa*. Common.

Eyed Cribella, *Henricia oculata*, (*Cribella oculata*). Very abundant.

Family 3.—*Asterinidæ*.

Bird's-foot Sea-star, *Palmipes membranaceus*. One specimen, dredged in Orkney, by Mr. J. Syme.

Templeton's Cushion-star, *Porania pulvillus*, (*Goniaster Templetoni*). Obtained in Orkney by the Rev. J. H. Pollexfen; rare.

Order IV.—CIRRHO-SPINIGRADA.

Family 1.—*Cidaridæ*.

Piper, *Cidaris papillata*. Only obtained hitherto in Zetland.

Family 2.—*Echinidæ*.

Fleming's Egg Urchin, *Echinus Flemingii*. First discovered in Zetland. One dredged in Orkney in 16 fathoms, by Mr. R. Heddle.

Common Egg Urchin, *E. esculentus*, (*E. sphæra*). Abundant.

Purple-tipped Egg Urchin, *E. miliaris*. Rare.

Silky-spined Egg Urchin, *Echinometra Dröbachiensis*, (*Echinus neglectus*). Found in Zetland by Forbes and Goodsir. One in Orkney, found by Mr. R. Heddle.

Family 3.—*Scutellidæ*.

Cake Urchin, *Echinorachinus placenta*. One obtained near Foulah, in Zetland, by Prof. Jameson.

Green Pea Urchin, *Echinocyamus pusillus*. Tolerably common.

Family 4.—*Spatangidæ*.

Purple Heart Urchin, *Spatangus purpureus*. Of doubtful occurrence.

Common Heart Urchin, *Echinocardium cordatum*, (*Amphidotus cordatus*). Common. One, of very large size, found by Mr. R. Heddle, in Ronsey.

Rosy Heart Urchin, *E. ovatum*, (*A. roseus*). Hitherto found only in Zetland.

Fiddle Heart Urchin, *Brissiopsis lyrifera*, (*Brissus lyrifer*). Obtained in Zetland by Prof. Melville.

Order V.—CIRRHO-VERMIGRADA.

Family 1.—*Cuveriidæ*.

Snail Sea-cucumber, *Psolus phantapus*. Pretty common.

Short Psolinus, *Psolinus brevis*. Discovered in Zetland by Forbes and Goodsir.

Family 2.—*Pentactidæ*.

Great Sea-cucumber, *Pentacta frondosa*, (*Cucumaria frondosa*). Common in Zetland.

Long Sea-cucumber, *P. fusiformis*, (*C. fusiformis*). Occurs in Zetland.

Milk-white Sea-Girkin, *P. lactea*, (*Ocnus lacteus*). Occurs in Zetland.

Angular Sea-cucumber, *P. pentactes*, (*Cucumaria pentactes*). Rare in Orkney.

Glassy Sea-cucumber, *Thyronidium pellucidum*, (C. hyalina). Discovered in Zetland by Prof. Fleming.

T. Drummondii, (C. communis). Pretty common.

Order VI.—VERMIGRADA.

Family 1.—*Sipunculidæ*.

Sipunculus Strombi, (S. Bernhardus). Occurs in 10—20 fathoms, in shells of *Turritella terebra* &c.

Family 2.—*Priapulidæ*.

Tailed Priapulid, *Priapulid caudatus*. Discovered in Zetland by Prof. Fleming.

The above list of forty species comprises all as yet recorded as being obtained in our locality, though doubtless active searching, and more frequent dredging, would reveal many novelties, and enable us to compile a more copious catalogue. This we trust to see accomplished ere long. The technical terms here employed are in accordance with Dr. Gray's 'British Museum Catalogue,' the synonymes of Forbes's 'British Star-fishes' being added for the sake of convenience.

WM. BALFOUR BAIKIE.

Haslar Hospital, Gosport,
January 18, 1853.

Notice of the Decease of the Rev. James Smith of Monquhitter.—Many of the readers of the 'Zoologist' will, doubtless, regret to hear of the death of the Rev. James Smith, A.M., Minister of the parish of Monquhitter, Aberdeenshire. He died at Banff, N.B., on the 29th of January, in the fifty-third year of his age. The respected and greatly lamented deceased was born in the parish of Drumblade, and was educated at King's College, Aberdeen. He was Rector of the Banff Academy for nearly twenty years, and was universally beloved and esteemed on account of his genius and learning, his amiable dispositions, and active benevolence. A profound scholar and theologian, he was at the same time an enthusiastic admirer of the beauties of nature, and a zealous and successful student of many departments of natural history. Ornithology was his favourite study, and he has contributed many valuable papers on this subject. But such was his modesty and diffidence, that he has left manuscripts of great value and interest on literary and scientific subjects still unpublished. His loss is irreparable, but it may be consolatory to his sorrowing friends to know that they have the warmest sympathy of the Church of which he was a distinguished ornament, as well as of some of the most eminent men of the present day, who admired and respected his great and varied talents and acquirements. Doubtless had

his life been prolonged, he would have added much to our knowledge of the natural history of the North of Scotland. The author of this short memoir enjoyed the advantage of being a pupil of the deceased for many years, and is deeply sensible of the benefits he received from him, and truly grateful for the kind interest he always took in his welfare, and in that of every one who had been under his charge. "The memory of the just is precious; The just shall be had in everlasting remembrance."—*John Rose, A.M., M.D., &c.; Royal Hospital at Haslar, Gosport, February, 1853.*

Occurrence of the Stone Plover near Penzance. — I have mentioned on a former occasion that the occurrences of the Norfolk or stone plover in this district have almost always been confined to the winter season. In reference to this, I have now to report that I saw a specimen yesterday which was killed in the parish of St. Levan, near the Land's End.—*Edward Hearle Rodd; Penzance, February 18, 1853.*

Occurrence of the Apteryx at large in Wales. — A few days ago a friend from the Isle of Anglesey was visiting me, and mentioned in the course of conversation that some three or four years ago he shot in a marsh near our respective residences in Anglesey, a singular bird of the species of which he was ignorant. On my expressing a wish to see it, he kindly promised to send it to me; and on its arrival, I was quite startled with its resemblance to the New Zealand Apteryx, which I had seen in the Gardens of the Zoological Society. The body of the bird measured 18 inches, the beak about 5. I saw an absence alike of wings and tail: the feathers of hard rough texture, the colour being an uniform dark brown: the head round the base of the beak and the eyes thinly covered with long bristly hairs. Nothing I had ever seen bore a resemblance to the creature before me, except the Apteryx; and I hastened to consult an eminent ornithologist, to whom I sent a description of the bird, along with a feather. He assures me that it belongs to the genus Apteryx, but to which of the three known species he cannot determine, without an examination of the bird. How this creature could arrive at Anglesey seems a mystery, unless it had escaped from some wrecked vessel. Perhaps some of your correspondents can suggest some solution of this difficulty: all I can do is to assure them of the fact of this bird having been found alive and shot in Anglesey, as I have related. — *Josiah Spode; Armitage, Rugeley, Staffordshire, January 28, 1853.*

NOTICES OF NEW BOOKS.

'*The Annals and Magazine of Natural History,*' Nos. 61 and 62,
dated January and February, 1853.

No arrangement could be more apt, more agreeable to all concerned, whether proprietors or subscribers, than the simultaneous publication on the 1st of every month of such journals as the 'Annals of Natural History,' the 'Zoologist' and the 'Phytologist:' the 'Annals,' for the reception of those technical and abstruse disquisitions

which constitute, as it were, the pabulum on which the inquiring philosopher of after years is to feed; the others, for the registration of facts of *immediate as well as lasting* interest, on which the science of Natural History itself may be said to subsist. To take the 'Annals' confers that scientific *status* of which every aspirant for scientific reputation stands in need; to read the others is equally necessary to render him *au courant* with the scientific intelligence of the day. Now that a new year has commenced, we purpose enriching our pages with a list of the contents of the previous month's 'Annals;' the enormously increased circulation of the 'Zoologist' on the continent, will render it the means of thus advertizing its friendly and highly valued contemporary.

The January number contains the following papers:—

'Descriptions of some newly discovered species of Araneidæ.' By John Blackwall, F.L.S.

The new species are:—*Thomisus versutus*, *Linyphia Meadii*, *L. anthracina*, *L. pulla*, *L. alacris*, *L. ericæa*, *Neriène agrestis*, *N. vigilax*, *Walckenaëra exilis*. Mr. Blackwall devotes about a page to the description of each of these minims, a fact which in itself is a sufficient proof of his elaborate painstaking. We have often had occasion to regret the comparative isolation which has attended the labours of this zealous naturalist; and it is with feelings of no ordinary pleasure that we find he is now assisted by so competent a coadjutor as our valued correspondent, Mr. Meade.

'Description of a new genus of Calanidæ.' By John Lubbock, Esq.

The genus is named *Labidocera*, from the somewhat forcipated antennæ: the species, *L. Darwinii*, was received from Mr. Darwin; it was taken in the Atlantic, off the coast of Patagonia, in latitude 38°.

'Characters of several Helices from West Australia and the Mauritius; with Notes on some species of Cyclostoma from Borneo.' By W. H. Benson, Esq.

The new species of *Helix* are *H. plectilis*, *Tescorum*, *cygnea*, *subtesta*, *suffulta*, and *albidens*.

'A Revision of the Genera of some of the Families of Conchifera, or Bivalve Shells.' By J. E. Gray, Ph.D., F.R.S., V.P.Z.S., &c.

'On the Janthinæ, Scalarinæ, Naticæ, Lamellariæ, and Velutinæ.' By William Clark, Esq.

Bibliographical Notice. Proceedings of Societies.

Note translated from M. Desvoidy, on the 'Ravages of Coccus.'—(See Zool. 3800).

The February number contains the following papers : —

‘Descriptions of species belonging to the genera *Pterocyclos* and *Cyclostoma* from Ceylon and West Australia.’ By W. H. Benson, Esq.

‘On the Animal of *Chamostrea albida*.’ By Albany Hancock, Esq.

‘Supplement to a Catalogue of British Spiders, including Remarks on their Structure, Functions, Economy and Systematic Arrangement.’ By John Blackwall, F.L.S.

‘Observations on the Anatomy of *Actinia*.’ By T. Spencer Cobbold, M.D., Vice-President of the Physiological Society, Edinburgh.

‘On the Division of Ctenobranchous Gasteropodous Mollusca into larger Groups and Families.’ By J. E. Gray, Ph.D., F.R.S., V.P.Z.S., &c.

Bibliographical Notice. Proceedings of Learned Societies.

Note by M. Duméril on the ‘Classification of Serpents,’ translated from the ‘*Comptes Rendus*.’

Note by M. Ulex on the ‘Influence of Coal-gas on Vegetation,’ translated from the ‘*Journal of Practical Chemistry*.’

Note on the ‘Habits of the Wigeon,’ by Matthew Moggridge, Esq. Mr. M. says that last summer he saw a pair of old wigeons with five young ones swimming on the lower lake at Penllegare.

Note by M. Garreau on the ‘Relation between the Oxygen consumed by the Spadix of *Arum Italicum* and the heat produced by it,’ translated from the ‘*Annales des Sciences Naturelles*.’

‘*Molluscorum Britannicæ Synopsis. A Synopsis of the Mollusca of Great Britain, arranged according to their Natural Affinities and Anatomical Structure.*’ By WILLIAM ELFORD LEACH, M.D., &c. London: Van Voorst. 1852.

DR. LEACH was an intellectual giant in Zoology. There is scarcely a branch of the science which he did not study, and certainly there is none which he studied that his genius did not illuminate. The posthumous publication of the volume before us is a just tribute to his memory; although there seems reason to regret its not having been previously brought to light: however, we are too glad to welcome anything from the pen of Dr. Leach, to quarrel with the time of its appearance, and what would once have been a valuable contribution to science, is still an acceptable memorial of its author’s genius.

'*Shells and their Inhabitants. The Genera of Recent Mollusca arranged according to their Organization.*' By HENRY AND ARTHUR ADAMS. Part I. London: Van Voorst. 1853.

ANOTHER work on the same subject as the last, but having a wider range. We like the manner in which the work is commenced, it gives promise of great excellence: the general observations exhibit a certain amount of original observation, a feature which we think of no mean importance in works on Natural History.

'*Transactions of the Entomological Society of London.*' Vol. II. New Series. Part 3.

WE fancy we can perceive symptoms of an improvement in these 'Transactions,' which have too long been almost exclusively devoted to mere technical descriptions. We have repeatedly endeavoured to draw the attention of the entomologists of this country to the fact that observations on the habits of insects are far more to be desired than the most accurate descriptions or the most elaborate criticisms on synonymy; these latter being mainly useful in so far only as they enable us to identify the species of which the habits have been observed and recorded.

The part of the 'Transactions' now before us contains two papers having special reference to the habits of insects. A paper on the Paussidæ, by Mr. Westwood, contains an extremely interesting communication from Mr. Bowring, of Hong Kong. Mr. F. Smith has a paper "On the Development of *Osmia parietina*, and other British Insects," from which may be obtained several useful hints: the author appears to have discovered the cause of those little cartridge-like rolls on the leaves of young oak trees, which have frequently attracted our attention in an autumnal ramble. Mr. Douglas has also an interesting paper of "Contributions to the Natural History of British Micro-Lepidoptera." When the variety of habits of these insects is considered, and the excellent notices of the natural history of a few of them that appear in the ever delightful *Memoirs of Reaumur and De Geer*, we are surprised that so few students have turned their attention to the wide field of investigation before them.

Mr. Douglas very wisely reminds our collectors that rare species may be more easily obtained by finding the larvæ than by beating for

the perfect insect. He is aware that the love of the study of the habits of the Micro-Lepidoptera might induce but few persons to come to his assistance in the somewhat Herculean task he has undertaken, were they not stimulated to extra exertion by the desire of obtaining a rarity.

Mr. Smith has long been known as a successful observer of the habits of bees, and his valuable papers on those interesting insect architects have a freshness about them peculiar to out-of-door naturalists. No amount of midnight in-door work will impart the peculiar charm which all records of original observations possess. Witness among others the papers by Mr. Douglas, intituled "Entomological Localities," which have from time to time appeared in our pages, and which have shown his accuracy as an observer, as well as evinced his partiality for the wood, the heath, and the down. Judging from the specimens of his papers on the Micro-Lepidoptera now before us, the habits of the larvæ of these insects appear capable of affording plenty of interesting occupation for the entomologist; we however regret that Mr. Douglas has said nothing of the habits of the perfect insects, as we imagine they must be as interesting as those of the larvæ.

We must not omit to notice the two plates by Mr. Wing (the new Secretary of the Society) which illustrate Mr. Douglas's papers, since they deserve especial mention for the care with which they have been executed; indeed, they reflect the highest credit on the skill of the artist, the magnified figures of the larvæ really looking as though they were alive and crawling about. We presume the apalpous appearance of fig. 1 c, in Plate XI., is correct; it strikes us however as extremely curious.

We heartily commend the zeal with which Mr. Douglas has entered on the wide field of observation that lies before him. The larvæ of many genera of Micro-Lepidoptera would appear to be altogether unknown; for example, *Micropteryx*, *Nematopogon*, *Nemotois*, *Æchmia*, *Zelleria*, *Opostega*, and others; we trust however that they will not long remain shrouded in their present obscurity.

Nor do we see why other orders of insects should not be treated in a similar manner; and trust ere long to have occasion to call the attention of our readers to the further results of researches similar to those of Mr. Douglas, records of which we may hope to see in future parts of the Society's 'Transactions.'

Proceedings of the Entomological Society.

February 7, 1853.—EDWARD NEWMAN, Esq., President, in the chair.

The President returned thanks for his election, and nominated as Vice-Presidents, W. W. Saunders, Esq., W. Spence, Esq., and J. O. Westwood, Esq.

The following donations were announced, and thanks ordered to be given to the donors:—The 'Zoologist' for February; by the Editor. The 'Literary Gazette' for January; by the Editor. 'Journal of the Society of Arts,' Nos. 1—10; by the Society. 'Entomologische Zeitung' for December, 1852; 'Linnea Entomologica,' 7 Band: Berlin, 1852; 'Catalogus Coleopterorum Europæ, herausgegeben vom Entomologischen Verein in Stettin:' Vierte Auflage, Berlin, 1852; all by the Entomological Society of Stettin. 'Bericht über die wissenschaftlichen Leistungen im Gebiete der Entomologie während des Jahres, 1850,' von Dr. Herm. Schaum, Berlin, 1852; by the Author. 'Description of a New Genus of Calanidæ,' by John Lubbock, Esq.; by the Author. 'Memorias de la Academia Real de Ciencias de Madrid,' Tomo 1, parti 2: Madrid, 1851; 'Resumen de las Actas,' 1850—51: Madrid, 1851; by the Academy. 'Journal of the Royal Agricultural Society of England,' Vol. XIII, part 2; by the Society. 'Reports of the Juries of the Exhibition of 1851;' by the Commissioners of the Exhibition. A specimen of *Glossina morsitans*; by Mr. Spence. A specimen of the insect-wax of China; by Mr. D. Hanbury. Specimens of *Asemum striatum* (3), *Pissodes Pini* (4), *Tinea ochraceella*, *Tengstrom* (3), *Elachista locupletella* (2); by Mr. John Scott, Renfrew.

The following gentlemen were balloted for and elected: John Garland, Esq., Dorchester, a Member, and F. T. Hudson, Esq., Greenwich, a Subscriber to the Society.

Mr. D. Hanbury brought for exhibition, specimens of the white insect-wax of China in its crude state, obtained by the persevering endeavours of his friend, William Lockhart, Esq., of Shanghai. The correct Chinese name for this production is *Chung-pih-la*—literally, insect-white-wax. He read the following particulars respecting it, and the insect by which it is produced, from a paper by Dr. Macgowan in the 'Journal of the Horticultural and Agricultural Society of India,' 1850.

"The animal feeds on an evergreen shrub or tree, *Ligustrum lucidum*, which is found throughout Central China, from the Pacific to Thibet, but the insect chiefly abounds in the province of Sychuen. Much attention is paid to the cultivation of this tree: extensive districts of country are covered with it, and it forms an important branch of agricultural industry. The ground is ploughed semi-annually, and kept perfectly free from weeds. In the third or fourth year they are stocked with the insect, which is effected in spring, with the nests of the insect. These are about the size of a 'fowl's head;' and are removed by cutting off a portion of the branch to which they are attached, leaving an inch each side of the nest. The sticks with the adhering nests are soaked in unhusked-rice-water for a quarter of an hour, when they may be separated. When the weather is damp or cool, they may be preserved in jars for a week, but if warm, they are to be tied to the branches of the trees to be stocked without delay, being first folded between leaves. By some the nests are probed out of their seat in the bark of the tree, without removing the branches.

At this period they are particularly exposed to the attacks of birds, and require watching.

"In a few days after being tied to the tree, the nests swell, and innumerable white insects, the size of 'nits,' emerge, and spread themselves on the branches of the tree, but soon, with one accord, descend towards the ground, where, if they find any grass, they take up their quarters. To prevent this, the ground beneath is kept quite bare, care being taken also that their implacable enemies, the ants, have no access to the tree. Finding no congenial resting place below, they reascend and fix themselves to the lower surface of the leaves, where they remain several days, when they repair to the branches, perforating the bark to feed on the fluid within.

"From 'nits' they attain the size of *Pediculus homi*. Having compared it to this, the most familiar to them of all insects, the Chinese authors, from whose writings most of these particulars have been derived, deem all further description superfluous. Early in June, the insects give to the trees the appearance of being covered with hoar frost, being 'changed into wax:' soon after this they are scraped off, being previously sprinkled with water. If the gathering be deferred till August, they adhere too firmly to be easily removed. Those which are suffered to remain to stock trees the ensuing season, secrete a purplish envelope about the end of August, which at first is no larger than a grain of rice, but as incubation proceeds, it expands, and becomes as large as a fowl's head, which is in the spring, when the nests are transferred to other trees, as already described.

"On being scraped from the trees the crude material is freed from its impurities, probably the skeleton of the insect, by spreading it on a strainer covering a cylindrical vessel, which is placed in a cauldron of boiling water; the wax is received into the former vessel, and on congealing is ready for the market.

"This white wax, in its chemical properties, is analogous to purified bees'-wax, and also spermaceti, but differing from both; being, in my opinion, an article perfectly *sui generis*. It is perfectly white, translucent, shining, not unctuous to the touch, inodorous, insipid, crumbles into a dry, inadhesive powder between the teeth, with a fibrous texture, resembling fibrous felspar; melts at 100° Fahr. (*sic*); insoluble in water, dissolves in essential oil, and is scarcely affected by boiling alcohol, the acids or alkalies.

"The aid of analytical chemistry is needed for the proper elucidation of this most beautiful material.* It has been supposed to be identical with the white wax of Madras, but as the Indian article has been found useless in the manufacture of candles, it cannot be the same as the Chinese, which is used for this purpose. It far excels also the vegetable wax of the United States (*Myrica cerifera*).

"Is this substance a secretion? There are Chinese who regard it as such; some representing it to be the saliva, and others the excrement of the insect. European writers take nearly the same view; but the best authorities expressly say that this opinion is incorrect, and that the animal is changed into wax. I am inclined to believe that the insect undergoes what may be styled a ceraceous degeneration, its whole body being permeated by the peculiar product, in the same manner as the *Coccus Cacti* is by carmine.

* "In a memoir in the 'Philosophical Transactions' for 1848, Mr. B. C. Brodie states, that although in appearance this substance resembles stearine or spermaceti more than bees'-wax, it comes nearest to purified *Cerim!*"

“It costs at Ningpo, from twenty-two to thirty-five cents per pound. The annual products of this humble creature in China, cannot be far from 400,000 lbs.”

Mr. Hanbury added, that it was harder than bees'-wax and that its fusing point was about 184° Fahr.; it had been imported into this country and employed for making candles and other purposes, but it was too expensive to be generally useful.

Mr. Westwood remarked that the insects were the wingless females of a species of *Coccus*, which, with the exception of their short legs, were wholly permeated with the secretion of wax. He proposes to call the species *C. Sinensis*.

Mr. Westwood exhibited the following species of *Coccidæ*, all more or less resembling the insect under notice, in producing colouring or waxy matter. *Coccus Ilicis*, from South of Europe, *Margarodes Formicarum*, the ground pearl of the West Indies, *Coccus manniparus*, from Mount Sinai, and a species from Manilla.

Mr. Hanbury also exhibited a Chinese print of the tree, the insects, and the masses left on the plants from which the *Cocci* are propagated.

Mr. Douglas read part of a communication made to the 'Gardeners' Chronicle' a short time since, by Mr. Fortune, on the insect in question.

“Sir George Staunton observed an insect of this description on the coast of Cochin China, 'busily employed upon the small branches of a shrub then neither in fruit nor flower, but its general habit bearing somewhat the appearance of a privet;' writers generally call this plant *Ligustrum lucidum*; yet M. S. Julien who has intimate knowledge of the written language of China, says, that the wax insects are stated to be raised on three species of plants, namely, *Ligustrum glabrum*, *Rhus succedanea*, and a species of *Hibiscus*, (*Comptes Rendus*, 1840). But I now possess evidence which goes a long way to prove that another plant, different from any of the above, is the true white-wax tree of Central China. Before leaving China I had the honour of receiving from the French Consul at Shanghai, two small trees, which had been brought down by one of the Catholic missionaries from the province of Sychuen. I cannot see how any mistake could have been made, as the tree is no doubt as common in that province, as the tallow-tree is at Che Kiang. I am happy to say that one of these plants has reached this country in good condition, and is now at the Exotic Nursery of Messrs. Knight and Perry at Chelsea. It appears very like an ash, but apparently different from any known species. It is deciduous, and no doubt will prove perfectly hardy in the gardens of this country.”

Mr. Baly exhibited some bees which had been preserved in spirit, and restored to their pristine beauty by washing with soap and warm water, the pile being dried and raised with blotting paper.

Mr. Waterhouse said he had often treated insects of all orders, except *Lepidoptera*, in this way, even when they were greasy, with the greatest success, and Mr. Edward Sheppard also spoke in its favour.

The following communication from Mr. Spence was read:—

“Through the kindness of Dr. Quain, of Harley Street, Cavendish Square, I am enabled to lay before the Society specimens of the African Dipterous insect, '*Tsétse*,' communicated to him by William Oswell, Esq., who has travelled extensively in Africa; and also the following very interesting memorandum respecting it, by the same

gentleman, who informed him that on one occasion he lost forty-nine out of fifty-seven oxen, of which his teams consisted, from the attacks of this insect, and that the interval from their being first attacked to their death, varied from three to twelve weeks.

“*Tsetse*.—This fly, which is the same as that found to the eastward of the Limpopo, infests the country of Sebitoeni, a chief living between the 18th and 15th degrees of South latitude, and the 24th and 28th of East longitude. It is fortunately confined to particular spots, and is never known to shift. The inhabitants herd their cattle at a safe distance from its haunts; and should they, in changing their cattle-posts, be obliged to pass through tracts of country in which it exists, they choose a moonlight winter's night, as during the nights of the cold weather it does not bite. From what I have seen, I believe that three or four flies will kill a full-grown ox. We examined about twenty of ours which were bitten and died, and the appearances were similar in all. On raising the skin, a glairy appearance of the muscles and flesh (which was much wasted) presented itself. The stomach and intestines healthy; the heart, lungs and liver, sometimes all, and invariably one or the other, diseased; the heart in particular attracted our attention, it was no longer a firm muscle, but collapsed readily on compression of its walls, and had the appearance of flesh that had been steeped in water. The blood was greatly diminished in quantity and altered in quality; not more than twenty pints could be obtained from the largest ox, and that thick and albuminous; the hands, when plunged into it, came out free of stain. The poison would seem to grow in the blood, and through it to affect the vital organs. All domesticated animals, save, I believe, goats, die from the bite of this insect. Calves and sucking animals however are not affected; and man and all wild animals are bitten with impunity. The symptoms of the bite are swelling of the eyelids and a watery discharge from the eyes, and considerable enlargement of the sublingual glands.”

“Mr. Oswell's interesting account gives several new and curious particulars relative to the effect of the bite of this insect on the animals attacked by it, not mentioned in Mr. Cumming's ‘Five Years of a Hunter's Life in the far Interior of South Africa,’ nor in the valuable paper by Mr. Westwood read to the Zoological Society, December 10, 1850,* on this species, where it is described as belonging to the genus *Glossina* of Wiedemann (allied to *Stomoxys*, but differing in having the proboscis straight, without any elbow, and with a round, hairy, bulbous base, possibly, as suggested to Mr. Westwood by Professor Owen, a reservoir of some powerfully poisonous liquid), under the name of *Glossina morsitans*, *Westwood*.”

“The specimens now laid before the Society, agree exactly with Mr. Westwood's description.”

Mr. Oswell, who was present as a visitor, gave a detailed and very interesting account of his experience with this African pest, the facts of which are embodied in the foregoing communication. He mentioned however that the fly makes a droning hum, and is so pertinacious in its attacks that it is impossible to drive it away.

Mr. Spence also called attention to the discovery in the caves of Illyria, of two more species of blind beetles, a printed account of which, by Herr Schmidt, had been sent to him by the author, extracted from the ‘*Laibacher Zeitung*,’ August 4, 1852.

* ‘Proceedings,’ in the ‘Annals of Natural History,’ x. 138—150.

These insects were both found in the darkest parts of the caves, and retreated quickly from the light into clefts of the rock.

“*Leptoderus angustatus*. Red-brown; head and thorax darker, shining, the latter swelled out in front, and hindwardly much contracted; elytra oval, viewed with a lens they are scarred and marked with fine points: palpi, antennæ and feet somewhat lighter brown, beset with strong, yellowish hairs. The female has in the tarsi of the fore-feet only four joints, but five in all the others; whereas the male has five joints in the fore-feet also, of which the first, second, and third, are enlarged from the base outwards, especially the first, which exceeds the next two both in length and width.

“*Leptoderus sericeus*. Brown; head and thorax slightly darker, face with fine yellow hairs; thorax nearly even with the head, cylindrical, long, broad, and widened a little in front: palpi and antennæ much lighter, the latter, particularly in the male, very long-jointed, and from the sixth joint with yellow hairs; the tarsi in the male are five-jointed as in the preceding species, but the joints are of equal thickness. The body is 2 lines long, and scarcely 1 line broad, and is of the form of *L. angustatus*. The elytra are marked with fine, round depressions, and covered with shining yellow hairs. Both sexes are much alike in colour, but in the female the joints of the antennæ are rather shorter, and the joints of the fore-tarsi are only four.”

Mr. Spence remarked, that though these beetles lived in the darkest caves, and were described to be eyeless (*augenlos*) yet their running away from light seemed to show they were not destitute of an optic nerve.

Read, the following extracts of a letter addressed to the Secretary by the Rev. Joseph Greene of Halton Rectory, near Wendover, dated December 8, 1852.

“In reference to the question of ‘whether the earth in caterpillar-boxes should be moist or dry?’ there are two points in favour of the latter, which I omitted to mention last night. Should the earth be in any degree of a clayey consistency, the moistening tends to make it so close, as to render it nearly impossible for the weaker larvæ to penetrate it, as I have found to be the case more than once. Again, if the earth be moistened, it often happens, that after drying, it becomes so hard as to prevent the pupa from bursting, and permitting the escape of the insect. I have repeatedly found this to be the case in digging for pupæ. And once I found even so large and strong an insect as *Smerinthus Tiliæ*, which from this cause had been unable to escape. It was perfectly formed; but was so firmly imbedded that it could not emerge, and miserably perished! This I imagine to be one of the causes of the periodic uncertainty in the appearance of many insects. I feel no doubt, that, when hard frosts succeed protracted rains, a multitude of subterranean pupæ are thus destroyed.

“You observed that Ireland had been much neglected by entomologists. I am quite of your opinion. I am sure there are many valuable insects to be found there. In proof of which, I may mention that Mr. Ball himself took five specimens of *Deilephila Euphorbiæ*, somewhere on the southern coast. I do not at this moment remember the exact locality, but could easily find out. I saw two of the specimens; the others perished though neglect. I have in my own collection, two *Euphorbiæ* and one *Galii*, taken in Ireland; and, as I mentioned to you, I am certain I saw *Catocala Fraxini*.”

Mr. Waterhouse observed, that the Rev. F. W. Hope used to rear great numbers of Lepidoptera, and he always kept the earth in his cages covered with damp moss.

Read also, the following note by the Rev. J. Greene, on a curious circumstance observed in hibernating specimens of *Vanessa Io*.

“About ten days since (December 8), being engaged in digging for pupæ, in a wood about a mile from my residence, I came to a moderate-sized beech-tree, whose roots formed an arch, about half a foot in height. As I was on the point of inserting my trowel into the cavity, I heard a faint hissing noise: thinking it might be an adder, I started back. Upon a closer inspection, however, I discovered, to my great surprise, three hibernating *Vanessa Io* (the peacock). Two were attached to the concave part of the arch, the third was on the ground, and the noise I heard proceeded from it. It is difficult to describe the noise exactly, but the nearest approximation to it, is the sound produced by blowing slowly, and with moderate force, through the closed teeth. It was decidedly not a rustling sound, such as would proceed from an imprisoned insect. While making the noise, the wings were slowly depressed and elevated. To remove any doubt as to whether the sound was produced by the insect, I pushed off one that was adhering to the tree, which immediately commenced the same movement of the wings, accompanied by a similar noise. That the noise was produced in part by the movement of the wings is very likely; but that it was wholly so, is, I think, improbable, from the fact of the extreme slowness (I might say, deliberation) with which the wings were opened and shut. Strange as it may appear, it certainly struck me that the noise was intended to intimidate! Whenever I pointed the trowel at it, it forthwith turned towards it, and commenced the noise with renewed vigour. I saw no more, neither do I remember to have ever met with hibernating *Diurnes* before.

“As I think I can find the tree again, I shall re-examine it, though I am not aware that I can add anything to the above.

“I may add, that a more unlikely place for hibernation could scarcely be found. The tree was on a high bank, facing the north, and the opening was quite exposed to rain, snow, &c.”

The following memoirs were also read:—

“Descriptions of some new species of Longicorn beetles, brought from the North of China, by R. Fortune, Esq.” By W. W. Saunders, Esq.

“Descriptions of new Genera and Species of Curculionidæ,” by G. R. Waterhouse, Esq. The following is an abstract:—

OXYRHYNCHUS.—Family *Oxyrhynchida*.

Oxyrhynchus Fortuni. A species much larger and proportionately shorter than *O. discors*, with the puncturing both on the thorax and elytra less distinct; general colour pale ashy brown; thorax with three longitudinal white lines; elytra with a white line running from the shoulder to the middle of the suture. Hab. N. China.

Oxyrhynchus Philippinensis. Like *O. discors* in its markings, but of larger size, the elytra relatively shorter, with a tooth in the middle at the base, the margin much raised between this tooth and the scutellum, and the raised part concave beneath and opening in front. Hab. Philippine Islands.

TETRALOPHUS, a new genus of the *Etimida*, which appears to approach most nearly to the genus *Mythites* of Schönherr, but, judging from the description, must have the antennæ shorter, and differs, moreover, in having two longitudinal crests on the rostrum, the sides of the thorax much produced and angular, and the upper surface with two high crests; the legs very slender.

T. sculpturatus is $5\frac{3}{4}$ lines long; black, and has two series of angular tubercles on each elytron, the hindermost tubercle being the largest in the inner series, and the foremost and last tubercles of the outer series are both very large. Hab. Swan River.

LEPTOSTETHUS, a new genus of *Pachyrhynchidæ*, near *Polyphrades* in its characters, but with the body much more elongated, and the anterior coxæ separated, leaving a narrow chest between them.

L. marginatus, a large insect, being $7\frac{3}{4}$ lines long,* and $2\frac{3}{8}$ wide; much elongated, the rostrum very broad and flat above, the sides of the body nearly parallel: black; thorax thickly covered with small glossy granules; elytra crenato-striated: both thorax and elytra with a broad, yellow, squamose band at the sides; femora red, with the apex black.

L. Waltoni is black, covered with pale, dirty yellowish scales; has the femora red, the rostrum with four keels; thorax thickly granulated; elytra punctato-striate, the apex somewhat produced at the suture; length 5 lines; breadth 2 lines. Both species are from South-West Africa.

ACHLAINOMUS, new genus of the *Pachyrhynchidæ*. General form most near to *Prostomus*, the rostrum wants the longitudinal ridges seen in that genus; the jaws are short, the joints of the antennæ rather shorter, the thorax less convex; the elytra shorter and less convex, separated from the prothorax, and with the humeral angles not produced: fore tibiæ much curved and very strongly dentated within; middle and hind tibiæ dilated and produced externally and internally at the apex.

A. ebeninus is from India: glossy black, destitute of scales; antennæ, and terminal joint of tarsi pitchy red; rostrum canaliculated; thorax very delicately punctured, canaliculated; elytra punctato-striated. Its length is $4\frac{1}{2}$ lines; width $1\frac{3}{4}$ line.

ENAPTORHINUS, a new genus of the *Brachyderidæ*, nearly related to *Geotragus*, but differs in the form being much more elongated, the rostrum somewhat convex above, separated from the head by a transverse depression, the antennæ stouter and with shorter joints. The male has the hinder tibiæ clothed with very long pale hairs.

A. Sinensis is $4\frac{3}{8}$ lines long, and $1\frac{1}{4}$ line broad, of a pitchy brown colour, sparingly clothed with scales; thorax rugose, and with three pale lines: elytra punctato-striate; the back much depressed, and even slightly concave in the middle, but somewhat humped near the apex, where there are numerous long hairs. Hab. N. China.

CUBICOSOMUS, a new genus of the *Cleonidæ*, near *Leptops*, but with the elytra very short and nearly of a cubical form; the two basal joints of the funiculus only are obconic, the rest very short; the rostrum rather longer than in *Leptops*.

* The rostrum is not included in the dimensions of length given in the paper.

C. Whitei is $5\frac{1}{2}$ lines in length, and $3\frac{1}{4}$ in width; black, with brownish scales; rostrum with a longitudinal depression, the base obtusely carinated, the forehead with a slight swelling on either side; thorax narrow, the sides nearly straight, above very uneven, rugose, the middle longitudinally impressed, and with an irregular transverse depression behind the middle; elytra above uneven, deeply punctured, the punctures arranged in somewhat irregular rows, the second and fifth (or sixth?) interstices each with four large obtuse tubercles, and the apex with some smaller tubercles. Hab. Richmond River, New Holland.

EURYCHIRUS, a new genus of the *Molytidae*, near *Hypera*. Rostrum and antennæ nearly as in *Hypera punctata*; the head rather more exerted; the thorax without any trace of post-ocular lobes: the legs very long and very stout, the femora much incrassated in the middle; the tarsi very large, and unusually broad.

E. bituberculatus. Length $4\frac{1}{2}$ lines; width $2\frac{3}{4}$ lines. Form short and broad; elytra with the humeral angles produced, obtusely angled: black, clothed with greenish gray, sub-metallic scales; rostrum pitchy, carinated; thorax thickly punctured; elytra punctato-striated, the punctures each enclosing a scale; each elytron with a large tubercle nearly in the middle, and a smaller one, sub-apical in its position. Hab. New Holland.

PLACODERES, a new genus of the *Cyclomides*, nearly related to *Acantholophus*, but differs in having the funiculus of the antennæ distinctly seven-jointed, the head and thorax destitute of spines, the latter very broad, much produced at the sides, and nearly angular in the middle, the dorsal surface nearly flat: elytra pedunculated, not touching the prothorax.

P. variegatus. Length 9 lines; width $3\frac{3}{8}$ lines. Black, clothed with minute, narrow scales, some brown and some yellowish; rostrum tricarinated; thorax thickly granulated, and slightly grooved along the middle; elytra punctato-striated, the punctures remote, interstices with small glossy granules, variegated with dirty yellow, brown and black. Hab. unknown, probably Australia.

ECTEMNORHINUS, a new genus of the *Phyllobidae*, near *Phyllobius*; the general form more elongated and less convex; rostrum shorter; the antennæ inserted in a cavity near the apex, which cavity has the fore part opening laterally, the hinder part curved inward, and opening on the upper surface of the rostrum: elytra much elongated, and each elytron obtusely rounded at the apex: body soft.

E. viridis. Length $3\frac{3}{4}$ lines; width $1\frac{1}{2}$ line. Elongate, pitchy, clothed with metallic green scales; legs and antennæ ferruginous; thorax small, sub-cylindrical, but slightly swollen in the middle, and rather obscurely keeled; elytra delicately punctato-striated. Hab. Kerguelen's Land, in the Southern Ocean.

DREPANODERES, a new genus, also of the *Phyllobidae*, remarkable for the thorax being produced on either side into a large sub-recurved pointed process, the apex of the process extending beyond the humeral angle of the elytra.

D. viridifasciatus (an insect in the collection of the British Museum), is $2\frac{3}{8}$ lines long; black; antennæ and legs red, clothed with bright green metallic scales; head with a triangular black patch behind; thorax punctated, with three longitudinal denuded bands; elytra punctato-striated, each with four irregular, short, transverse,

green bands, which extend neither to the suture nor the outer margin, and with a few irregular green patches near the apex.

D. fuscus, is a trifle smaller than the last, and of a brown colour; the legs and antennæ testaceous; the interstices of the striæ of the elytra clothed with small hairs. Both species are from India.

SYNAPTONYX, a new genus of the *Eriirhinidæ*. Body of a short ovate form, the thorax very little narrower than the elytra, which are emarginated in front in the form of a segment of a circle; rostrum about equal to the head and thorax in length, and of moderate thickness, rather suddenly bent down near the middle; the antennal groove scarcely visible excepting in front, where the antennæ are inserted; antennæ moderate. Legs rather short, claws united at the base, and very little separated at the apex.

S. ovatus, black, clothed with small ashy white scales; antennæ and terminal joint of the tarsus ferruginous; rostrum clothed with scales above, carinated at the base, the apical portion acutely margined on either side, and the upper surface nearly flat; thorax very finely punctured and with but few scales; elytra striato-punctated, the interstices broad, and having the scales in small patches, giving a variegated black and pale appearance. Hab. Australia.

CHELOTONYX, a new genus of the *Eriirhinidæ*, nearly allied to *Prionomerus*, but differs in having the body of a somewhat longer and more ovate form, the rostrum and antennæ longer; the tarsi also longer, and furnished with bifid claws. The claws in *Prionomerus*, it may be remarked, have a large square appendage at the base. The fore-femora have the same large serrated tooth beneath, and the anterior tibiæ are curved as in *Prionomerus*.

C. Batesii is about equal in size to *Balaninus nucum*, of a bronze colour, and clothed with piliform, whitish scales, those on the elytra forming little patches: rostrum tricarinated above; thorax punctured; elytra punctato-striated. Length $3\frac{1}{2}$ lines. Hab. Pará, Amazons.

ANOMÆARTHRIA, a new genus of the *Baridiidæ*, near *Cylindrocercus*. The female of the species on which the new genus is founded, differs from *Cylindrocercus* in having all the joints of the funiculus of the antennæ obconic, and the rostrum very strongly curved, so that the point is directed backwards; and the male is distinguished from all other *Baridiidæ* in having the funiculus composed, first, of a very small joint, then a very large oval joint, and with the following joints all nearly oval but decreasing successively in size. The middle tibiæ at the apex, the posterior tibiæ on the inner side, and the basal joint of the four posterior tarsi are each furnished with a tuft of velvet-like yellow hairs.

A. cæruleipennis is nearly equal in size to *Cylindrocercus signum*, but of a narrower form; glossy black, with the elytra purple-blue, a small spot of yellow scales at the base of each elytron, not far from the scutellum: male, with the joints of the funiculus clothed with long hairs, and the body with scattered yellow scales beneath. Length 3 lines. Hab. Minas Geraes, Brazil.

PROTOPALUS, Schönher (Cryptorhynchidæ). Mr. Waterhouse expresses an opinion that the characters of this genus are drawn up from a male insect only, and that the

female does not present the crenulations on the under side of the rostrum, and that it differs further from the male, in having the anterior legs very little longer than the others. This opinion is founded upon the fact that he possesses an insect presenting these differences (and these only), when compared with Schönher's description of *P. Stephensi*. A second species is described, which differs from the insect referred to in Mr. Waterhouse's collection, in having the thorax and elytra rather less humped, and in having the second joint of the funiculus fully twice as long as the first. Its length $7\frac{1}{2}$ lines. Hab. Moreton Bay. It is named *P. Schönherri*.

PEZICHUS, a new genus of the *Cryptorhynchidæ*—first division: founded upon an insect in which the structure of the antennæ resembles that in *Cylindrocorynus*, excepting that these organs are rather longer and more slender. The legs are very long and slender, the femora not clavate; the tarsi very long and slender and with the first joint nearly as long as the remaining three taken together; thorax rather small; elytra moderate as to length, nearly twice as broad as the thorax.

P. binotatus is $5\frac{3}{4}$ lines in length, and $2\frac{1}{2}$ in breadth. Black, unequally clothed with brown scales; thorax granulated behind and at the sides, and keeled above; elytra punctato-striated, the punctures very widely separated, and each enclosing a scale; the second interstice keeled; a small, oblique, dirty white mark on each elytron, rather behind the middle: femora dentate. Hab. Moreton Bay.

GLOCHINORHINUS, a new genus of the *Cryptorhynchidæ*—first division: body nearly cylindrical, tubercular and squamose; funiculus with the terminal joint more slender than the rest, and longer than several of the preceding joints. Male with a recurved spine on each side of the rostrum in the middle, and a small spine behind this.

G. Doubledayi (Protopalus? Doubledayi, *Jeckel's MSS.*): black, clothed with cinereous scales; thorax granulated, and with a middle keel; elytra irregularly punctato-striate; the second interstice with three short crests, each appearing as if composed of an aggregation of tubercles; third interstice with one tubercle in the middle, fourth with several small tubercles, and with a sub-apical group of four or five small tubercles; legs long and slender, fore-legs the longest. Length $5\frac{1}{2}$ lines; width $2\frac{1}{2}$ lines. Hab. Moreton Bay.

PROTOPTERUS, Schö. Four new species of this genus are described, and these are placed in two sections.

Section I.—The second joint of the funiculus much longer than the first. It includes—

P. Chevrolatii, which is of an elongate-ovate form, has the thorax attenuated and two-pointed in front, and produced considerably beyond the head, with a short keel in the middle of the dorsal surface, and an obtuse tubercle on each side of this keel: small granules are scattered over the surface of the thorax and elytra; the latter are irregularly punctured, excepting at the sides, and each elytron has about nine obtuse tubercles, three in the second interstice, three in the fourth, one in the sixth, and two near the shoulder: the apex is produced into two conical tubercles, one belonging to each elytron. General colour black, clothed with brown scales; a band of greenish

ash-coloured scales runs from the shoulders obliquely inwards and backwards, beyond the middle of the elytra. Length $6\frac{1}{2}$ lines; width $2\frac{1}{2}$ lines. Hab. Moreton Bay.

P. Jeckelii is rather broader, and less convex than the preceding, has the thorax produced beyond the head, and bilobed in front; the dorsal surface keeled and bituberculate, the sides rounded and notched in the middle; a few very minute granules scattered on the elytra: each elytron with three large obtuse tubercles on the place of the second interstice, two on the fourth, one on the sixth in the middle, and two at the shoulder, besides a transverse irregular elevation at the base; the apex produced into a large tubercle, having a triangular base. Black with minute brown scales, and scattered large scales. Length $6\frac{3}{4}$ lines; width $2\frac{3}{4}$ lines. Hab. Moreton Bay.

Section II.—Antennæ with the two basal joints equal, or very nearly so.

P. Parryi nearly resembles *P. Jeckelii*, but the tubercles on the elytra are less obtuse, and some of them pointed; humeral angles of the elytra more prominent; the thorax with two tubercles in front, and not produced beyond the head; a very obtuse keel in the middle, and two tubercles (one behind the other) on each side of the keel, besides a lateral tubercle; elytra each with a sub-apical, dirty white mark, united posteriorly to a small tubercle of the same colour, the scales on other parts brown. Length $7\frac{1}{2}$ lines; width $3\frac{1}{4}$ lines. Hab. Sydney. In the collection of the British Museum.

P. Westwoodii, more elongate and more convex than the two preceding species; thorax produced slightly beyond the head in front, where there are two obtuse tubercles; the central portion with a short keel; and four tubercles are arranged nearly in a transverse line on the middle of the thorax, the outer pair project horizontally from the sides of the thorax, which, together with the upper surface of the elytra, presents numerous small glossy granules scattered over the surface. Each elytron has five conical tubercles arranged in a line parallel with, and not far from the suture, of which the fourth is very large and prominent, the last (or fifth) small; besides these are a few other tubercles, of which three may be especially noticed; they are arranged in an oblique line, extending from the shoulder to the third of the inner row of tubercles; apex of the elytra truncate. Length $7\frac{1}{2}$ lines; width $2\frac{3}{4}$ lines. Hab. Australia.

PLAGIOCORYNUS, a new genus of the *Cryptorhynchidæ*—first division: founded upon a large *Cryptorhynchus*, with a general form of the body somewhat like that of *Leptops quadrituberculatus*. Rostrum very short and stout, and irregularly quadricarinated above; thorax large, produced in front into a rounded lobe which projects considerably beyond the head; elytra of the same width at the base as the thorax, gradually becoming wider towards the hinder part, the sides very deep and bent somewhat inwards, the apical portion bent suddenly downwards, with four obtuse tubercles in a transverse line, behind the middle; the base rather deeply trisnuated; legs short and stout, femora not dentate; tarsi small; antennæ with the second joint of funiculus elongate obconic, the first short obconic, the rest very short; club short, and obliquely truncated, the three terminal joints for the most part hidden and enclosed by the basal joint.

P. quadrituberculatus is black, clothed with dark brown scales; thorax rather coarsely punctured, with a mesial keel and a short keel on each side of the disc; elytra with large punctures arranged in rows. Length 6 lines; width 3 lines. Hab.

Moreton Bay. The male smaller and narrower than indicated by the dimensions here given.

CHÆTECTETORUS, Schönherr.

C. spinipennis, a new species. Length 4 lines; width $1\frac{3}{4}$ line. Black, clothed with brownish scales: thorax with a short mesial keel, and two longitudinal and slightly elevated crests on the fore part, diverging slightly as they extend backwards towards the middle of the thorax; elytra punctate-striated, with a transverse black band behind the middle, and which does not extend to the outer margins; an oblong black spot between this and the base, a small tubercle towards the apex, clothed with pale brown scales, and minute black markings; apex produced at the suture into a sharp spine, and some acute denticles external to this spine. Hab. Australia.

SYMPIEZOCELUS, a new genus of the *Cryptorhynchidæ*—first division: founded upon an insect which in general form reminds one of the species of *Tranes* or *Iphipus*.

S. Spencei is of a glossy, pitchy-black colour, destitute of scales: rostrum short, rather slender and depressed, dilated at the base; antennal groove in form of an oblong fovea, situated immediately in front of the eye; antennæ with the basal joint (or scape) very short and almost obconic; first and second joints of funiculus obconic, the rest short; club of a very short oval form, almost round: thorax emarginated on each side behind the eye, constricted in front, the sides very little rounded, upper surface but little convex, with scattered punctures, and a very short keel behind: elytra very little broader than the thorax, oblong, rounded at the apex, strongly punctato-striated: legs short, femora large and compressed; tibiæ broad and compressed, dentated externally near the apex, and with a large incurved claw at the apex; tarsi small, not dilated: the two basal joints destitute of spongy substance beneath. Hab. Richmond River, Australia.

HYBOPHORUS, a new genus of the *Cryptorhynchidæ*—second division: the rostral groove not acutely margined behind: founded upon an insect having the general form nearly similar to certain species of *Centrinus*, such as *C. morio*: the thorax short, narrow before, and broad behind; the elytra much broader than the thorax at the base, with the shoulders prominent, but rounded, the width gradually decreasing to the apex, which is rounded; nearest *Rhyssomatus* in affinity, but differs in having simple diverging claws (those in *Rhyssomatus* being bifid), and in having the humeral angles of the elytra prominent: rostrum long, sub-carinated; antennæ with two basal joints of funiculus longish obconic, the rest short; eyes large, much approximated in front: thorax constricted in front, then dilated with a rounded outline, with a much elevated keel on the fore part.

Hybophorus rufo-tuberosus; black; without scales; thorax with a transverse row of large punctures in front, interrupted by the large central keel, and some coarse punctures on either side; elytra with the region of the suture smooth, and in the place of the first stria, with widely separated depressions, each bearing in the centre a small glossy black granule, the remaining parts very uneven, with irregular and obtuse tubercles, the crowns of which are red, the interspaces having scattered black granules; of the tubercles one at the shoulder is very large, and the same may be said of a second, which is placed about midway between the base and apex of the

elytra, and not far from the suture; femora with a strong tooth beneath, rather beyond the middle, and a smaller tooth between this and the apex. Length $3\frac{3}{4}$ lines; width $2\frac{1}{2}$ lines. Hab. Australia. Probably Moreton Bay.—*J. W. D.*

Occurrence of the Summer Duck (Dendronessa Sponsa, Swainson) in Sussex.—On the 24th of December, 1851, I observed, whilst driving in a gig past a pond in West-grinsted Park, near Horsham, Sussex, two ducks on the water; and at once saw that they were some species which I had never before met with. Having ascertained from the owner of the property, that they were not turned out by him, I returned to the spot with my gun. I found the birds still there, but very wary: I, however, by going on my hands and knees some three or four hundred yards, succeeded in shooting one, which turned out to be an adult male in most perfect plumage. The other escaped for the time, but on the 27th of the same month was shot by a man of the name of Downer, game-keeper to Sir C. M. Burrell, and sent to me. This was also an adult male. The said keeper told me that they had been about the park for about three weeks, but that he had never been able to get a shot at them, on account of their being so wild. The bird I shot had an old gun-shot wound on one of the tarsi, from which I pressed out a shot with my thumb: the bone appeared to have been broken, but to have united and healed, thus showing that the bird must have been some considerable time at large. The gizzard of each contained a few acorns, and a small quantity of grass, with some minute particles of gravel and flint. They were exceedingly wild, the plumage was quite perfect, and they had not the slightest appearance of ever having been in confinement.—*W. Borrer, jun.; Cowfold, Sussex, February, 1853.*

Occurrence of the Glaucous Gull (Larus glaucus) in Sussex.—My friend the Rev. R. N. Dennis, of East Blatchington, Seaford, Sussex, sends me word that about the 20th of December, 1852, a bird of this species, apparently commencing the plumage of the third year, was brought to him alive, having been caught in that neighbourhood; he was exceedingly savage, and severely bit the person who brought him.—*Id.*

Occurrence of various Birds in Sussex.—On the same authority, I beg to record the occurrence of the following visitors. A well-marked specimen of the ringed guillemot (*Uria lachrymans*), was picked up dead, on the beach in Seaford Bay, in December, 1852; and about the same time several specimens of the puffin (*Puffinus arcticus*); and on the 3rd of January, 1853, another puffin was picked up: this last was in full plumage and quite fresh, the others being stale. How came the puffins on the Sussex coast at this time of the year? A specimen of the common thick-knee (*Eidienemus crepitans*), was picked up alive, but in a dying state, on the 7th of this present February; this also is an unusually early occurrence: this bird not generally appearing before the middle or latter end of April, and departing in the autumn. I have, however, a specimen shot near Newhaven, Sussex, on November 5, 1845; so that the bird possibly occasionally remains throughout the winter.—*Id.*

Occurrence of the Little Auk near Edinburgh.—I beg to inform you that I shot a specimen of the little auk (*Mergulus Alle*) near Cramond, on the Firth of Forth, about four miles from Edinburgh, upon the 14th of February.—*Robert H. Broughton; 21, Inverleith Row, Edinburgh, February 21, 1853.*

Proceedings of the Royal Physical Society of Edinburgh.

Saturday, January 8, 1853.—PROF. FLEMING, D.D., in the chair.

John Stewart, Esq., exhibited a collection of stereoscopic photographs, in illustration of which he made the following remarks:—

For some time past, Mr. S. said, he had endeavoured to ascertain by experiment the possibility of procuring a distinct representation of an object in motion, by means of very sensitive photographic plates. He meant by this a correct likeness of an object from an *instantaneous exposure* of a plate to its shadow while in motion. He was fully aware that part of what he proposed was of old date, and that photographic plates had years ago been rendered sensitive enough to require but an instant's exposure in order to procure a picture. Talbot proved this when he caught the distinct image of a revolving wheel illuminated by a spark of electricity; and an amateur photographer, Professor Machonochie, told him, that while taking a view of the inauguration of the Wellington statue in this city, he accidentally caught the distinct representation of a flash of lightning that occurred, as many present will recollect, during the ceremony, and which chanced at the instant he exposed his plate. He had not yet had the pleasure of seeing this photograph, but the Professor had kindly promised that he should soon do so. However, in both these cases the rapidity of taking these views was thrown *from the operator on to the illuminating cause*. Talbot's wheel was seen but for a fraction of a second, and, if his plate was sufficiently sensitive, was sure to impress its outline thereon. So with his friend's flash of lightning, though there is a remarkable difference in the two cases, the last being taken in the broad glare of daylight. To obtain a view of a moving object in daylight, the case is different; the rapidity of action must then be thrown upon *the operator*, and the speed of the plate's exposure must exceed the quickness of the object's motion, in order to ensure a distinct outline. The summer before last he *caught* (for he could use no other word) distinct views of many objects in motion, such as people walking, carriages moving, and the waves of the sea. These were on single plates. What he wished to show the Society to-day were stereoscopic views of the sea taken last summer. It will appear at once to every one who understands the stereoscope, that two views are required for this object. These two views must both be taken *instantaneously from nature*, and also *at the same instant*. They must be taken *instantaneously*, to procure a distinct outline from nature, in order that they may stand out in the instrument (which copies from a picture will not do), and at the same instant, to ensure their uniting together. Those he had on the table were so taken, and were views across Morecambe Bay, in North Lancashire. The waves and ripple on the sea have a distinct outline, the hill of Blackcombe on the opposite side is fourteen miles distant, and light clouds may be distinguished hanging half way across the bay. The process of preparing these plates Mr. Stewart at present declined to communicate, as it was intimately connected with some researches he was making to test the possibility of procuring natural colours along with a photographic view. He did not at present think it impossible that a process may be discovered by which nature may be represented in her own colours by means of the camera. Some traces of colour he had already been able to procure, but as yet not the faintest shade of that all-pervading one of green, which always comes out black in this style of photograph.

Hugh Miller, Esq., read a communication "On Bothrodendron, Ulodendron, Stigmara, and other characteristic Plants of the Carboniferous Period; with a restoration

of *Sphenopteris elegans*." The author began his paper by quoting from Mr. Bunbury's description of a fossil fern of the North American coal measures, published in the 'Journal of the Geological Society' for 1852. "It is rare," says Mr. B., "to find in the ferns of the carboniferous period, even the stipes or leaf-stalk completely preserved down to its base; the only specimen of the kind that I have seen is a beautiful *Sphenopteris* (I believe *Sphenopteris elegans*) from the Edinburgh coal-field, in the collection of Mr. Hugh Miller." What is deemed rare by Mr. Bunbury, one of our highest authorities in fossil Botany, must be regarded as absolutely so; and Mr. M. now exhibited, he said, and attempted to describe, this unique fossil, in the hope of adding a very little to what was already known regarding one of the most beautiful and characteristic ferns of the lower coal measures. From a suite of specimens on the Society's table, it would be found that, save in one particular, the entire frond of *Sphenopteris elegans* could be restored, so as to be rendered as palpable to conception as the fronds of the green brake, which in one respect it resembled, that flourished last season on the sunny hill-sides or amid the deep woodland glades of our country. In one important particular, however, the restoration must be incomplete. So far as Mr. M. knew, no specimen of any coal-measure species of this ancient genus exhibits the fructification; and we must be content, therefore, to acquaint ourselves simply with the general outline and venation of the plant. All previous attempted restorations of *Sphenopteris* had been unfortunate. It seems to have been inferred, from the minuteness of the pinnules, that the frond to which they belonged had also been minute; and so in the restorations, — such as that of the late Dr. Mantell, in his 'Wonders of Geology,' and that of the interesting oil painting of carboniferous plants in the Museum attached to the Edinburgh Botanic Garden, — restorations introduced, however, rather for pictorial than scientific purposes, — the large, eminently handsome, and apparently solitary frond given to the plant by Nature, has been represented by mere dwarfish pinnæ, rising gregariously, as in *Polypodium* and *Asplenium*, from a common rhizoma. In one important respect *Sphenopteris elegans* resembled *Pteris aquilina*, — our common hill-side bracken. It was furnished with a stout leafless rachis, exceedingly similar in form to that of *Pteris*. Nay, it exhibited so completely, in Mr. M.'s specimen, the same club-like slightly bent termination, the same gradual diminution in thickness, and the same smooth surface, that one accustomed to see this part of the bracken used as a thatch — and a very durable thatch the stipites of the bracken do form — can scarcely doubt that the stipes of *Sphenopteris* would have served the purpose equally well. Evidently, were it still in existence to be employed for that purpose, a roof thatched with *Sphenopteris*, with its pinnæ and leaflets concealed, and only its club-like stems exposed row above row, in the ordinary style of the fern-thatcher, could not be distinguished — so far as form and size went — from a roof thatched with *Pteris*. At a height of from seven to eight inches above its club-like termination, the stem divided into two equal parts, which shot upwards with a divergence that rendered the fork between an angle of about 30°; and at unequal heights, a little farther up, each of these divided stems bifurcated, in turn, at about the same angle, and then shot up, in some individuals, without further bifurcation; while in others they bifurcated again, and yet again. It is probable that, as in many of the recent ferns, the greater divisions of the plant were constant, while the smaller varied according to the richness of the soil, and the consequent size and degree of development attained by the frond. As in *Pteris aquilina*, there shot out from these main stems numerous pinnæ irregularly alternate, and which, becoming less compound as they approached

the top of the plant, passed, in ascending, from tripinnate to bipinnate, and assumed finally the form of more alternately pinnate leaflets. Unlike *Pteris*, however, whose stem remains bare of pinnæ until its larger divisions take place, the stem of *Sphenopteris elegans* sent forth on its opposite sides two decomposed pinnæ, the one about an inch, the other about an inch and a quarter or so, below the first fork,—a peculiarity of structure that must have imparted a graceful fulness of outline to the lower portion of the frond, which, had the rachis been bare, it could not have possessed. Alternation, save in the bifurcations of the main, secondary, and tertiary stems, and in the case of a few irregular pinnæ that seem to have been placed opposite, or nearly so, constituted the law that regulated the form of the plant. The pinnæ alternated on the greater stems,—the semi-pinnæ alternated on the pinnæ,—and finally, the minute, closely nerved, spatulate leaflets alternated on the semi-pinnæ. The entire frond must have been of great lightness and beauty, of a style intermediate, from the slowness of its leaflets and the slenderness of its secondary and tertiary stems, between that of the frond of *Pteris aquilina*, and that of the fully developed sucker of the graceful *Asparagus*. A hill-side clothed with these delicately fronded ferns must have rolled its mimic waves of soft green to every light breeze that stirred the depths of the old carboniferous forests; and the light and flexile covering which it gave to undulating plain or gentle acclivity, must have contrasted not unpleasingly with the columnar trunks of fluted *Sigillariæ* or scaly *Lepidodendra*, or with the huge rectilinear boles of gigantic *Araucarians*. After several remarks on the numerous so-called species of *Sphenopteris* found at Burdiehouse, most of which Mr. M. regarded as but mere varieties of a single species, he went on to state that he had an opportunity of seeing, about six years before, though but for an instant, the larger portion of a frond of *Neuropteris gigantea*. He laid it open at a pit-mouth near Musselburgh, in a mass of gray shale, sorely split and weathered; but he could do little more than determine that, like *Sphenopteris elegans*, and the common bracken, it too had a thick bare rachis, and that its pinnæ, like its leaflets, were alternate in their arrangement, when it fell to pieces in his hands. Mr. Miller regretted that, during the glimpse which he enjoyed of this beautiful frond, he failed to remark the order in which the larger divisions of the rachis took place; he merely saw, from the general effect, that the frond as a whole—balanced on its strong club-formed leaf-stem—was greatly massier than that of either *Pteris aquilina* or *Sphenopteris elegans*; and that in the clustered richness of its leaflets, although not in their disposition, it resembled our recent *Osmunda regalis*, or royal fern. So transient was his glimpse of the plant, that it has since reminded him of those momentary glances caught, according to tradition, of long-buried monarchs in their sepulchres, that in one moment are seen august in all their robes, and in the next descending before the admitted air into a shower of light dust. Mr. Miller next exhibited and described a very fine, and in some respects unique specimen of *Ulodendron minus*, which he had disinterred from out a bed of ferruginous shale in the Water of Leith, a little above the village of Colinton. Though little more than 10 inches in length by 3 in breadth, it exhibited no fewer than seven of those round beautifully sculptured scars, ranged rectilinearly along the trunk or stem, by which this ancient genus is so remarkably characterized. The specimen is covered with small, sharply relieved, obovate scales, most of them furnished with an apparent mid-rib, and with their edges slightly turned up; and from these peculiarities, and their great beauty, are suited to remind the architect of that style of sculpture adopted by Palladio from his master, Vitruvius, when, in ornamenting the Corinthian or composite torus, he fretted it into closely imbricated

obovate leaves. These scales are ranged in elegant curves, which one of the members of the Royal Physical Society, Mr. Charles Peach, as his quick eye caught the arrangement in Mr. M.'s specimen, compared not inaptly to those ornamental curves—a a feat of the turning-lathe—which one sees roughening the backs of ladies' watches. Mr. Miller's specimen exhibited, as it lay in the rock, what, so far as he knew, no other specimen of *Ulodendron* had yet shown,—a true branch shooting out at an acute angle from the stem, and fretted with scales of a peculiar form, verging from irregularly rhomboidal to irregularly polygonal. It has been shown by Messrs. Lindley and Hutton, on the evidence of one of their specimens, figured in the 'Fossil Flora,' that the line of circular or oval scars, so remarkable in this genus, and which are held to be the impressions made by a rectilinear range of cones, an almost sessile row existed in duplicate, occurring on two of the sides of the plant directly opposite. Its cones were thus ranged all in one plane. The branch struck off from one of the intermedial sides, at what in the transverse section would be at right angles with the cones; and though little can be founded on a single specimen, such, certainly, is the disposition of branch that seems best to consort with such a disposition of cone. It may be added, said Mr. M., that if all the branches were also ranged in one plane like the cones, such a disposition would not be quite without example in the vegetable kingdom, even as it now exists. "Our host," says the late Captain Basil Hall, in his brief description of the island of Java, "carried us to see a singular tree, called familiarly the 'traveller's friend,'—*Urania* being, I believe, its botanic name. We found it to differ from most other trees, in having all its branches in one plane, like the sticks of a fan or the feathers of a peacock's tail." Influenced, perhaps, by Captain Hall's description, and the figure of *Urania* given in his work, Mr. M. had been accustomed, he said, to think of *Ulodendron*—though his evidence on the subject was still far from ample—as a plant somewhat resembling in its contour the old Jewish candlestick, as sculptured on the arch of Titus. Mr. M. then went on to show that *Ulodendron* was not, as surmised by the authors of the 'Fossil Flora,' a mere form of *Lepidodendron*; though not improbably another of their genera, *Bothrodendron*, was a form of *it*. At least, *Ulodendron*, when decorticated, exactly resembles the latter plant, being mottled over with minute dottings quincuncially arranged, and presenting its rectilinear line of oval scars devoid of the ordinary sculpturings. After several remarks on *Lepidostrobus variabilis*, which, as shown by specimens on the table, could not be the cone of *Ulodendron*, as Messrs. Lindley and Hutton had surmised, but was unequivocally, as had been inferred by Adolphe Brongniart, that of *Lepidodendron*; Mr. M. went on to describe what he deemed a new species of *Stigmaria*, which he had found in Joppa quarry. In the specimen exhibited, the characteristic areolæ of the plant presented the ordinary aspect. Each, however, formed the centre of a sculptured star, consisting of from eighteen to twenty rays, or rather the centre of a sculptured flower of the composite order, resembling a garden daisy,—the minute petals being ranged in three concentric lines. Mr. M. then referred to the discovery by Mr. Binney of Manchester, that the *Stigmariæ* are the roots of *Sigillariæ*, or rather, said Mr. M., the discovery that they occupy the *place* of roots. From a specimen on the table, it would be seen that they terminated very differently from true roots,—ending as abruptly as any of the Cactus tribe, and with their bud-like areolæ thickly clustered at the extremities. After arguing the point at considerable length, Mr. M. went on to say that it might, he thought, be consistently held, that while the place and position of *Stigmaria* were, as shown by Mr. Binney, those of true roots, just as the place and position of the rhizoma

of *Pteris aquilina*, or of *Cryptogramma crispa*, are those of true roots, it was, notwithstanding, not a true root, but merely a congeries of subterranean stems, that sent forth from the centre at which they converged, a thick subærial trunk, richly sculptured, and covered with a foliage of which every trace has long since disappeared. There was but one other plant of the coal measures, said Mr. M., to which he would at present call the attention of the Society. It was evidently a fern, but presented at first sight more the appearance of a Cycadaceous frond than any other vegetable organism of the carboniferous age yet seen. From a mid-stem, about a line in thickness, there proceed at right angles, and in alternate order, a series of sessile lanceolate leaflets, rather more than two inches in length, by about an eighth of an inch in breadth, and about three lines apart. Each is furnished with a slender mid-rib; and, what seems a singular, though not entirely unique feature in a fern, the edges of each are densely hirsute, and bristle with thick, short hair. The venation is not distinctly preserved. In conclusion, Mr. M. took the liberty, he said, of urging on such of the members of the Society as possessed unique fossils of our carboniferous flora,—unique either from the circumstance of their being positively new, or of throwing new light on the forms or structure of plants already known in part,—the importance of exhibiting and describing them for the general benefit. The authors of both Fossil Floras and Fossil Faunas, however able or accomplished they may be, have often to find their genera and species, and to frame their restorations, when they attempt these, on very inadequate specimens. For, were they to pause in their labours until better ones turned up, they would find the longest life greatly too short for the completion of even a small portion of their task. Much of their work must of necessity be of a provisional character,—so much so, that there are few possessors of good collections who do not find themselves in circumstances to furnish both addenda and errata to our most valuable works on Palæontology. And it is only by the free communication of these addenda and errata that geologists will at length be enabled adequately to conceive of the by-past creations,—of, in especial, the faunas of the palæozoic and secondary periods,—and of that gorgeous flora of the carboniferous age, with some of whose organisms Mr. M. had been attempting to deal, and which seems to have been by far the most luxuriant and wonderful which our emphatically ancient earth ever saw.

The third was a “Notice of the Octopus octopodia,” by John Stewart, Esq. Mr. Stewart referred to the description given in Fleming’s ‘British Animals,’ p. 254; and stated that the specimen he exhibited was caught on a hook in the Bay of Luce, October 26, 1852. Its dimensions were as follow:—Length of body, about $3\frac{3}{4}$ inches; breadth, $2\frac{3}{4}$ inches; length of head, $1\frac{1}{2}$ inch; breadth, $1\frac{3}{4}$ inch; length of arms, 9 inches; but the lowest arm on the left side was only 7 inches long. He had taken three specimens last year in Loch Ryan, and two in Morecambe Bay, North Lancashire. Mr. Stewart also stated that Mr. George Wilson, who had sent him this specimen, informed him that an albicore had been taken last year in a salmon bag net at Strathaven, which was 25 inches in length, 17 in girth, and weighed 10 lbs.

James C. Howden, Esq., M.D., then read a communication, entitled “Notes on Marine Zoology.” Dr. Howden said that of the star-fishes which occur in the Firth of Forth, by far the most common on muddy bottoms between Inch Michry and Gullaneness, is the little *Ophiura albida*; below that point, again, *Ophiura texturata* is of frequent occurrence. *Ophiocoma neglecta* appears to have a wide range, living in pools, at low-water mark, under stones, and especially among *Corallina officinalis*; he had found it at Joppa rocks, Prestonpans, Crail, &c., and also in mud, in four or five

fathoms, off Prestonpans. The two most curious of our British Ophiuridæ are *Ophiocoma brachiata* and *O. filiformis* (of Forbes); both of them are found in the Firth of Forth. The first appears to be rare; but Dr. H. has obtained several unquestionable specimens in the trawl from Largo Bay. *Ophiocoma filiformis* is certainly not rare in mud, in from three to twelve fathoms, between Musselburgh and Kirkcaldy. Indeed, one can seldom dredge off Musselburgh, without meeting with rejected members of this species; but it is very apt to be overlooked, especially as the very curious character ascribed to the third row of spines by Professor Forbes, is seldom met with. All the spines of the spine-bearing Echinoderms that Dr. H. has had an opportunity of examining, are more or less sculptured, and there is a general tendency to be compressed, especially in the third row, on the arms of the *Ophiocomæ*. Their margins are thin and transparent in *Ophiocoma rosula* and *O. filiformis*,—the former bearing large teeth, which are produced forward at an acute angle to the axis of the spine; on the latter, the spines are generally more or less truncated, and finely serrated along their margin, and often terminate by two large teeth projecting laterally, so forming the resemblance to a pickaxe; but there are all degrees of variation between this form and an acute terminal spine, as in other *Ophiocomæ*. *Ophiocoma bellis* and *rosula* are both common, especially the latter, as littoral, laminarian, and coralline species. Dr. H. has a small and imperfect specimen, which does not agree well with any of the species of this genus described by Professor Forbes. The disk is covered with scales, as in *O. neglecta*, but these have a frosted appearance, quite unlike the smooth surface of that species. The spines on the rays, instead of being ovoid, as in that species, are somewhat pyramidal and acute at the apex. The most remarkable character, however, is the absence of the superior plate on the two first segments of each ray. Until more specimens are obtained, nothing definite can be said; but it is not improbable that it may turn out to be merely an immature specimen of one of the larger species. *Asterias aurantiaca* and *Solaster endeca* are both brought up in abundance by the trawls from Largo Bay, and on the lines further down the Firth. *Solaster papposa* abounds everywhere, and in all depths of water. Rays of *Luidia fragilissima* are of common occurrence on the fishing-lines from the Mar-bank; and Dr. H. has also met with them in the trawl from Largo Bay. *Uraster rubens*, *U. violacea*, and *Cribella oculata* are common on our coasts. In dredging on muddy or sandy bottoms, one of the most common crustaceans met with in all parts of the Firth of Forth is *Stenorhynchus phalangium*. *Inachus Dorsettensis* is sometimes brought up on the lines of the deep-sea boats. *Hyas araneus* is frequently met with on sandy sea-beaches at low water, as at Musselburgh, in the salmon-stake nets, where it indulges its carnivorous propensities on the fish left dry by the tide. The common shore crab (*Carcinus Mænas*) and the edible crab (*Cancer pagurus*) are also very injurious to the salmon-fisher in this way. Dr. H. had seen trout and mackerel reduced to skeletons in a very short time; and grilse and salmon are often rendered unfit for market by an unseemly scar, the work of these marauders. The finest specimens of *Hyas araneus* obtained by Dr. H. are from the crab-pots at Prestonpans; some of these (males) measured a foot from the extremity of the third limb to that of the opposite one, and were of a bright flesh-colour. The edible crab is very particular as to the time and quality of his meals; he will seldom enter the crab-pots except over-night; and then only when the fish with which they are baited is fresh. On the other hand, the *Hyas* as invariably feeds during the day, and seems to prefer his food a little high. Had we the means of observing, it is highly probable that we should find marine as well as terrestrial

animals respectively diurnal and nocturnal in their habits. *Hyas coarctatus* must be common between Gullaneness and Largo, judging from the hundreds that are brought up by the trawl; but it rarely occurs above this. Dr. H.'s observations coincide with those of Mr. Bell in regard to the disparity in size between the male and female; $6\frac{1}{2}$ inches is not uncommon for the span of the male across the third pair of limbs, whereas the largest female met with by Dr. H. had only a span of $3\frac{1}{2}$ inches at corresponding parts. *Eurynome aspera* is probably not uncommon on mud in five or seven fathoms off Prestonpans and Portseaton. It is very apt to be overlooked, as it is generally incrustated with minute Algæ and mud, and in that state resembles the young of *Hyas araneus*. *Portumnus variegatus* appears to be rare: Dr. H. found one small living specimen on the sands between Musselburgh and Prestonpans two years ago; and Lieutenant Thomas obtained two cast shells at Portseaton last October. *Portumnus marmoreus* is occasionally thrown on the beach at Portobello and Musselburgh. *Portumnus pusillus* is very plentiful in mud off Prestonpans. *Portumnus depurator* is common everywhere. *Corystes cassivelanus* is believed to be frequently cast ashore at Portobello after storms. *Lithodes Maia* is familiar to most of the fishermen engaged at the mouth of the Firth; but it is probably very local, and an occupant of deep water. Of the small Paguri, the most common and best-marked species is *Pagurus Hyndmanii*; it is at once distinguished from all the others by the length of the second joint of the inferior antennæ. Dr. H. found it common in from three to twelve fathoms, off Musselburgh and Prestonpans. Along with the preceding *Pagurus lævis* occurs, though sparingly. Besides these, Dr. H. has two mutilated specimens, which, however, are characteristic enough. The one appears to be *Pagurus ulidianus*, the other *Pagurus Forbesii* of Bell. *Porcellana platycheles* may be found, although not plentifully, under stones at low water, between Crail and Fife-ness; within a stone's cast, however, round the corner, in St. Andrew's Bay, it abounds in great numbers: it is also believed to be common on the Berwickshire coast. While *Porcellana longicornis* is very abundant in the upper part of the Firth, it is comparatively scarce where the former species occurs. *Galathea squamifera* is common under stones at low-water mark of spring tides, on rocky coasts, as at Prestonpans, Portseaton, and Crail. It is occasionally brought up by the dredge, but these specimens are much smaller and lighter in colour than the littoral ones. *Galathea strigosa* is obtained in deep water near the Bass, &c. *Galathea nexa* is frequently dredged in mud, in from three to twelve fathoms, between Seafield and Portseaton. *Munida Rondeletii* must be rare in the Firth of Forth; Dr. H. is aware of only one instance of its occurrence, namely, to Mr. R. Gray, at Dunbar. *Nephrops Norvegicus* is frequently brought up by the line-boats from deep water; also in the trawl from Largo Bay. *Crangon vulgaris* is common on all sandy beaches; it is the only species Dr. H. has yet met with. *Hippolyte vulgaris* is very common in pools at low water at Prestonpans, Portseaton, Crail, &c: the variation in colour in different specimens is remarkable, and generally agrees with the colour of the prevailing sea-weed in these pools. Sometimes it assumes the precise hue of *Laminaria* or *Delesseria*, at others it is dark green, or light green, or bright red, as the case may be; and the colour does not disappear at death, but remains for months after. In the crab-pots at Crail Dr. H. found several specimens of *Hippolyte* which apparently differ from any of the described British species. It bears some resemblance to *Hippolyte Cranchii* of Leach, but has the rostrum shorter, more depressed, and not bidentate at the apex, as in that species. The wrist of the second pair of limbs is composed of seven articulations instead of six: and the central plate

of the tail is furnished with five pairs of teeth, instead of four, as in *H. Cranchii*. It seemed a common species at Crail, and Dr. H. had since seen a specimen in Dr. Fleming's collection, obtained many years ago by him in Orkney. *Mysis Chameleon* is common in pools at low water. Besides the common *Talitra saltator* and *Gammarus lacustris*, and also, perhaps, *G. campylops*? whose specific distinction, however, is by no means a good one, namely, that of having the eyes shaped like the letter S., Dr. H. mentioned one of the carinated *Gammari*, agreeing with *G. Sabinii* of Milne-Edwards. During the summer of 1851 he obtained many specimens of a small amphipodous crustacean from the genital cavities of *Cyanea purpurea*, which, on examination, he found to be the *Hyperia Latreillii* of Milne-Edwards, which is synonymous with the *Gammarus Galba* of Montagu, (Linn. Trans. xi.) The eyes are strikingly large, and of a bright green colour. Of the Isopods, the most common are *Ligia oceanica*, *Idotea pelagica*, *I. tricuspidata*, and *I. linearis*. *Arcturus longicornis* is brought up by the lines of the deep-sea boats. *Corophium longicorne* occurs in pools at low water at Musselburgh. The *Caprellæ* described by Dr. Johnston in his 'Illustrations of British Zoology,' in Loudon's Magazine for 1835, are, *Caprella Phasma*, *C. acanthifera*, *C. Pennantii*, and *C. linearis*. Milne-Edwards and Dr. Johnston, although giving the same synonyme, are evidently describing different species when they refer to *C. acuminifera* of Desmarest, which is adopted by Dr. Johnston as *C. acanthifera*. He describes and figures it with a spine on the head, and with the terminal segments of the body smooth. Milne-Edwards, again, gives his *C. acuminifera* a smooth head, but a tuberculated body. In a specimen found by Dr. H. at Crail, which corresponds in some respects with that species, the head has a small obtuse spine, and the last three segments of the body are much tuberculated. The inferior antennæ are strongly ciliated beneath. Another species met with by Dr. H., while dredging at Prestonpans, resembles in some respects *C. Phasma*; but, besides having a spine above the origin of each of the second pair of limbs, it has two larger ones placed side by side on the dorsal aspect of that segment. The hands of the second pair of limbs have three teeth on their under surface. Two specimens taken by Dr. H. last October had attached themselves by their posterior limbs to an *Antennularia*; on gently touching them they moved up and down rapidly, the articulation between the second and third segments acting as a hinge-joint. In conclusion, Dr. H. mentioned four species belonging to that curious family the *Pycnogonidæ*. The first and most common is *Pycnogonum littorale*, which is plentiful under stones at low water, and also often dredged in three to five fathoms. The next in frequency is *Nymphon femorale*, or *hirtum* of Fabricius, which is frequently met with on shelly ground, especially about Inch Michry. *Nymphon gracile* appears to be much scarcer than either of the preceding. On *Corallina officinalis*, in a pool at Joppa rocks, Dr. H. found a specimen apparently belonging to the genus *Phoxichilidium*. It differs from any of those described by Milne-Edwards or Mr. H. Goodsir in the 'Edinburgh Philosophical Journal;' its colour was exactly that of the coralline.

Dr. John Alex. Smith next exhibited a specimen of a duck which was shot in December, 1851, near the Bass Rock, by some boatmen, who, from its unusual appearance, brought it to one of the Edinburgh bird-stuffers. Dr. Smith said he had been puzzled to find out what it was; but by the kind assistance of one of our celebrated ornithologists, he learned that it was a West Indian species,—the Bahama duck,—the *Anas Bahamensis* of Catesby's 'Carolina,' the *Anas urophasianus* of Vigors ('Zoological Journal,' iv. 337), the *Dafila urophasianus* of Eyton's 'Duck Tribe,' and the

Urophasianus Vigorsii of Beechey's Voyage, &c.; the inference being that it had probably escaped from confinement. Dr. Smith said there were no individuals of this species in the Zoological Gardens here, or amongst the collection at Gosford House; and, indeed, he was quite unable to learn of any being kept in confinement, either immediately to the south or north of the Firth of Forth. He was informed that three living specimens are at present in the collection of the Zoological Gardens, Regent's Park, London. The colour of the bird, Dr. Smith observed, was dark and light reddish brown, spotted with dark brown; the lower parts of the head and upper parts of the neck in front pure white; speculum green, glossed with purple and edged with black and light reddish fawn; the tail light drab, without spots, rather elongated, shaped somewhat like a pheasant's—whence the name; and there was a striking patch of yellow on each side of the dusky bill.

Proceedings of Natural-History Collectors in Foreign Countries.

MR. H. W. BATES.*—“Santarem, October 18, 1852.—I returned from my Tapajos journey last week. A letter I wrote you on the 1st of August from Aveyros (Zool. 3801) would give you some account of my ascent of the river to that place, and my plans for exploring the branch river Cuparé. I left Aveyros on the 2nd of August, and entered the Cuparé on the following day; in this river I remained until the 13th of September: thence I crossed over to the west bank of the Tapajos, and worked at several points till the 21st, when I commenced my slow journey down the river. Altogether it has been the most laborious excursion I have made. I had to contend with almost every kind of difficulty and privation, even with actual hunger, from the difficulty of procuring subsistence, and, towards the last, ill health. The two Indians I obtained with great difficulty of the Commandant of Aveyros, gave me constant trouble and anxiety,—two lazy insolent young lads, who at last, when I wished to ascend the river to Curé, refused to accompany me any further. The voyage down the river to Santarem was very difficult and perilous, in fact I do not know how to describe it, so as to give you an adequate idea of what it is necessary to undergo. At all seasons the passage is difficult, but at the present time, the dry season, is the worst. The distance from Aveyros to Santarem is about 100 miles, and the breadth of the river varies from 5 to 8 miles. The coast is studded with rocky points, between which stretch wide shoally bays; in some places these shoals reach nearly half way across the river; in others, there are isolated sand-

* Communicated by Mr. S. Stevens.

banks, especially off the rocky points. There is no current or tide to aid in descending the river, and to complete the difficulty, the trade-winds blow furiously upward from the Amazons all day, and often at night. The slightest wind is sufficient to obstruct all progress by oar, but the wind generally blew a gale, and sometimes a regular hurricane. Three times we were near being wrecked. The time for travelling is at night, when sometimes a gentle land-breeze from the eastern shore assists, but this is apt, towards midnight, to veer too much towards the North. When this was the case, or when there was no wind at all, we got along by poleing; the vessel went very well in one fathom of water, which was generally the depth about half a mile from the shore, and thus we were at last enabled to reach Santarem in safety. In travelling at night, it was necessary to calculate well the voyage from one harbour (of which there are several along the coast, called by the inhabitants *esperas*, or waiting-places) to another. However, I am glad to have to tell you that I am safe again in a civilized town, with all my collections landed in good condition.

“The river Cuparé proved an excellent locality. The banks of the Tapajos are too dry and sandy, and the forest too sparse for any great abundance of insects; but the district of the Cuparé proved to be a deep and wide valley, between the dry hilly country, the soil clayey, and the forest very luxuriant. I reached the country of the savage Indians, passing the last half-civilized village (called Maloca) of the Mundurucus, and must have been near the sources of the Xingá. I was sorry to find no great amount of novelty among the Diurnes, *i. e.*, groups of new species of conspicuous things, which we may say make a great change in the fauna of a country, as was the case in passing up the Amazons to Ega. But the number of new species, one or two of a genus of those genera frequent at Pará, &c., will be great, and I have no doubt will much please our friends. In the genus *Papilio* I found nothing new, and the usual species very rare; this was the case generally in the *Nymphalidæ*, but I have plenty of species new to me in *Pieris*, *Leptalis*, *Heliconia*, *Ithomia*, *Eurygona* and allied genera, *Nymphidium*, *Calospilus*, *Satyridæ*, *Theclæ* and *Hesperiadæ*. A few Ega species occurred, such as *Papilio Pausanias*, *Timetes Themistocles*, and *Margarea*, two species of *Cybdelis* and one *Arisba*, but only one or two individuals of each. There is a small but I think very good collection of *Coleoptera* and other orders. I also paid much attention to the fishes; most of them were very curious and new to me. Of the small kinds I preserved two or three specimens of all the species I could get, perhaps forty species; of the larger species I could not get

specimens, for such was our paucity of provisions, and the insufficiency of our means to take plenty of fish, that there were never any to spare, and it would have been running the risk of mutiny to abstract a specimen for my pickle-jars from my hungry people.

“I made a great effort to get specimens of the hyacinthine macaw, and engaged two hunters for some ten or twelve days. They ascended amongst the cataracts in a small boat, and I thus obtained six tolerable skins; although the price given by ornithologists in London, will never repay the extra expense and trouble they occasioned me.

“I am sorry I cannot get any part of the things ready to send by this vessel. I arrived here quite exhausted, suffering under a bilious attack, and quite incapable of doing anything; but now, thanks to a course of calomel, rest, and wholesome food, am a little better.

“H. W. BATES.”

Occurrence of the Otter in various Localities.—In the ‘Nottingham Journal’ for the 25th of February, 1853, it is stated that “An otter of about 30 lbs. weight was shot at Barrow-on-Soar, Leicestershire, on Saturday last.” There has also been one seen about Colwick Hall, Nottingham, this winter. A few years ago an otter was shot at Beeston Weir, by the present Sir Robert Clifton, who saw it come out of the water as he was lying in wait for ducks in the dusk of the evening. Traces of otters are still occasionally seen on the river Derwent, between Matlock and Derby; but the animals must be in extremely small numbers. An otter was caught in a landing-net some months ago in the Thames, a short distance below Windsor Bridge. There are still a few of them in the slow-running feeders of the the Thames in Berkshire.—*Edward Wolley; Beeston, February 25, 1853.*

Additions to the List of Birds of Orkney and Zetland.—In addition to our list of birds printed in 1848, besides the occurrence of several rare species, we have to add the following, as novelties:—Tengmalm’s owl, (*Noctua Tengmalmi*); the common whitethroat, (*Curruca cinerea*); Bohemian waxwing, (*Bombycilla garrula*); and spotted redshank, (*Totanus fuscus*).—*Wm. Balfour Baikie, M.D.; Haslar Hospital, March 2, 1853.*

Occurrence of the Collared Pratincole (Glareola torquata) in Wiltshire.—I have great pleasure in recording the occurrence of that rare visitor to this country, the collared pratincole, which pleasure is considerably enhanced by the circumstance of its being shot in my own county, and of its finding its way into my collection, through the kindness of the gentleman who killed it. It appears that in the middle of November last, when Mr. Hussey, a farmer, of Tilshead, was walking over his land, the day being very rough and cold, the wind blowing from the East, he saw a strange bird descend near him with the velocity of lightning, and settle inside a sheep-fold among the sheep.

As Mr. Hussey chanced very fortunately to be an observer of birds, he immediately remarked that this was one he had never seen before, and pointed it out to his shepherd, who was with him, desiring him to watch the bird well while he returned to his home, at the distance of a mile, for his gun. Before he went, however, he saw the bird suddenly rise from the ground, and after a short flight of the most marvellous velocity, return again to the fold, where it seemed to enjoy the shelter from the bleak East wind, and to care nothing for the presence of the sheep, the men, and the dogs. This short excursionary flight was renewed several times, which made Mr. Hussey hesitate whether he should take the trouble to return home on so remote a chance of still finding on his return so singularly restless and swift a bird; however, as the bird always came back to the same spot after each successive excursion, Mr. Hussey hesitated no longer, but hurried home for his gun, giving strict charge to the shepherd to keep quiet, and on no account to lose sight of the bird. Now the shepherds of Salisbury Plain (in the midst of the bleakest part of which the parish of Tilshead lies) are not remarkable for their sharpness, indeed, I fear we must own them to be the perfection of all that is dull, heavy, and ignorant; no wonder, then, that a bird so very rapid in its movements as the collared pratincole should soon elude the slow gaze of the heavy-eyed Argus, and that on Mr. Hussey's return, in answer to his inquiries as to the whereabouts of the strange bird, he should be met with the provoking reply, — "Doant know, zur, he flee'd away so terrible sudden that I could'n zee 'en nowhere, I could'n: I never zee sech a bird to flee." Upon this, it may be supposed that Mr. Hussey walked on somewhat disappointed, when, in a moment, at the distance of about 30 yards, up sprang the bird, and was darting off at a prodigious rate, but a well-aimed shot laid it dead on the ground. On picking it up, the long wings and forked tail caused Mr. Hussey and others to suppose it to belong to the swallow tribe, and the dull-eyed shepherd, seeing no brilliant hues in the dead bird, as if to excuse his slowness, exclaimed with a sneer of contempt, "Well, zur, 'taint much of a bird, arter all, I'm zure!" In addition to the above narrative, Mr. Hussey tells me that "the land on which I found the bird, was of a stiff clay soil. I shot it close to the sheep-fold, where there were sheep feeding off turnips; the bird appeared to be rather tame, but whether from exhaustion or nature I cannot tell." I have already remarked that Tilshead lies in the middle of Salisbury Plain, and a more bleak, exposed situation can scarcely be imagined. The village is long and straggling, and all around it are large tracts of open down, now in a great measure brought into cultivation, but formerly a vast expanse of unbroken turf. Here, it is well known, the great bustard had a stronghold, where he was chased with greyhounds, and afforded admirable sport to the Wiltshire squires of that day; and here may still be found many of the family Charadriadae, — the golden plover, and the dotterel, as well as the commoner peewit; so that the situation is just such as seems fitted to the habits of the pratincole, and yet this is (I believe) the first instance known of the occurrence of that bird in Wiltshire. Seldom indeed does this singular bird appear to have visited our island; in addition to the few captures recorded in Yarrell's 'British Birds,' the last of which was in 1840, I believe it has but twice been observed, and both these occurrences were in the northern counties. It is singular, too, that while every record of the date of its capture has pointed to the summer as the time chosen for its visit (the months of May and August being the only ones on which it has been seen), the individual of which I am writing chose a cold raw day in the middle of November, to make its appearance during an East wind, on one of the most exposed parts of the bleak Wiltshire downs. I believe I have

nothing more to add to this account, except that my bird scarcely deserves the name of "torquata," his collar being very indistinctly marked; the position of it however is clearly seen by the dark brown spots which almost encircle his pale fawn-coloured throat; hence I conclude, from Mr. Yarrell's description, that mine is a bird of the year.—*Alfred Charles Smith; Yatesbury Rectory, Calne, March 7, 1853.*

Occurrence of the Fire-crested Regulus (Regulus ignicapillus) near Penzance.—A day or two since another adult male specimen of the fire-crested Regulus was obtained from Lariggan Valley, near this town, the locality whence nerly all the examples I have reported to you have been obtained.—*Edward Hearle Rodd; Penzance, Feb. 23, 1853.*

The Apteryx in Britain.—As the Apteryx is confined to a very limited region on the opposite side of our planet, not aquatic in its habits, totally incapable of flight, and consequently one of the last birds likely to be met with in Britain; I think the readers of the 'Zoologist' would feel obliged to Mr. Spode, if he would favour them with a more detailed account of the occurrence of this bird, which, in his communication of January 28 (Zool. 3815), he merely states was shot on a marsh in Anglesea "some three or four years ago." It would be interesting to know as much of its habits as the person who shot it observed; at what time of the day, and at what season of the year it was obtained; what condition it was in; and what vessels (if any) were wrecked in the neighbourhood at the time. It is highly improbable that any one who would be at the trouble of bringing a bird so very difficult to cater for during a long voyage all the way from New Zealand, would, after all his pains, turn it adrift in North Wales; and in the event of a wreck, the Apteryx seems one of the last creatures likely to escape. Without some of these particulars, I fear it will prove as difficult for the readers of the 'Zoologist' to account for the presence of the Apteryx in Anglesea, as it would be for the physiologist to explain the growth of Mr. Pickard-Cambridge's spider (Zool. 3766) which, that gentleman tells us, increased to at least ten times its original bulk "without material sustenance."—*Edmund Broune; 10, Bedford St., Bedford Row, February 22, 1853.*

Catalogue of the Fishes of Orkney and Zetland.

By WILLIAM BALFOUR BAIKIE, Esq., M.D.

Order I.—PLAGIOSTOMI.

Sub-order 1.—*Raiinæ.*

Raiidæ.

Thorn-back, *Raia clavata.* Very abundant.

Sharp-nosed Skate, *Raia oxyrhynchus.* Not uncommon.

Skate, *Raia Batis.* Abundant.

Sub-order 2.—*Squalinæ.*

Squatidæ.

Angel Fish, *Squatina Angelus.* Rare.

Scymnidæ.

Greenland Shark, *Scymnus borealis*. One specimen in Zetland.

Alopiidæ.

Fox Shark, *Alopias Vulpes*. Not common.

Lamnideæ.

Porbeagle, *Lamna Cornubica*. Not rare.

Basking Shark, *Selachus maximus*. Rare.

Squalidæ.

Blue Shark, *Carcharias glaucus*. Not unfrequent.

White Shark, *Carcharias vulgaris*. Doubtful; on Low's authority.

Galeidæ.

Smooth Hound, *Mustelus lævis*. Occasionally met with.

Scylliidæ.

Small-spotted Dog-fish, *Scyllium canicula*. Very common.

Large-spotted Dog-fish, *Scyllium catulus*. Rare.

Spinacidæ.

Piked Dog-fish, *Acanthias vulgaris*. Very abundant.

Order II.—HOLOCEPHALI.

Chimæridæ.

Northern Chimæra, *Chimæra monstrosa*. Hitherto obtained only in Zetland.

Order III.—GANOIDEI.

Sub-order.—*Chondrostei.**Acipenseridæ.*

Sturgeon, *Acipenser Sturio*. Mentioned on Low's authority; no specimen of late years.

Order IV.—LOPHOBRANCHII.

Syngnathidæ.

Great Pipe-fish, *Syngnathus acus*. Common.

Deep-nosed Pipe-fish, *Syngnathus Typhle*. Rare.

- Æquoreal Pipe-fish, *Syngnathus æquoreus*. Not rare.
 Snake Pipe-fish, *Syngnathus anguineus*. Not uncommon.
 Worm Pipe-fish, *Syngnathus lumbriciformis*. Common.

Hippocampidæ.

Short-nosed Hippocampus, *Hippocampus brevirostris*. One dead specimen obtained.

Order V.—PLECTOGNATHI.

Gymnodontidæ.

Pennant's Globe-fish, *Tetrodon Pennantii*. Very rare. Two specimens have occurred in Orkney.

Short Sun-fish, *Orthogoriscus mola*. Has been obtained on two or three occasions.

Oblong Sun-fish, *Orthogoriscus oblongus*. One specimen obtained in Orkney.

Balistidæ.

European File-fish, *Balistes capriscus*. One specimen obtained in North Ronaldsey, about 1827 or 1828, is at present in the possession of William Traill, Esq., of Woodwick.

WM. BALFOUR BAIKIE.

Haslar Hospital, Gosport, March 2, 1853.

(To be continued.)

Occurrence of Herrings in the Lakes of Killarney.—At a meeting of the Dublin Natural History Society on the 11th of January, 1853, Mr. Ffennell, Inspecting Commissioner of Fisheries, said that in one of his tours of duty, when inspecting the salmon-fisheries in the neighbourhood of Killarney, he was much surprised to find taken in the salmon-nets what he at the time considered to be the pollan. He had, at a meeting of the Society last session, mentioned several widely situated localities where pollan had been met with in this country, and he was therefore pleased at being able to trace their existence still further. This was in the month of May last. The matter escaped his further attention, until Mr. Mulvanny, Commissioner, accidentally saw the specimens that he (Mr. Ffennell) had obtained and preserved in spirits, and at once pronounced them to be the true herring, identical with those taken on this coast, noticing at the same time the absence of the fatty dorsal fin which characterized the pollan and the trout species. A fact so interesting led Mr. Ffennell to make more full inquiries, and he found that the herring abounded at seasons in the lakes at Killarney, and that they could be taken in numbers. Although very frequently taken in the salmon-nets, the fishermen, by whom they were known as and called "goureens,"

did not seek them. The specimens exhibited by Mr. Ffennell were taken in the Lower Lake of Killarney, fourteen miles from the head of the tide-way. According to the seasons, if the fishermen used proper means of capture, he thought that herrings might be taken there in abundance. Mr. Andrews remarked that he could not but receive with astonishment such a statement. He was aware that many singular habits of fish had been noticed; the mullet and the cod-fish have been recorded as living in fresh water, and the finest soles have been taken in the Arun river, miles above the tide-way, and where they breed and remain throughout the year. Nilsson states instances of the salmon remaining permanently in fresh water, for it is known that it winters in the interior Swedish lakes, Wenern and Silgern, from whence it ascends the rivers at the close of the spring, without entering the salt water at all. Could the *Clupea harenga* be proved to be in such numbers in Killarney, it would be of vast importance to that district. Jolters brought them from the coast to Killarney and other inland places. Too frequently the uncertainty of taking herrings, and the storminess of the weather, made them scarce and dear. Mr. Andrews was aware that the *Alosa* had been met with in the rivers in Kerry, but it was difficult, in the young state, to detect well the differences between *A. communis* and *A. finta*. They were frequent in some of the rivers in England, and abundant in the northern lakes and rivers of Europe. *Alosa finta* spawned in fresh water in May.—*From the Report in 'Saunders's News-Letter,' February 18, 1853.*

Occurrence of Pennant's Globe-fish (Tetrodon Pennantii) near Ardmore, Co. Waterford.—My communication [to the Dublin Natural History Society] dated Ardmore, Co. Waterford, Sept. 28, 1852, was to the following purport. I am anxious to place on record the occurrence of *Tetrodon Pennantii*, a fine specimen of which was washed ashore here on Sunday, the 26th instant, after a smart North-easterly gale. It was dead when found. This makes the third specimen which has been taken on the Irish coast, and it differs from Pennant's description, both in the colour of its spines, and in the fact of its having a double row of dark spots extending from the snout, backwards over the eyes, and ending by curving downwards in front of the branchial openings. These spots, when the skin dried, became elevated and rough to the touch. The measurements of this fish were as follow:—From the mouth to the extremity of the caudal fin, 21 inches: from the commencement of the spines beneath the lower jaw to the vent, 13 inches: circumference round the moderately dilated pouch, 33 inches. The fin-notation was:—Caudal, 7: dorsal, 12: anal, 12: pectoral, 14. The colour of the fish was a most brilliant ultra-marine blue on the back; the belly silvery; pouch gray, covered with white spines, each arising from four roots; the spines extended from beneath the lower jaw to the vent. The irides were gray, with white spots. In other respects the fish agreed with Mr. Yarrell's description. After it was preserved, the colours faded considerably, especially that on the back.—*Edward H. Sargent; 19, Bolton Street, Dublin, February 18, 1853.*

Note on Frogs and Toads inclosed in Stones.—During the summer of 1846, in the formation of a railroad, about half a mile from Pontefract, in Yorkshire, the works were carried a "depth of four feet through a rock betwixt lime and sandstone, about the junction of the two formations;" the rock being so firm as to require blasting. "It is entirely free from beds of any kind, or what the workmen term 'backs' running up

it," but therein are "an infinite number of small nodules of a harder quality, entirely crystallized in the interior." After blasting, the labourers were much surprised to find among the fragments several of these nodules, each one containing a frog, as many as seven having been counted after one "shot." These were not casually seen when exposed, and then disregarded, but were examined in their stone prisons through very minute holes, some even preserved in that state for a long period. For example, the relator states of one specimen, "I kept this toad in a cellar for about five months, during which time it ate nothing, and was without light, the hole in the stone being covered with a piece of clay, and the whole kept moist and cool with water." Of another he says, "The frog lived only about a week, as I kept it in a place which I think was too warm for it, and also not sufficiently dark and quiet. When the frogs were disturbed by the shots, their first desire seemed to be to get under shelter of some stone, or into their old holes again, showing thereby that sight was not wanting, and bodily activity was perfect as far as could be seen. One thing struck me as singular with regard to the frog I kept, its fresh, plump, and healthy appearance, its skin being soft and transparent. One day when I was holding my finger over the hole in the stone, it pushed its head between my finger and the sides of the hole, and drew its whole body after it on to the table, where it appeared more like a skeleton than any living animal I have ever seen, but by degrees it extended itself to its former dimensions." Of the above curious occurrence my only knowledge is derived from the account, written to a distant friend, of which the substance has now been extracted. The writer is an utter stranger, but he was officially employed in the operations which resulted in the discoveries; and my information leads me to believe his report deserving of confidence, for which reason I have not hesitated to offer this abstract for publication in the 'Zoologist.' Since the above narrative was submitted to my perusal, and before I received permission to make this communication, I have read Mr. Plant's notice (Zool. 3808) repudiating the credibility of "these marvellous relations." Without expressing an opinion whether or not the Chesterfield quarry-men he mentions desired to impose upon him, it may be suggested, that the failing to meet with a *confessedly great rarity* within a given (and comparatively short) space of time, no more proves the non-existence of that rarity, than the innocence of a culprit was established by his asserting, when sundry witnesses affirmed they saw him commit the offence he was accused of, that he could produce ten times the number, who would swear they *did not* see him. — Arthur Hussey; Rottingdean, March 15, 1853.

[Having ever warmly advocated inquiries of this kind, and strenuously opposed all attempts to quash such inquiries by the statement that the phenomena were contrary to what *ought* to be the proceeding of Nature; I am bound, not merely by courtesy and fairness, but by consistency, to give every encouragement to the expression of opinion on this and every other moot question, and shall be very glad to receive and publish any communication on the subject: at the same time I must beg correspondents to make their communications as precise as possible. In almost every statement I have yet seen on this subject, there is an absence of that exactitude which ought always to accompany records of phenomena that are liable to be controverted. — Edward Newman.]

Note on Large Snakes. — Seeing in your last number (Zool. 3809) a note from Mr. Pickard-Cambridge, giving the dimensions of a snake's skin, 4 feet 2 inches long, which he recorded for its large size, I beg to state that in two instances snakes exceeding 4 feet in length have come under my observation: both occurred here. The

first was captured by my brother, a few years ago, to add to a collection of live snakes which we kept in a cask and tried to tame. This specimen exceeded 4 feet in length by an inch or two, but I cannot distinctly remember by how many inches. On being caught, it struck my brother's hand, and inflicted a wound which bled freely. This is the only case in which I have seen the bite of the common snake bring blood; and this snake, though we tried him, never struck again with the same force. The second instance of a large snake was a recently killed one, which I found the year before last while out butterfly-catching. This snake, from its size, I was induced to measure on the handle of my butterfly-net, and found that it must have been about 4 feet 1 inch long. Doubtless snakes of this large size are of very rare occurrence. The largest viper I remember to have measured was exactly 2 feet 1 inch in length. — *William Henry Hawker; Ashford Lodge, near Petersfield, Hants, March 15, 1853.*

NOTICES OF NEW BOOKS.

‘*A Naturalist's Sojourn in Jamaica.*’ By PHILIP HENRY GOSSE, A.L.S., &c.; assisted by RICHARD HILL, Esq. London: Longmans. 1853.

“NATURAL HISTORY is far too much a science of dead things; a *necrology*. It is mainly conversant with dry skins furred or feathered, blackened, shrivelled, and hay-stuffed; with objects, some admirably beautiful, some hideously ugly, impaled on pins, and arranged in rows in cork drawers; with uncouth forms, disgusting to sight and smell, bleached and shrunken, suspended by threads and immersed in spirit (in defiance of the aphorism, that ‘he who is born to be hanged will never be drowned’) in glass bottles. These distorted things are described; their scales, plates, feathers counted; their forms copied, all shrivelled and stiffened as they are; their colours, changed and modified by death or partial decay, carefully set down; their limbs, members, and organs measured, and the results recorded in thousandths of an inch; two names are given to every one; the whole is enveloped in a mystic cloud of Græco-Latino-English phraseology (often barbaric enough),—and this is Natural History! Of the hundred thousand animals which are considered as ‘known to naturalists,’ it is probably much within the mark to assert that ninety thousand are ‘known’ only in such sort as is described above. What should we think if the world were to collect from Egypt the tens of thousands of mummies that are said to be entombed in the mighty catacombs of that country, and having placed them in museums should appoint learned men minutely to measure their differing features and limbs, to describe

their appearance with exactitude, and to depict their portraits in all the leathery blackness of their physiognomy; then to give each a name and record the whole in a book,—what should we think if the world would call this Egyptian *History*?

“It is manifest that there is not an iota of *History* in either the one or the other. For *History* is the record of the actions of men, their relations to other men, the circumstances in which they acted, their characters, the influence of their lives upon society, their connexion with the times preceding and following their own, and other points of interest, not one of which could be gathered from a description of their dead and preserved bodies, though ever so exact and minute. So, that alone is worthy to be called *Natural History*, which investigates and records the condition of living things—of things in a state of nature; if animals, of *living* animals:—which tells of their ‘sayings and doings,’ their varied notes and utterances, songs and cries; their actions, in ease and under the pressure of circumstances; their affections and passions, towards their young, towards each other, towards other animals, towards man; their various arts and devices, to protect their progeny, to procure food, to escape from their enemies, to defend themselves from attack; their ingenious resources for concealment; their stratagems to overcome their victims; their modes of bringing forth, of feeding, and of training their offspring; the relations of their structure to their wants and habits; the countries in which they dwell; their connexion with the inanimate world around them, mountain or plain, forest or field, barren heath or bushy dell, open savanna or wild hidden glen, river, lake, or sea:—this would be indeed *Zoology*, *i.e.*, the science of *living* creatures. And if we have their portraits, let us have them drawn from the life, while the bright eyes are glancing, and the flexible features express the emotion of the mind within, and the hues, so often fleeting and evanescent, exist in their unchanged reality, and the attitudes are full of the elegance and grace that free, wild nature assumes.”—*Preface*, p. v.

To these observations we most cordially say Amen! They are after our own heart; they advocate that very system of observation which we have ever advocated; they go far to hold up *Natural History* in a more attractive form than usual,—to place it in a better light than usual; they recall to our minds the labours of Gilbert White; they breathe the very essence of that spirit in which the idea of the ‘*Zoologist*’ was conceived, and in which it has been our unceasing wish to conduct it. Honour be to Mr. Gosse for his sentiments; and honour be to him for this promise of amending *Natural History*: honour be

to him also for the manner in which his promise has been kept. His 'Naturalist's Sojourn in Jamaica' is a capital book; a book full of amusing instruction; a book which we cordially commend to every lover of Nature. Here are a few extracts from its truly pleasant pages.

Pelicans. — "Many little flat kays, as such islets are called, lay around, among which our tortuous course led us; scarcely more than the flat tops of coral rocks, almost level with the sea, on which sand and shells had been accumulated by the waves; yet pleasant to look on, because covered with low bushes of a refreshing greenness. On their snowy beaches, where the gentle ripple was sparkling, or perched on the irregular blocks of black rock, that lay half covered with the tide, sat many pelicans, preening their plumage, and dashing the water over their wings, or lazily resting after their morning's fishing excursion. Some sat sleepily on the sea, their forms reflected from its bosom, inert and motionless, except for the alternate rise and fall which were produced by the undulation of the ground swell."—p. 22.

The Painted Swift-foot. — "About the rocks in the vicinity of Black River, I noticed many specimens of this beautiful crab (*Grapsus tenuicrustatus*). Its form is remarkably flat, as are also the legs, and particularly the thighs, which pack one on the other in a very curious manner: the hue is a chaste warm gray, marked with transverse zig-zag black lines, somewhat like writing. It is difficult to capture, for it is very wary, and its swiftness of foot is amazing: it darts from side to side over the rough surfaces of the rocks, with a rapidity that is much more like flying than running; not in a continuous course, but fitfully and irregularly, now shooting hither, now thither, and remaining still for momentary intervals between, watching for the intruder. What is remarkable is, that it does not matter whether the rock upon which it runs so swiftly be horizontal or perpendicular, nor whether its back or its belly be uppermost; it shoots round the projecting ledges, and darts about on their under sides, with as perfect security and ease as on the broad flat top of the rock. Does not this indicate a delicate sense of touch in the tips of its shelly feet?"—p. 34.

Pelicans and Man-of-war Birds. — "In the smooth water in-shore, that accurately reflected the outline of the land, long strings of pelicans were alternately plunging after their prey, and sailing on heavy flagging wing; and far, far overhead, like black specks against the bright sky, a flock of man-of-war birds were placidly floating; resting, if I may be allowed the term, in the lofty air, after their morning meal upon the flying-fish in the offing."—p. 36.

The Soldier Crab.—“Among the loose pebbles that formed the surface of this hill wherever the huge out-cropping masses of rock did not appear, and that added to the difficulties of penetrating the maze, were many large shells. The first of these that I saw was a large round brown snail (*Helix Jamaicensis*), and as its exterior was very fresh, I thought I had a prize; but on taking it up, I saw the large claw of a hermit crab, red and tuberculous, closing up the orifice, which it exactly fitted. The negroes call these crabs soldiers, perhaps from their red hue. Afterwards I saw other specimens, and some of a large Trochus (*Meleagris picus*) with pearly interior, as well as a capacious Ampullaria, inhabited by the same species. It crawls irregularly, but quickly, making its shell rattle against the pebbles as it proceeds; but if alarmed, it instantly withdraws into its house, and bringing its strong legs around its head in the form of a semicircle, claps its great claw upon the whole, presenting, as I have said above, nothing but a hard, shelly, prickly, convex surface, within the margin of the house, so accurately filling the aperture, and so strongly held down, that it is impossible to extract the animal alive without breaking the shell to fragments. Yet the wary soldier is ready for fight: while I was holding one in my hand, the rogue protruded his claw, and seizing the skin of my palm, fairly took the piece out.

“The species was the well-known *Cænobita Diogenes*, and, as I afterwards found, abundantly common in the woods near the coast. I even found it numerous, inhabiting the shell of the same large *Helix*, far up on the side of the mountains, behind Blue-fields, in the driest and most rocky situations. Sir H. de la Beche found it inhabiting sea-shells, near the Rio Minho, ten miles from the sea. It is evident that the active little creatures must have crawled the whole distance, and as the *Helix* is found in a living state only in the woods, and as far as I know, only in the mountains, it follows that the soldiers must have travelled up the country in their sea-side shells, until they came to the region of the *Helix*, and there have changed their houses, and brought the latter down towards the sea on their return. Many of the *Helix* shells were so pearly in the interior, and so bright and fresh on the exterior, as to show that they could not have long lain exposed to the weather since tenanted by the original proprietor. This suggests the inquiry, whether in any case the *Cænobita* destroys the snail to obtain his shell for a dwelling.”—p. 44.

Long-tailed Humming-bird.—“While I was up in the calabash tree, engaged in detaching the bunches of *Oncidium*, the beautiful long-tailed humming-bird (*Trochilus polytmus*) came shooting by with

its two long velvet-black feathers fluttering like streamers behind it, and began to suck at the blossoms of the tree in which I was. Quite regardless of my presence, consciously secure in its power of wing, the lovely little gem hovered around the trunk, and threaded the branches, now probing here, now there, its cloudy wings on each side vibrating with a noise like that of a spinning-wheel, and its emerald breast for a moment flashing brilliantly in the sun's ray; then apparently black, all the light being absorbed; then, as it slightly turned, becoming a dark olive; then in an instant blazing forth again with emerald effulgence. Several times it came close to me, as I sat motionless with delight, and holding my breath for fear of alarming it, and driving it away; it seemed almost worth a voyage across the sea to behold so radiant a creature in all the wildness of its native freedom."—p. 48.

Calling Crabs.—“A small stream running through a foetid morass crosses the road about half a mile from Blue-fields, and has deposited a broad flat bank of mud at its mouth, which is uncovered at low water. At this time it is seen to be pierced with innumerable little holes; and hundreds of a tiny calling crab (*Gelasimus vocans*) are running over its surface, the males of which hold up their enormous claw in front, as if in defiance.

“At the approach of an intruder, every one hastens into his burrow, and in a moment the muddy bank, that was alive with the moving atoms, is perfectly still; except that a dull-coloured but agile beetle (*Cicindela Guadalupensis*) is flitting about and alighting upon it. The little crabs are very swift and wary, so that it is difficult to capture them, except by making a sudden rush from a distance among them.”—p. 50.

Glow Flies.—“I will now speak of our other luminous insect, the glow-fly, (*Pyrophorus noctilucus*). From February to the middle of summer, this beetle is common in the low lands, and at moderate elevations. Lacordaire's account of the luminosity of this Elater (known to me, however, only by the citation in Kirby and Spence's 'Introduction to Entomology,' ii. 333, 6th edit.) differs so greatly from the phenomena presented by our Jamaica specimens, that I cannot help concluding that he has described an allied but very distinct species, and I feel justified therefore in recording what I have myself observed. The light from the two oval tubercles on the dorsal surface of the thorax is very visible even in broad daylight. When the insect is undisturbed, these spots are generally quite opaque, of a dull white hue, but, on being handled, they ignite, not suddenly, but gradually, the

centre of each tubercle first showing a point of light, which in a moment spreads to the circumference, and increases in intensity until it blazes with a lustre almost dazzling. The colour of the thoracic light is a rich yellow-green. In a dark room, *pitch dark*, this insect gives so much illumination as to cast a definite shadow of any object on the opposite wall, and when held two inches from a book, the whole line may be read *without moving it*. The under part of the thorax has a singular appearance when the tubercles are fully lighted up, for the horny coat of skin being somewhat pellucid, displays the light within redly and dimly, as if the whole thorax were red hot, particularly at the edges, immediately beneath the tubercles. When left alone, the insect soon relapses into stillness, and the tubercles presently fade into darkness, either total, or redeemed only by a spark scarcely perceptible.

“I had been familiar with this glow-fly for some weeks, and had made the above observations on it, without being aware that it possessed any other source of light than the thoracic tubercles. I had indeed remarked that when flying at liberty the light which it diffused was of a *rich ruddy glow*, and yet these individual insects, if captured and held in the hand, showed only a *green* light. I much wondered at this, but knew not how to account for it, until a friend explained it, illustrating his remarks by experiment. On the *ventral surface*, when the abdomen is extended, there is seen between its first segment and the metathorax, an oval transverse space, covered with thin membrane, which glows with orange-coloured light, totally concealed, however, when the abdomen is relaxed, by the over-lapping of the metathorax. When the insect is placed on its back, it throws itself into the air like other Elaters; but if it be made to repeat this many times it appears to become weary, and endeavours to raise itself by bending the head and the abdomen back, so as to rest on the extremities, in hope to *roll over*. It is when thus recurved that the abdominal light suddenly appears, the oval space being uncovered. When held in the hand, the same effect is produced by forcibly bending back the abdomen with the fingers; but this is not very easy of accomplishment, on account of the resistance of the closed elytra; but if these be held open with one hand, and the abdomen recurved with the other, it is readily shown. As the open space, then, can be exposed only when the elytra are expanded, the reason is manifest why the red light is never displayed by the insect when walking or resting; the green thoracic light, on the other hand, *may* be displayed at any time; it is however very rarely shown during flight. On one occasion two or three glow-flies, having entered the sitting-room in the even-

ing, gave out the red light most brilliantly as they flew round near the ceiling, the spectators being beneath them; one of these, being alarmed by my efforts to capture it, gave out the thoracic light also very brightly; and the mingling of the green and red light in the evolutions of flight produced an effect indescribably beautiful.

“That the thoracic light is subject to the will of the insect is indubitable; but whether the same can be predicated of the abdominal light I am not assured. During flight it is every second intermitted, as far as the observer can detect; but its appearance or disappearance may depend upon whether the dorsal or ventral surface is presented to the eye. This is when, soon after dark, the insect is sweeping in rapid, headlong, irregular curves over the fields or along the edges of the forest, when the appearance resembles that of a stick with the end on fire (but not in flame) carried or whirled along by one running swiftly, quenched suddenly after a course of a dozen yards, to appear again at a similar distance. When slowly flying over the grass, the progress of one may often be traced by the red glare on the ground beneath; a space of about a yard square being brightly illuminated, when no light at all reaches the spectator’s eye from the body of the insect.”—p. 106.

The Venus Lizard. — “One day in February, having ascended the ridge with a companion, my attention was arrested by a lizard about a foot long, and of a lively green colour, on the trunk of a small tree, head downward, intently watching our motions as we stood near. My young friend suggested the possibility of capturing it by slipping a noose over its head, while its attention was engaged by whistling. I laughingly proceeded to try the spell, and having made a noose of small twine, which I tied to the end of a switch, I gently walked towards him, whistling a lively tune. To my astonishment, he allowed me to slip the noose over his head, merely glancing his bright eye at the string as it passed. I jerked the switch, the music ceased, and the green-coated forester was sprawling in the air, dangling, greatly to his annoyance, at the end of my string. He was very savage, biting at everything near; presently his colour began to change from green to blackish, till it was of an uniform bluish black, with darker bands on the body, and a brownish black on the tail; the only trace of green was just around the eyes. I carefully secured without injuring him, and brought him home in the collecting-basket, into which I had no sooner put him, than he fiercely seized a piece of linen in his teeth, and would not let it go for several hours. I transferred him to a wired cage, linen and all, and at length he suddenly let go his hold, and

flew wildly about the cage, biting at anything presented to him. At night I observed him vividly green, as at first; a token, as I presumed, that he had in some measure recovered his equanimity. The next day he continued very fierce. I hung the cage out in the sun; two or three times in the course of the day I observed him green, but for the most part he was black. The changes were rather quickly accomplished.

“After he had been in my possession about four days, I observed him one morning sloughing his skin; the delicate epidermis, loosened from the body and legs, looked like a garment of thin white muslin, split irregularly down the legs and toes, and separated from that of the tail, on which the integument yet adhered unbroken. Throughout the day the loosened skin hung about the animal, though more and more loosely. He had not abated a whit of his fierceness; leaping at a stick pointed at him, and seizing it forcibly with his teeth.

“Another individual, caught in the same locality, and by the same device, I introduced into the cage of the former, who did not offer any molestation to the intruder. After they had remained in my possession, the one about six weeks, the other about four, they both died, almost on the same day, and both in the process of sloughing. In this operation the skin appears to be first separated from the head; for in one of these it was perfectly loose from the whole head, and was removable in one piece, but to the neck and entire body it still adhered by organic union. I suspect that the sloughing of the skin is, at least sometimes, the result of universal excitement. All that I had taken alive, and caged (amounting to many individuals), after the most violent behaviour at first, soon sloughed; usually the very next day. The food of this lizard appears to include both vegetable and animal substances. I was never able to induce one to eat in captivity; but the dissection of several has given me this result. Thus in one I found hard seeds and farinaceous substance; in another the fragments of a brilliant Curculionideous beetle, and other insects. I once observed a large one on the summit of the mountain, deliberately eating the ripe glass-eye berries, munching half of one away at a mouthful. It would require no great warmth of imagination to identify these sunny, spicy, pomiferous groves with the golden-fruited gardens of the Hesperides, and this fierce, sinister, saw-crested lizard, with the watchful dragon that guarded them. If I had the naming of him, I would call him Ladon.”—p. 148.

(To be continued).

'*The Annals and Magazine of Natural History*,' No. 63, dated
March, 1853.

THE communications to this number are intituled : —

'Descriptions of some of the larger forms of Fossilized Foraminifera in Scinde ; with Observations on their Structure.' By H. J. Carter, Esq., Assistant Surgeon, Bombay Establishment.

'Further Notes on British Zoophytes, with Descriptions of New Species.' By the Rev. Thomas Hincks, B.A.

'Observations on the genus *Schwenkia*.' By John Miers, Esq., F.R.S., F.L.S.

'Observations on Relative Position ; including a new Arrangement of Phanerogamous Plants : — Part II. On the Position of Carpels.' By B. Clarke, F.L.S., &c.

'Note on the *Gryphæa* of the bed called Gryphite Grit in the Cotteswolds.' By John Lycett, Esq.

'On two new Subgenera of *Calanidæ*.' By John Lubbock, Esq., F.Z.S.

'On the Germination of the Resting Spores, and on a form of Moving Spores in *Spirogyra*.' By Dr. W. Pringsheim. [Translated from the '*Flora*' of August 14 and 21, 1852, by Arthur Henfrey.]

'Revision of the Families of Nudibranch Mollusks, with the Description of a new Genus of *Phyllidiadæ*.' By J. E. Gray, Ph.D., F.R.S., V.P.Z.S., &c.

'Additional Notice of the Genus *Tancredia*, *Lycett*, *Hettangia*, *Turquem*.' By John Lycett, Esq.

'Rambles in Ceylon.' By Edgar Leopold Layard, Esq.

Bibliographical Notice:—Macgillivray's '*History of British Birds*.'

Proceedings of Learned Societies : — Professor Owen on the Anatomy of the Wart Hog. Mr. E. Newman on some Species of *Distichocera*.

Miscellaneous : — Notice of a Binocular Microscope ; by J. L. Riddell. On the Genus *Bifrontia* ; by J. E. Gray, Ph.D. On a New Method of Illuminating Opaque Objects for the high powers of the Microscope ; and on a new Achromatic Condenser ; by J. L. Riddell. On the Structure of the Cells of Plants. Meteorological Table.

This number contains 102 pages and 7 plates, and is charged double the usual price.

'Insecta Saundersiana : or Characters of undescribed Insects in the Collection of William Wilson Saunders, Esq. Diptera, Part IV. By FRANCIS WALKER, Esq., F.L.S. London : Van Voorst. March, 1853.

THE title of this work sufficiently defines its object. The present part contains 162 pages of letter-press, in 8vo., and 2 plates. The insects described are 5 new species of Conops, 1 of Gymnosoma, 1 of Trichopoda, 1 of Phasia, 1 of Hyalomya, 1 of Phania, 2 of Ocyptera, 74 of Tachina, 1 of Gonia, 21 of Dexia, 23 of Sarcophaga, 38 of Musca, 1 of Idia, 32 of Anthomyia, 6 of Cœnosia, 1 of Dryomyza, 4 of Sapromyza, 4 of Ortalis, 2 of Ropalomera, 2 of Sepsis, 2 of Lauxania, 2 of Lonchæa, 20 of Trypeta (*Tephritis, Auct.*), 15 of Calobata, 1 of Ulidia, 8 of Sciomyza, 2 of Tetanocera, 1 of Thecomyia, 2 of Heteromyza, 5 of Helomyza, 5 of Notiphila, 2 of Ephydra, 9 of Drosophila, 1 of Opomyza, 2 of Gymnopa, and 1 of Chlorops. The new species figured are 3 of Tachina, 1 of Phania, 1 of Ocyptera, 2 of Calobata, 1 of Ropalomera, and 8 of Trypeta.

'List of the Specimens of British Animals in the Collection of the British Museum. Part XII. Lepidoptera (continued).'
Printed by order of the Trustees. 1853.

THIS portion of the Lepidoptera, like the two which have preceded it, is from the pen of the late lamented James Francis Stephens. It comprises only the Crambidæ, and contains 54 pages 12mo. It is merely a synonymic list, without descriptions.

'List of the Specimens of Neuropterous Insects in the Collection of the British Museum. Part II. (Sialidæ—Nemopterides).'
Printed by order of the Trustees. 1853.

THIS portion of the general collection of Neuroptera, like that which has preceded it, is from the pen of Mr. Walker. It contains descriptions of all the species comprised in the Museum collection, *viz.* : — 3 of Sialis, 1 of Ithone, 1 of Merope, 1 of Dilar, 8 of Chauliodes, 17 of Hermes, 2 of Corydalidæ, 13 of Raphidia, 48 of Mantispa, 2 of Hophophora, 3 of Nymphes, 1 of Polystæchotes, 8 of Osmylus, 93 of Chrysopa, 66 of Hemerobius, 1 of Dromophila, 4 of Coniortes, 217 of

Myrmeleon, 81 of Ascalaphus, 1 of Stilbopteryx, 1 of Chorista, 3 of Boreus, 20 of Panorpa, 1 of Euphania, 18 of Bittacus, and 19 of Neuroptera.

'Shells and their Inhabitants. The Genera of Recent Mollusca arranged according to their Organization.' By HENRY and ARTHUR ADAMS. Part II. London: Van Voorst. February, 1853.

THE 1st part comprised the following genera of Cephalopoda: — Octopus, Cistopus, Pinnoctopus, Eledone, Cirrhotentis, Philonexis, Tremoctopus, Argonauta, Cranchia, Loligopsis, Chiroteuthis, Histio-
teuthis, Enoploteuthis, Ancistrocheirus, Abralia, Octopodoteuthis, and Onychoteuthis. All these genera are beautifully figured by Mr. J. de C. Sowerby.

The 2nd part comprises the following genera of Cephalopoda: — Ancistroteuthis, Onychia, Ommastrephes, Gonatus, Loligo, Teuthis, Sepioteuthis, Rossia, Sepiola, Fidenas, Sepia, Spirula, and Nautilus; and the following genera of Pteropoda: — Cavolina, Diacria, Clio, Balantium, Styliola, Triptera, Cymbulia, Euribia, Psyche, Tiedman-
nia, Limacina, Spirialis, Heterofusus, Cheletropis, Clione, Clidita, Pneumodermon, Spongiobranchia, Trichocyclus and Pelagia. All these are figured.

Proceedings of the Zoological Society.

Tuesday, February 8, 1853. — JOHN GOULD, Esq., F.R.S., in the chair.

Dr. Baird communicated a paper on new species of Entozoa, contained in the national collection at the British Museum, which he described under the following names: — *Ascaris similis*, *A. lævissima*, *A. bifaria*, *Gordius platyrurus*, *G. Tolosanus*, *G. verrucosus*, *G. violaceus*, *G. pustulosus*, *Mermis rigidus*, *M. spiralis*, *Pentastoma megacephalum*, *Tetrarhynchus rugosus*, *Tænia Bremseri*, *T. Calva*, *T. Zederi*, *T. Goezii*, *Bothriocephalus antarcticus*.

Dr. Gray communicated a description of the animal of *Cyclina siuensis*, which he stated was drawn up ten or twelve years ago, from a specimen presented to him by Mr. John Reeves, to whom we are indebted for the knowledge of the greater part of the animals of China with which zoologists are as yet acquainted. The animal in most particulars agrees with that of the genus *Dosinia*, next to which Dr. Gray lately proposed to place it in his arrangement of the genera of *Veneridæ*.

Mr. Adam White contributed a monograph of the genus *Ægosoma* of Serrille, with the description of *Cyrtonops*, a new genus allied to it, for the type of which he

proposed the name of *Cyrtonops punctipennis*. It was obtained in India. The additions to the genus *Cegosoma* are remarkable, and five in number, *viz.*, *Cegosoma sinicum*, collected by Mr. Fortune at Shanghai; *C. ornatocolle*, from India; *C. cingalense*, from Ceylon; *C. sulcipenne*, collected by Mr. Packman in Tenasserim; and *C. tibiale*, from Northern India.

The Secretary read to the meeting some extracts from notes on the Zoology of the Malay Peninsula, with which he had been supplied by Mr. George Windsor Earl, whose long residence in the Indian Archipelago had given him abundant opportunities for observation. Amongst the most remarkable animals alluded to, were two species of wild cattle, of immense size, to which the natives give the names of *Sapi* and *Saladang*.

The Secretary exhibited, on the part of Mr. Richard Hill, Corresponding Member, a beautiful series of birds' eggs, collected by that gentleman in Jamaica, and therefore authentically named. It is greatly to be regretted that a considerable number were broken in their transit to this country, or during their detention at Southampton. The extreme beauty of these eggs, and the certainty with which they have been determined, give an unusual value to this donation, although Mr. Hill has ever been regarded as one of the most active and intelligent contributors to the objects of the Society, in connexion with the Zoology of the great island in which he has so long resided.

Tuesday, February 22, 1853.—Dr. GRAY, Vice-President, in the chair.

Mr. Henry F. Walter exhibited a fine series of the eggs of vultures from his own extensive cabinet, for the purpose of comparison. The immediate object he had in view was to introduce to the notice of the meeting an egg of *Otogyps auricularis*, which he believes to be the only specimen as yet existing in this country, and in fact he is only acquainted with two others in the collections of the continent. The Society are so fortunate as to possess living examples of every genus of vultures, with the single exception of *Neophron*, the Egyptian vulture, which will be added to the menagerie, without difficulty, during the ensuing summer. Mr. Walter also exhibited the eggs of several other rare species of birds, which are at present living in the Society's menagerie, including the great snow-partridge of Persia, the *Kep-ke-dereh*, presented to the Society by Mr. Stevens, Her Majesty's Vice Consul at Tabreez. A beautiful drawing of this fine bird, by Mr. Wolf, was on the table. The most remarkable egg was that of the Tui bird (*Prothemadera Novæ Zealandiæ*), which was described for the first time, and is unique in Mr. Walter's collection. The Tui bird now in the Society's possession, has lived in the menagerie upwards of four years.

Mr. Gould exhibited a nearly complete collection of the family of *Rhamphastidæ*, or toucans, including fifteen species not yet figured in his Monograph. After pointing out the characters which distinguish the generic groups into which he separates them, Mr. Gould took occasion to describe a very singular addition to those previously known, conspicuously marked by a patch of bright blue on the throat; it belongs to the genus *Aulacorhamphus*, and received the name of *A. cæruleogularis*. It was collected in Veragua by Mr. Seemann, during the voyage of H. M. Surveying Ship, *Herald*. The Society's menagerie contains three fine species of toucans, *Rhamphastos toco*, *R. erythrorhynchus*, and *R. Ariel*. These very interesting birds are in perfect health, and even during the present severe weather take exercise every day in the open air in the great aviary.—*D. W. M.*

Proceedings of the Entomological Society.

March 7, 1853.—EDWARD NEWMAN, Esq., President, in the chair.

The following donations were announced, and thanks ordered to be given to the donors:—The 'Zoologist' for March; by the Editor. The 'Athenæum' for February; by the Editor. The 'Literary Gazette' for February; by the Editor. The 'Journal of the Society of Arts;' by the Society. 'Insecta Saundersiana.—Diptera, Part IV.;' by W. W. Saunders, Esq. 'Entomologische Zeitung' for November, 1852, and January, 1853; by the Entomological Society of Stettin. 'Annales de la Société Entomologique de France,' 1851; by the Society. 'Proceedings of the Royal Society,' Vol. vi., No. 94; by the Society. Boxes of English Lepidoptera from the following gentlemen:—Mr. F. Bond, Major Sheppard, Mr. A. F. Sheppard, Mr. Edwin Shepherd, and Mr. T. Boyd. A box of English Micro-Lepidoptera; by Mr. Douglas. Two boxes of European Lepidoptera; by M. Becker, of Paris. One hundred lists of British Lepidoptera; by Mr. J. W. Dunning.

These lists were presented for the special purpose of benefiting the Society's collection of British Lepidoptera, by having the desiderata marked thereon, and then circulated among those members who had duplicate specimens to give away. Messrs. A. F. Sheppard and Edwin Shepherd had so marked several of the lists, and the above donations of English Lepidoptera were the first result.

J. N. Winter, Esq., Brighton, and M. H. F. de Saussure, Geneva, were balloted for and elected Members of the Society.

The President announced that the Society offered a prize of £5 5s. for the best essay on the Natural History of the species of *Coccus* injurious to fruit-trees in this country (with an especial reference to the "mussel-scale" of the apple, of which a full and particular account is to be given), and the best means of preventing their ravages.

The essays, each distinguished by a motto, and with the author's name in a distinct sealed envelope, to be addressed "To the President and Council of the Entomological Society," and delivered on or before the 31st of December next.

Mr. Spence exhibited specimens of a Thrips, received through Dr. Lankester from Dr. Theophilus Thompson, to whom they had been sent from Australia, where they prevented rose-trees from blossoming by eating the petals of the flowers.

Mr. S. Stevens exhibited a specimen of each of the rare Coleoptera, *Agasma semicrudum* and *Calodera Kirbii*, lately received from Australia.

Mr. T. Spencer exhibited a specimen of *Chærocampa Celerio*, captured last October in the Regent's Park, and a scorpion, found last summer in the middle of a field at Edgware.

Mr. Douglas, on the part of Mr. A. R. Hogan, exhibited the specimen of *Hipparchia Janira*, with six whitish appendages to the haustellum, respecting which he had sent an inquiry to the 'Zoologist' (p. 3775), and which Mr. Douglas had answered in the same journal (p. 3809), considering the presence of these bodies to be attributable to the adhesion of parts of flowers. Subsequent examination of the butterfly, kindly sent by Mr. Hogan, had confirmed this impression.

The President said he was convinced that Mr. Douglas was correct in his opinion, for not only did he find the appendages in question to be the pollen-masses of an Orchidaceous plant, but he identified the very species as *Orchis bifolia*. The pollen-granules were still distinctly observable at the distal extremity of the appendages, while the basal end, always extremely viscid, had fixed itself firmly to the maxillæ of the

insect. These extraneous bodies are affixed to the maxillæ in very regular order, but he regarded their position as purely accidental; and the hairs observed by Mr. Hogan adhering to the pollen-masses were no part of the plant, but doubtless derived from the palpi or pectus of the butterfly. The occurrence of pollen-masses on various parts of insects had been repeatedly noticed by botanists as well as entomologists; they are very common on the heads of wild bees, especially in foreign countries, in such cases being not only derived from Orchids, but also from Asclepiads,—a natural order of plants which does not occur wild in this country, and which, although widely differing from the Orchids in other structural peculiarities, possesses similarly constructed pollen-masses. To such an extent has this phenomenon prevailed in some instances, that botanists have conjectured that Nature availed herself of the services of the bees to carry out the fecundating process, for many Orchids, without their assistance in conveying the pollen-granules from one flower to another, failed to mature their seeds. The pollen-masses are very carefully and accurately described by the late Sir J. E. Smith, Dr. Lindley, and other botanists.

The Secretary read the following notes, communicated by Professor Zeller, Honorary Member of the Society.

“*Impaled Insects.*—I only remember two examples of impaled insects, but both of them afford good evidence of the cause of their position. In one of these cases the insect was a suicide: a male of *Triphæna comes*, *Tr.*, in the finest condition, had a point of the rush, *Juncus acutus*, in its breast, and was dead when I found it. I still keep the thorax in my collection; it is quite uninjured, which would not be the case if a bird had captured and impaled the moth. Besides, the locality, in the environs of Catania, is such as no *Lanius* would inhabit, being a small meadow, wet in winter, surrounded by a large lava-desert, without tree or shrub. *Juncus acutus* is the haunt of an *Œdipoda* which I think new, (*Œd. Junci*, mihi, in litt.); and I sometimes observed this insect, after a short flight, fall down and impale its wings on the pin-like points of the rush, and get them loose only after many efforts. That insects would be easily impaled here I was sure from my own experience, as when stooping quickly for any capture, I often found myself on these unhappy points almost in a Turkish fashion. The moth here spoken of is mentioned in the ‘*Isis*,’ 1847, p. 442.

“The other instance is of an earlier date, and happened to a *Triphæna fimbria*, *Tr.*, ♂. This insect was impaled on a sloe-thorn, and was still living when I found it. It had its *back downwards*, the wings on its right side *half bitten off*, and its thorax *much injured*. In the alder-brake where this happened, there were some *Lanii* (shrikes), the species of which I do not now remember.”

“*Larva of Polyommatus Artaxerxes.*—From the affinity of this species with *Polyommatus Agestis*, I infer the possibility of its larva feeding on a species of *Geranium* or *Erodium*; for on *Erodium cicutarium* I have detected the larva of *Agestis*. If it be deemed probable that any species of these plants affords food to the larva of *Artaxerxes*, a quantity of them should be gathered at the proper season in the locality inhabited by the butterfly, by cautiously cutting them off above the roots, and they should then be torn and shaken over white paper or a table-cloth. But an undoubtedly better method of obtaining the larvæ is the following. Most butterflies are very easily observed laying their eggs, and the *Polyommata* are particularly favourable for such investigations. Therefore, when the females of *Artaxerxes* have been out some

time, and begin to be wasted, patiently follow one on a fine morning without troubling it, and observe on what plant it settles; after some preliminary attempts it will probably be seen to bend its body under a leaf, which proceeding is a certain sign of its laying an egg; this may soon be recognized by its white colour. The female will continue to lay eggs for a long time without resting to feed, and thus in a short period a number of eggs may be collected. To prevent their drying up, they must be fixed upon leaves of a living plant set in a flower-pot, and thus every opportunity may be had for leisurely observing the larva during its changes. In this way I procured the eggs of and reared to perfection *Argynnis Dia*, *Colias Hyale*, *Polyommatus Corydon*, *Alexis*, *Amyntas*, *Hylas*, *Arion* (both the latter on *Thymus Serpyllum*), *Argiolus*, *Acis* (on the capitula of *Armeria vulgaris*), *Phlæas*, *Circe*, *Hippochoë*, *Chryseis*, &c., *Leucophasia Sinapis* (on *Trifolium arvense* and *Coronilla varia*), *Papilio Machaon*, *Podalirius*, *Hesperia Actæon* (on *Stipa capillata*), *alveolus* (on *Potentilla alba*, but I often find the larva on *Potentilla anserina* among alder-bushes), *Emmelesia albulata* (on *Alectorolophus minor*), and many others."

Mr. F. Smith read a monograph of the Hymenopterous genus *Cryptocerus*, including descriptions of 14 new species, and illustrated by outline figures of all the species known. Three new genera are established,—*Meranoplus* for two species having the body pedunculated and rounded in the female, *Cataulacus* for four species of the Old World structurally different from *Cryptocerus*, and *Onychognathus* for a single species from New Zealand remarkable for having only five joints in the antennæ.

Mr. Spence presented for the signatures of the members, a petition to the Government, originated by the Royal Society, praying that it and the other Societies for the study and advancement of natural knowledge, should be provided by the State with apartments in juxta-position; showing the disadvantages under which such Societies, and, through them, science, at present laboured, on account of their disconnected locations, and having severally to support heavy expenses for house-rent and other necessary charges.

Part 4, Vol. II., n. s., of the Society's 'Transactions,' was announced as ready.—*J. W. D.*

Occurrence of Onychoteuthis Banksii at Banff, N. B.—I beg leave to place on record, through the pages of your journal, the capture of *Onychoteuthis Banksii*, *Leach*, at Banff, N. B. It is a decapodous cephalopod, which usually inhabits the Atlantic and Indian Oceans. I am not aware of the previous occurrence of this mollusk in Britain; and my friend Arthur Adams, Esq., F.L.S., whom I have consulted on the subject, thinks it new to the British Fauna.—*John Rose, M.D., R.N.; Haslar Hospital, Gosport, March 14, 1852.*

Mr. Stephens's Entomological Library and Collection.—Entomologists will be pleased to learn that Mr. Stephens's rich collection of British insects has been purchased by the Trustees of the British Museum. His valuable entomological library is likely to pass into the hands of Mr. Stainton.—*E. N.*

NOTICES OF NEW BOOKS.

'*A Naturalist's Sojourn in Jamaica.*' By PHILIP HENRY GOSSE, A.L.S., &c.; assisted by RICHARD HILL, Esq. London: Longmans. 1853.

(Second Notice).

THE copious extracts from this work given in our last number (Zool. 3850), will we think abundantly justify the cordial commendation we bestowed upon it. Mr. Gosse is not a mere compiler,—a mere popularizer of other men's observations; he possesses not only the art of clothing his subject in a garment of agreeable phraseology, but has made that subject peculiarly instructive and complete by a very great number of original and interesting observations. And here we cannot confine our praise to the author, but feel in justice bound to divide it between himself and his most able coadjutor, Mr. Hill, whose long residence in Jamaica has afforded him opportunities of observation which a mere sojourner could not hope to enjoy. Mr. Gosse gives his coadjutor full credit for the value of this assistance: in the title-page, in the preface, in almost every chapter, does he give full and grateful credit to the worth and importance of Mr. Hill's co-operation: indeed, a considerable portion of the volume, and that certainly not the least interesting, consists of verbatim extracts from this observant naturalist's manuscripts. Truly delightful is it to see kindred minds thus associated,—kindred minds thus working together for the public good. Such, we could fancy, were Gilbert White and Daines Barrington; and such might have been the correspondence of White and Barrington, had not the part of Barrington been unfortunately omitted.

The time is certainly approaching, when Nature shall claim from her admirers more of these tributes to her living and breathing majesty; when Natural History shall cease to be a mere science of admeasurement; when it shall become, in accordance with its name, really a *history*. Honoured be those who use their energies in such a cause,—who employ their pens in bringing about a revolution, a consummation so devoutly to be wished!

We shall give but one more extract from the '*Naturalist's Sojourn*,' but that one comprises a much more complete history than the unconnected paragraphs already cited: and, in conclusion, we have only to

add that we strenuously recommend every reader of the 'Zoologist' to become a purchaser of the 'Sojourn.'

The Smooth Sheath-claw.—“June 3rd.—Coming down from Bluefields Peak about noon, my attention was attracted to two of these geckos (*Thecadactylus lævis*), resting near each other on the trunk of a tree, beside a deep cleft. From a slight difference in their size, I supposed them male and female; I struck at one with my riding-switch but failed to reach it; and they both glided into the hollow tree. Soon, however, they began to peep out again; and I desired my servant to mount the tree in order to drive them out; which he did by thrusting in a stick at the opposite side. The larger darted out, and on being touched, precipitated himself to the ground, where he began to wriggle with the usual awkward agility of the species; I struck him lightly with a stick, but in so doing unfortunately severed the tail from the body.

“The amputated member, however, continued to writhe in rapid contortions. I now put down a tin canister on the ground, with the open mouth just before the animal's head, and on being touched behind, it darted in according to its natural propensity to take refuge in dark holes and crevices, and I thus secured it. Its colours had been till now dark brown handsomely mottled with black, but on my arrival at home I found it of a dirty white or drab, with the mottlings few and almost obsolete. The stomach was found on dissection to contain fragments of beetles, but in the intestine was a leguminous seed.

“The appearance and physiognomy of this lizard are unprepossessing; there is a savage sullenness in its look, very different from the meek countenance of the Ameiva. It is very common, particularly in out-buildings and offices, where it inhabits crevices in the roofs and rafters, a pair commonly living in the same hole or near together. On the approach of night one hears on all sides the singular, cracked, cackling call of these animals, somewhat like the sound produced by drawing a stick across a comb. M. Dumeril's suggestion, that this voice may be produced by the tongue smacked as it were in the concavity of the palate, is the less unlikely from the fact that this organ is large, flexible, and fleshy. The name of croaking lizard commonly applied to the species in Jamaica, is derived from its peculiar voice. In the woods the voice is also heard at night proceeding from hollow trees, and continued through the whole of the hours of darkness.

“The large prominent eye without any eyelid, whose pupil contracts in strong light to a perpendicular line, indicates their nocturnal habits; yet they are frequently seen by day, as in the case just mentioned.

In the old mill-house at Bluefields they are numerous; and two or three pairs may be seen day after day at the same spot, peeping out of their crevices and remaining perfectly still for hours. Sometimes they venture forth, and may be observed crawling slowly along the beams and rafters, moving with excessive deliberation, and never going far from their holes, into which they dart on the least alarm with swift rapidity.

“The curious structure of the feet in the Geckotidæ, by which they are enabled to walk on reversed surfaces, has been often described. The toes in this species radiate from the foot, are dilated into broad oval disks, and have the under surface covered with transverse laminæ, the edge of each overlapping its successor. Minute hooked claws, very acute, like those of a cat, doubtless assist the animal in its feats of this kind. I do not, however, remember to have ever seen this gecko actually back downward, but often crawling on the vertical side of a beam.

“The skin of this animal is very loosely attached to the muscles, and is so soft and fragile that it tears with a mere touch, like wetted brown paper. The head and back are covered with minute conical tubercles very closely set, which on the sides and towards the tail, become more inclined, and flattened in a posterior direction, so as to form overlapping scales, which are most regular and largest on the belly and tail; each is in contact with six other surrounding ones. The under side of the tail is crossed by a series of broad plates here and there, varied however by two broad scales supplying the place of one plate. The tail has no transverse folds, but the scales are arranged with regularity there. I have not been able to detect any femoral pores.

“The periodical casting of the skin takes place much as in other lizards. The head and fore parts begin to assume a white appearance, and the next day the skin of these parts separates from the surface of the body, often irregularly, and lies in loose ragged folds around it. It now looks like muslin of the most delicate fineness; it is slit down the back and separated, but not yet thrown off. At the same time the hinder parts have the same whiteness as the head on the previous day; for there seems always to be the difference of the day in the sloughing of the fore and hind parts. When the cuticle is however manifestly detached, it is not thrown off at once, but hangs around the lizard like a ragged garment for several days; apparently to its no small annoyance.

“The reproduction of the tail in lizards, after it has been accidentally lost, is a very curious phenomenon which seems not to have been observed with sufficient precision. In this species it takes place with

great rapidity. The facility with which the tail separates has been already alluded to ; it is said that the animal will frequently cast off this member spontaneously in its contortions on being put alive into spirits ; and that the contraction of the tail into a globular form has given occasion to the supposition that a distinct species existed, called the turnip-tailed gecko, (*Thecadactylus rapicauda*) ; this, however, I have not seen.

“ One day, at Grand Vale, I observed on a gate a gecko with a new tail, not more than an inch and a half in length, abruptly tapered. The animal had a singular appearance, the tail being of a bluish gray hue, marked with longitudinal black stripes ; it had a silky gloss ; but was closely covered with minute transverse wrinkles. (The ordinary length of the tail when perfect is about five inches).

“ About the middle of September I caught in a noose one which I had deprived of its tail a few days before in attempting to secure it. The separation had taken place about half an inch behind the vent. I put the reptile into a gauze-covered box for observation. In less than a week the new tail was manifest in the form of a bluish tubercle projecting from the centre of the wound. About this time I captured one with a renewed tail, which member was covered with tuberculous scales as the original had been, and the inferior surface of which displayed the ordinary transverse plates.

“ In fact I should not have known it had been severed but for the dark gray colour, the peculiar character of the striping, the manifest suture at the point of junction, and the smaller size than normal of the scales and plates. On comparing the tail of my own living one with that of this specimen, I perceived that it differed in the absence of scales, the surface being silky and covered with fine transverse wrinkles as the one observed at Grand Vale. On the 10th of November the tail was about an inch and one-eighth long, when it threw off its skin, the sloughing being confined to the recent part, and I was surprised and pleased to observe that the new surface displayed both scales and transverse plates, but both small. The colour was still dark gray, with pale irregular longitudinal stripes or dashes. About the beginning of December the animal escaped, the cage having incautiously been left open ; the tail was then fully an inch and a half long, and the tip had become compressed.

“ On the 21st of October I had found, adhering to the inside of the door of the cage, an egg of a short oval form, shelly in texture, and of a pure white hue. It adhered to the wood by a flattened base, as if it had been deposited in a soft state ; when I saw it the top had

been slightly crushed in, probably by accident, and this appeared to have been fatal to it, for its contents gradually dried up. I conjectured at the time that this egg had been deposited by the gecko, but I could not be quite certain, because one or two Anoles were kept in the same cage. But on the 21st of February, as I was riding to Savanna-la-Mar, and passing a large fig-tree that overhangs the sea-shore at Cave, I observed in a little crevice in the trunk—or rather in one produced by the singular anastomosing of the supra-terrestrial roots—several eggs. On dismounting, I found they were about eight in number, and evidently of the same kind as the one above noticed. Their form was irregularly oval, round, or rondo-triangular, all flattened, very much resembling in size, shape and colour, those comfits called lemon-drops: their greatest diameter was about half an inch. They were shelly, but the shell was thin and very brittle; yet it was evident they had been soft when laid, for they adhered to each other, and the side of one was, as it were, let in to that of its neighbour, and at the base of some was a thick mass of shelly matter, as if a semifluid substance had run down and then hardened. That all had not been deposited at once, seemed apparent from their diverse degrees of maturity; some containing only a white cream or soft curd, others the lizard fully formed but immature; while one which I broke displayed the smooth sheath-claw perfectly formed and coloured, which presently crawled out, being quite independent of the vitellus. The head of this new-born gecko was large; the belly (of course) thin; the toes well formed; the tubercles perfect, the markings dark and beautifully distinct; the pupil linear and perpendicular. The length was two inches and a quarter; one-third of an inch of the extremity of the tail was pure white, abruptly defined from the darker colour. The surface of the eggs, under a lens, was covered with minute tubercles of lime, something like a whitewashed wall.

“The cavity in which these eggs were found was so narrow that I cannot understand how the lizard managed to deposit them in their situation, unless (which seems very improbable) they were first laid and afterwards placed with the feet.

“After a few weeks, being again in that neighbourhood, I noticed that another egg had been laid since the removal of the former, and in the course of a month two more, occupying the place of those first deposited.

“We thus perceive that the gecko lays her eggs at considerable intervals of time, but selects the same spot for their deposition.

“The ill fame under which this genus labours in most parts of the world where it is known, attends it here. An indefinite dread of its being in some way hurtful generally prevails, perhaps mainly dependant on its repulsive aspect and stealthy motions. It is however perfectly harmless; feeding on insects and berries. I have already mentioned the contents of the stomach in one specimen that I examined; in another this viscus, a membranous sac, nearly as long as the trunk, contained nothing of an animal nature, but only some pulpy berries, and several stony seeds closely like those of a grape.

“One which I captured with a hair noose, indeed, on being turned into the lizard-box, seemed to manifest hostility to the Anoles which were there; these fled from it, and the gecko appeared to have a desire of pursuing, for it crept towards one and another with a stealthy step, the belly and head being on the ground, like a cat watching a mouse. Yet these actions might be nothing more than the manifestation of caution on being put into unwonted circumstances.

“While thus engaged, it ever and anon licked its lips with its protruded tongue, an action common to all our Geckotidæ. The ordinary length of the species is about nine inches.”—p. 158.

‘*The Annals and Magazine of Natural History*,’ No. 64, dated April, 1853.

THE papers in this number are intituled:—

‘Remarks on British Plants.’ By Charles C. Babington, M.A., F.R.S., F.L.S., &c.

‘On the Chitonidæ.’ By William Clark, Esq.

‘Additional Character of the Shell of the Cyclostomatous genus *Alycæus* of Gray, with descriptions of its Animal Inhabitant—of a fourth Species—and of other new Indian Cyclostomata; also remarks on an unrecorded Character in *Diplommatina*.’ By W. H. Benson, Esq.

‘On the Animal of *Myochama anomioides*.’ By Albany Hancock, Esq.

‘On the Germination of the Resting Spores, and on a form of Moving Spores in *Spirogyra*.’ By Dr. W. Pringsheim. [Translated from the ‘Flora’ of August 14 and 21, 1852, by Arthur Henfrey.]

‘Description of *Rhopalodina*, a new form of Echinodermata.’ By J. E. Gray, Ph.D., F.R.S., V.P.Z.S., &c.

‘Rambles in Ceylon.’ By Edgar Leopold Layard, Esq.

Bibliographical Notices: — ‘Principles of the Anatomy and Physiology of the Vegetable Cell.’ By Hugo Von Mohl. ‘Handbuch der Conchyliologie und Malacozöologie.’ By Dr. R. A. Philippi.

Proceedings of Learned Societies: — Royal—Zoological—Botanical of Edinburgh—Dublin University Zoological Association—Entomological.

Miscellaneous: — Eucræta chelata; by John Coppin. A new genus and species of Crustacea; by James Eights. On the Coleopterous Insects of the genus Cebrio; by M. Guérin Méneville. On the Reproduction of the Toad and Frog without the intermediate stage of Tadpole; by Edward Joseph Lowe, Esq., F.G.S., F.R.A.S.

Mr. Lowe’s paper on the reproduction of frogs and toads without the intermediate stage of tadpole, is one of great interest, and is not altogether unsupported by the previous observations of naturalists. The same facts have been repeatedly asserted of several exotic species of toad; and kindred facts have been observed in this country of the reproduction of the common salamander in confinement. Nevertheless, in reading the five positions laid down by Mr. Lowe, which are given verbatim below, it is impossible not to observe that some of the inferences drawn are not sequent on the premises. More exact and methodical observations are required before we can receive this departure from Nature’s laws as an established fact.

“First: — *Toads deposit Spawn in Cellars, and Young Toads are afterwards observed.*

“Last summer several masses of spawn were procured from my cellar, having been found deposited amongst decaying potatoes, &c.; and subsequently young toads were noticed. The cellar is free from water, and at a considerable distance from any brook.”

In this observation spawn is stated to have been present; but, although under the author’s own eye, no attempt appears to have been made to trace a connexion between the spawn and the young toads. The deposition of toads’ spawn in masses, moreover, is at variance with my own experience: I have always found it in ropes, after the fashion of a string of beads.

“Secondly: — *Young Toads are observed about hot-beds.*

“In the kitchen-garden at Highfield House (which is entirely walled round), young toads have been noticed about the cucumber and melon beds. The gardeners have been in the habit of bringing toads to these beds to destroy the insects: these have continued amongst the

warm damp straw all summer. It is after these beds have remained three or four months that the young ones have been noticed. Toads would have to travel nearly half a mile to reach this garden from the brook or lake, and also to mount a steep hill, besides taking the opportunity of coming through the door. Toads so small are not seen in any other part of the gardens."

The occurrence of toads, large and small, in walled gardens, and especially about cucumber-frames, is very familiar to me: it may be a question how they get there, but other solutions to the difficulty may be proposed quite as plausible as the supposition that Nature has so widely deviated from her ordinary course. A well-authenticated instance of a toad's vagaries is before me: — a singularly fine specimen was shut in a small empty room, to await immersion in spirits, when the etceteras could be procured; on opening the door of the room he was missing, and was eventually found sitting peacefully on the ledge over the door.

"Thirdly: — *Young Toads and Frogs observed in abundance at the summit of another hill, whilst quite small.*

"During the past summer, especially in the month of July, very many young toads and frogs were seen amongst strawberry-plants, apparently from a week to a month old. These might possibly have travelled from the brook a few hundred yards distant; yet it is strange, that with the exception of these beds, no young toads could be found elsewhere in the garden. A number of full-grown toads are mostly to be seen about these beds."

Such an occurrence is very common, indeed it is observable every summer; but it does not appear to bear on the subject under discussion, it merely shows that toads, whether large or small, are fond of strawberry-beds.

"Fourthly: — *Young Frogs dug out of the ground in the month of January.*

"In digging in the garden amongst the strawberry-beds (near where so many toads were observed last summer), in the middle of January in the present year, a nest of young frogs were upturned. These were apparently three or four weeks old. This ground had been previously dug in the month of August, and many strawberry-plants buried; it was amongst a mass of these plants in a state of partial decomposition, that these young ones were observed."

There is a *non sequitur* here: surely the young *frogs* are not supposed to have been the issue of the old *toads*! and their occurrence in the ground does not at all support the author's view, for it is quite

as probable that a frog which had passed the tadpole state would be found in the earth, as one which had not.

“Fifthly : — *Young Frogs are bred in Cellars where there is no Water for Tadpoles.*

“In mentioning this subject to Mr. Joseph Sidebotham, of Manchester (an active botanist), he informed me that young frogs, and in fact frogs of all sizes, were to be seen in his cellar amongst decaying Dahlia-tubers. The smallest of them were only about half the ordinary size of the young frog when newly developed from the tadpole. He further stated that there was no water in the cellar, and no means of young frogs entering, except by first coming into the kitchen, a mode of entry if not impossible, highly improbable. Mr. Sidebotham never found any spawn.”

This observation would go to prove that the spawn itself was an unnecessary stage, and therefore militates against the second observation, in which the presence of spawn is cited in support of the theory.

‘*Transactions of the Entomological Society of London.*’ Vol. II.
New Series. Part 4.

THIS is one of the best parts, if not the very best, ever issued by the Society. It contains the following papers : —

‘On the Identification of the yet undetermined Species of Micro-Lepidoptera, mentioned in the Mémoires of Reaumur.’ By J. W. Douglas, Esq.

‘Descriptions of some Longicorn Beetles discovered in Northern China by Robert Fortune, Esq.’ By W. Wilson Saunders, Esq., F.L.S., &c.

‘Notes on the Habits of various Insects.’ By Mr. William Varney.

‘Contributions towards the Natural History of British Micro-Lepidoptera.’ By J. W. Douglas, Esq.

‘Notices of some new Species of Strepsipterous Insects from Albania, with further Observations on the Habits, Transformations, and Sexual Economy of these Parasites.’ By S. S. Saunders, Esq.

The Chinese Longicorn beetles described by Mr. Saunders are six in number : — *Eurypoda antennata*, *Philus inconspicuus*, *Callichroma Faldermannii*, *Colobus sericeus*, *Cerosterna hispida*, and *Glenea Fortuni*.

The subjects in Mr. Varney's paper are : — Sting of Bee, Moss-carder Humble Bees, Wasp-nests, Mason Wasps, Wasps killing Flies, Honey Bees, Bees fond of Water, Leaf-cutter Bees, Transformations of Caterpillars, Winter Midge, Caterpillars of *Bryophila perla*, Blow Flies. On each of these subjects there is interesting information, not always striking for its novelty, but in every instance quite worth recording.

The paper by Mr. S. S. Saunders on the habits of the *Stylopidae* in the larva state, is of great value, and exhibits the knowledge both of "what to observe" and "how to observe." The author's observations are made with the greatest possible care, and are recorded in the most lucid manner. His remarks have reference, 1st, to the saltatorial powers of the larvæ in the minute hexapodal state ; 2ndly, to their mode of attack ; 3rdly, to their first moult ; 4thly, to their position in the feeding state ; and 5thly, to their mode of effecting their exit.

'Proceedings of the Berwickshire Naturalists' Club.' Vol. III. No. 3.

A NEW part of these 'Proceedings' is just issued, and is so interesting, that we cannot but regret that the papers it contains should have so limited a circulation as their publication in so restricted a channel of necessity entails. The contents are thus intituled : —

'Address to the Members, delivered at the Anniversary Meeting held at Newtown, September 8th, 1852.' By Robert Home, Esq., President.

'Sketch of the Geology of the Howick Coast and Ratcheugh Crag, visited by the Club on the 4th of August, 1852.' By Geo. Tate, F.G.S.

'Notice of *Asplenium germanicum*.' By Geo. R. Tate, Alnwick.

'An Account of an Assemblage of Ancient Sepulchral Monuments, in the East of Berwickshire.' By Mr. James Hardy.

'On some Excrescences &c. on Plants, occasioned or inhabited by Mites.' By Mr. James Hardy.

'The *Acarides* of Berwickshire specifically described.' By George Johnston, M.D.

'On the Frugivorous Habits of some *Geodephaga*.' By Mr. James Hardy.

'Notice of two ancient Tombs or Graves discovered and opened in Spring, 1851, upon Adderstone Low Mill Farm, in the Parish of Bamburgh.' By P. J. Selby, Esq.

Two of Mr. Hardy's papers are so interesting to the zoologist, that we give them entire: the first refers to the excrescences produced on plants by mites.

"A few days ago, I met with several small galls on the leaves of the hackberry (*Prunus Padus*), which I expected would furnish the larva of a gall-midge (*Cecidomyia*) or gall-fly (*Cynips*). They are green or slightly purplish, obovate, thickish, white, hirsute, and are scattered over the upper surface of the leaf, like a crop of minute mushrooms. On opening them I found them hollow, without any apparent inmate, or anything remarkable except a few hairs, the continuation apparently of a thick crop placed at their orifice in the depression on the under side of the leaf. A few pink objects, however, at length caught my attention; and on reflection, knowing that such excrescences were sometimes ascribed to mites, I resolved to ascertain if these were not such. Next day, on shaking a few upon a slip of glass, and placing them under the microscope, I observed that they exhibited motion; and some of them were not long in pushing out their legs and crawling slowly about. They were all in the larva state, elliptical, round-bodied, with four short legs placed close behind the head; the abdominal part is long and flexible, and has about four hairs before the tip, and about as many near the shoulders. They are too minute to be seen by the naked eye; even under a triple lens, they are mere linear atoms, without vestige of limbs. They are white, yellow, pale brown, or pinkish. Two species of mites were found on the outside: one, a yellowish rapidly running species, common upon foliage, that appears to deposit its ova upon the hairs of the plants on which it occurs; the other was a true, flattish, pale whitish, testaceous *Acarus*, and is most likely the parent of the young mites in the gall.

"Knowing there were many similar galls on leaves, I next investigated those hairy purple warts so abundant near the midrib of the sloe, and found them likewise to be nests of apparently the same species of *Acarus*.

"The alternate blisters along the sides of the alder-leaf, and occasionally found on that of the birch, gave the same result. The species on the alder is probably different. The old mite accompanying them is a mere point, and is well distinguished by two or three squarish brown spots near the tip of the abdomen.

"The leaf of *Salix aurita* offers not less than four different galls: one large and smooth, occasioned by a black saw-fly, (Linn. Fn. Suec. 2301); two caused by the larvæ of unknown species of gall-midge, (*Cecidomyia*); and a fourth minute purple one, which is very abun-

dant, and is analogous to those occurring on the sloe and bird-cherry. The last, like them, contains only young mites.

“Another locality for mites I find in some round bud-like productions on the twigs of hazel. From green they become yellowish, and then wither. The larva is white, as is the accompanying mite.

“A rough, pale green or purplish, fungus-like gall, which opens from the under side of the leaf, is abundant on the foliage of the alder in some of our deans. This is also a nursery of young Acari.

“A conspicuous yellow gall near the summits of the stalks of *Galium verum*, growing on the sea-coast, is also owing to mites. The round fleshy galls of this plant are caused by the larvæ of a *Cecidomyia*.

“Colonies of young mites distort the leaves of *Galium Aparine*, *Lotus corniculatus*, *Polygala vulgaris*, and *Campanula rotundifolia*, by causing them to assume fantastic shapes, to become discoloured, to thicken, or their margins to roll inwards. The foliage of *Galium Aparine* is also affected in this manner from the presence of the larvæ of *Psylla velutina* of Foerster, (*Verhand. Natur. Vereins. Preuss. Rheinlande*, 1848, p. 87); which appears not to differ from *Ps. Galii* of the same author. This *Psylla* produces similar effects on *Galium palustre* and *G. uliginosum*; and it lives likewise upon the leaves of *Comarum palustre*.

“The hoary, rounded, woolly tufts, so abundant in some places at the summit of the shoots of the wild thyme, are also the production of a crowd of young mites, as was first ascertained by Loew, (*Dipterologische Beitr.* iv. 24). Lightfoot (*Flora Scot.* i. 318) attributes them to a *Chermes (Psylla)*; and Bremi thought they were owing to the larvæ of a gall-midge. The two Bauhins considered plants in this condition as a distinct species; the ‘*Serpillum vulgare, minus, capitulis lanuginosis*,’ (*C. Bauhini, Pinax*, 220); ‘*S. vulgare, capitulis tomentaceis, candicantibus*,’ (*J. Bauhini, Hist. Plant.* iii. 269). Tournefort, however, conjectured that such appearances were owing to the irritation occasioned by some insect pricking the buds (*Hist. Plantes des Environs de Paris*, 149. Paris: 1698).

“I have not had an opportunity of examining lately these white tufts on the wild thyme; but young specimens that I brought from Northumberland in July, afforded no traces of a gall-midge, to which they had been ascribed by various writers.

“In conclusion, I may mention that I shall feel obliged to any member of the Club for fresh specimens of the following galls, should they ever occur during their researches:—

“Smooth galls on the leaves of the beech.

“Smooth galls on the leaves or buds of the lime.

“Galls on the dyer’s green-weed, (*Genista tinctoria*).

“Galls on the bryony and the box-wood.

“Galls and excrescences on *Salix alba*, *S. purpurea*, and *S. fragilis*.

“Large gall on the stalk of *Hieracium sabaudum* and *Cnicus arvensis*.”—p. 111.

In his paper “On the Frugivorous Habits of the *Geodephaga*,” Mr. Hardy gives the following examples of this apparent aberration of insect appetite, which have fallen under his own observation:—

“It is now, I believe, agreed on all hands, that *Zabrus gibbus* occasionally feeds upon grain; and some of the larvæ of *Amaræ* have been ascertained to be vegetable feeders. This, however, is the amount of information that we possess on the subject: all the other beetles of this division have been ranked as carnivorous, an inference drawn principally from the structure of their mouth and stomach. Notwithstanding this, however, it appears that several of those so-called Carnivora mix with their stronger meals a certain proportion of vegetable diet. Of the *Amaræ* I have observed two feeding on plants:—*Amara plebeia*, which often mounts *Poa annua* to feed on the pollen; and *A. familiaris*, which tears open the capsule of the mouse-ear chickweed (*Cerastium viscosum*), and devours the half-ripened seeds. *Omaseus melanarius*, a well-known destroyer of earth-worms, I have detected eating the nearly ripe seeds of the hemp-nettle, (*Galeopsis Tetrahit*). *Curtonotus piceus* is well known to occur frequently upon the knapweed, and to thrust its head down amongst the seeds, with, it was supposed, the intention of obtaining the dipterous maggots that feed upon the seeds of the plant. I have now little doubt that its object is the seeds alone, as only yesterday I found one employed in a similar manner upon the bog-thistle, after it had devoured the skin of one of its seeds, the interior having been eaten before my arrival. I afterwards saw another pull up a seed from the head of an autumnal dandelion (*Apargia autumnalis*), and then proceed to make a meal of it. *Calathus cisteloides* will probably be found to have similar habits. One evening I found four individuals near the summits of the rag-wort; but they observed my approach, and either hid themselves amongst the foliage, or dropped to the ground.”—p. 123.

List of the Land and Fresh-water Mollusca found in Aberdeenshire and Kincardineshire. By JAMES TAYLOR, Esq.

THE publication of Mr. Norman's list of the Mollusca of Oxford and its neighbourhood (Zool. 3761), has led me to believe that a similar list of those found with us would be acceptable; since it is only by the publication of such lists that collectors can arrive at a knowledge of the rarity or abundance of species in different localities throughout the kingdom. Besides the utility of local lists of species to collectors in effecting the exchange of specimens, they lead to a more correct knowledge of their geographical distribution. One thing is certain, the publication of such lists shows how much the study of Mollusca has been on the increase during late years, and one now and then in the pages of the 'Zoologist,' would give us further information. Local lists of shells are to general Conchology what local lists of plants are to general Botany; since it is well known that many species both of plants and mollusks are confined to particular spots, the result of some peculiarity of constitution in the animal or the soil, while others are more generally distributed. A correct knowledge of the distribution of the Mollusca would greatly facilitate the labours of the collector.

Some of the species mentioned in Mr. Norman's list have not been found here in a living state, *e. g.*, *Neritina fluviatilis*, *Paludina vivipara* and *achatina*, *Bithinia tentaculata* and *ventricosa*, *Helix pomatia* and many others, as may be seen on a comparison of the lists; but dead specimens of some of these have been found amongst ballast, and some cast on the beach; these will be mentioned at the end of the list.

The nomenclature is that of Gray's Turton; any other authority will be mentioned.

Arion ater. Common in meadows and by way-sides during summer and autumn.

Limax maximus. Plentiful by the sides of the Don and the Dee, at Nether Banchory.

„ *flavus*. Rather common under stones and by the walls of houses.

„ *agrestis*. Abundant.

• „ *marginatus*, *Drap*. Gardens at Old Aberdeen, Den of Leggart. This *Limax* may be seen ascending trees to a great height during moist weather.

- Helix aspersa*. Common about old walls in gardens.
- „ *hortensis*. Very abundant.
- „ „ var. *fasciata*. Common.
- „ „ var. *unicolor*. Common.
- „ „ var. *arenicola*. Rare. In the Belhelvie Link, at the roots of *Ammophila arundinacea* and *Triticum junceum*.
- „ *nemoralis*. Plentiful at Birse, about thirty miles from Aberdeen, up Dee-side; first found there by Mr. Ewan. I find that it has the same varieties as *H. hortensis*.
- „ *arbustorum*. Common.
- „ „ var. *maritima*. Plentiful along the coast.
- „ *caperata*. Plentiful in cornfields at Upper Banchory, and on an old granite wall near the brick-kilns, Old Aberdeen.
- „ *hispida*. Not common. Under stones at the ruins of Duntottar Castle.
- „ *Trochilus*. Rare. Banks of the Dee and Don, and the Den of Rubislaw, among dead leaves.
- „ *lamellata*. Rare. Found by Dr. Dickie in the Den of Rubislaw, on the fallen leaves of *Acer Pseudo-platanus*.
- „ *aculeata*. Rare. Den of Rubislaw.
- „ *pulchella*. Abundant among moss and in damp places at Nether Banchory, and sand-hills between the Dee and Don.
- „ *fusca*. Plentiful on fallen leaves at the old bridge of Don, and Nether Banchory.
- Zonites rotundatus*. Abundant.
- „ *cellarius*. Common by walls and hedges, in damp shady places.
- „ *nitidus*. Common among herbage at the foot of walls, and under stones.
- „ *lucidus*. Not common. Don Bridge, and at Nether Banchory; Den of Leggart.
- „ *radiatulus*. Not common. Among decayed leaves at Nether Banchory and banks of Don.
- „ *alliaris*. Abundant on banks among mosses in woods, in almost every situation.
- „ *crystallinus*. Not common. Among moss on the stumps of fallen trees, at Nether Banchory, Dee and Don banks.
- „ *purus*. More common than the last, in the same situations.
- Vitrina pellucida*. Common. This may be found in vast numbers under stones with the animal, and which seems to be destroyed by Coleopterous insects.

Succinea putris. Abundant among the herbage on the sides of marshy places, ditches, &c.

„ *Pfeifferi*. Rare, in ditches.

Bulimus lubricus. Common.

„ *obscurus*. Rare, among the ruins of Dunottar Castle.

Pupa umbilicata. Common.

„ *marginata*. Not common. Found on the sand-hills in the link between the Dee and Don. More plentiful in some seasons than in others.

Vertigo edentula. Rare. Found at the roots of ferns, sometimes on the fronds.

Clausilia nigricans. Common, but rather local; at the foot of rocks some distance South of the Bay of Nigg.

Balea perversa. Rare. Among the ruins of Dunottar Castle, and at the foot of a wall behind Old Macher cathedral; Old Aberdeen.

Charychium minimum. Rare. Rubislaw Den.

Limnæus pereger. Common.

„ „ *var. ovatus*. Abundant in Loch Skene; pools on the banks of Dee.

„ „ *var. limosus*. Common in marshy places, at Old Aberdeen and Bay of Nigg.

„ *palustris*. Not common. In pools and streams, near the sea, and in the low districts.

„ *truncatulus*. Rare. Found in the pool in Belhelvie Links, by my friend Mr. Wilson; Hilton quarries. Of this shell there many varieties, depending much on the situation.

Physa fontinalis. Common: in ditches at Nether Banchory; on *Lemna minor* and *Potamogetons* in the ditches or streams that run into the Dee and Don.

Planorbis vortex. Common; on aquatic plants, as *Potamogetons*.

„ *spirorbis*. Abundant in a ditch at Banner-mill, and in the links, where it is found on *Poa fluitans*, *Ranunculus aquatilis*, &c.

„ *contortus*. Not common. In ditches and pools, upon grass and decayed leaves, in the Old-town links and at Nether Banchory.

„ *albus*, *Flem.* Rare. On the leaves of *Potamogetons* in the canal near Aberdeen.

Ancylus fluviatilis. Common on stones in streams, and the rivers Dee and Don.

Cyclas cornea. Rare. A beautiful specimen has been found by Mr. Ewan, in a pool at Morrison bridge.

Cyclas flavescens, *MacGill*. Common; in the Loch of Skene, ten miles to the west of Aberdeen.

Pisidium Jenynsii. Common in all clear stagnant water, both in pools and ditches.

„ *pulchellum*. Common in muddy and sandy pools and ditches; and most beautiful specimens occur among *Sphagna* in pools of water among the hills.

„ *nitidum*. More rare, but occurring with the last.

„ *pusillum*. Abundant in many places, as in a mill-pond near the new bridge of Don.

„ *ammicum*. Rare. In the canal and the Hilton quarries,
Mr. Clark.

Anodon anatinus. Common; in the St. Fergus canal, Banff.

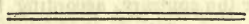
Alasmodon margaritiferus. Common in the Dee and the Don, and discovered in great plenty in the burn of Canry, at Upper Banchory, by Mr. Ewan.

All the above have been seen by myself during the last two or three years, and all occur in Aberdeen and Kincardine shires, with the exception of *Anodon anatinus*, which as yet is only found in Banffshire.

In conclusion I may mention that *Zonites pygmæus*, *Planorbis imbricatus*, *Paludina vivipara* and *Bithinia tentaculata* have been found here, but not alive, and consequently are not included in the list.

JAMES TAYLOR.

Pitmuxton, Aberdeen, March 3, 1853.



[The following note from Mr. Warrington appeared on the wrapper of the 'Zoologist' for April, 1853.—*E. N.*]

Apothecaries' Hall, March 26, 1853.

My dear Sir,

In recapitulating my experiments of 1849 and 1850,* in January, 1852,† I stated that I was carrying out a similar investigation, in the small aquarium, with a confined portion of sea-water, employing some of the *green* sea-weeds as the vegetable members of the series, and the common winkle or whelk to represent the snail as a scavenger; and in September, 1852,‡ I mentioned that I had succeeded perfectly in my endeavours, having had the sea-water quite clear and sweet for upwards of six months, and had for some time maintained the healthy life of several sea anemo-

* 'Quarterly Journal of the Chemical Society,' iii. 52. 'Zoologist,' p. 2868.

† 'Gardener's Magazine of Botany and Garden Companion,' for January, 1852.

‡ 'Annals and Magazine of Natural History,' x. 280. 'Zoologist,' p. 3633.

nies, &c. Since this period I have received from Mr. Gosse, and several friends, numerous additional subjects to experiment with, which have passed through the trying period of winter with complete success.

Now as I have heard that other investigators are experimenting with sea-water in these miniature ponds, I am anxious to take the earliest opportunity of communicating for their benefit the kind of sea-weeds which I have found most beneficial for the purpose of maintaining the water in this healthy state, so that they may avoid the difficulties I had myself to encounter in first commencing the experiments. The plants which appear to answer best are *Ulva latissima* and other sea varieties of *Ulva*, the *Enteromorphæ*, and *Zostera marina*, particularly the latter. The observations which I have been able to make on the numerous inhabitants of my aquarium, I hope to find time to state in detail before long.

I remain, Yours very truly,

ROBERT WARINGTON.

E. Newman, Esq.

Note on the supposed Total Abstinence of a Spider.—Mr. C. R. Bree's observations (Zool. 3800) on my communication relative to the "abstinence of a spider" (Id. 3766), have much pleased me by the candid and philosophical spirit in which they are written; and I can assure him that a feeling of the difficulty of accounting physiologically for the so greatly increased bulk of the spider, was my sole inducement to communicate the facts of the case, through the medium of the 'Zoologist,' to those who, from their greater and more scientific acquaintance with the physiology of animals, might better than myself offer some solution to the apparent mystery. And, assuming these facts to have been really, and as they appeared to me on close observation at the time to be, correct, to throw out the fair deduction from them, "That the spider existed and even throve without material sustenance during the time in question," as a point for discussion, to be established or the contrary, according to evidence; and if established, then, how far it could be accounted for by the economy or organization of the animal under consideration, or by analogy of other examples of organized life, (supposing in the course of time and observation such analogous examples to arise). I thus recorded my observations in the pages of the 'Zoologist,' as a "tittle" of evidence towards the discussion of this point, and not as "a miracle," nor as set up in opposition to the principle, "Ex nihilo nihil fit;" and I do not hesitate to say that I can easily and without any violence to that principle conceive it to be established (if indeed it be not already so), that some living creatures can increase to a certain extent, within a limited time, without having during that time received any sustenance, in the same way as an elm tree uprooted, or large branch broken off, in the spring of the year, will, during a certain time afterwards, push forth leaves and small branches. I am perfectly aware that in this case the leaves &c. are the result of the sap contained in the branch at the time of disruption; but so, in the case of an animal, may the increase be the result of prior aliment, enabling it to exist and thrive to a certain point, which passed, it would of necessity die, as also do the leaves &c. of the tree. This was all I intended to convey in my remarks; and if my words there seemed to convey more, it was entirely contrary to my intention. I here also take the opportunity of acknowledging the justness of the remark by Mr. Browne (Zool. 3845), that "it

would be as difficult to account for the appearance of the Apteryx in Anglesea," as for the physiologist to account for the increase of my spider to "ten times its original bulk without material sustenance;" which, however, I conceive only goes to the *extent of the increase*, not to the *possibility of any increase whatever*. I have, at the risk of being thought needlessly prolix, gone into the above explanations, to show what my views were in recording the circumstance, (Zool. 3766). But now, in justice to the readers of the 'Zoologist,' and more especially to Mr. Bree, who concludes that the spider *did* receive nourishment, though unperceived by me; as well as to Mr. Browne, who is alarmed at the *extent* of the increase, and, I trust, to their entire satisfaction, I am enabled to state that they are completely borne out in their conjectures, by the result of further observations made on the subject since my communication: for within the last month, not only has a small moth made its appearance within the bird-case, and is now dead in the web, but also a host of minute spiders, probably the progeny of the one I first observed there, and which died last summer. From this I am perfectly ready to acknowledge that the spider, in all probability, *did* receive sustenance, which must, as Mr. Bree suggests, have been inclosed in the case with the spider, since the case is at this moment perfectly free from crack or crevice, although, as I stated, the fact of its eating anything, or of there having been anything in the case for it to eat, entirely escaped my observation, though repeatedly and searchingly directed to what appeared to me a very unusual circumstance. — *Octavius Pickard-Cambridge; Bloxworth House, April 2, 1853.*

[The following is the account from the 'Banffshire Journal,' alluded to in Mr. Pickard-Cambridge's previous communication, (Zool. 3766).—*E. N.*]

"*A Spider living Twelve Months without Food.* — Mr. T. Edwards sends us the following curious particulars: — 'Having mounted and arranged a number of birds, I put them in a case. The case had lain aside for a short time previous to the front, which is of glass, being put on; and during this time a spider (*Aranea domestica*), doubtless on the look-out for a canny nook, managed to take up his quarters among the birds, and was not observed until after the front had been attached, and the whole finished. It was a little vexing to see the unwelcome intruder parading about in the box, as regardless of its contents as if they had been as many old rotten sticks. He walked over one bird, then over another; now in the bottom of the case, then again on the back, sides, &c., until he at last became stationary in one of the corners. Being an eyesore in such a place, he would have been summarily dealt with, but for the case being a close one, and all but hermetically sealed, the re-opening of which would have cost some trouble, and not a little risk. The consequence was that the little creature was permitted to remain, in the hope that want and the confinement would soon terminate his existence. In this, however, I have been mistaken; and from being looked upon as a grievance, he ultimately became an object of some interest, and has in consequence already more than fully repaid the stance which he occupies. Towards noon of the second day of his incarceration, he commenced operations in the corner already alluded to, and by breakfast-time of the day following the web was completed. The little artizan was then observed to walk slowly and very sedately all over the newly-formed fabric, seemingly with the view of ascertaining if all was secure. This done, the aperture was next examined, and with more apparent care than was bestowed upon the rest of the structure. This wonderful mechanical contrivance, which serves at least the fourfold purpose of storehouse, banqueting-hall, watch-tower, and asylum in times of danger, being found all right, the artificer then took up his station within it, no doubt

to await the success of the net which he had spread, and whence, had fortune proved kind, he would have boldly rushed to secure the struggling prey. It happened, however, that no other insect had the misfortune to be imprisoned along with himself, and, as already hinted, none can get in. There, on his watch-tower, he still remains as motionless as a statue. There has the patient little animal continued for the space of twelve long months, having taken up his position on the 3rd of October, 1851, and kept watch and ward without having ever moved night or day, as far as could be observed, except on three occasions, which, however, were so trifling, that they are not worth mentioning. But this is not all, as will be anticipated. The animal being still alive, it follows, as a natural consequence, that life has been sustained during all this time without the least particle of food having been obtained. The little creature is still as life-like as on the first day of his imprisonment.' This circumstance is not a little curious, and, to the naturalist, the fact must be of some value. Mr. Edwards adds that the longest period during which, so far as he can learn, spiders have been ascertained to have lived without food, is ten months." — *From the 'Banffshire Journal,' October, 1852.*

Some Remarks on the Habits of the Hesperidæ. — Most writers on Entomology state that the majority of the Hesperidæ rest with the fore-wings vertical, while the hind ones are horizontal. This is certainly the case with many of the species with which we are best acquainted; but in the great majority of exotic species the wings are carried either vertically, as in most other diurnal butterflies, or expanded horizontally, as in many Geometræ, and occasionally some Nymphalidæ. I do not remember having seen any of the Hesperias carry their wings deflexed, as the Castnias and Noctuidæ generally do. During my residence in Brazil, I noted accurately these various modes of repose in all the species I captured, but most of the ticketed specimens and my notes referring to them are unfortunately lost. I am inclined to think, however, that this character will serve to divide the family into two, or perhaps three, natural groups. On looking over my own collection, I find about 150 species which sit with their wings erect; about 50 with expanded wings; and but very few, which I cannot now determine with certainty, which carry the fore-wings only erect. On referring to Messrs. Doubleday and Westwood's work on the genera of butterflies, I find that the species of the first division, such as Antoninus, Rhetus, Exodeus, Amyclas, Gnetus, fulgurator, Celeus and Proteus, belong to the genera Pyrophyga, Ericides, Goniurus and Goniloba, and some species of Pamphila, as P. Epictetus. Of the second division, such as Thyreus, Oreus, Herenius, obscurus, &c., to the genera Pyrgus, Nisoniades and Achylodes. Those of the third division appear to belong to the genus Pamphila, but certainly do not include all the species. Some of the long-tailed species, such as Goniurus Proteus &c., sometimes expand their wings in the morning sun, as do some of the Epicalias, Ericinas, and several others; but their true habit is to rest with their wings erect. I once bred a species of this family, which offered some peculiarities. The larva was long, cylindrical, smooth, pubescent, and green; it fed on the plantain. The pupa was suspended horizontally beneath a leaf of the same plant, and braced; it was pale green, and the head pointed; but the greatest peculiarity consisted in the spiral tongue being contained in a free external sheath, forming

a straight bristle longer than the whole body of the pupa. The perfect insect was one of those with vitreous spots, closely allied to *Goniloba Antoninus*. — *Alfred R. Wallace*; *March*, 1853.

Note on Vernacular Names.—Having lately had the good fortune to meet with the 1st and 2nd volumes of the ‘Entomological Magazine,’ to complete my set, I observe in vol. i. p. 317, the following: — “Rather Extraordinary.—On Sunday, as Mr. Wm. Ferris, of Pennywell Lane was in his garden, about 11 o’clock in the forenoon, millions of insects of the caterpillar species, forming quite a cloud which darkened the air, passed over him from West to East.—*Bristol Mercury*.—!!! Ed.” Had the worthy Editor of that volume only known that the common May-beetle or chaffer (*Melolontha vulgaris*) is called by the name of “the caterpillar” in this part of the kingdom, it would have eased him of a considerable portion of his doubts as to the correctness of the statement; although I believe it is very unusual for such extensive flights to take place in the middle of the day, the close of the day being much more congenial to their habits. While upon the subject of this insect, I may as well remark that last summer, on several successive evenings (very sultry ones), from about sunset to the end of the twilight, I watched them coming from a pasture field on the opposite side of the road from a row of houses, (the road running nearly North and South). They undeviatingly flew from about North-east by East to South-west by West; not an individual varied from the assigned course. They averaged about one every second that passed over the house I stood in front of: how far they extended right and left I cannot say; I often observed from four to six on the wing at the same time. The flight was direct, without any wavering one way or the other; a few that seemed not to have taken a sufficient angle of elevation to enable them to clear the roof, struck against the upper part of the house, but soon recovering themselves, they followed the same course as their companions had taken. But to return to the previous subject: — so completely has the *Melolontha* possessed itself of the name “caterpillar,” to the exclusion of its rightful owners, the larvæ of the *Lepidoptera*, that when I have been speaking to persons not acquainted with insect metamorphoses about the changes they undergo, if I happened to mention a caterpillar, I have been obliged to explain that it was not the insect or beetle that children fasten with a thread to make it spin, but the *grub* that devours cabbages or other plants that was meant. The name by which the *Lepidoptera* are commonly known to the Welch is “*Pillipállá*,” an evident corruption of the Latin *Papilio*.—*James Bladon*; *Pont-y-Pool*, *February 14*, 1853.

Proceedings of the Zoological Society.

Tuesday, March 8, 1853.—*Dr. GRAY*, Vice-President, in the chair.

The Secretary read a letter which had been addressed to *Dr. Gray* by *Mr. Oswell*, respecting the discovery of a rhinoceros by himself and *Capt. Vardon*, in the country about the river *Limpopo*, which they at the time considered to be a new species, as it probably is. The horns of this animal, brought home by *Col. Steele*, and about to be presented by him to the *British Museum*, were exhibited to the meeting. Their peculiarity consists in the forward direction of the lower horn, the end of which was evidently worn away by contact with the ground in feeding. In a note attached to *Mr.*

Oswell's letter, Dr. Gray stated that Col. Steele had also brought home the horns of a new species of *Tragelaphus*, allied to *T. Euryceros* and *T. Angasii*. He proposed to name it *T. Nakong*.

Dr. Crisp exhibited the skin of a horn-bill, of which the neck-feathers were covered with the eggs of an apparently new species of *Acarus*. Dr. Crisp observed that the eggs of *Acari* are always deposited beyond the reach of the beak in birds. Both eggs and perfect insects were exhibited under the microscope, and the subject was further illustrated by elaborate drawings.

Dr. Crisp afterwards read a paper on the habits and anatomy of the wolf-fish, containing, among other interesting information, a careful explanation of its dental system, and of the intestinal canal.

Mr. Gould exhibited and described the nest and eggs of *Menura Alberti*, from specimens transmitted to this country by Mr. Willcox, of Sydney. The structure of the nest fully corroborated the views which Mr. Gould had developed many years since as to the position of *Menura* among the Insectorial birds, in contradistinction to those of Temminck, Illiger, Swainson, and Lesson. The *Menura*, according to Mr. Willcox, only lays one egg, but on that point there exists some doubt. The egg of the old species, *Menura superba*, is still unknown.

The Secretary read a note on the capture of *Delphinus Orca* in South Greenland, by Mr. Rehüller, of Thorshavn, which was communicated by Sir W. Trevelyan, to whom it was addressed. It contained the description of a method of capturing these animals with a net, which had proved so successful, that the number taken in Westmanhavn alone, since 1843 (when the net was first used), amounted to 2200, whereas between 1843 and 1819, 280 only had been secured. As each animal is taken to average 30 gallons of oil, this branch of industry has produced upwards of £4000 sterling to the inhabitants of Westmanhavu in the last ten years.

Tuesday, March 22, 1853.

Mr. Gould exhibited to the meeting four species of *Tetraogallus*, including a new one from the collection of the Hon. East India Company, obtained in Ladak, which differs essentially from the older species by its smaller size, its orange legs, and its sides being streaked with black instead of tender chesnut. The name proposed for it is *T. Thibetanus*. The whole of the species live in temperate or snowy regions of the Himalaya and Caucasus; and the fine health in which *T. Caucasicus* has for several months been preserved in the Society's menagerie, would indicate that the whole of them might be acclimated in the Scotch and Cumberland mountains.

Lieut. Burgess exhibited an extensive series of drawings of the eggs of Indian birds, made by himself.

Mr. G. R. Gray communicated the descriptions of two new species of *Ptilonopus* in the national collection, the habitat of which is unknown. These extremely beautiful birds were characterized under the names of *Pt. chrysogaster* and *Pt. purpureocinctus*.

Mr. Westwood directed the attention of the meeting to a series of most interesting drawings illustrative of the transformations of several genera of Australian insects, from the able pencil of Miss Scott, of Hunter's Island, New South Wales.

Mr. Cuming communicated a paper on twenty-three new species of land shells

from his own collection, by Dr. Pfeiffer. These shells were referred to the genera *Helix*, *Bulimus*, *Cyclostoma*, *Cataulus*, *Pupina*, and *Helicina*. Mr. Cuming also communicated the descriptions of three new species of *Limnæacea* by Dr. William Dunker.—*D. W. M.*

Proceedings of the Entomological Society.

April 4, 1853.—EDWARD NEWMAN, Esq., President, in the chair.

The following donations were announced, and thanks ordered to be given to the donors:—The 'Zoologist' for April; by the Editor. The 'Athenæum' for March; by the Editor. The 'Literary Gazette' for March; by the Editor. The 'Journal of the Society of Arts;' by the Society. 'On two new Subgenera of *Calanidæ*,' by John Lubbock, Esq., F.Z.S., &c.: by the Author. Hewitson's 'Exotic Butterflies,' part 6; by W. Wilson Saunders, Esq. 'Descriptions de trois Coléoptères: 'Descriptions des Coléoptères nouveaux: 'Rappel des Coléoptères décrits par Palisot et Beauvais: ' all by M. A. Chevrolat, and presented by the Author. Specimens of *Coelopterous larvæ* with a *Sphæria* attached; by T. J. Stevens, Esq., Bogotà.

T. H. Langcake, Esq., Beeston, near Leeds, and F. Bates, Esq., Leicester, were elected Subscribers to the Society.

Mr. T. Desvignes exhibited a fine *Chærocampa Celerio*, taken by Thomas Thompson, Esq., at Welton, near Brough, Yorkshire; also a new British bee, — *Anthidium maculatum*, taken in Scotland by E. C. Buxton, Esq.

Mr. F. Smith remarked that this bee was common in the South of Europe; and it was curious and interesting, if no mistake had occurred, to find it first captured in Britain so far North as Scotland.

Mr. Bond exhibited a *Steropus madidus*, with a *Filaria* about 6 inches long protruding from the abdomen; also a *Filaria*, 15 inches in length, extracted from another specimen of the same species of beetle.

Mr. Douglas exhibited some young larvæ of a *Solenobia*, produced from eggs laid by females without male intercourse. Last July, at Charlton, he found larvæ moving about on the stem of a poplar tree; he put some into a box with a piece of the bark, and forgot them until recently, when he found they had produced apterous females only, and from them had been developed the larvæ now exhibited, which had died in the box where they were born.

Mr. F. Smith exhibited some *Bruchi* reared from seeds of *Sophora myrtillifolia* from the Cape of Good Hope. Almost every seed had contained a larva of the *Bruchus*, from the greater number of them, however, only a parasitic *Chalcis* had emerged.

Mr. S. Stevens exhibited some fine insects, chiefly *Lepidoptera*, just received from Mr. Bates, on the Amazon River.

The following extract of a letter from Mr. T. J. Stevens, Corresponding Member, at Bogotà, was read.

"Having seen in the hands of my friend, Mr. Mack, our Consul, a dead larva with a fungus growing from the body, I was much struck with the curious appearance, and with some trouble procured specimens from Mr. Haldane, of Palmar, on whose estate

they are found. I have forwarded to you four specimens, and now give you extracts from the information I received from Mr. Haldane, who is no naturalist.

“The grub is in its glory and is decidedly brought to life in decayed timber. It is never to be found on trees, but underground, and in timber pulverously rotten. It does not attack the potato, and is to be found on lands where fern has been extirpated, but the roots still left behind in a state of decomposition. When found in the hard state it is always dead. Such specimens are scarce, and although I know where to seek, the difficulty is to find. Eight years elapsed after the first specimen was brought to me, ere I could meet with a second; but in a living state they are known to every clod-breaker. The body of the grub, when found in the hard state, does not become putrid in keeping, like other insects in general. The first specimen brought to me had a green bud protruding from the mouth, resembling a green pea when it first bursts the soil.”

Mr. Andrew Wilson, of Edinburgh, sent a communication recommending chloroform as an agent for disabling the larger Lepidoptera before they are killed or pinned, instead of sulphur or German tinder; and stating that no danger to the person using it need be apprehended.

The Rev. Joseph Greene communicated the following corrections of his note read at the March meeting:—

“Since I wrote to you, I have been informed that the insect taken by Dr. Ball was *Deilephila lineata*, and not *Euphorbiae*; and that the locality was *Youghal*, in the South of Ireland. In point of rarity, I believe there is not much difference between the two; but I thought it better to rectify the error. There is, likewise, one other slight mistake, which I should wish to correct. Instead of, in my collection are *two* specimens of *Euphorbiae* and *one* of *Galii*, it should be, *one* of *Euphorbiae* and *two* of *Galii*.”

The following notes by the Rev. Joseph Greene, “On digging for pupæ of Lepidoptera,” were also read:—

“Having met with considerable success in my search for pupæ of Heterocerous Lepidoptera, it has been suggested to me that a few remarks relative to localities, &c., might be useful to other collectors. This method of obtaining insects recommends itself to the entomologist in three ways. 1. As an amusement during the winter months. 2. As enabling him to procure fine specimens without the trouble of rearing. 3. As occasionally rewarding him with rare species, curious varieties, and others, which, from their habits or forms, are difficult to procure in the perfect state, *e. g.*, apterous or partially apterous females. During the past winter, I have found the pupæ of all the apterous females, except *Nyssia zonaria* and *Cheimatobia borearia*.

“Wherever in the following remarks any statement is made as to certain circumstances being uncommon, usual, or invariable, I wish it to be distinctly understood that they are so, merely so far as my own personal experience goes.

“The only instrument I use is a common garden trowel. The form is immaterial: perhaps a rounded blade is best, as passing with greater ease between the roots.

“The trees which I have found the most productive are the following:—elm, oak, ash, poplar, beech, and willow. I never found anything at birch, maple, or chesnut. Perhaps a short list of a few of the pupæ obtained at those trees may prove interesting.

“*Elm.* — *Smerinthus Tiliæ* (why this insect should be called the *lime* hawk-moth I know not; I have found dozens of pupæ at the roots of elm, but not one at lime), *Petasia cassinea*, *Tæniocampa rubricosa*, *T. Populeti*, *T. munda*, *Cosmia diffinis*, *Xylina semibrunnea*, *Anisopteryx Æscularia* ♂ and ♀, *Hibernia leucophæaria* ♂ and ♀, *H. aurantiaria* ♂ and ♀, &c.

“*Oak.* — Considering the number of larvæ that feed upon oak, I have been surprised at finding so few pupæ at it. This, I suppose, is partly owing to the fact, that a considerable number of the insects whose larvæ feed upon oak, do not pass the winter in the pupa state. However, when you do succeed in getting one, it is generally good; and I have found *Notodonta trepida*, *N. Chaonia*, *N. Dodonæa*, *Geometra Papilionaria*, *Biston Prodomaria*, &c. I was much surprised to find, on two occasions, the empty cocoon of *Cerura Vinula* on the trunk of an oak.

“*Ash.* — *Pœcilocampa Populi*, *Acronycta Ligustri*, *Geometra Lunaria*, *G. illustraria*, &c., &c.

“*Beech.* — This and the poplar are the best trees. At the former I have found *Lithosia rubricollis*, *L. aureola*, *Orgyia Coryli*, *Notodonta Camelina*, *Tephrosia consonaria*, &c.; at the latter, *Phragmatobia mendica*, *Pœcilocampa Populi*, *Cerura bifida*, *C. furcula*, *Ptilodontis palpina*, *Notodonta Dictæa*, *N. Dictæoides*, *Clostera curtula*, *Ceropacha Or*, *C. ocularis*, *Ypsipites ruberaria*, &c.

“And now a word with regard to *localities*. Meadows and parks with scattered timber trees are decidedly the best localities: being near a wood seems no advantage. It is, however, a very curious fact, that the nearer these meadows or parks are to inhabited places, as towns, villages, or even a single farm-house, the more abundant are the pupæ. I have observed this repeatedly, and in the most marked manner. I may mention two examples. Nine specimens of *Notodonta Dodonæa* were all obtained at the roots of an oak about a dozen yards from a farm-house; and though I searched upwards of forty trees in the neighbouring fields, I could not find a pupa of any kind whatever. At the same tree I found *Biston Prodomaria* and *Tæniocampa Gothica*. Again, the winter before last (1851-52), being in Dublin, I went to the Phoenix Park to dig. So long as I continued near the city, I found the commoner sorts of pupæ in plenty; but the further I retired from it, the scarcer they became: until, at about three miles distance, I could not find one. I should be very glad to see some explanation of this curious circumstance. Perhaps it may partly be accounted for on the supposition that the parent moth is attracted by the lights in the houses, and lays her eggs on the neighbouring trees.

“Next to parks and meadows I place woods. Searching in woods, however, is a tedious and fatiguing affair, and to search successfully requires some experience. Perhaps the following hints may prove useful. It is in vain to examine the *dense* portions; it is equally vain to dig at the *roots* of trees, with few exceptions: and you will rarely find anything, unless upon trees of considerable growth. The thick moss which collects about the trunks and roots, is the part to be examined. *Bombyces* are generally (almost invariably) found under the moss which covers spreading *roots*, and not on the trunks. The best localities in woods are the borders and open places. It is curious that such places when elevated, or facing the North, are generally the most productive.

“There remains one other locality — *hedge-rows*. These may be dismissed in a few words: it is perfectly useless to try them. I do not think I have found a dozen pupæ in such places: *why* it should be so I cannot tell. There are, of course, other localities, but as I have never tried them, I am unable to give any opinion on them.

“The next point which may be considered worthy of notice, is the mode of search. This, of course, varies according to locality. In digging, it must be borne in mind that all pupæ are close to the trunk of the tree, seldom more than 2 inches distant. Frequently the trunk of the tree forms one side of the cocoon, especially the cocoon of such insects as spin. Again, pupæ lie close to the surface of the earth, (I have seen those of *Smerinthus Populi* and *S. Tiliæ* half out of the earth); the larva of *Calocampa exoleta* is the only one I know of that goes to a considerable depth. Insert then the trowel about 3 inches from the trunk, to the depth of 2 inches or so; then push it to the tree and turn it up. If the soil be dry and friable, without grass, knock it gently with the trowel, which will be sufficient. If, however, there be grass, you must proceed more cautiously: take up the sod in the left hand, knock it very gently with the trowel, and those pupæ which merely enter the ground will drop out. To find those which spin, you must carefully examine the sod, tearing the roots of the grass asunder. These are, of course, much the most difficult to find, the cocoons being generally of the colour of the earth. I may here remark, that it is useless to try sticky or clayey ground, the caterpillars being unable to penetrate it. In searching under moss, the best plan is to loosen the edge, then to tear it gently off, observing whether any pupæ fall. Look at the trunk to see if anything adheres to it, and then carefully examine the moss itself. Experience alone will enable you to detect a spun cocoon.

“Searching under loose bark requires no comment: one observation, however, on the *Ceruræ*. I have heard it mentioned that the pupæ of the *kittens* are to be found near the roots: my experience goes to prove quite the reverse. Every one who has looked for them knows the extreme difficulty of detecting them. I found fifteen last autumn, and they were all, without exception, at least 2 feet from the ground. The puss moth certainly forms its cocoon near the ground generally, but not the kittens, I think. Though not connected with the subject of pupæ, I think it may be useful to mention that the larvæ of the genus *Cerura* are always found on the *upper* side of the leaf, generally about the centre.

“If I were asked which are the most likely trees, I should say those whose branches spread out towards the ground, since moths seldom fly to the high branches; those whose roots form an angle filled with loose dry earth, especially when covered with grass; and lastly, those which have a thick loose moss upon them. Nothing however can be more uncertain than any rules in this matter. You will perhaps see ten elm trees, to your eye exactly alike: at nine you may find nothing; at the tenth, possibly twenty or thirty pupæ. I remember, on one occasion, trying a number of ash trees, without the slightest success, and was about to give up the search as hopeless, when I resolved to try one more. At that one I found forty-six pupæ of *Ennomos illunaria*, and three of *Pæcilocampa Populi*!

“No pupa-hunter can hope for success, unless he have a good stock of patience and perseverance. He must not mind cold hands, wet feet, or an aching back; for although these are drawbacks, yet is the pursuit (to me) quite exciting, when successful, and it will reward the seeker, not merely of *Lepidoptera*, but also of all the other orders of insects.

“The longer I continue to dig for pupæ, the more convinced I am that one of the causes of the periodical uncertainty in the appearance of many insects is their inability, under certain circumstances, to force their way through the earth. As I have remarked, on a former occasion, severe frost following protracted rain will have this effect, as also will great heat. I once had a singular illustration of this. Digging at

the roots of an elm, I turned up a large lump of baked clay. On breaking it, I found no fewer than sixteen pupæ of *Tæniocampa instabilis* imbedded in it: the shells were quite brittle, and on opening them I found the insect perfectly developed, but dead. Another cause which tends to make insects scarce or uncertain in their appearance, is, of course, the Ichneumon, that foe to the entomologist. The havoc committed by them would appear incredible to those who have not witnessed their destructive powers as I have, while digging for pupæ. Take, for example, *Lithosia rubricollis*. At Guiting I found the pupæ of this insect by hundreds. It is no exaggeration to say that three-fifths at least of these had been destroyed by Ichneumons. Their empty pupa-cases, with the circular opening always made by the Ichneumon, lay scattered about by dozens; and I have repeatedly liberated the parasite itself in turning up the sod.

"It may be asked—'How do you know the species of those pupæ which are as yet undisclosed?' To this I would answer, chiefly by experience. As a general principle, it is not difficult to decide to what family a pupa belongs. A Bombyx may sometimes be known at once by its form, which nevertheless varies considerably. Moreover, all Bombyces form a web or cocoon, at least all those with which I am acquainted in the pupa state. This, however, is by no means a decisive criterion, as some Noctuæ (*Acronycta*) and Geometræ (*Tephrosia*) do the same. Still, I think a Bombyx may be known with tolerable certainty, if attention be paid to the following peculiarities:—1. A web or cocoon. 2. The bulky form of the pupa, which is almost invariably either of a nearly uniform thickness throughout, and round, or else stout to the middle and rapidly tapering to a point. 3. The form of the antennæ (which is an excellent criterion) and the invariable shortness of the wing-cases: to this I call particular attention. The genus *Lithosia*, of which, however, I know only two species in the pupa state, is an exception to some of these rules. Examples of the rounded form will occur to every one, as *Orgyia potatoria*, *Cerura bifida*, *C. furecula*, &c. As an example of the tapering form I may mention *Orgyia Coryli*. Some of the genera, also, among the Bombyces may readily be distinguished by the form of the pupæ; I may mention in particular *Notodonta*. I think I could instantly detect a pupa of that genus from its form. I have either reared or found in pupa, *Notodonta Camelina*, *Chaonia*, *Dictæa*, *Dictæoides*, *Dodonæa*, *Dromedarius trepida* and *Ziczac*. In all these (with the exception of *Camelina*, which slightly differs) the pupa is round, of a nearly uniform thickness, rounded at the anal extremity, and ribbed.

"The genus *Lithosia* is quite different. The pupæ which I have had (*L. rubricollis* and *aureola*) are short and stout, expanding somewhat in the middle, and tapering slightly towards each end.

"The Geometræ are easily distinguished by their size and slender shape, except the genera *Biston*, *Phigalia*, *Nyssia*, and part of *Ennomos*. They are, moreover, the most active pupæ, except perhaps some species of the genus *Acronycta*.

"It seems to me quite impossible to assert, with any degree of certainty, as to what subfamily or genus of Noctuæ or Geometræ a pupa belongs to, or to assign any data by which to decide, except, perhaps, experience and observation; and even then, owing to the great resemblance of many species to each other, one is constantly liable to error. The tree at which a pupa is found will sometimes assist, as showing the food; but even this is uncertain, as I have found the pupæ of insects, whose larvæ are supposed to feed on only one particular tree, at many others. I believe, for example, that the larva of *Acronycta Ligustri* is said to feed on privet; I never took it there, but have found the pupa under moss on willow, beech, ash, and oak."

Mr. G. R. Waterhouse read a revision of the synonymy of the British species of the genera *Hydrochus* and *Ochthebius*, founded upon an examination of the specimens in the collection of the late Mr. J. F. Stephens, now in the British Museum; the result being that in the majority of instances the names given or adopted by Mr. Stephens, and for which others had been substituted on the continent, would remain.

Mr. Westwood hoped that advantage would be taken of the acquisition by the Museum of Mr. Stephens's collections, and the facilities of investigation thereby afforded, to work up other genera or groups of our indigenous insects. He was convinced that, as in the memoir just read by Mr. Waterhouse, one result would be the vindication of Mr. Stephens's reputation from the aspersions which, he was sorry to say, had recently been cast upon it abroad.

Mr. Westwood read a memoir intituled "Descriptions of new Species of Coleoptera from China and Ceylon," illustrated by figures of the principal species.—*J. W. D.*

Proceedings of the Microscopical Society.

January 26, 1853.—GEORGE JACKSON, Esq., President, in the chair.

A paper by the Rev. Wm. Smith, "On the Stellate Bodies occurring in the Cells of Fresh-water Algæ," was read. After referring to the papers by Mr. Shadbolt, "On the Sporangia of some of the filamentous Fresh-water Algæ," published in the 3rd volume of the 'Transactions of the Microscopical Society,' the author stated that the stellate bodies which form the subject of this paper, are not, in his opinion, the result of conjugation, as supposed by Mr. Shadbolt, but of some disease affecting the cells in which they are found, being, in fact, bodies of a parasitic, or, perhaps, of a fungoid growth, consequent upon the degeneration of the cell-contents. To these star-like bodies he proposes to give the name of Asteridia, and adduced various facts which he considered as confirmatory of the opinion he had brought forward, of these bodies being examples of a singular and far from common monstrosity, produced by a peculiar disease affecting that curious and interesting class of plants.

A paper by Professor Quekett, "On the presence of a Fungus, and of masses of Crystalline Matter in the interior of a living Oak Tree," was also read. Mr. Quekett stated that while dining with a pic-nic party in Marlborough Forest, in the immediate vicinity of the King Oak, a large limb of a neighbouring oak fell with a loud crash. On investigating the fractured portion, which was nearly 3 feet in diameter, the centre was seen to be covered with a white filamentous mass, studded here and there with numerous crystals. When examined microscopically, the white mass was found to be made up entirely of the fibres of a minute fungus, many spores of which were adherent to the fibres. The crystals were mostly of a tabular form, and were ultimately connected with the fungus, their composition being probably some salt of lime. No indications of decay were to be observed on the outside of the branch, nor any external wound whereby the spores could have gained access to the interior. All the parts of the wood in the neighbourhood of the fungus were rather softer than usual, and the woody fibres having been displaced by the growth of the filaments, cavities were formed, and in these the crystals were the most abundant. The occurrence of a fungus in the heart of a living oak tree, the author believed had never yet been recorded, and its

presence in this instance might lead to its detection in oak timber previous to its being employed for building purposes.

March 23, 1853.—GEORGE JACKSON, Esq., President, in the chair.

A paper by Dr. Wm. Gregory, F.R.S.E., Professor of Chemistry in the University of Edinburgh, intitled, "Notice of a Diatomaceous Earth found in the Isle of Mull," was read. The author commenced by stating that this earth was discovered about two years ago by the Duke of Argyll, who gave a short account of its geological position to the Royal Society of Edinburgh. It constitutes a bed, resembling marl in appearance, lying in a rough piece of ground at Knock, near Aros, between Loch Baa, a fresh-water lake, and the sea. It is extremely rich in Diatomaceous remains, containing (according to a synopsis sent with the paper) various species of the genera *Pinnularia*, *Navicula*, *Gomphonema*, *Amphora*, *Stauroneis*, *Cocconeis*, *Durirella*, *Cymbella*, *Himantidium*, *Tabellaria*, *Epithemia*, *Eunotia*, *Synedra*, *Fragilaria*, and *Orthosira*. The most remarkable for their abundance are the genera *Pinnularia*, *Navicula*, and *Stauroneis*; and many of the species of these and of the other genera are of great rarity. After giving the chemical analysis of this earth, the Professor concluded by stating that the Mull deposit appears to him to be richer in Diatomaceous species, and perhaps also in genera, than any other known deposit, there being at least sixty species and sixteen genera enumerated as having been found in it. A portion of the earth, and some slides containing specimens, accompanied the paper.—*J. W.*

Proceedings of the Royal Physical Society of Edinburgh.

Saturday, February 12, 1853.—HUGH MILLER, Esq., President, in the chair.

The first communication laid before the meeting was—"On some Insects from the Rocky Mountains, received from the Botanical Expedition to Oregon under Mr. Jeffrey," by Andrew Murray, Esq., W.S. After alluding to the principal object of the Expedition, and describing some of the new Coniferæ, the seeds of which have been sent home, Mr. Murray said that when the Association was first started, he suggested to the Committee of Management that an addition might be made to its funds by admitting a limited number of entomologists, to receive beetles instead of seeds. In spring and early summer there would be few or no seeds to collect, while that was the very best season for insects; and at other times the collecting of the two might be made compatible, by instructing the collector to make the seeds his principal, and the insects only his subordinate object. The Committee adopted the suggestion, and the allowed number of entomologists immediately came forward. Unfortunately, Mr. Jeffrey was not an entomologist, and consequently, although he has no doubt done his best, only a very small supply of insects has yet been received. These consist of a few taken near York Factory and on the way to the Rocky Mountains, a few taken at Jasper House on their east flank, and the rest on the west flank.

Mr. Murray handed round a box containing the specimens which fell to his lot, with the insects from the different quarters placed slightly apart. Those in the first detachment were taken near York Factory (the nearest point to this country visited by

Mr. Jeffrey), and it was evident that a very great resemblance existed between them and the insects of this country. One or two British specimens of the same species were placed on coloured paper immediately after some of the American specimens, in order that the members might have an opportunity of comparing them; and in these instances they appeared to be nearly the same. There are a considerable number of insects which are common both to North America and Europe. Kirby, in Richardson's 'Fauna Boreali-Americana,' describes forty-nine beetles as identical. So far as Mr. M.'s observation went, he was of opinion that they were too close to be specifically separated; but still that there is a slight difference, which enables a practised eye to detect which is American and which is British: but such variations were looked upon by Mr. M. as the effect of the difference of food and climate. The next division in the boxes contained the insects taken on the east flank of the Rocky Mountains, and among them were two or three very beautiful undescribed Carabi. The last division comprised those from the west flank of the Rocky Mountains, most of which also are undescribed. Among them were a few specimens of a representative of our blister-fly, and next to these, on coloured paper, was placed the common blister-fly of Europe. A considerable number of these beetles was received, in fact, a greater proportion of them than of any other species; from which it was inferred by Mr. M. that they are found in large numbers, in the same way as they are in Europe, and that when a great empire shall have grown up on the west of the Rocky Mountains, the apothecaries of its cities would be supplied with this essential article from their own hills. That the species has the same blistering properties as the European insect, Mr. M. had not the least doubt: the specimens of course are too few and too valuable to allow of any of them being pounded to make the experiment, but the whole of the spirits in which the insects came home was tinged by them of their own greenish hue. The only other insects in the lot which particularly required attention, were two that were placed last, and stood a little apart. The first was a Carabus, of very curious form, or rather, perhaps, a new genus approaching Carabus, which Mr. M. proposed to call apoplecticus, from its apoplectic appearance. The other small fawn-coloured insect beside it was by far the most curious of the whole. Mr. M. believes it to be an undescribed species of a most extraordinary genus of beetles (*Nemognatha*, *Latr.*), of great rarity, and which he imagined few of the members had had an opportunity of seeing before. The extraordinary part of the insect consisted in the two curling appendages at its mouth. For the benefit of the non-entomological members present Mr. M. described the principal parts of a beetle's mouth in their normal state, and illustrated his description by a sketch, in which the mandibles were coloured black and the maxillæ red. In the normal state, the mandibles and maxillæ (to which Mr. M. wished in this instance to call attention), like the antennæ and palpi, as well as every other part of an insect, vary much in form; but however much they do so, they still bear the same relation to the rest of the body. In the insect exhibited by Mr. M. there appeared to be a deviation from this rule: all the other parts remained in their normal state, while the maxillæ were changed into long flexible processes (coloured blue in the sketch) projecting from the mouth. These processes appeared to be composed of a succession of rings meeting at the back. The specimen being unique, is too valuable to be sacrificed for dissection, so that it cannot be ascertained whether the processes are tubular or not, but they have every appearance of being so; in fact, they bear a strong resemblance to the trunk of an elephant, with the exception of the termination, for instead of having a mouth or opening, they appear to terminate in a point; at least, with the most

powerful lens, Mr. M. has been unable to discover any opening at the end of the tube. This strange conversion of the maxillæ would find a parallel, were we to suppose an elephant with a pair of additional trunks (though impervious) issuing from its mouth, in place of the molar teeth. These observations have been made solely from the dried specimen, which occurred among the lot that fell to the share of Dr. Lowe, to whose kindness Mr. M. said he owed the specimen, as well as several others of the most valuable in the box. Dr. Lowe was at once struck with the singular appendages above described, which he found to be highly flexible when the insect was taken out of the spirits. As to their probable use, Mr. Murray said he could not even hazard a conjecture, as there is no information regarding the habits of the insect; but he might say that, to his eye, the organs appeared to have more relation to the antennæ than to anything else. A few species of this genus have been already found in North America and Mexico, as well as five or six in Africa; but they are very scarce. In the corner of the box there were a few specimens of two insects (an Anobium and a Cryptophagus) which came home alive, feeding on the pine-cones, and which, however acceptable to him as an entomologist, he (Mr. M.) could honestly say he would rather have dispensed with, for the sake of his horticultural friends, who may have suffered from their ravages.

Mr. R. F. Logan next exhibited and described various additions to the Lepidoptera of Edinburghshire, captured during the last year. After placing at the disposal of the Society, for the use of the members, a few copies of the "Catalogue of the Lepidopterous Insects of Mid Lothian," published in the 'Naturalist,' Mr. Logan enumerated twenty-eight additional species which had been unintentionally omitted from the list; among them were *Agrotis Lunigera*, *Eupithecia palustraria*, *Micropteryx fastuosella*, *Ecophora senescens*, and several other species of interest. He then read a list of twenty-five species added during the past summer (1852), and exhibited the insects, among which were *Phlæodes immundana*, *Lithocolletis Messaniella*, Z., *Nepticula Argyropeza*, Z., *Gelechia politella*, Doug., *Gelechia Anthyllidella*, G. *marmorea*, *Crambus dumetellus*, C. *contaminellus*, and *Actebia præcox*. In conclusion, he brought before the notice of the Society the plan of a work which he projected, should it meet with sufficient support, to be intitled 'Illustrations of Scottish Lepidoptera,' in which he intended to figure many of the rarer and more interesting species, with details of their transformations and economy. He exhibited a number of the drawings in preparation, three or four of which would form a part, to be issued quarterly; and solicited the names of subscribers, to enable him to carry out his undertaking.

Mr. Hugh Miller read a paper "On the Red Sandstone, Marble, and Quartz-rock Deposits of Assynt, with their supposed Organisms and probable Analogues."

James Bonar, Esq., W.S., York Place, and George Meldrum, Esq., Accountant, 53, York Place, were balloted for and unanimously elected Members of the Society.

Saturday, March 12, 1853.—HUGH MILLER, Esq., President, in the chair.

The following donation to the library was announced, and thanks ordered to be given to the donor:—'Description of a Skeleton of the Mastodon giganteus of North America:' presented by the author, John C. Warren, Esq., M.D., Boston, U. S. A.

Read, a paper by William Rhind, Esq., intitled, "Facts respecting the Laws which regulate the Distribution of Rivers and the principal Watersheds of the Earth."

Mr. R. F. Logan then read a note "On the Exuviation of *Chydorus sphaericus*, one of the smallest of the British Entomostraca." When first observed, Mr. L. said the specimen was swimming about along with another of the same species, but soon attached itself by the feet to portions of the decayed grass and *Confervæ* under the microscope, and, when disturbed from one station, speedily assumed another. At last it fixed itself on a piece of *Conferva*, with its back uppermost, and commenced contorting and bending itself within the shell, which speedily ruptured across the centre of the back, (as shown in an interesting drawing exhibited by Mr. Logan); and in a few seconds the animal withdrew itself, leaving the exuvia perfectly entire, with the exception of the fissure across the carapace. The whole proceeding did not last more than two or three minutes; and in the course of as many more it was swimming about again as lively as ever, a little paler and more transparent at first, but rapidly assuming its ordinary colour.

Dr. John Alex. Smith exhibited a specimen of a black-coloured duck, of which, he said, he was rather puzzled to distinguish the species. It belonged to the genus *Anas* of Gray's 'Genera of Birds,' and bore a considerable resemblance to the mallard. Its colour, however, is entirely a dusky brownish black on the upper parts of the head and body, slightly glossed with green and purple reflections; the under parts are more of a brown colour, the chin and lower parts of the head mottled with grayish brown; a very small whitish spot on the lower part of the neck in front; under parts of the body dark brown, edged with lighter brown; sides and abdomen dusky brown; under tail-coverts edged with lighter brown; the primaries and their coverts are dusky brown, secondaries darker, the dull speculum dark green, glossed with purple, and faintly edged with light brown; under the wings the colours are light grayish white, the lesser coverts dusky brown, edged with grayish white, the axillaries being of this light colour on the one side, and dusky on the other. The bill was greenish dusky, the nail black; the tarsi and feet were reddish orange, the webs dusky, the hind toe small, slightly edged with a membrane. The bird, when stuffed, measured 23 inches from the bill to the extremity of the tail; bill, $2\frac{1}{4}$ inches along the ridge; wing from flexure, $10\frac{1}{2}$ inches; length of tarsus, 2 inches; middle toe, $2\frac{1}{2}$ inches; hind toe, $\frac{1}{2}$ an inch. Dr. Smith said he had examined the body of the bird, and found that the trachea was without dilatation, the bird being a female; the stomach was a powerful gizzard, $2\frac{1}{4}$ inches across, and contained some small pieces of white quartz, and apparently the remains of aquatic larvæ. The intestine was 59 inches, and the two cæca were $5\frac{3}{4}$ and $6\frac{1}{4}$ inches long. Dr. Smith remarked that it did not agree with the description of any of our British birds, and appeared to him somewhat to resemble that of the dusky duck of North America (*Anas obscura*), with which it agreed in general dimensions, but which he believed was quite unknown in Europe; or it might more probably be one of those strange hybrids which occur among ducks, as with the mallard and Muscovy duck. The bird was in perfect and unbroken plumage, and had not the slightest appearance of having escaped from confinement. He was indebted to Mr. John Dickson, jun., gun-maker, Prince's Street, for being able to exhibit the bird, and that gentleman had also favoured him with a few particulars of its capture. It was shot on the river Ouse, not far from York, on the 11th of February, and when first observed, was flying high in the air with other ducks. When closely watched, it was found that they were three in number—which, by the way, is rather against the idea of their being hybrids. One was supposed to be a male, its general plumage being described as of a

glossy black, and shining like a rook's; it had a white bar on the wings, and, apparently, a broad ring of white round the neck: the others were supposed to be females, from their duller plumage. The birds were very shy, and were carefully followed for six miles before it was possible to get a shot at them; and on doing so, the two remaining birds immediately took flight, rising very high in the air, and were soon completely out of sight: and although the river was carefully watched for several days, no trace of them could again be found.

Dr. Smith also exhibited a specimen of the red-headed pochard (*Anas ferina*), which is not a very common bird in Scotland, occurring generally during severe storms. It measured nearly 30 inches from tip to tip of the wings; whereas, in Macgillivray's Birds, it is described as only 25½ inches. It was shot on the Forth, near Stirling.

A fine specimen of the gray plover (*Squatarola cinerea*), shot near Dunbar in the beginning of February, and two specimens of the greenshank (*Totanus glottis*), shot in the same neighbourhood about the beginning of February, were also exhibited, neither of them being a common bird in the district.

And, lastly, Dr. Smith called the attention of the meeting to a specimen of the common curlew (*Numenius arquata*), which by some accident had lost nearly the half of its upper mandible. The point had, however, become quite rounded, so that the poor bird had contrived to pick up a rather difficult subsistence, even under such unpropitious circumstances.

Proceedings of Natural-History Collectors in Foreign Countries.

MR. H. W. BATES.*—"Santarem, November 22, 1852.—I now forward the results of my Tapajos voyage, consisting of three boxes of insects, a case of medicinal and economic Botany, a barrel of fishes and reptiles in spirits, a few birds, eggs, nests, shells, mammals, &c., the present being the only opportunity of sending them to Pará since I arrived. The vessel they go by is heavily laden, and I feel rather nervous about the safety of the many precious things I commit to it; but there is no remedy, as there will be no other opportunity so good till January. I wrote to you soon after my return, saying how unwell I was at the time; I am sorry to say I have been still worse, and have suffered severely from the fatigue of the voyage and the unhealthiness of the Tapajos, (nearly all the branch rivers here are pestilential); but still I have had no acute disease, merely bilious attacks, head-aches, prostration of strength, &c. Medicine only made me worse; so I put myself on a rigid diet, took gentle exercise, avoided close application and exposure to the sun. For these reasons I have been unable to send you many notes on the collection sent — only copying my note-

* Communicated by Mr. S. Stevens.

book on the specimens of economic and medicinal Botany. I should have liked to send my notes on the fishes, but it would have been necessary to copy my rough pen and ink outlines of the species—the only means, of course, of recognizing them; but my ill health quite disabled me from all close application. There must be, I am sure, some rare and curious fishes amongst them, as they were chiefly taken in remote creeks in the depths of the forest. There is a *Syngnathus*, some curious *Apodes*, *Esocidæ*, and a *Pleuronectes*; also some pretty things allied to the *Percidæ*. I hope the rum, which I have renewed, will preserve them until they reach you: tomorrow, I will get a case made for the barrel, which is leaky, and paint it thickly over, as it is not safe to send it loose.

“I have now summed up the expenses of the four months’ trip; it amounts to £50, within a few shillings. I went to work in the most economical manner, denying myself all luxuries and conveniences, and I don’t think I, or any one else, can travel thus in one’s own vessel, so cheap again. I am afraid it will not pay, and that we must come to the conclusion that districts where one cannot travel by favour as passenger, avoiding the expense of a vessel, and a lot of lazy natives (one item of my expenses is £6 for rum, chiefly given away), are not remunerative to explore; and therefore, where there are not civilized towns, I, for one, shall not attempt to travel again.

“My private collection of insects I still retain; it preserves very well in Downie’s boxes, and I find it very useful for comparison of fresh captures: it contains 2200 specimens, singles and pairs only, nearly all *Lepidoptera* and *Coleoptera*, and of course has a glorious amount of new things. Since my insects were packed I have resumed my excursions, but to avoid too much fatigue, only three days a week. I have added about half-a-dozen new and curious *Diurnes*. The weather is unprecedentedly dry, nearly three months without a shower! Vegetation is withered up, except in virgin forests along the water-courses beyond the campos of Santarem.

“I was not successful in shells up the Tapajos; I arrived at a place where the *Anastoma* certainly was abundant, but I saw only dead bleached shells in the clearings; the natives told me they never saw it alive, but suppose it conceals itself under old logs &c., and is burnt up when they burn their clearings, and only comes out in the wet season. I tried every means I knew of to procure the living shell,—dug about roots of trees, turned over great numbers of rotten logs, got a good many felled trees chopped up, searched in moist forests, and dug by banks of creeks, &c., and now suppose it conceals itself deep

in the earth in the dry season, and that this is the reason I could not find it. I send a few of *Helix rosarea* &c.

“I am delighted to hear that my paper on the Megacephali is to be so much honoured as to be published in the ‘Transactions of the Entomological Society,’ and now look forward anxiously to receive a copy. I found no Megacephali in the Tapajos, although I searched the vast tracts of sandy beaches in the river; the cause of their absence, and that of other shore Coleoptera, is the abundance of a voracious stinging ant, which swarms on all the shores to an extent I can give you no idea of: it is so annoying, that villages have been forsaken on account of it: one cannot land on any shore without being instantly overrun and stung severely. These ants burrow in the sand, and there is scarcely a square inch of ground on the Tapajos shore free from them: what sand-insect can stand against such an enemy?

“I hope some of my specimens of medicinal and economic Botany may prove curious and saleable. I have never lost sight of the subject, chiefly from my desire to serve my good friend, Mr. Saunders; but in a country so uncivilized as this is, it is impossible to get up the series of specimens as they ought to be. 1. There is no trade in wood or timber; and it is only on a chance occasion that a carpenter here gets more than two or three of the common kinds of wood: even of these woods, I have tried to coax one or two carpenters to make up for me a few squares, for payment, of course, but it is out of their regular way, and they won't do it. 2. In the midst of such a vast variety of trees in the forest, it is difficult to find the particular species of tree you have an illustration of (say the wood), and want a flower, a piece of bark, &c.; and it is only a very few persons who can thus recognise the few known and useful trees, the far greater part not having even native names. If you get a rare chance of seeing a tree in the forest, say a *Masaranduba* or an *Itariba*, ten to one it is not in flower or fruit, and your guide cannot tell you when it does flower. All this has happened to me repeatedly, and I despair of getting up the illustrative series of economic Botany complete. I have, as you will see, often sent you a branch of leaves only of some interesting trees.

“I am now uncertain as to my future proceedings, and depend much on results of sales of the collections of May and June, your letters about which I am daily expecting. There is still enough for a six months' journey up the Tapajos, going at least 100 or 200 miles above my last point; but we must conclude that there is not a great difference in the insects in this direction, such as takes place about Ega: and besides, the moist forest valley ceases about 200 miles up,

when insects are undoubtedly much fewer. If the report is true that a steamer is about to run from Pará to beyond Ega, there is a chance of my again visiting the marvellous country of the Upper Amazons. From Santarem there is no conveyance to Ega: to buy a canoe, and go up on one's own account, by easy stages, as you once proposed, has only one difficulty — hands to work it, and that I find nearly impossible to surmount. Indians cannot be got by any means a poor stranger like myself can command. Considering these things, I think it better not to send me any parcels after the receipt of this: for if I see no chance of being further useful in this country, I shall leave for England about April next; if I meet with a good chance of going up to Ega, of course I will write to you immediately, to make other arrangements.

“After all, I think our great difficulty is want of means of travelling liberally. If one could spend £200 or £250 a year, have a handsome canoe, a well-paid pilot, &c., with goods &c. to make liberal presents with, one could go anywhere, and meet with every assistance.

“An intelligent Spaniard came down from Quito *viâ* the Napo the other day. He said the privations of the voyage on the river were such, that to return to Quito he preferred going round by Cape Horn. He came down with the current; how much worse then would it be to work up against the current, for ten months prisoners in a canoe!

“H. W. BATES.”

NOTICES OF NEW BOOKS.

‘*The Annals and Magazine of Natural History*,’ No. 65, dated
May, 1853.

THIS number of the ‘Annals’ contains the following papers:—

‘On the Occurrence of Palms and Bambus [Bamboos] with Pines and other Forms considered Northern, at considerable elevations in the Himalaya.’ By Major Madden, H.E.I.C.S., F.R.S.E., M.R. Dublin Society.

‘On the Genus *Pachybatron*, and on some new Species of *Marginea*.’ By J. S. Gaskoin, Esq.

‘Remarks upon British Plants.’ By Charles C. Babington, M.A., F.R.S., F.L.S., &c.

‘On the Genera of the Tribe Duboisieæ.’ By John Miers, F.R.S., F.L.S.

‘On Marine Vivaria.’ By William Thompson, Esq.

‘Rambles in Ceylon.’ By Edgar Leopold Layard, Esq.

‘A Revision of the Genera of some of the Families of Conchifera, or Bivalve Shells.’ By J. E. Gray, Ph.D., F.R.S., V.P.Z.S.

Bibliographical Notice:—‘Revue et Magasin de Zoologie.’ Par M. F. E. Guérin Méneville.

Proceedings of Learned Societies:—Royal Institution—Zoological Society.

Miscellaneous:—On the Nervures of Leaves and their distribution; by L. von Buch. On the occurrence of large quantities of the Shells of *Anodonta cygnea* on the Sea-coast near Sandgate; by Francis Brent, Esq. Description of a new Genus of Gorgoniadæ; by J. E. Gray, Ph.D., F.R.S., P.B.S., &c. Note on a new Species of *Franco-lin*; by Dr. Nicholson, H.E.I.C. Medical Service.

From Mr. W. Thompson’s paper ‘On Marine Vivaria,’ it appears that he has for some years been following up, and with complete success, Mr. Warrington’s plan, of keeping the water pure by preserving the balance of animal and vegetable life. The experiment is a most interesting one; and the cases constructed for this purpose at the Zoological Gardens, Regent’s Park, will doubtless be a source of great attraction during the present summer.

On the Persecution of Birds and Animals, unhappily so general in this Country. By the Rev. ALFRED CHARLES SMITH, M.A.

IN my “Notes on the Natural History of Norway,” I have already alluded to the continual and wanton persecution of birds in England, as contrasted with their kind treatment in Norway; and their consequent confidence and familiarity with man in the one country, their shyness and fear in the other. Perhaps some may be inclined to think that this difference arises from the very scanty population of the one country, and the swarming multitudes of the other: undoubtedly, the two countries are widely different in respect to population; but while numbers of inhabitants on the one hand may have the effect of causing greater wariness in birds, on the other hand they produce greater familiarity with man. At any rate, whatever effect this may have, I must still assert that I fear our own countrymen cannot lay claim to

that universal kindness towards the animal creation, which is so remarkable in the Norwegian character.

Now the persecution of which I complain is twofold. 1. That crusade against birds and animals, which arises from the erroneous impression that they are injurious to the farmer and gardener. 2. The indiscriminate and wanton persecution of all kinds of birds and animals, for no cause or purpose whatever. I am sure the readers of the 'Zoologist' will agree with me, that this is a subject well deserving the attention of naturalists; and if we could induce a dispersion of narrow-minded prejudices, and an adoption of greater benevolence towards the animal kingdom, we should do more for our favourites, than volumes of anecdotes in their praise. To effect this desirable object is undoubtedly difficult, as we have to contend with false impressions long entertained, with deep-rooted and long-established views of expediency, handed down, in many cases, from our forefathers, as well as with a certain innate love of destruction peculiar to mankind from the days of Nimrod to the present time: we are often met with most dogged obstinacy, most persevering determination to cling to the old custom, irresistible ignorance, and secret but not the less strong suspicions that we are concealing the truth. Perhaps this prejudice is strengthened, in some measure, from the well-intentioned but often erroneous arguments of many warm-hearted naturalists themselves: in defending their favourites, they often overrun the mark; and, too loud in their praises, and too eager to acquit them of committing injury, they do not perceive that they are but strengthening the preconceived opinions of their opponents, who, *knowing* that rooks *will* eat seed sown, and that moles *will* stop drains, see that their defenders are one-sided arguers, prejudiced on their side, in their behalf, and so turn a deaf ear to their arguments. But now let the cause be fairly and truly drawn; let nothing be concealed; let the injuries as well as the benefits done by the bird or animal be clearly shown, and I have little fear for the result. Men will learn to see how wonderful the balance held by Nature without the intervention of man; that He who gave the bird his life to enjoy, at the same time provided food for the sustenance of that life, without any dependance on man. The rook may be tempted by the newly sown and newly springing corn, or by the ripening crops; but during all the rest of the year what thousands of grubs does he not destroy — what multitudes of wireworms which lesser birds with weaker bills cannot reach? The mole may burrow into the drains, and, in a well-drained farm, may do considerable damage; but, for the generality of land, what an

ally to the husbandman — what a destroyer of grubs ! But I did not mean, in this paper, to show the comparative benefit or injury effected by these or any particular species of the furred or feathered race ; for this, let me refer the reader to those admirable ‘*Essays on Natural History*,’ by Mr. Waterton (and particularly to the Essay on the Barn Owl in the first series, and to those on the Rook in the first and second series), to Bishop Stanley’s little work on birds, to the ‘*Zoologist*’ *passim*, and other sources of similar information. My object is merely to call attention to this fact, the perception of which, I am truly glad to say, is daily gaining ground amongst the farmers and others in this country, namely, that indiscriminate and wholesale destruction, and in some cases, even the extirpation of certain animals and birds formerly so much in vogue, is not expedient, but the contrary. Well-timed expostulation may, I think, very often remove prejudices long entertained against them ; but nothing can be so convincing to the farmer and gardener as actual proof, which dissection enables us readily to offer.

With the first class of persecutors, who wage systematic war with certain of God’s creatures which they suppose to be injurious to them, I advocate gentle means, as most promising of success. They have, or think they have, some reason for their enmity, and so deserve to be met with courteous though earnest remonstrance, kind though firm arguments, gentle though grave expostulation. Not so with the second class of persecutors, to whom I have already alluded, who wantonly, and from the mere love of cruelty, never lose an opportunity of destroying or injuring the animal creation : with these I would counsel open and incessant war. Now, it is hardly necessary for me to remind any observer, that such a general and cruel persecution of animals, whether birds, beasts, or insects, does prevail in this country to a very great extent, and especially among the lower orders ; every one will know how the accidental appearance of any creature within the grasp of the labourer, is usually the certain signal for its murder. Who ever heard of a poor innocent field-mouse being spared, if he strayed within the reach of the digger’s spade ? Who ever heard of the harmless hedgehog being suffered to remain rolled up in his prickly coat till danger was over, and then to trot back to his cover, without being kicked to death by the iron-clad boot of the hedger, or crushed by some deadly weapon ? Who ever saw the poor snake suffered to continue his path through the grass, unharmed by the vindictive stone or the murderous stake ? Where is the man or boy that gave back liberty to the poor bird which has accidentally fallen into

his hands? Where the peasant who has neglected the opportunity to maltreat the insect, be it cockchaffer, or butterfly, or any other, that has come within his grasp? I fear we should search in vain for such kindly feeling amongst the uneducated part of our community; and too often is their example followed by those whose education should have taught them that they have no right wantonly to destroy that life which the universal Creator has given His creatures for their enjoyment.

As an instance of this thoughtless cruelty, I must give an account that has just come to my notice. Some labourers were pulling down an old wall, in the thickness of which they found one of those phenomena, so frequently heard of and so unsatisfactorily accounted for, a toad completely embedded in stone and mortar. "There was no doubt," said the labourer who described it, "that he had been there for a great number of years, for there was no hole or chink by which he could have entered or left the place of his long sojourn." "Well," said the listener to his account, "but are you sure that the toad was alive when you found it?" "No doubt of that, Sir," said the man, "for he crawled out of his round hole, and was moving away, when I knocked him on the head with my pickaxe." So here was this poor harmless creature, whose long incarceration in his gloomy dungeon might have excited compassion in his favour, suddenly released from his prison, only to be slain by his liberator! Well might this toad (if toads be musical) have sung those touching lines at the close of 'The Prisoner of Chillon':—

"It might be months, or years, or days,
 I kept no count—I took no note,
 I had no hope my eyes to raise,
 And clear them of their dreary mote;
 At last men came to set me free,
 I ask'd not why, and reck'd not where,
 It was at length the same to me
 Fettered or fetterless to be,
 I learn'd to love despair.
 And thus when they appear'd at last,
 And all my bonds aside were cast,
 These heavy walls to me had grown
 A hermitage,—and all my own!
 And half I felt as they were come
 To tear me from my second home."

It is marvellous how naturally the death of the toad ensued in this man's mind upon his discovery; and yet, there is no reason to set

him down as unusually cruel and wanton. Any other labourer in his place would probably have done the same thing; they have seen nothing but persecution against such creatures, and they do but follow the practice of their fathers.

It is therefore, as I conceive, a subject by no means beneath the notice of our most scientific zoologists, ornithologists and entomologists, to endeavour, by any and every means in their power, to bring about a kindlier feeling in the people of this country towards the animal creation, by never losing an opportunity of pointing out the uselessness and the cruelty of such persecution. It is a subject on which the country gentleman may expatiate with advantage to his labourers and servants; and it is one that may most deservedly and properly be introduced by the clergyman in his parish school, and instilled into the hearts of all his people. And I am quite sure it will ever be found, that those who practise systematic kindness to the animal race, are far more kindly disposed to the human race, are far more amiable and gentle towards their fellow creatures, and have better hearts as Christians, than those who wantonly and cruelly persecute and destroy the wonderful and beautiful creatures which the Almighty, in His infinite wisdom, has made and endowed with life and with feeling.

ALFRED CHARLES SMITH.

Yatesbury Rectory, Calne,
May 6, 1853.

Occurrence of the Otter in Derbyshire.—The following may be interesting to some of the readers of the 'Zoologist,' and will support, by additional evidence, my friend Mr. Wolley's communication in the April number, (Zool. 3843). My cousin, Sir J. Harpur Crewe, of Calke Abbey, co. Derby, has now in his possession, stuffed, a beautiful pair of full-grown otters, which have been taken within the last three years by his keepers, on the banks of the Trent, in the neighbourhood of Calke. — *H. Harpur Crewe; 17, Cavendish Road, St. John's Wood, April 15, 1853.*

Occurrence of the Water-shrew (Sorex fodiens) at Castle Eden. — On Friday last, the 6th instant, a party of nine or ten of these beautiful little creatures were seen running along a path in a plantation in this place (Castle Eden), about a mile from any water. I obtained one of them, a full-grown male. The water-shrew has never before been observed in this neighbourhood, so far as I can learn: its habits, of course, might easily conceal it from observation; but the occurrence of so large a party, in such a situation, seems to suggest the idea that possibly, like some of its congeners, the water-shrew migrates at times to a considerable distance from its usual haunts. — *H. B. Tristram; Castle Eden, Durham, May 10, 1853.*

Anecdote of a Cat and a Kestrel Hawk.—I am indebted to a lady of my acquaintance for the following incident:—A tame kestrel, which is kept in a garden with one

wing cut, has contracted a friendship with a cat inhabiting the same premises, which the latter reciprocated on a recent occasion by bringing a live mouse, and putting it down before its friend the hawk, who immediately attacked and devoured it; the cat in the mean time sitting quietly by at a short distance, complacently observing its ally enjoying the result of this display of feline benevolence.—*J. H. Gurney; Easton, Norfolk, May 17, 1853.*

Note on the Geographical Distribution of Accipiter Tachiro and Terekia cinerea.—Accipiter Tachiro.—The Norwich Museum contains an adult male specimen of this fine sparrow-hawk from the neighbourhood of Erzeroum, in Armenia. I am not aware that any other localities have hitherto been quoted for this species, than the southern and eastern portions of the African continent. *Terekia cinerea.*—The Norwich Museum also contains a specimen of this curious little wader, in nearly full breeding plumage, obtained in South Africa. I am not aware of this bird having been included in any list of African birds, although it is known to exist in Europe, Asia and Australia.—*J. H. Gurney; Easton, Norfolk, May 17, 1853.*

On the Occurrence of the Golden Oriole (Oriola Galbula) in Norfolk.—Two specimens of the golden oriole were sent to Norwich to-day to be preserved: they were both very fine male birds, and both in the flesh. One had been shot at Kenninghall, and the other at Dilham, the distance between the two localities being rather under thirty miles in a straight line.—*Id.*

Occurrence of the Golden Oriole (Oriolus Galbula) near Weymouth.—On the 4th of May, an adult male of the golden oriole (*Oriolus Galbula*) was shot near the village of Fleet, which is about three miles to the westward of Weymouth. I have this day seen it, and believe this to be its first occurrence in Dorsetshire.—*William Thompson; Weymouth, May 7, 1853.*

Occurrence of the Jacamar (Galbula ruficauda) in Lincolnshire.—The record of the occurrence of the Apteryx at large in Wales (Zool. 3845), induces me to mention an instance of a straggler, captured in England, of a species scarcely less likely to be found in these latitudes. In the spring of 1850, I was told by a friend, the Rev. J. Brewster, of Greatham, and of Loughton, Lincolnshire, that his butler had obtained a bird which he believed to be new to the British Isles. I called on the man and procured the bird, which proved to be a specimen of the jacamar (the *Galbula ruficauda* of Cuvier, *G. Leptura*, Swainson), a female in perfect plumage, though badly mounted. On further inquiry I found that the bird was shot in the month of June or July, 1849, by S. Fox, the gamekeeper of H. Bacon Hickman, Esq., on a manor adjoining Loughton, in the parish of Gainsborough, Lincolnshire. It was flying over a small brook in a wood, apparently in pursuit of butterflies, and bore no marks of having escaped from captivity. Mr. Brewster's butler received it in the flesh, when quite fresh, and neither he nor the gamekeeper had any idea of its ornithological curiosity, but took it for a singularly marked kingfisher, which in its flight they said it resembled. I mentioned the circumstance to Mr. Yarrell, who expressed himself as quite at a loss to account for the capture of such a bird in Lincolnshire. I am not aware of its ever having been found North of Trinidad, much less on the eastern side of the Atlantic. Has such a bird ever been brought to this country alive? From its insectivorous habits I scarcely

think this possible; and yet, how otherwise could it have found its way to the eastern side of the British Isles? I simply mention the facts relating to the specimen in my possession, and shall be glad if any of your readers can throw light on the subject. I should have communicated its occurrence before, but that I had a dread of the prevalent anxiety to include every captured straggler in the catalogue of British birds. Its claims appear as good as those of the Australian spine-tailed swallow, or the Asiatic minor grackle; and yet, I trust you will agree with me, that clear as is the evidence of its capture at large within the four seas, it would be ludicrous to assign to the *Galbula ruficauda* a place in the list of our denizens and visitors.—*H. B. Tristram; Castle Eden, Durham, May 10, 1853.*

Susceptibility to cold of Sylvia Trochilus.—The weather on Saturday last and yesterday was extraordinarily cold, with snow on both days, and last night we had severe frost. Under a Portugal laurel, close to the house, and in which it had evidently sought shelter from the cold wind, we found a willow-wren dead; and in a hollow formed by a defective brick, on a level with the ground, under the same evergreen shrub, lay two more, also dead. Had the odd bird escaped? Two or three yards off was another little evergreen, similarly situated against the wall of the house; I looked under it, and there was the odd bird, also dead, evidently from cold. In woods and thickets they would creep into the long grass, and so, for the most part, escape: but we have here an adequate cause wherefore these pretty but susceptible visitors cannot come to us at an earlier period, much less remain with us through the winter. The absence of insects is not the only reason they must quit our shores before the winter's cold arrives.—*W. H. Wayne; Much Wenlock, Salop, May 10, 1853.*

Occurrence of the Blue-throated Warbler (Sylvia suecica), the Little Auk (Uria Alle), and the Black Redstart (Sylvia Tithys) near Worthing, in Sussex.—I beg to inform you that I have this morning received from a friend at Worthing, near which place it was shot on the 2nd instant, a female specimen of that rare British bird, the blue-throated warbler. From an examination since it has been skinned, it appears to have fed exclusively on small beetles, and is exceedingly fat. No previous record of the occurrence of this bird is given in the pages of the 'Zoologist.' I have also received from the same locality a beautiful specimen of the little auk, and a female example of the black redstart; the former of which was shot on the 15th of November, and the latter on the 23rd of that month.—*J. W. Stephenson; 2, Loudoun Place, Brixton Road, May 4, 1853.*

Note on the Black Redstart.—Another example of the black redstart occurred near Bembridge at the end of March. The day following its discovery, we proceeded to the place where it had been first seen, a large meadow sprinkled over with recently cut timber. We had scarcely made one round of the field, when the peculiar "ducking" action of a bird alighting on a trunk attracted our attention, and on nearer approach the fiery tail, as the bird flew off, showed we were not mistaken. The bird was restless rather than shy, and kept taking short flights from one heap of faggots to another, occasionally settling on the turf, as if in search of insects. On securing it, it proved a middle-aged male, and I am pretty confident that I afterwards saw a second individual on the same spot. Does not the occurrence of these birds, at the time of the spring movement, tend towards explaining the course of their migration, especially since we hear that they are not very uncommon as winter visitors in Devon? It seems to me quite possible that these birds, when seen in the Isle of Wight, were at the time proceeding towards their summer quarters, moving in a direction from West to East along

the Channel. At all events, the mild climate of our South coast would ensure a supply of insect food during the more rigorous winters of the eastern and inland parts of Europe.—*A. G. More; Trin. Coll. Cambridge, May 3, 1853.*

Occurrence of the Continental White Wagtail (Motacilla alba, Linn.) in Sussex.—On the 21st of this month, I saw and examined carefully five specimens of this bird, four of which—one female and three males—were shot on the 19th of this month, between Shoreham and Worthing, and the fifth at Hove, near Brighton. They are all in the possession of Mr. Swaysland, Naturalist, Cranbourne St., West St., Brighton. They may be at once distinguished from the pied wagtail (*M. Yarrellii*) by the following leading features:—The head is covered by a distinct hood of pure black, perfectly defined, and not mixing either with the gray of the back or with the white of the forehead; and the white on the cheeks and sides of the neck completely separates the black of the head from that of the throat and breast, there being no black before the shoulders: the sides also are much lighter, and the tail somewhat longer. In the female, there is no mixture of black on the back and nape, which there is in all the females of the pied wagtail which I have examined. This female had the eggs only of the size of an ordinary pin's head, whereas, in the pied wagtail, the eggs are at this time generally as large as or larger than a pea, so that I suppose the former bird to be a later breeder: I have, however, as yet seen but one female. The note is said to differ from that of the pied wagtail. I am not aware of the present species having previously occurred in Britain.—*Wm. Borrer, jun.; Cowfold, April 25, 1853.*

Note on the Brambling Finch.—A few days ago I obtained one of these birds from a small flock, which was attending the common chaffinches roosting in some holly-bushes.—*J. Johnson; Denby, near Huddersfield, March 8, 1853.*

Occurrence of the Rook (Corvus frugilegus) in Shetland.—I almost forgot to inform you that on the 12th of March (last month) I saw a flock of about thirty rooks feeding on some cultivated land about a mile from my house. Although the rook is a very common bird in England, it is very rare here, as the above are the first I have seen in Shetland.—*Robert Dunn; Helister, near Weesdale, Shetland Islands, North Britain, April 11, 1853.*

Occurrence of the Hoopoe (Upupa Epops) near Selborne.—On Tuesday last, the 3rd instant, as I was driving from this place towards Alton, on the very confines of the parish, a fine hoopoe rose from behind a hedge, and flew over it into the road. It continued its flight before me for about fifty yards, and then disappeared over the hedge. There was a drizzling rain, and I was in haste, so that I could not stop to watch it; but I shall keep a good look out, in the hope that I may be able to ascertain whether it has a mate, and whether they may possibly breed here. As I am not one of those ruthless collectors who shoot every interesting bird they may find, I shall say nothing about its habitat here, but endeavour to leave it in quiet. You will doubtless recollect Gilbert White's pretty notice of the occurrence of this bird on the very spot on which I can at this moment look out (for I am writing within a few yards of the place where he describes them as "walking in a stately manner, feeding in the walks, many times in the day"), and which account you will find in his eleventh Letter to Pennant. The whole paragraph is very pleasing. In the very year in which I first came to this place, a pair of hoopoes were seen on the lawn of my excellent friend and neighbour, the Rev. Mr. Snow, of Newton Vallance. Mr. Yarrell, in his 'History of British Birds,' mentions Dorsetshire and that line of coast as particularly the haunt of hoopoes; and I remember, when I was a very young man, I think about the year 1810, a

fine specimen being sent to me at Poole, which had been shot at Wareham.—*Thomas Bell*; *Selborne*, May 6, 1853.

Occurrence of the Hoopoe (*Upupa Epops*) in *May, in the Isle of Portland*.—I beg to record the occurrence of the hoopoe, *not* on account of its rarity of late years in this county, as specimens are obtained every year. The subject of this notice was shot yesterday, the 6th of May, in the Isle of Portland: all the other specimens that have come to my knowledge have been obtained in the months of April or September.—*William Thompson*; *Weymouth*, May 7, 1853.

Note on the early appearance of the Quail, (*Coturnix vulgaris*).—A female quail, having been noticed for several days near some stacks, was shot at Thrextton, near Watton, on the 1st of March, the snow being then quite deep.—*L. H. Irby*; *Sahan*, *Norfolk*, April 16, 1853.

Occurrence of the Stone Curlew (*Edicnemus crepitans*) near *Thetford*.—A pair of stone curlews were also shot near Thetford, when the snow was quite deep.—*Id.*

Note on the abundance of Woodcocks.—I have to observe that no less than twelve of these pretty visitors have been obtained here since October last. For the last four or five years not more than one or two at the most have been killed annually. This locality is bordering on the high moors.—*J. Johnson*; *Denby, near Huddersfield*, March 8, 1853.

Note on Woodcocks' Nests in the Forest of Bere, and in Highden Wood, Hants.—On the 28th of March, I was out walking in the Forest of Bere, with Sir Jervoise Clarke-Jervoise, Bart., of Idsworth Park, Hants. We had the rabbit-beagles with us, and they flushed as many as twelve or fifteen woodcocks during the time we were out. The woodcocks frequently rose two at a time, which, together with their heavy owl-like flight, showed that the breeding-season had commenced. One couple in particular got up with a good deal of fuss, and evidently had a nest or, young close by; for they flew a very short distance in a semicircle, and one of them performed in the air evolutions similar to those of a peewit when its nest is approached: it also gave a peculiar cry, which I think worth mentioning, as it is the first time I ever heard (and I never heard of) a woodcock uttering any sound. We continued our walk with our "eyes open," and at length Sir J. Clarke-Jervoise had the good fortune to flush one close to him; and on examining the place whence it rose he found the nest, containing four eggs. He most kindly allowed me to take one of the eggs for my collection. On blowing it, it appeared to have been sat upon for four or five days; in which case, the nest must have been formed and the eggs laid when the ground was covered with snow, and even when we found it, the ice had not entirely disappeared. The bird deserted her nest, and so, of course, the remaining eggs were taken, and, through the kindness of Sir J. Clarke-Jervoise, another has been added to my collection. This is the first instance of the woodcock's *nest* being discovered here, but the young birds have occasionally, for years past, been found by the keepers; and there is no doubt whatever that they breed here regularly. The keeper, on whose beat the nest was found, told me that he could now, sometimes of an evening, get at least twenty good shots at them as they are "flying about:" the other keepers also speak of the numbers they see when out on their rounds about dusk. It is gratifying to know that every possible protection is given to these interesting birds, and that Sir J. Clarke-Jervoise makes it a rule never to kill a cock after the last day of January, thereby giving the survivors of the previous campaign every encouragement to try a domestic life in England, and time to prepare for a matrimonial choice on Valentine's day. Many of the

woods about here are admirably adapted for the woodcocks to breed in; and if Sir J. Clarke-Jervoise's rule, of letting them rest after January, were adopted generally in the neighbouring preserves, "a day's woodcock-shooting" in Hampshire might be worth coming some distance for; at any rate, would not be so problematical a thing as it is at present. The poor woodcock is looked upon too much as a stranger, who is only to be here a few days, and will never come back; a most erroneous idea, as has been frequently proved on the highest authority: the consequence is, that the moment he is flushed there is a hue and cry, and every gun within a hundred yards is let off, "on the chance; because you know one should always fire at a cock!" Since writing the above, I have been told that a woodcock's nest has been found in Highden Wood, about four miles from here. It was discovered by a woodman who was cutting some copse-wood, and contained four eggs. As some accident invariably happens when a bumpkin gets hold of anything rare, so this case, though it followed the rule, did not prove it by being an exception, for the man rolled up the eggs in his smock frock and sagaciously sat upon them; not, however, with the same happy result as would have attended the incubation of the real bird.—*William Henry Hawker; Horndean, Hants, April 22, 1853.*

Woodcocks breeding in this country.—On Monday, the 25th of April last, a young woodcock, about half grown, but unable to fly, was brought to my father by his game-keeper, who found it, with two others, running about in a copse at Bloxworth, Dorset. Now, to have arrived at this size by the 25th of April, they must at least have been hatched by the first week of that month, so that the eggs were probably laid by the 10th of March, perhaps earlier. I was not aware that the woodcock ever nested so early as this, though I have always known it to be an early breeder. Does not this, then, show the bad policy, to say the least of it, of shooting woodcocks, as is commonly the case, "whenever they can be got at?"—though I must myself plead guilty to having been instrumental in the death of eleven birds out of twelve found, on the 10th of March last, in covers only a short distance from that in which the young ones were found. All these twelve birds were in *pairs*, and perhaps some of them would have bred there, or, indeed, might *then* have had nests with eggs. Had I at that time known of its nesting so early, or that there was so fair a chance of their breeding with us, I should by no means have molested them; but I only then knew that they did occasionally breed there, for a neighbour's keeper found some young ones, two or three years ago, in an adjoining wood, though whether that was as early as April he did not tell me, and this is the only other instance that has ever come to my knowledge. Late in the season, towards the middle and end of March, up to which time they are considered fair game, woodcocks lie very close and in pairs, and when put up, drop again almost immediately, so that (the length of the day also telling against them) there is no part of the season at which they are so sure of being eventually bagged. Added to this, nearly all other shooting being over, woodcocks are increasingly persecuted whenever a day's shooting is wanted by those whose sporting ardour has not quite cooled down for the season. Woodcocks also fall an easy prey at this time to the keepers, who, released from attendance on shooting-parties, are then busily employed in killing rabbits; and as on these occasions every understrapper who can hold one musters a gun, to aid in the extermination of rabbits, the unfortunate woodcocks get but a poor chance; and I have myself seen, on such an occasion as this, a woodcock that had been flushed several times, and after escaping repeated volleys fired by these understrappers, at last fall by an accidental shot from the gun of the worst marksman among

them. All this, then, seems to me amply to account for the few known instances of their breeding, at least about us. Though I have long thought that woodcocks should not be shot after the 1st of March, I have hitherto, for want of a conclusive reason to the contrary, continued the usual practice of killing them whenever to be found, in some years even up to the 1st of April; however, for the future, they will be intact, by me, after the 14th of February: and I now firmly believe that most of those which I killed on the 10th of last March, would have bred there had they been spared, for the ground is in every way what one would suppose well suited for the breeding and rearing of this bird. I trust therefore that all who may read this will, in time to come, give them a chance of breeding in this country, by allowing them to go free after the 14th or so of February; and I doubt not, if this plan were pretty generally adopted, that it would materially increase the number of birds in the ensuing season, and make their nesting in England a comparatively common occurrence. Since writing the above, I have learned that a pair of woodcocks were also seen by my brother on the 6th of April last, while hunting his beagles, in another copse at some distance from that where the young ones were found. — *Octavius Pickard-Cambridge; Hatch Beauchamp, Taunton, Somerset, May 12, 1853.*

Occurrence of the Great Snipe (Scolopax major) near Durham.—Two or three specimens of the great snipe were obtained in this neighbourhood during the winter, and they are considered to be pretty regular winter visitants. The Hon. Augustus Barrington informs me, that some thirty or forty years ago, as he and his brother, the present Lord Barrington, were shooting on Fishburn Car, about half way between Castle Eden and Darlington, they killed, in the month of *August*, four solitary snipes, two of which were young birds, scarcely fully fledged. This is the only instance I ever heard of this bird breeding in Britain. So careful an observer as Mr. Barrington could hardly have mistaken this snipe, and the singularity of the occurrence imprinted the fact on his memory, although he was not aware at the time that the nest of the solitary snipe had never been found in this country. Last summer I met with this bird in vast numbers along the coast of Nordland and Finmark. In one marsh near Bosöë, we obtained I think seven brace in half an hour, in the month of August, the young birds being fully fledged.—*H. B. Tristram; Castle Eden, Durham, May 10, 1853.*

Occurrence of the White-winged Black Tern (Sterna leucoptera) near Yarmouth.—This bird was killed on the 17th instant, by Mr. Robert Rising's keeper, at Horsey, near Yarmouth. Three or four of the black tern were killed at the same time with it.—*George Trederick; 11, Charles Street, Westbourne Terrace, May 21, 1853.*

[I have seen this bird in the flesh, and can state therefore that it is an example of the white-winged black tern.—*W. Yarrell; May 21, 1853.*]

Occurrence of the Little Gull (Larus minutus) in Shetland.—On Thursday, the 7th of April, I had the pleasure of shooting a specimen of the little gull (*Larus minutus*). When I first saw it, it was flying by itself at a distance, and from its small size I fancied it was one of the tern tribe, but as it came nearer I readily perceived, by the roundness of its wings and the shortness of its tail, that it was not a tern. As it flew, it kept dipping down to the sea every here and there, as if picking something off the surface of the water. It flew past us once out of shot, but did not go far before it turned again, we crossed it with the boat, and I was fortunate enough to shoot it as it flew past. It is an adult female, in fine plumage, excepting that the head was moulting from white to black. This, and an adult specimen of the Iceland gull (*Larus leucopterus*), which I shot on the 22nd of November, 1852, together with three or four

adult glaucous gulls (*Larus glaucus*), are amongst the rarest of the birds which we have shot in Shetland this winter.—*Robert Dunn*; *Helister, near Weesdale, Shetland Islands, N. B., April 11, 1853.*

Occurrence of the Masked Gull (Larus capistratus) in Sussex.—On the 25th of February last, I received a living specimen of a gull, which I suspected to be the masked gull (*Larus capistratus*) of Yarrell's 'History of British Birds' (iii. 430), in a transition state between the summer and winter plumage, showing a few dark feathers behind the eye and on the front of the head, but the occiput and back of the neck being pure white. Having pinioned it, I put it on a pond with other gulls, &c., and it soon began to assume more dark feathers on the head and face, and has now, April 25th, fully assumed the mask, the back of the neck and the occiput being still *pure white*, so much so, that when the bird is running or swimming away from the spectator, no dark colour is visible. This is a mature bird, the tail being pure white. It was caught off Brighton, the day before it was sent to me: I am not aware of any record of its having before been obtained in the South of England."—*Wm. Borrer, jun.; Cowfold, April 25, 1853.*

Note on the Reproduction of Frogs.—Mr. Edward Lowe's paper on the reproduction of frogs without the presence of water, which appeared in the 'Annals' for April, and is quoted in the 'Zoologist' of this month (Zool. 3871), is one most deserving the attention of all naturalists. In support of Mr. Lowe's fifth observation, I cannot help sending you these few remarks. Year after year I have observed the same circumstance, and to account for it has always been to me the greatest puzzle. It was in a wine-cellar that the frogs were seen; the exact position of which I must first attempt to describe. This wine-cellar had no other entrance than a close-fitting door, under which a moderate-sized frog could not possibly pass; nor do I think that even young ones, such as those seen, could have done so, but of this I cannot speak for certain. This door opened into a dairy, having a window communicating by a small area with the garden. Minute frogs were found continually, two or three years following, among the damp sawdust in the cellar. They were *very small*, not larger than if they had just assumed the perfect state. And now, as to how they got there. Is it possible that they were brought into the cellar with the sawdust, and, from want of food, did not increase in size during that lengthened period? I should say not. We have now two propositions left:—either they must by some means have found their way into the cellar, or they must have been bred in it. The nearest water to the cellar was a small pond in a field separated from the garden by a deep walled *ha-ha*; but I have never seen any tadpoles in that pond, nor do I think it likely that there would be any there, as the water is very pure, coming from a spring not far off, and running in and out of the pond in a continued stream. But granting, for the sake of argument, that the frogs might have been bred there, to have reached the cellar they must have crossed the field, mounted the perpendicular wall of the *ha-ha*, traversed the garden, passed through the area and window into the dairy, and thence under the door into the wine-cellar, and this, too, in a party of some dozens! That frogs and toads will do wonderful things in the shape of locomotion, is a fact well known, and of this, perhaps, the most extraordinary instance on record is that given in the number for November,

1843, (Zool. 321); and while on the subject, I may as well mention one instance which has fallen within my knowledge. In a hot-bed in the above-mentioned garden a toad was wont to take possession of a particular corner. This proceeding, however, was not approved of, and the toad was unceremoniously carried to the other end of the garden and thrown over the *ha-ha* into the field. To our astonishment, however, the snug little corner of the hot-bed was not long without its tenant; in a day or two the toad was found again on its form. How did *he* get up the wall of the *ha-ha*, and what instinct led him back to his favourite haunt? We have yet much to learn about the Amphibia, for, disgusting as they used to seem to most people, they are now found to be a family perhaps more curious in their economy, and more interesting in their habits, than any other; and I trust that I shall see before long something more on this and other subjects connected with them in the pages of the 'Zoologist.' — *Alfred Merle Norman; Clevedon, May 13, 1853.*

[Far be it from me to discourage any inquiry like this into the supposed departure from a law of Nature in the réproduction of metamorphotic reptiles: but we must not overlook difficulties that stand in the way of our receiving an hypothesis like this; such, for instance, as the following: — Suppose it impossible, or even improbable, for the *small* frogs and toads to gain access to the places where they have been found, is it not equally impossible and improbable for the *parents* to get there? Are not the parents larger than the children? To receive the hypothesis in full, we must also receive another and older hypothesis, — that of spontaneous generation! — *Edward Newman.*]

Occurrence of the Lump Sucker (Cyclopterus Lumpus) at Lynn.—A fine male example of this fish was caught in our harbour yesterday, measuring about a foot in length. It was of a bright red tint, which has however changed to-day into a dull brown. Our fishermen are catching small herrings and smelts, which may serve to account for its presence in the estuary, but the force of the flowing tide must account for its being so high in the river. Is it probable that the pair had entered the river for the purpose of spawning?—*Edward L. King; Lynn, March 31, 1853.*

List of Land and Fresh-water Shells found in the Neighbourhood of Sudbury. By WILLIAM DOUBLEDAY KING, Esq.

ENCOURAGED by observing that the inland Conchology of our own country has of late obtained occasional notice in the 'Zoologist,' I venture to send a list of such species of land and fresh-water shells as have occurred in this neighbourhood.

By far the greater part have been found within a mile of the town of Sudbury; the remainder at a distance not exceeding two or three miles. The Stour, frequently overflowing the low meadows close to the town, leaves a considerable drift of weeds &c. upon its banks,

which, on examination, is found to be rich in shells, not only of the aquatic species, but of the smaller terrestrial kinds also. Many, perhaps most, are, as might be expected, bleached or imperfect; but still a large number of specimens may be thus obtained, as perfect and transparent as if found alive in their natural abode, although the animal inhabitant has, in general, wholly disappeared: thus sparing the collector the unpleasant business of killing and extracting it. I have been much puzzled to account for this circumstance, as it can hardly arise from gradual decay. Is there any race of insects which prey upon these mollusks, either in a dead or a living state, thus leaving the shells in a beautifully perfect condition? If so, my cabinet is much indebted to them for their labours.

I have entirely omitted the slugs from this list, not having collected or studied them; as well as several of the more obscure species, especially of *Zonites* and *Pisidium*, from my not feeling sure of being able to distinguish them in their different stages of growth, though I have but little doubt of their occurrence here.

Neritina fluviatilis. Numerous in the river, and extremely variable; when alive, always encrusted with mud, the removal of which appears to destroy the beautiful coloured markings, so ornamental when the shell is found dead and empty.

Paludina vivipara. Very fine and tolerably abundant in the Stour. I have kept these curious creatures in a pail of water, and had a large accession of young ones, their delicate shells adorned with spines, which disappear as they become mature.

Bithinia tentaculata. Common.

„ *ventricosa*. Not rare.

Valvata piscinalis and *cristata*. Common.

Vitrina pellucida. Now and then found in moss.

Helix aspersa. One picked up in my garden had the whorls much produced.

„ *hortensis* and *nemoralis*. Abundant.

„ *hybrida*. Two or three specimens I believe to be of this intermediate species.

„ *arbustorum*. In some moist mossy hedges near the town.

„ *lapicida*. Not uncommon.

„ *pulchella*. Excessively abundant in the drift, and, I think, inhabiting the meadow close to the river.

„ *Cantiana*. Common on the chalky banks, white, pale pink, and of a rufous colour.

- Helix fulva*. Rare, in drift.
 „ *aculeata*. One specimen.
 „ *hispidata*. Occasional.
 „ *rufescens*. Abundant, as elsewhere,
 „ *virgata*. Abundant, of two very distinct varieties.
 „ *caperata*. Frequent, on dry banks, chalk-pits, &c.
 „ *Ericetorum*. Less numerous, but not rare; mostly without bands, and of a plain horn-colour.
- Zonites radiatus*. Common.
 „ *pygmæus*. Rather rare.
 „ *nitens*. Common.
 „ *allarius*. Frequent, in moss.
 „ *radiatulus*?
 „ *crystallinus* and *lucidus*. Frequent in the drift.
- Succinea putris*. Common.
Bulimus obscurus. Frequent in hedges.
Zua lubrica. Very abundant.
- Achatina acicula*. This elegant shell sometimes occurs in great numbers amongst the remains of a flood, but I never find any vestige of the animal that inhabits it.
- Pupa umbilicata*. On an old church-yard wall, in considerable numbers.
 „ *marginata*. Frequent in the drift.
- Vertigo pygmæa*. Not rare.
 „ *palustris*. A few specimens with the two former shells.
- Balea perversa*. In the bark of old willows, not common.
Clausilia bidens. One or two, in moss.
 „ *nigricans*. Very common.
- Carychium minimum*. Extremely common.
Acme fusca. One specimen, in the drift.
- Limnæus auricularis* and *pereger*. Common.
 „ *stagnalis*. Frequent and large on Cornard Mere, in pools.
 „ *palustris*. Common.
 „ *truncatulus*. Frequent.
- Ancylus fluviatilis*. Occasional.
Velletia lacustris. Frequent in the river.
Physa fontinalis. Pretty common.
Aplexus Hypnorum. A few specimens in a small stream.
Planorbis corneus. Common.
 „ *albus*. Not rare.
 „ *carinatus*. Abundant.

Planorbis marginatus. Common.

„ *vortex*. Very common.

„ *nitidus*. Occasional.

„ *contortus*. Frequent.

Cyclostoma elegans. On a bank near the village of Belchamp ; large, and mostly of a buff or clay-colour, without the beautiful purple spots which ornament the smaller variety usually found near the coast.

Cyclas cornea. Common.

„ *calyculata*. Rather rare.

Pisidium pusillum and *pulchellum*. In drift.

„ *Henslowianum*. Not very uncommon in the river.

„ *annicum*. Frequent.

Anodon cygneus. Common.

W. D. KING.

Sudbury, April 25, 1853.

Occurrence of Eolis Landsburgii at Weymouth.—In my occupation here of collecting living animals and plants for the purpose of stocking the marine aquaria in the Zoological Gardens, I have been so fortunate as to meet with some objects marked in our lists as rare; I will however refer only to one species, *Eolis Landsburgii*, perhaps the loveliest gem of all our nudibranch Mollusca. On the 23rd ultimo I took two specimens of this charming amethystine *Eolis* within a few minutes; both on the under surface of stones near low-water mark (spring tide), but not in association with each other. *Eolis coronata* occurred at the same time, and since, in unusually fine condition: it is spawning about this time. These are the only littoral Eolididæ that I have met with here, except a single example of *E. papillosa*. When *E. Landsburgii* was published by Messrs. Alder and Hancock, it was on the authority of a single specimen. In the 'Annals and Magazine of Natural History' for January, 1852, the capture of a second is recorded by the Rev. Thomas Hincks, and the occurrence of a third is alluded to. I am not aware that this rare and beautiful creature has been seen since, until this twofold capture, which I now beg to record in the 'Zoologist.'—*P. H. Gosse; Weymouth, May 16, 1853.*

Note on the Acarus of the Hornbill.—In the report of the Proceedings of the Zoological Society for March 8 (Zool. 3886), it is stated that Dr. Crisp, after exhibiting a specimen of a hornbill, observed that the Acari of birds were never within the reach of the bill. As this report is entirely erroneous, you will probably allow me to give my own version of the matter. On looking over a few specimens of the hornbill (*Buceros Rhinoceros*) with my friend Mr. Bartlett, he directed my attention to the enormous

number of eggs upon the feathers at the back of the head, neck, and throat. On a more careful inspection, I found that the ova were only deposited in this situation, where the bird, from the great length of the bill, could not reach them. The eggs amount to many thousands: they are placed chiefly at the base of the feathers; their numbers varying from twenty to fifty on each. Whether the hornbills generally are affected with these parasites I am unable to say; but in three living toucans (birds which bear some resemblance to the hornbills) now at the Regent's Park Gardens, I find no trace of these animals. As regards other birds, my experience does not enable me to speak. The bill of the hornbill and of the toucan is so beautifully constructed, that the smallest insect would be crushed by its well adjusted point; but the claw, I apprehend, would be of little service in this kind of warfare. Whether the mites instinctively deposit their eggs in the situation named, is a question difficult to solve; but looking to the habits of some grades still lower in the scale of creation (the coral insect, for example), I think it more than probable that the animal in question does possess this amount of instinct. On placing several of the feathers upon which the eggs are deposited under a power of 40 diameters, I find that the mite has escaped from the greater number, but in several the young Acarus may be distinctly seen through the egg-shell, the exterior of which is composed of cells of a pentangular form. I found several of the mites dead on various parts of the body, and although dry and shrivelled, their forms are tolerably distinct under the microscope. They present most of the characters of the Acaridæ. The mandibles are large, their inner edges trenchant, and their anterior extremities expanded and lobated; the legs are eight in number, with the tarsi of all terminating in a disk-like appendage. The body and legs are furnished with spines, and the posterior part of the body is pointed. In some specimens the mandibles are much smaller, but the disk-like tarsal appendage in all is very distinct. I have immersed some of these Acari in spirits of turpentine, and hope hereafter to be able to describe them more accurately. I believe they have never before been noticed, for on referring to the interesting papers, and drawings of the Acariens, by MM. Dugès, Dufour, and Gervais, in the 'Annales des Sciences Naturelles' for 1833, 1839, and 1841, I find none that correspond with those depicted in the inclosed drawings, which I exhibited at the Zoological Society.—*Edwards Crisp, M.D.*; 21, *Parliament Street, May 13, 1853.*

Note on the Abstinence of Spiders.—In the February number (Zool. 3766) there is an account, by Mr. Pickard-Cambridge, of a spider which lived for upwards of eighteen months in a stuffed bird's case, without obtaining any visible supply of food, and even increased considerably in size during that period: and in the following number of this journal (Zool. 3809), Mr. Bree remarks on this statement, that the animal must have obtained food by some means, it being impossible that it could have increased in size without sustenance. Like Mr. Bree, I was much pleased with Mr. Pickard-Cambridge's account, and, had I not been prevented by other avocations, should have offered a few remarks on this subject before, it evidently being one of much interest both to the naturalist and the physiologist. With respect to the length of time that Mr. Pickard-Cambridge's spider lived apparently without food, it has been long known to arachnologists that many species of Araneidea will bear a very protracted abstinence without any perceptible diminution of vital energy. Martin Lister, in his "Tractatus de Araneis," contained in the 'Historia Animalium Angliæ,' which he published in 1678, has the following passage:— "Aranei nihil reconduunt, quòd diu sine cibo vivere possunt; per hyemem verò ex toto abstinent, et ne victum quidem quærunt;"

* * * Omni etiam anni tempore jejunium diutinum ferre possint; calidis quoque regionibus etiam per æstatem, non solum cum hyems eas necessariò cogat. Araneas, inquit F. Redi, tam masculas quàm fœminas, vasis vitreis excepi; longitudinem vitæ sine alimento interalia observavi; nonnullis à 15 Julii, quo die capti erant, in finem usque Januarii producentibus,"—(p. 12). The most interesting and remarkable case, however, in illustration of the fact in question that I have been able to meet with, is narrated by Mr. Blackwall in his 'Researches on Zoology,'* published in 1834. He says, "A female Theridion quadripunctatum, captured in the month of August, 1829, was placed in a phial of transparent glass, and fed with flies till the 15th of October, in the same year, during which interval she accomplished her final moult, and attained maturity. She was then removed to a smaller phial, which was closely corked and locked up in a book-case, her supply of food being at the same time discontinued. In this phial she remained till the 30th of April, 1831, on which day she died, without receiving the slightest nourishment of any description; yet till the autumn of 1830, no apparent change had taken place, either as regards her external appearance or physical energy. Throughout the entire period of her captivity, she never failed to produce a new snare when the old one was removed, which was frequently the case; and it is particularly deserving of attention that the alvine evacuations were continued, in minute quantities and at very distant intervals, to the termination of her existence,"—(p. 302). This experiment shows that spiders will live as long as the one noticed by Mr. Pickard-Cambridge, without food, but the individual in Mr. Blackwall's case had attained maturity, after which period, as with perfect insects, they undergo no further increase in size,† (the abdomen of the impregnated female being excepted); but it has been found that young individuals, if kept in confinement and only sparingly supplied with nourishment, increase very little in size, moulting only once or twice instead of five or six times in a given period, and, if altogether deprived of food, soon die. Mr. Pickard-Cambridge's spider must have obtained nutriment from some source, and this leads me to the most interesting part of the subject, namely, what was its nature? I have often examined webs made by the house-spider in wine-cellars and other close situations, some of which are perfectly dark, and have little communication with the air, and have seldom if ever found any insects entangled in them, or the remains of insects near them; and I have therefore been puzzled to know on what food the spiders subsist. Spiders and their webs may also often be seen in the corners of empty and closed drawers, in which no insects will be found. What then is the nature of their food? It appears that some species require little more than water for their sustenance (all of them live on liquid food, their mouths being only adapted to imbibe the juices of their victims), and if supplied with it will continue plump and well for a long time without any other food. Mr. Blackwall found that a pair of the

* This work, which contains many interesting observations on Ornithology, Arachnology, and other branches of Natural History, is, I think, but little known.

† I may here remark, that spiders cannot be strictly said to grow at any period of their existence, their increase in size taking place through the means of periodical moultings, or casting of the skin: and the number of times that this takes place is not the same in all species. It has been ascertained that the common house-spider (*Tege-naria civilis*) changes its skin nine times before it arrives at maturity; *Epeira callophylla* five times, and so on.

pretty little spiders named *Drassus nitens*, which were confined in a phial, having become feeble and greatly emaciated, drank with avidity a few drops of water which were introduced to them, and speedily resumed their strength and former plump appearance.* Though the imbibition of water is thus capable of prolonging the lives of some species, still there is no doubt that those spiders which select close and dark situations for the construction of their webs, find some living prey upon which they can feed, though they may not be able to meet with winged insects; and further observations are required to clear up this interesting subject. My own idea is, but it is only supposition, that they prey principally upon small species of Acari; for numbers of these minute and little-known Arachnidans may be found wherever decaying organic matter exists, particularly about dead wood, skins, &c., where they afford food to various insects and other animals besides spiders: for instance, to the little book-scorpion (*Chelifer museorum*, Leach).—*R. H. Meade; Bradford, Yorkshire, April 19, 1853.*

Are Telephorus rusticus and T. lividus the Male and Female of one Species?—This question I am induced to put in consequence of my having, for some seasons past, so very frequently taken in copulâ these two insects, hitherto looked upon as distinct species. The time for their appearance is again come round, and perhaps, by a little careful observation, this may be noticed in other districts. May not such affinities exist among other members of this family? And by carefully noting and recording from time to time such facts as present themselves, might not some one be tempted to undertake a general revision of this group?—*John Scott; London Works, Rensfrew, May 7, 1853.*

Note on the Impalement of Geotrupes stercorarius.—When going home a few evenings ago, I met with a case of accidental insect-impalement. It was almost dark, and numbers of *Geotrupes stercorarius* were booming about. One louder and more continuous buzz than the rest arrested my attention; this I found to proceed from a *Geotrupes* impaled on the point of a sharp upright thorn, which had penetrated between the dorsal segments of the abdomen, near its apex. The beetle was wheeling round and round, with expanded wings, and making violent efforts to escape, but only fixing itself the more firmly at every turn. Most probably it had been struck down during flight by a twig, and falling with open wings into the hedge, had exposed a vulnerable part to the pointed thorn. I examined the beetle closely, but found it quite uninjured except where the thorn had entered. — *Thomas J. Bold; Angas's Court, Bigg Market, Newcastle-on-Tyne, May 3, 1853.*

Occurrence of the Gray-headed Wagtail (Motacilla neglecta) near Penzance. — A specimen of this bird has again come under my notice during the past week. It was observed in Marazion Marsh, and proved to be an adult male, in good plumage. — *Edward Hearle Rodd; Penzance, May 23, 1853.*

Imperial L. C. Academy.—Election of Fellows.

The 'Bonplandia,' the official organ of the Imperial L. C. Academy Naturæ Curiosorum, announces that the six naturalists mentioned below have received the honour of Fellowship in the Academy, with the accompanying Academical names:—

1. H. C. Beck, Pastor in Schweinfurt, = Metzger.
2. Anatol Nicolajewitsch, Prince of Demidoff, who, it will be recollected, sent the principal part of the Russian articles to the Great Exhibition of 1851,..... = Franklin.
3. Edward Newman, of London, = Latreille.
4. F. L. Fülleborn, President of the Court of Appeal in Marienwerder, = Röschlaub.
5. F. Goldenberg, Professor of Natural History and Mathematics in Saarbrücken, = Steinhauer.
6. Philip Wirtgen, Ph.D. Director of the College in Coblenz,... = Ehrhart.

Proceedings of the Entomological Society.

May 2, 1853.—J. O. WESTWOOD, Esq., V.P., in the chair.

The following donations were announced, and thanks ordered to be given to the donors:—The 'Zoologist' for May; by the Editor. The 'Literary Gazette' for April; by the Editor. The 'Athenæum' for April; by the Editor. The 'Journal of the Society of Arts' for April; by the Society. 'Proceedings of the Berwickshire Naturalists' Club' for 1851; by the Club. 'Révision de la Famille des Cicindélides de l'Ordre des Coléoptères,' par Th. Lacordaire, Liège, 1842; and 'Monographie de la Famille des Phytophages,' par Th. Lacordaire, tome ii., Liège, 1848; both presented by the Author. 'Monographie des Guêpes Solitaires,' par H. F. de Saussure, Cahier 4, Paris, 1852; by the Author. 'Mémoires de l'Académie Royale des Sciences, des Lettres, et des Beaux-Arts de Belgique,' tome xxvi., 1851: 'Mémoires Couronnées et Mémoires des Savants étrangers,' tome xxiv. 1852: Ditto, in 8vo., tome v. 1re partie, 1852: 'Bulletins de l'Académie,' tomes xvii. 2me partie, xviii. and xix., 1851—52; all presented by the Académie. Two book-cases, by Mr. Waring; and a set of bookshelves, by Mr. Edwin Shepherd.

The Chairman stated that in consequence of several inquiries from the apple-growing districts of the country, the Council wished him to announce that the "insect-scale" of the apple, the insect whose natural history the Society had this year proposed as the subject of a Prize Essay, was the same as that known in many places as the "scale-insect" or "scale-blight" of the apple.

The Chairman also called the attention of the Meeting to copies of a Catalogue laid upon the table by Mr. Stainton, for distribution, intitled, 'Bibliotheca Stephensiana, being a Catalogue of the Entomological Library of the late James Francis Stephens, Esq., F.L.S., which has been preserved entire, and is now removed to Mountsfield, Lewisham, where it may be consulted by any entomologist, every Wednesday evening, as heretofore.'

Mr. H. Doubleday presented a beautiful drawing of the under side of a very singular variety of *Polyommatus Alexis*, taken near Cambridge by the Rev. Rudston Reid. The usual ocelli were absent, but on both wings was a row of strong black marks within the posterior margin, not extending outwardly beyond the red spots on the lower wings, and similarly situated on the upper wings, but there the red spots were wanting. Part only of the posterior ocelli are represented by black dots.

Mr. Bond exhibited a specimen of a *Psyche* new to this country, pronounced by M. Bruand, who was engaged on a monograph of the *Psychidæ*, to be his *P. marginenigrella*. Mr. Bond reared it from a case which he found attached to a tree, either in Lancashire or Yorkshire.

Mr. Edwin Shepherd exhibited a larva of *Notodonta Camelina*, which had been attacked and killed by muscardine; a very pale and little-marked variety of *Argynnis Euphrosyne*; a unicolorous variety of *Fidonia atomaria*; and a specimen of the rare *Aleucis pictaria*, taken on the 24th of April last, on the palings at Dartford Heath.

Mr. S. J. Wilkinson exhibited larva-cases of *Incurvaria Zinckenii* and *I. mascullella*. They were both of considerable size, and of a broad-oval form, each constructed of two pieces of leaf neatly cut out and fastened together at the edges; the former species from the leaf of oak, the latter from the leaf of birch. The perfect insects, which he also exhibited, had emerged, leaving the pupa-skin projecting from the case, showing that the larvæ had changed to pupæ within the case. He also exhibited three specimens of the new *Lithocolletis Nicellii*, reared from nut-leaves, and a cocoon of a *Bucculatrix?* found attached to a fence.

Mr. Stevens exhibited specimens of the fine Goliath beetles, *Amarodes Passerinii* and *Eudicella Smithii*, lately received from Port Natal.

The Chairman read a note from Mr. Weaver, stating that the insect exhibited at the November meeting, reported as *Bolitophagus crenicollis*, should be *B. crenatus*; and that another Coleopterous insect should be added to his list of discoveries in Scotland, namely, *Ampedus tristis*, belonging to the family *Elateridæ*.

The following letter was read:—

“Liverpool, April 30, 1853.

“SIR,

“Perhaps the following hints may not prove uninteresting to some of the members of your Society. At your meeting on the 4th of April, a communication was received from Mr. Wilson, recommending chloroform as a means of disabling large *Lepidoptera* before pinning or killing them. Some years since, when in Switzerland, I took great delight in making a collection of *Lepidoptera*, and invariably found that the easiest way of killing the insects was by dropping sulphuric ether on their heads. This suffocates them immediately, excepting the very large kinds, and then a second dose is generally needed. In this manner I have killed *Papilio Podalirius*, *Parnassius Apollo* and *Mnemosyne*, *Apatura Iris*, *Acheroutia Atropos*, *Sphinx Convolvuli*, *S. Ligustri*, *S. Pinastri*, *Chærocampa Nerii*, &c.

“When the insect is captured and killed, Mr. Humphreys, in his beautiful book, mentions that ‘the wings must be kept expanded by thin braces of card.’ An easier plan is to have a flat board, with grooves of various sizes to receive the bodies, and then to keep the wings expanded by small pieces of glass until dry. The advantage

is, that the glass presses equally all over the wings, and also that you can always see whether they are in their proper position or not.

“ I remain, Sir,

“ Your obedient Servant,

“ J. W.”

“ To the President of the Entomological Society.”

Dr. Dutton said that he preferred hydrocyanic acid to all other agents for destroying life in insects. He had found one drop, of Scheele's strength, sufficient to kill fifty insects; and, so small a quantity being necessary, no danger to the operator need be apprehended.

Mr. Spence communicated the following note on *Termes lucifugus* :—

“ As the small yellow ant (*Myrmica domestica*), now become such a pest in London, might probably have been easily extirpated, had it been brought under the eye of entomologists on its first introduction from abroad, it may not be amiss to direct the attention of the members of the Society to the possible importation of a still worse pest, the *Termes lucifugus* of Rossi. The ravages of this minute white ant (first discovered in France at Bordeaux by Latreille), at Saintes, Rochefort, and Tournay-Charrente, in the western departments of France, were described by M. Audouin twenty years ago, and the accuracy of his observations has been since confirmed by those of MM. Milne-Edwards and Blanchard in the same localities; but it appears from a paper read before the Académie des Sciences at Paris, on March 28, by M. de Quatre-fage, that this insect has now found its way also into the Port of Rochelle (interesting to entomologists as the birth-place of Reaumur), where it is rapidly extending itself; and how easily it might thence be brought to our ports in the West of England, where it would find a temperature probably as well suited to its propagation as at Rochelle, need not be pointed out. This species, as Latreille observed, and as M. de Quatre-fage informs us, does not confine itself to dead wood, but attacks living plants and trees, having excavated the stems and tubers of Dahlias, and the trunks and larger branches of poplars. He found chlorine the most effective agent for its destruction.”

The Chairman said Dr. Burmeister had shown him the same *Termes* from the South of Prussia.

Mr. Stainton communicated the following extract of a letter from Count Nicelli:—

“ *Lithocolletis Scabiosella*, *Douglas*, is a very good species. However, it is not the only species on low-growing plants, for Herr von Heyden, of Frankfort-on-the-Maine, sent me a very beautiful species, something like *lautella*, bred from a species of *Vicia*; it is *L. Bremiella*. Besides this, I may mention *L. Sagittariella*, a species allied to *Faginella* and *Mannii*, bred from broom; and another, named by him *L. Staintoniella*, which is allied to *L. Betulæ*, but much smaller, and feeds on broom.”

Mr. Westwood mentioned that by a careful examination of the fragments of the Chinese wax-making *Coccus*, given to him by Mr. Hanbury, he had been able to find wings of the male, and dried bodies and some other parts of both male and female, so that he now thought he could make a sufficient description of the species. He had also found three species of *Encyrtus* parasitic on this *Coccus*.

Mr. Westwood also informed the meeting that specimens of a blind shrimp, found in a well near Maidenhead, had been sent to him, and that he had identified them as the *Niphargus Stygius* of Sciödte, found in the caves of Carniola, and of which a figure, description and account were published in the Society's 'Transactions,' vol. i. n. s. The well in question was about 18 feet deep, and these Crustaceans abounded in it to such an extent, as to render the water unfit for use. The well had been cleaned out, but the shrimps were still there, though to a less extent.—*J. W. D.*

Proceedings of the Society of British Entomologists.

April 19, 1853.—MR. HARDING, President, in the chair.

The President announced that a box of Lepidoptera, containing between 200 and 300 specimens, had been presented to the Society for the cabinet.

The President exhibited a box of caterpillars, preserved by removing the intestines, and filling the vacant space with coloured worsted. The markings and colours were nearly as bright as when the caterpillars were living, especially in those with smooth skins. He also exhibited a pair of *Anerastia Farrella*, taken on the coast of Kent.

The President made some observations on the tenacity of life in *Mesium sulcatum*. Having placed a specimen in a pill-box in April, 1852, the box was not opened until the 5th of April in the present year, when the insect was found alive, and apparently in as good health as when put away twelve months before. That spiders will live for a long time without food is well known; but tenacity of life in beetles under similar circumstances is of more rare occurrence.

A copy of Stainton's 'Entomologists' Companion' was presented by the Author.

May 3, 1853.—MR. HARDING, President, in the chair.

The President exhibited two specimens of *Aleucis pictaria*, taken on the 13th and 26th of April, both in fine condition.

The President said that in the course of his perambulations during the month of April, he had been much surprised at the number of specimens of *Vanessa Polychloros* that were basking in the sunshine; he could not remember any time that he had seen such a number. He observed that the members had without doubt seen articles in the 'Zoologist,' in reference to the tenacity of life in spiders. It was a well-known fact, that spiders were capable of existing a long time without food. As an illustration, he recollected, when he was a very young naturalist, taking a nest of spider's eggs in mistake for those of a Lepidopterous insect, and putting them in a pill-box. On opening the box some days afterwards, he found it full of young spiders and web: it was then put by for a time, and upon opening it by chance he found the spiders still alive. His curiosity being excited, he put the box away carefully for nine months, and on opening it at the end of that time, he found the spiders still alive, but they died a few days after. These little creatures had never tasted food. Many species of spider, in the perfect state, remain torpid during the winter months, and do not move until the warm days of spring call them into life, which will tend to account for their abstinence; but this does not apply to the case above mentioned. After all, however,

what is this to the case of a toad living for ages encased in rocks and trees? This would prove a much greater tenacity of life, but unfortunately no such examples have ever come under the notice of a naturalist.

Mr. Dalman, on the part of Mr. Miller, exhibited a box of insects, containing, among others, a pair of *Cassida splendidula*, taken at West Wickham on May 1.

Mr. Jones exhibited specimens of *Lithocolletis alpinaliella*, from the leaves of the alder.—*J. T. N.*

Proceedings of the Tyneside Naturalists' Field Club.

Anniversary Meeting, March 30, 1853.—The Ven. Archdeacon THORP, Warden of the University of Durham, President, in the chair.

There was a very full attendance of Members, and the proceedings were commenced by the delivery of the presidential Address of the Ven. Chairman, in which he reviewed the proceedings of the past year. The first field meeting of 1852, he said, had been held at Lumley, on which occasion the members visited the castles of Lumley and Lambton, and the ancient Collegiate Church of Chester-le-Street—an edifice filled with memorials of the past, and the former owners of these neighbouring feudal piles. The second meeting was held on the 14th of June, at Featherston and Haltwhistle, amid wild moorland scenery, adorned by the blooming heather, and watered by the Tyne, which flowed there, a pure and shining stream. The Ven. President referred to the association of those scenes with the memory of his early friend, the Rev. John Hodgson, the historian; and, after a just and eloquent tribute to his diligence, his faithfulness, and the simplicity of his character, exhorted the younger members to imitate his bright example. The third field meeting had been held on the 16th of July, at Castle Eden; but the excitement attending the general election at that time, had prevented many members of the club from joining the meeting. The fourth meeting had been held at Bamborough,—a locality of peculiar attraction and interest. In the neighbourhood might be mentioned Twizel House, and Spindleston Hills, the latter associated with the romantic history of the Earl of Derwentwater; and, beyond these, was Holy Island, hallowed by the Priory of Lindisfarne and the Farn Islands, where St. Cuthbert's Hermitage and Chapel were to be seen, not uncared for at the present day; while, on the mainland, the old historic Castle of Bamburgh yet stood in stately pride, with the venerable church, whose history ascended to the earliest days of Christianity in Northumberland. The many attractive objects of this locality deserved, he said, repeated visits from the members, more especially they ought to make a pilgrimage to Holy Island, and linger amidst memories which were in truth the history of the English Church in its early days. The meeting at Bamburgh had been marked by the reading of a paper by Mr. Albany Hancock, on the nidification of the stickleback, a peculiarity which had been noticed by Aristotle, but not treated of by subsequent writers. Dr. Thorp said that the well-known legend of the worm of Spindleston offered a corroboration of the view suggested by his predecessor in that chair (Mr. Ingham), in his address last year, that great reptiles, formerly inhabiting the primeval forests, may have lingered in this country down to a comparatively late period, and have given rise to the many popular traditions about dragons. The fifth and last meet-

ing had been held at Otterburn, on the 28th of September, on the hospitable invitation of Mr. Coward. That was a vicinity full of ancient memorials. Besides the Roman camp, at which such interesting discoveries had recently been made, and which had formed the subject of a paper read to the Club by Mr. Kell, there was Elsdon, where the family of Umfreville had once their tower of strength, and, besides many sylvan objects, there were all the martial memories of Otterburn, that still live in tradition, and "look green in song." The worthy Archdeacon then remarked that it was strictly within the objects of this Club, to cultivate a knowledge of local antiquities; its members in their excursions, which were often taken in places remote from the frequented paths of men, had opportunities of collecting local tradition, and of visiting localities which had been the scenes of historical events, or had been marked by buildings of which the material traces were fast disappearing. In the buildings and monuments which it was the province of the archæologist to investigate, the history of the country and its former inhabitants was written, and a rich field of usefulness, as well as rational pleasure, was open to a Club which combined such investigations with the immediate pursuits of the naturalist. As to these, the Ven. President pointed out several plants that were to be found in the neighbourhood of the city of Durham, and the birds whose notes gladdened the inhabitants from April to September. He urged members to avail themselves of the health-giving pleasures which the social meetings of the Club in rural localities afforded, and to make every step in their field-walks a step in the path of wisdom, and an approach towards such knowledge as our finite comprehension could attain of the great Author of nature, the Infinite and All-wise.

The eloquent and appropriate Address of the Ven. President was received with cordial applause; he however omitted to state therein, that he had himself entertained the members at dinner, on the occasion of their visit to Bamburgh Castle, — a visit, the pleasures of which were greatly enhanced by courteous hospitality.

The President then read a statement of plants and insects, new to the district, which had been met with during the year. Of the latter, Mr. J. T. Bold exhibited some of the rarer species of *Hydroporus*: namely, *H. rufifrons*, *Dup.*, taken at Boldon Flats; *H. Gyllenhalii*, *Schiödte*, from Gosforth; *H. tristis*, *Payk.*, from Prestwick Car; *H. obscurus*, *Sturm*, from Gosforth and Prestwick Car; and a small obscure species, apparently unrecorded as British, which was met with in some plenty at Gosforth, in company with *H. angustatus*. The same gentleman exhibited a few of the wild bees of the district; also, some very interesting *Coleoptera*, mostly taken in Cumberland, including a fine series of a large, dark variety of *Hydroporus elegans* (?), from Talkin Tarn. A series of *Aphodius Laponum*, and three specimens of *A. alpinus*, *Scop.*, from Tindal Fell. Single specimens of *Ips quadripustulata*, *Oömorphus concolor* and *Seymnus nigrinus*; the first and last captured near Gosforth. Another rarity was a specimen of the true *Blaps mortisaga*, *Linn.*, taken in Scotland.

Part 2 vol. ii. of the Club's 'Transactions,' and part 3 (the concluding one) of Messrs. Hardy and Bold's 'Catalogue of the *Coleoptera* of Northumberland and Durham,' were on the table and distributed to the members.

The meeting terminated by the election of officers for the year, Sir W. C. Trevelyan being unanimously voted President.

Proceedings of the Dublin Natural History Society.

Friday, April 8, 1853.—PROFESSOR ALLMAN, M.R.I.A., in the chair.

Several donations were announced, and among them was a very fine engraving, handsomely framed, of the celebrated wood-engraver, Thomas Bewick; presented by Dr. Gordon: who passed some deserved eulogiums on Bewick's skill and truthfulness in his delineations of animal life.

Mr. Williams presented a fine specimen of the wild swan (*Cygnus feras*). This bird had been in his possession for more than sixteen years, and lately met with a severe accident, which had broken its wing close to the shoulder, thus rendering it necessary to kill it. Mr. Williams had bought the swan from a party at Abbeville, in France. The bird had then been kept nearly sixteen years by the person he purchased it from, who had captured it, when a mature bird, in a snow-storm. It was therefore difficult to say what age the bird had reached. He would mention a remarkable fact connected with the death of the bird. Being anxious to put an end to its sufferings, he had given strychnine to the bird to the extent of 40 grains, without producing any sensible effect.

A paper by Mr. Andrews, "On the Embryology of the Trout," was then read.

The author said,—“The true value and importance of the natural sciences are the useful and practical results that can be derived from the study. The mere collecting of objects, or the display and arrangement of a museum, may indeed afford pleasure to many, whose time, or powers of observation, cannot command a more extended sphere of scientific inquiry; but a far nobler aim in the study of the natural sciences is the blending with scientific details enlarged views of practical utility, and to make Natural History conducive, not merely to amusement, but to the substantial improvement of man. Such are the views of this Society, and to such are its pursuits and exertions directed.

“Another important feature in the proceedings are the opinions so freely given by the members: and it is by discussion, which is the life and soul of a Society like ours, that we arrive at the truth on subjects which often otherwise would appear perplexed and obscure.

“So far back as 1847, I had the pleasure, at a meeting of the Society, of submitting to the members a statement relative to the fisheries of Ireland, and alluded at the time to the many extensive lakes and rivers of this country, whose waters might be made valuable by the introduction of the impregnated ova of some of the most esteemed kinds of fish from the lakes and rivers of the Continent; such as the *Perca lucio-perca*, *P. Zingel*, *Salmo hucho*, &c., which the Danube, Iser, and Sáve abundantly afford. In France, the inland fisheries are so cherished, that an acre of water is rendered as valuable as an acre of ground; and the successful experiments in that country attending the propagation of the ova, are now rendering the object one of mercantile value.

“One of the most delicious and esteemed fish for the table, the *Osphromenus* of Commerson, is remarkable for its size and excellent flavour. It is mentioned as originally from China, and known as the Gourami; thence introduced by the Dutch to Batavia, who kept and fed it in large earthen vessels, where it deposited its spawn. It was also kept in tanks in the Isle of France, whence it escaped into the rivers of the island, and now abounds there. Introduced also to Cayenne, and to the West India

Islands, it has abundantly multiplied, proving, where climate and temperature are adapted, how readily the propagation can be extended."

The author here read a letter from Mr. Daniel Smith to Mr. S. Gurney, jun., in reference to the impregnated ova of salmon and trout sent from England to Australia. This letter is given in our number for June, 1852, (Zool. 3504). He then continued:—

"Mr. Gurney also wrote to me from Carshalton on the 21st of January last, this pleasing communication:— 'I expect to begin spawning my fish tomorrow. I have just heard that some spawn I sent to New Zealand about two years ago, was hatched in due course, and that the fish from my river (the Wandle), are now flourishing in the Antipodes.' This is the course to make Natural History truly useful; and is it not of the highest importance to have it so directed, that a knowledge of the habits and spawning states of our most esteemed fish can render their distribution to unproductive waters, where climate and temperature may prove congenial. The object of the present paper is not to enter fully into the physiological details of fœtation, or the development of the embryo, to the growth or development of extrication from the ovum, but merely the record of observations made during a recent visit to Mr. Gurney, at Carshalton."

After a brief description of Mr. Gurney's grounds, the author proceeds:—

"I was fortunate in visiting Carshalton about the middle of last month, and had the opportunity of learning from Mr. Gurney, and of seeing, his successful plans. At that time the spawning-season was over, and the parent fish had retired from the deposit-beds to deep water. After the artificial impregnation of the ova, they are placed in beds of gravel, in boxes secured with wire gratings, and through which a stream of water plays, of sufficient depth to allow the light and temperature necessary for the due development of the embryo fish. In such state the ova are prepared for transportation to our remotest colonies. Mr. Gurney had at the time some ova kept in the house in a tin vessel, which were spawned at Christmas, and sent to him from Derbyshire. Several had extricated themselves from the eggs, and were actively moving through the water, with the large vitelline sac attached. The time of extrication much varies, according to season or temperature, generally from six to seven weeks. These, under the microscope, afford most beautiful examples of the circulating system, and I was fortunate in witnessing the extrication of one from the ovum. When the ovum is fully matured, the external tunic or shell becomes exceedingly thin and transparent, is easily ruptured, and the tail of the embryo fish unbending, first forces the passage out. At this time the eyes are large and prominent, and all the fins are rudimentary and undeveloped. The little creature, however, rapidly grows, the irides assume a brilliant tinge, the pectoral fins rapidly play, and traces of the formation of the dorsal, caudal and anal fins are seen. It is then that its extreme beauty is so conspicuous under the microscope. The vitellicle is attached to the forepart of the abdomen, of an oblong shape, highly vascular, and the vitelline vessels and circulating cells are beautifully shown; the blood flows through the blood-vessels ramified along the sides of the back, rushes through the large vessel of the vitellicle, and communicates with the heart, which is situated under the throat, immediately anterior to the pectoral fins, the richly coloured blood in the pulsating tube beating from 60 to 70 in a minute. Along with the blood, a transparent matter is seen in constant circulation. This state was admirably shown to me by Mr. Gurney, who kindly presented me with four specimens, and these lived for three weeks, until killed within these few days, probably by some impurity of the water. At the time of their death they had grown much, were exceedingly

active, swimming with much velocity; their backs and sides had become darker and spotted; all the fins were well developed, with the exception of the adipose or posterior dorsal fin; the respiratory organs were beautifully shown, but the vitelline sac had not diminished in size, nor was the globular yolk in any way absorbed. The little creatures would rise with great rapidity to the surface, particularly when fresh water was given, dart about, then suddenly sink to the bottom, lying on their sides. I regret that I lost further opportunity of witnessing their progressive development.

"In the salmon, trout and all oviparous fish, the ova are expelled from the female, and undergo development independently of the mother; the nourishment necessary for them being contained within themselves. Thus, when depositing spawn, the parent fish seek the shoaler grounds, as the influence of light and higher temperature are absolutely necessary to the maturation and proper development of the ova, and according to their peculiar habits the ova are deposited in sandy or muddy, gravelly or rocky ground. In the ovo-viviparous fish, of which the piked dog-fish (*Acanthias vulgaris*) is an example, the young are produced before expulsion, remaining for a period within the parent. In the young state of the *Acanthias*, the vitellicle is extremely large, and hangs as a pedunculate sac from the anterior abdominal portion of the body. The specimens exhibited were taken in the month of July, at a long distance from the land, off the coast of Kerry, in 86 fathoms water, on the long lines. I took numbers out of the old fish, expulsion not having taken place.

"These few remarks, and the specimens submitted, will, I am sure, in some degree satisfy the meeting of the great value and interest that the study of the habits of fishes presents, and how much we have yet to arrive at in the knowledge of the generation of those animals."

Mr. Andrews concluded by referring to Mr. Warington's marine vivaria, and mentioned that he had himself found the Characeæ to be most useful plants in keeping the water pure. He had had *Chara delicatula* growing and fructifying beautifully in the vase, with the water unchanged for months, merely adding fresh as evaporation took place: and he had kept *Amphipeplea glutinosa* and several delicate Mollusca in a perfectly health state.

Specimens of the embryo trout were exhibited preserved in glycerine.

Mr. Ffennell, Inspecting Commissioner of Fisheries, made some observations on the high importance of Mr. Andrews's statements in relation to the fisheries of this country. He referred to the liberal encouragement given by the French Government to the artificial propagation of fish in France; and mentioned that Messrs. Ashworth, of Stockport had purchased property near Galway, and were successfully carrying on the breeding of salmon in Lough Corrib.

The Chairman also made some observations on the great interest of Mr. Andrews's paper, as containing practical views on an important subject. He then gave a rapid sketch of the phenomena of embryonic development, illustrating, by means of diagrams on the black board, the successive stages, from the first traces of organization in the egg to the final escape of the little fish into the surrounding water.

Mr. Kinahan read the commencement of his paper "On the Autumnal Song of Birds."

Short Extracts from a Journal of a Voyage made to Central America in 1852. By JULIAN DEBY.*

I LEFT Antwerp on board the brig *Plantin*, bound for La Guayra (Venezuela) and St. Thomas de Guatemala, on the 21st of February, 1852. My intention was to have travelled over a great portion of Central America; but, as I shall further relate, the unsettled state of the country, and severe fever, ultimately drove me home much sooner than I had anticipated. However, being now restored to health, and my spirits unabated, I am determined to recommence my expedition very shortly.

Believing that a few rough and imperfect notes from my journal, on subjects of Natural History, may be agreeable to the readers of the 'Zoologist' (some of whom will perhaps recollect my name), I forward the following extracts for insertion in that journal, should you deem them worth reading. The present portion treats only of the few observations I made at sea; in those which are to follow I shall briefly relate my subsequent proceedings on land, which, I believe, will be found more interesting.

On the 25th of February, in lat. $47^{\circ} 16' N.$, long. $9^{\circ} 22' W.$, having hung a small net behind the vessel, I caught several *Sagittas*, and a large number of *Noctilucas*. The first of these, viewed under the microscope, is a singular hermaphrodite animal, the classification of which is very difficult to establish. I distinctly saw the zoosperms moving briskly in the ovaria. The *Noctilucas*, which are the principal agents of the phosphorescence of the sea in our temperate regions, are very certainly Infusoria, with a flagelliform articulated swimming-apparatus: the radiated lines seen in them, and which by some naturalists have been looked upon as traces of a nervous system, according to my views are nothing else than external elevated lines, which disappear on the slightest pressure. These small and delicate animals remain by thousands at the bottom of the net, forming a jelly-like mass, which, on turning the net inside out into a large tumbler full of sea water, immediately swim about slowly (having the appearance of small transparent bubbles, of the size of a pin's head), and may be collected separately for observation under the microscope, by means

* Hoping some day to publish a complete account of my voyages and travels, I must be excused for not entering here into scientific details of all I observed.—*J. D.*

of a small glass tube, or even with a common pipe-stem, the finger acting as a kind of valve on the top or open end of the tube.

Feb. 29: (lat. 36 55; long. 15 56). I was called out of the cabin to see some "Meerswein" (sea-pigs), which were swimming in front of the ship, passing and repassing with incredible velocity before the stem of the vessel. As well as I could distinguish, I took them for the common dolphin. Having made myself fast to the bowsprit, I tried to harpoon one of them, but my awkwardness only served to frighten them away.

March 1: (lat. 34 18; long. 17 54). I saw today, for the first time, the beautiful Portuguese man-of-war (*Physalisa pelagica*). This singular animal, with its silvery, pink, and violent tints shining in the sun on the blue sea, is to me one of the most beautiful of ocean sights.

March 2: (lat. 31 49; long. 20 28). Saw some more dolphins and numbers of *Physalisa*, which latter animal I continued to observe during nearly the whole of my voyage.

March 4: (lat. 27 8; long. 25 12). We have entered the region of *Fucus natans*, *L.*, (*Sargassum vulgare* of modern botanists); small patches of which are floating here and there around the vessel. According to Meyen, this plant is found from 22° to 36° N. lat. and from 25° to 45° W. long. I collected some specimens, all of which exhibited evident marks of decay. This is the well-known plant described by all navigators since Columbus; and called by the French navigators, "Raisin du Tropique." On my return home, I had occasion to pass through the Bahama field of Sargasso, which is noticed by Humboldt and other naturalists. I caught a gray-coloured parasitical Entomostracan, of the family Caligidæ, of which I made a microscopical drawing: it was swimming freely in the sea.

March 5: (lat. 25 32; long. 26 43). I have collected a few animals on some floating masses of Sargasso; the most remarkable of which is a brown nudibranchiate mollusc, with four branchial appendages on the back and two on the head. The sailors called it a "sea-horse," from the appearance of its head. Being without the necessary books, I cannot determine the species. On the same seaweed I found some small crabs, and a beautiful and delicate species of a compound Campanularia, each specimen of which bore from three to ten individuals. The total length of the whole polype was a quarter of an inch; the arms of each individual in one row, and about twenty in number.

March 7. Passed the Tropic and saw a shark. I saw several very small flying fish, (*Exocetus mesogaster*, Cuv., or *Hillianus*, Gosse?);

they looked like small birds, but, glittering in the sun, presented a singularly airy aspect, their fins becoming nearly invisible.

March 8: (lat. 21 57; long. 32 13). The sea is most beautifully phosphorescent this evening; thousands of sparks—some yellow, some green, some red, and of different sizes—are shining in the white spray caused by the ship's rapid course through the waves. The sea near the vessel has the aspect of a black sky, on which are floating fleecy snow-white clouds, through and around which hundreds of stars are twinkling with surprising brilliancy. The clear moon, on rising, puts out the animated stars of the ocean, and at the same time eclipses the light of the celestial ones; Venus alone, throwing on the waters her long ray of silvery glow, does not shrink before the glaring disk.

March 9: (long. 33 23; lat. 21 15). Four large Cetaceans passed slowly alongside our vessel: their length was about 20 or 25 feet; the back and hinder part of the very convex head were alone out of the water, the blow-holes very far back; the back was dirty brown, the nape and head being grayish. These animals blew the air through their spiracles, so as to produce a loud snorting sound, but did not eject any water. They were, I believe, some species of *Globicephalus*, perhaps *G. fuscus*, which is unknown to me otherwise than by name.

March 10: (lat. 20 31; long. 36 54). I fished up two pretty *Medusas*, of the family *Oceanidæ*, about 2 inches long, with vermilion-coloured nucleus; also some fine specimens of *Velella*, which were floating in great numbers on the surface of the calm sea, in company with *Physalis*. These singular *Siphonophoræ* are of a fine blue colour when living, but change to yellowish brown in spirits. I believe I can distinguish two species, by their size and the shape of the dorsal cartilaginous plate: the smaller one having it triangular; the larger, oval-oblong. The *Velella* can float on its back, making use of its under side (as would a gasteropodous mollusc of its foot), so as to form a vacuum: it is, however, generally seen with its carina uppermost. Empty shells of *Spirula* are common, floating on the surface of the waves; as also a fine species of compound *Salpa*, with blue nucleus.

March 12: (lat. 19 45; long. 37 32). Many large flying fish (*Exocetus volitans*) appeared today. Several small white birds were observed at a distance, but did not come near enough to be recognised.

March 13: (lat. 18 44; long. 39 21). *Exocetus volitans* very frequent. I still see patches of *Fucus natans*; this is more than three degrees further South than is indicated by botanists. I caught a small isopodous Crustacean, of a shining steel-blue colour; the

caudal respiratory lamellæ were in perpetual motion. I also fished up in a bucket of water a luminous amphipodous Crustacean.

March 14: (lat. 17 13; long. 41 35). Flying fish numerous. I ascertained, by frequent observations, that these animals can make one turn, right or left, whilst flying, using their tail to direct their course, much in the same manner as a bird does, or like the rudder of a ship.

March 17: (lat. 12 55; long. 42 30). Caught a small *Physalisa*, which appears distinct from the common species: its size is five times less; the smaller tentacula are of a clear yellow colour; and a thin, membranous, wing-like dorsal fin occupies the upper part of the swimming-bladder. I also collected a beautiful sky-blue Medusa.

March 18: (lat. 12 56; long. 42 11). Thousands of small globular gelatinous masses (*Medusæ*?) are floating at different depths in the clear and calm water, following the direction of the great ocean-current. They are so delicate that I find it impossible to take them in my net without destroying them.

March 22: (lat. 12 48; long. 49 53). A petrel hovered over the ship this evening at dusk; it looked like a large bat, so fantastical and noiseless were its evolutions. Flying fish of the two species have been numerous all day.

March 26: (lat. 13; long. 50 28). This evening a noddy (*Sterna stolidæ*) came on board, and was caught by the hand. This bird is well known to all navigators on account of its stupidity, *i. e.*, its fearlessness of man. We passed in sight of the island of Barbadoes today.

March 27: (lat. 12; long. 61 44). After passing the island of Carriacou and some of the Grenadines, we sailed along the eastern side of the most beautiful island of New Granada. Between the vessel and the coast a flock of at least a hundred small dolphins were frolicking. They were following each other in Indian file, jumping out of the water fifteen to twenty at a time, exhibiting their white and shining bellies: none came near the ship. Two or three larger whales were slowly swimming in a small bay, loudly spouting up water ever and anon to a considerable height. From the deck, this seemed to disperse into the air, just like a jet of steam allowed to escape from the valve of an engine-boiler. Divers birds, among which the most remarkable to a stranger's eye was *Phaëton æthereus*, visited our vessel.

March 28: (lat. 11 37; long. 63 34). A few birds flying in the distance, and some jets of steam thrown up by a whale, are the only signs of life I can discern this morning. In the evening we are just

opposite the dark rocks of Los Hermannos, behind which the sun sets gloriously; large birds are slowly winging their course towards their resting-places on these small islands. Taking my evening bath on deck, in a large barrel of sea-water, I was surprised to find it full of phosphorescent animals, which were creeping all over my body.

March 29: (lat. 11 10; long. 69 12). Today I enjoyed a beautiful sight which highly interested me; thousands of beautiful blue bonitas (a large and well-known fish) were pursuing shoals of flying fish and other small fry. Innumerable flocks of sterns, Phaëtons, and many other birds, accompanied them and disputed their food. As soon as the bonitas, leaping out of the water, and lashing loudly in all directions in their eagerness to seize their agile prey, produced on the surface of the sea a white and foaming spot, some bird, soaring on high, would perceive them, and, uttering a loud cry, call all its feathered companions to the feast. In a minute the scene was indescribably curious: the bustle of the birds, splashing into the water in the midst of the bonitas, and all screaming and yelling together, reminded me of a yard where different kinds of poultry are fed on a small quantity of grain, which they are all eager to make the most of in as short a space of time as possible. We passed in sight of the flat, inhospitable, and uninhabited island of Tortuga.

March 30. This morning we came in sight of the mountains of the Sierra de la Costa of Venezuela. Plantations of cocoa-trees, Phœnix, Indian corn, sugar-cane, &c., were stretched along the coast, the rocks above being covered to a considerable height by a forest of gigantic candelabra-like Cactuses, from 20 to 30 feet in height. In the afternoon we reached La Guayra, and cast anchor. This town has a singular aspect: it is spread out along a narrow slip of land, between the rocks and the sea, and is backed by steep and dark mountains, several thousand feet high, the most elevated of which, according to Humboldt, is the Scilla. A walk I took in the evening on the strand, procured me the pleasure of seeing some plants for the first time in a wild state. Amongst them were large quantities of *Argemone Mexicana*, in full blossom, the immense Cactus (*C. Peruvianus?*) already spoken of, *Cereus triangularis*, a pretty leafless *Euphorbia* with red flowers, the true cotton-tree, cocoa-nut trees, bananas, and many others. In the Posada de Neptuno, where I have taken lodgings, I was pleased to see, cultivated in pots, and with great care, a plant of *Plantago major*, and some of our common roses. It is difficult to express the pleasure felt by the naturalist at seeing even a common and ugly plant of his native land, cultivated so far from home; it immediately brings

to mind associations of country strolls in our colder climes, of the green orchard where we romped in our boyhood, of the lane of our village where we were wont to dream on sunny evenings, and pick a spike of plantain-seeds for our sister's canary-bird; such sensations can only be felt — they cannot be described. Mosquitos are not numerous at La Guayra, so that I could sleep with all my windows open, and without a mosquito-net. The European vegetables are eaten here, being cultivated round Caraccas, where the temperature is much lower. Many pigs, of a dirty gray colour, long in shape, very flat on the ribs, very hairy all over, and with thin crooked legs, are running about the streets; and many may be seen in the huts of the negroes, living *pêle-mêle* with men, women, squalid children and screeching parrots. These pigs, when of a good size, are worth 5s. each. Ox-meat sells at about 3s. the five-and-twenty pounds; it is brought to market from the Llanos of the interior. Sharks are very numerous on this coast; and I cannot understand what led Humboldt to state that they are not dangerous here, as they are very much dreaded by all the native sailors and boatmen, and accidents caused by them are numerous. Walking, or rather clambering, around the place next day, I saw some small humming-birds, numbers of the Caraccas vultures flying in pairs, turtle doves, and small yellow-banded and green-chinned lizards. I found in the gneiss a vein of quartz, containing blue carbonate of copper, and a substance which looked much like Halloysite.

April 1. I hired a mule to go to Caraccas. I followed the old road over the mountains, so well described by Humboldt; a new one has since been made, which takes a long circuit round the mountains, so as to follow the valleys. On the way I noticed a beautiful plantation of cocoa-trees near the sea-shore; and as I ascended the steep and tedious path, which winds irregularly up the mountain side, I was delighted with the singing of birds: turtle doves of two kinds ran familiarly before me on the road. I first passed through the forest of Cactuses, among which were numerous fine Mimosas, Agaves, &c. As I ascended, the air became cooler, and small forms of ferns and Lycopodiaceæ were common; also a pretty Gesneria, some Melastomas, a Bignonia, a large Arum, a Tradescantia, a Pteris, or something that looked very like our *P. aquilina*; a small yellow-flowered Oxalis, and a delicate pink-coloured terrestrial Orchis, also attracted my attention. I remained two days at Caraccas, visiting the town and its environs; a description of all I noted there would lead me too far for this paper. Everything interests one in these distant lands. In a walk through the market-place, I saw conical loaves of brown sugar,

cochineal, skins of the jaguar and of tiger-cats, black beans (*frijoles*), bananas, plantains, pine-apples, living peccaries led by tawny Indians, fresh-water *Chelonix* sold by more than half-naked negroes, stinking meat spread out under small, hot, wooden sheds, &c. &c.; all these things forcibly impress on the mind of the stranger the fact that he is far indeed from old Europe, and that he must be wide awake to observe all worth noting as curious, interesting, or instructive to himself or others.

On the 6th of April we again embarked, doubled Cape Blanco, and then lost sight of land.

April 7. Passed the islands of Buenos Ayres and Curazao, and saw the mountainous outline of Oruba. Small flying fish numerous.

April 8: (lat. 14 25; long. 76 16). Saw today, for the first time, the large flying fish with black pectoral fins (*Exocetus Noveboracensis* ?), noticed by Mr. Gosse in his most interesting work on the Natural History of Jamaica, a book which I took out with me, and which made many hours pass very agreeably that would have appeared long and dreary without so lively a companion.

April 9: (lat. 19 51; long. 79 10). Large patches of Sargassum are floating around us; it is very long since we saw any. Smaller flying fish numerous.

April 11. A *Tringa* came and rested on board.

April 12. Passed near the Santanilla, or Swan's Island, a small, low, sandy, arid, uninhabited and dismal bit of land. A few sea-birds and shrubs are the only living productions of this island. In the night, a small shoal of porpoises surrounded the vessel: they announced their arrival by loud, short, and frequent snortings, and left long, luminous, phosphorescent tracks in the sea wherever they passed. The island of Santanilla was wrongly marked on my map and on the captain's: we compared our observations, and found it to lie in long. 83° 51' W., and lat. 17° 25' N.; whereas on my map it is placed in long. 84° 10' W., long. 17° 15' N. The island being low, vessels might easily be grounded on it during a dark night.

April 13. After passing the Zapotilla Kays, near which the sea was covered with circular brown Medusæ, and doubling Cape Manabique, we entered the fine Bay of Sto. Thomas de Guatemala, having safely crossed the Atlantic in fifty-three days. In a future paper, I shall continue to note such of my subsequent proceedings on land as may appear likely to prove interesting to the readers of the 'Zoologist.'

JULIAN DEBY.

Notes on the Habits of some Species of Bats.

By JONATHAN COUCH, Esq., F.L.S., &c.

THERE are no British animals of the distinctive habits of which so little is known as the bats. It is not even a settled question whether any of them migrate from us in the winter; whether they change their quarters according to the seasons; or to what extent they are influenced by the variations of the atmosphere.

From these considerations, at the season of the year when these creatures appeared to be beginning to feel the influence of the shortening days and an alteration of temperature, I began to keep a journal of their appearances; and in doing this, I beg to remark, that when I have noted the absence of bats, it does not simply mean that they have not fallen in my way; but that they were carefully sought for in situations where, if they were to appear at all, they were most likely to be found.

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September 4. Bats not seen: evening calm, but overcast.

September 5. No bats: evening clear and fine. This evening is so far favourable for them, and so quiet, being Sunday, that I can only suppose they have taken new hunting-ground, which probably they often do.

September 6. At T—— (2½ miles from the coast), an ancient castellated mansion, where, from former knowledge, all the bats appear to be of the horse-shoe species. They are on flight in good daylight, and fly more rapidly than bats appear to do elsewhere. I find them flying about half a mile from what must be their resting-place. I saw only one near my home (near the coast), although the place is more sheltered from the wind. Wind N.W., and a little chilly:

September 7. Only one bat seen, for a moment, in the Warren near the sea. Wind N., showery and chilly.

September 8. One bat, only seen for a moment at a distance; none where they are usually abundant. Wind N.E., mild and showery.

September 9. No bats: fine evening; wind N.E., mild and overcast.

September 11. One bat hovering for a short time: evening fine, calm; wind N.

September 12. No bats: calm and overcast.

September 13. Bats flying at T——, and a couple flying in the hall, which they not unfrequently enter in autumn. A fortnight since, a

young one, of the small horse-shoe species, was caught in a bed-room in the house. This evening they are flying to the distance of half a mile from the mansion: evening fine and calm. A gentleman living there informs me, that a few days since he saw bats flying near his window between 2 and 3 o'clock in the morning, when quite dark.

September 14. Bats common in flight at Looe. I find that horse-shoe bats are common there. Some of them make their homes in an adit of an old attempt at mining at Penrock, near the sea; but they are not found suspended close together. Four or five were found, not torpid, in the cold weather of a former winter: the weather at that time was cold in the open air, but sensibly warm in the adit. I examined two specimens of *Vespertilio Nattereri*, and one of *V. Pipistrellus*, caught at Looe.

September 16. One large bat flew straight and quick over the upper end of a garden on the side of a steep hill, a little after 7 o'clock, and did not return. Weather calm, fine, feeling rather cold.

September 17. No bats. Wind S.E., blowing rather strong, with flying showers.

September 18. One bat seen in the Warren: a very wet day.

September 19. No bats seen after a short search.

September 20. At T——. Bats, believed to be the horse-shoe species, flying early in the evening, near the ground, on the sheltered side of the mansion; none elsewhere. Weather fine, windy; moonlight.

September 21. One bat seen hastily: fine evening.

September 22. No bats: weather very fine.

September 23. One bat seen in the morning, between 5 and 6 o'clock; and one in the evening, which flew rapidly from the Warren towards a cove in the sea-cliff, and did not return. Weather fine but cool.

September 24. No bats: fine evening; bright moonlight.

September 25. One bat, appearing of larger size, flying high and straight over the tops of trees in a plantation; afterwards one, probably the same, flying high over the street in large circles. None seen among the houses, where, in summer, the small bats are numerous. Weather fine.

September 26. One bat, in a glade in the side of a hill. It took long and straight flights, which might have proceeded from the scarcity of prey. Once or twice it flew in among the leaves of an ash-tree, as if seeking something on or among the foliage. I remember once, in broad day-light, to have seen a long-eared bat (*Plecotus auritus*) come close to where I was standing, and take something from the

surface of a leaf: probably this one is of the same species, for the size appears the same. If so, it may show one use of the long ears, which may act as organs of quick sensation, as it flies among leaves which stand thick on the tree.

September 27. A few, flying low, at T——, near the mansion; none elsewhere. Weather overcast, with a brisk North wind.

September 30. In the Warren. One bat, in a rapid and transitory flight; seen but a short time. Weather calm and cloudy.

October 1. No bat: evening calm.

October 4. No bat: heavy rain all day.

October 5. No bat: showers.

October 6. At T——. No bat: weather fair.

October 7. At a village in the country and homeward. No bat: weather overcast.

October 8. In the Warren. No bat: weather fine but cold.

October 9. One bat flew once in a straight line along the tops of a line of elms in a plantation: evening fine.

October 11. No bats.

October 12. Early in the evening, one bat, of large size, seen flying high, and passing quickly from place to place, at considerable distances apart. Another in the Warren, seen only for a short time: none seen later. Weather fair, wind E.

October 14. One bat in a sheltered place: wind E. and strong.

October 15. A small bat flying in repeated circles about one station, a little sheltered: wind strong.

October 16. A small bat, like that of the preceding evening, probably the same, flying at the same place, in moderate circles, but not remaining long in one place. I think it makes the circuit of the town. Its fare must be scanty. It is incommoded by the wind, which is East, and strong.

October 17. Several bats early in the evening, flying high; one of them small: all flying in circles. One flew near me in a plantation of trees, passing through the foliage backward and forward. Gnats abundant. I am informed that there were also several near T——. Weather calm and mild.

October 18. Bats abundant, as in a summer evening; some flying low: weather fine.

October 20. No bats: weather changing to wet.

October 21 and 22. Very rainy evenings.

October 23. No bats: damp evening.

October 24. A few bats, of small size: cloudy and calm.

- November 1. Bats flying : rainy evening, with thick mist. The weather has been very wet and windy for a week.
- November 5. One bat seen in the evening : rainy and cold.
- November 6. No bats : much rain and wind.
- November 7. No bats : rainy. Rain every day.
- November 12. No bats : high wind.
- November 13. Severe rain.
- November 14. Several bats, some of a larger size, and flying rather high : windy, cloudy, and disposed to rain.
- November 15. No bats : cloudy and disposed to rain.
- November 19. Bats flying rather high, on a sheltered side of a hill : cold showers.
- November 21. No bats : brisk North wind after a rainy day. Days and evenings following very wet, and generally stormy.
- November 27. No bats : slight showers, and chilly.
- December 6. No bats : evening overcast. From the time of the last note, the weather has been generally rainy, with wind in the evenings.
- December 8. No bats : showery.
- December 12. Bats, of small size, flying high and rapidly in a sheltered place : wind rather high, overcast.
- December 25. No bats : wind moderate, overcast.
- December 26. No bats : windy. Very stormy evenings.
- December 29. No bats : overcast.

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- January 2. No bats : weather windy.
- January 5. No bats : weather mild.
- January 9. Two bats flying actively : weather clear.
- January 10 to 12. Stormy.
- January 14. No bats : overcast, and slight rain.
- January 20. No bats : mild, slight clouds.
- January 23. No bats : clear, cold, wind North.
- January 26 and 27. No bats : cloudy, cold, wind East, frosty.
- January 30. No bats : weather moderately fine.
- February 1. No bats : cloudy, with some wind.
- February 6. No bats : clear, frosty, thermometer 41°.
- February 16. No bats : the weather has continued with smart frost, wind N.E.
- February 17 and 18. No bats : sharp frost, thermometer 33°.
- February 22. No bats : weather milder, slight showers, wind N.

- February 26. No bats : windy from N.W., chilly.
- March 3. No bats : fair, slight wind from the North.
- March 5. No bats : overcast, wind N.W.
- March 6. No bats : a thick wet mist.
- March 7. One bat at T——, near the mansion : weather calm, fair.
- March 8. One or two appearances of bats ; a momentary flitting : one on a secluded side of a hill, with trees : weather fair.
- March 9. No bats : weather overcast.
- March 10. No bats : wind South and brisk, overcast.
- March 12. No bats : windy, with clouds.
- March 14. No bats : showers.
- March 19. No bats : clear, with smart frost ; wind East.
- March 21. No bats : cloudy, slight snow-showers ; wind North.
- March 22. No bats : clear, frosty ; wind N.E.
- March 26. No bats : clear, frosty.
- March 27. No bats : clear, cold.
- March 28. No bats : fine evening.
- April 1. Bats flying : wind West.
- April 2. No bats : showery ; wind S.W.
- April 4. No bats : rainy evening.
- April 6. Bats : a damp mist.
- April 7. No bats seen in the place where I saw two on the 6th, but one seen in the Warren, where none have been seen for a long time.
- April 8. No bats : weather clear, cool ; wind North.
- April 9. No bats : cloudy ; wind W.N.W.
- April 11. One bat, flying along the lane near T——, the first seen in any situation that is not much sheltered : weather fair and clear ; wind North.
- April 13. No bats along the road from T—— and home : weather fine but cool ; wind N.E., and a cold day.
- April 14. No bats along the same road : cold, wind N.E.
- April 15. No bats : overcast, slight wind from the North.
- April 16. No bats : overcast, wind W.N.W.
- April 17. No bats : overcast.
- April 18. Bats more numerous than I have seen them for the season, appearing early in the evening. One large one flew rapidly straight along, and did not return : it is the first of this size I have seen this season. Weather cloudy, calm ; wind light from S.W.
- April 19. One bat : cloudy, wind N.W.
- April 20. No bats : rainy, cool evening.
- April 21. Bats : light showers, and mild.

April 22. One bat, in a sheltered place; showers through the day, in the evening wind North, and cloudy.

April 23. Bats flying: wind W.N.W., cool.

April 25. No bats at T—— and homeward: evening cold.

April 28. Early in the evening a bat flew straight outward through our harbour from the town, to Scilly Cove, and did not appear again. Later in the evening bats were numerous, in places long forsaken by them, flying in long curves. Weather mild and cloudy.

From this time the bats have resumed their summer habits, but seem still influenced by the weather, as on: —

May 7. No bats: cold showers, wind North.

May 11. No bats: clear, cool, wind N.W.

May 16. Bats now take long and active flights, and in such numbers, as to show that hitherto those which have appeared could only have been a small proportion of such as lay hid. With such frequent and long interruptions of flight, is it possible to suppose that the chief part of their sustenance can be obtained on the wing?

May 20. No bats: a fine evening, calm and warm, bright moonlight. I observe that bats do not continue to fly later when the moon shines brightly, but their absence this evening is remarkable.

May 21. Bats flying, but they disappeared earlier than usual; I saw none after the moonlight prevailed over the day. A fine evening, wind East.

May 30. No bats: yet the evening is fine and calm, although yesterday, when the weather was cool, and the wind East, bats were in flight.

June 5. Only one bat seen for a moment, after 9 o'clock: weather calm, overcast.

The following notes from other parts of my journal will further tend to illustrate the habits of different species of bats.

January 11. A specimen of the larger horse-shoe bat brought to me, taken as it was in flight, and proving that this species does not leave us in the winter.

Several specimens of the lesser horse-shoe bat have come into my possession, and I observe that both the ears and horse-shoe membrane on the nose are very sensitive and movable. The weight of one specimen was 77 grains, of another, 74 grains, of another, 73 grains; extent of wing 9 inches and 3-tenths. When at rest, this species turns up its tail over its back: it is exceedingly beautiful when closely folded up in its wings.

Long-eared Bat.—December 21, a specimen found abroad, attached to a wall. May 24, one was on flight at half past 3 o'clock in the afternoon; its flight heavy and with labour. April 25, at half past 9 in the morning, one hawking for flies in bright sunshine. On being pursued it became confused, and was caught: in captivity it rose from the ground with great facility. Extent of wings, $10\frac{1}{2}$ inches; weight, 95 grains.

Vespertilio emarginatus.—A specimen weighed 97 grains; extent of wing $10\frac{1}{2}$ inches.

Pipistrelle.—I find the extent of wing to vary from 7 inches to $8\frac{1}{2}$, and the weight from 42 grains to 55. There is also a note of one with the extent of wing $7\frac{3}{10}$ inches, which weighed 93 grains; but this I imagine to be a mistake. A friend observed of one to which the young ones were attached, that they were separated from the teats with difficulty, and that when separated, they were not again able to lay hold of them: and the old one then seemed quite indifferent to her young, running over them without care.

February 10.—One of this species was seen on the wing at 1 o'clock in the day, with the weather bright, appearing much at its ease. It came from a cove in the sea-cliff.

In July, twenty-eight of them were discovered, congregated together in a square hole in the wall of a mill; they were all of one species, but differing in size and colour. The smallest weighed 40 grains, the largest 83; colour of the former very dark, the fur less so than the membrane; colour of the old ones much more fulvous. They made a stridulous noise when irritated, or when creeping over each other; the sound being uttered with a jerk, with the mouth thrown widely open. When left at rest they huddled together. One of the smaller ones held on by the teats of the dam until she escaped from its hold.

August 30, at half-past 5 o'clock, the sky clear, with a bright sun, a bat, probably of this species, mounted high in the air in pursuit of food; and whilst engaged in this occupation it was seen by a swallow, which immediately gave chase to it. The swallow persecuted this little animal by repeatedly striking at it, and followed it closely, until at last the bat was compelled to descend for shelter near to the houses. But when the persecutor appeared to have withdrawn, the bat boldly mounted again to the upper region of air; there, however, it was soon discovered by the swallows, two or three of which now joined in the persecution, and ultimately forced it again to descend to a place of safety. For the third time it mounted aloft, and there turned and

dipped after its prey, but was again discovered ; and now, as if in resentment of its daring invasion of their territories, a little host of swallows gathered about it, and strove to strike or drive it down. But this was not soon or easily accomplished ; the bat appeared determined to enjoy some of the good things to be obtained in its unusual elevation, and it was a considerable time before it was finally obliged to seek its shelter among the houses. I could not help admiring the courage, as well as agility, which the little flutterer exhibited on this occasion.

JONATHAN COUCH.

Polperro, June, 1853.

Note on the Song of the Willow Wren and Chiff-chaff.—A curious circumstance came under the observation of Mr. Vingoe yesterday, which he has reported to me, respecting the song of what he considers to have been a chiff-chaff. It consisted of the usual passages of both its own chirp song, and the modulated cadence of the willow-wren. It commenced with the “chip, chop” notes, but these passed gradually to the song of the willow-wren, but the blending of the two songs was different at times, sometimes the performance being confined to one without the other, at others united, but the notes peculiar to each species were, when uttered, distinct and specific.—*Edward Hearle Rodd ; Penzance, May 23, 1853.*

Note on the Copulation of Swifts.—There is an observation in White’s Selborne (Letter 61, to Daines Barrington), relative to the way in which sexual intercourse takes place amongst the swifts, the author firmly believing that it is effected while on the wing. He says, “The fact I would advance is, that swifts tread or copulate on the wing ; and I would wish any nice observer, that is startled at the supposition, to use his own eyes, and I think he will soon be convinced.” A little further on he continues :—“If any person would watch these birds of a fine morning in May, as they are sailing round, at a great height from the ground, he would see, every now and then, one drop on the back of another, and both of them sink down together, for many fathoms, with a loud piercing shriek. This I take to be the juncture when the business of generation is carrying on.” This observation of the worthy old historian of Selborne, is one that appears not to have been noticed by subsequent writers. I have searched the works of Temminck, Degland, Keysorling and Blasius, and, among our own writers, Montagu, Fleming, Selby, Jenyns, Yarrell, Thompson, and Morris, without meeting with any comment ; but the late Professor Macgillivray, in his admirable work on British birds, has the following remarks :—“Such phenomena certainly present themselves, yet it is not by any means improbable that they are merely indicative of the hostility of rival males, for we often see larks fighting in the air, and so keenly engaged, that they sometimes descend ‘many fathoms’ before separating ; and I have observed eagles struggling on wing, and emitting ‘a loud piercing shriek,’ although no one could reasonably suppose them to be then copulating.” It is quite evident that none of these writers have ever observed what White alludes to, or they would neither have passed it over in silence, nor yet supposed it to be the rivalry of males. On the

25th of May, this year, I had an opportunity of noticing a manœuvre, the nature of which I had no difficulty in deciding upon. Two swifts, at a great height, were chasing each other and uttering loud screams, an evident attempt being frequently made by one to settle on the back of the other. This was repeated a great many times without effect, for the female contrived to flutter from under the other in a playful manner. At length, however, she suddenly extended her wings, keeping them perfectly quiet and motionless, and in a moment the male alighted softly upon her back, with his wings distended perfectly flat, and so exactly fitting upon those of the female, that I could not have known it was more than one bird, had I not been watching them before. In this manner, they descended in an oblique direction for a great many yards, the wings all the time quite motionless, and both quite silent. After separating, they pursued their usual avocation of feeding in a most business-like and orderly manner, not troubling themselves to toy or play, or to utter their well-known screams. I feel not the least hesitation in deciding that White was perfectly right in his supposition respecting the copulation of the swift; but, at the same time, I feel quite confident that it can be accomplished on the wing in perfectly calm weather only, as a very moderate wind, in the instance recorded, would have rendered it difficult, if not impossible.—*Robert F. Tomes; Welford, Stratford-on-Avon, June 4, 1853.*

Note on the supposed occurrence of the Aptyryx in Anglesey, and on the capture of Galbula ruficauda in Lincolnshire.—In common, I doubt not, with the other ornithological readers of the 'Zoologist,' I had hoped that Mr. Browne's remarks (Zool. 3845) on Mr. Spode's communication (Id. 3815), relative to the supposed occurrence of an Aptyryx in Anglesey, would have led the latter gentleman to have favoured the public with some further particulars of a circumstance which, if the account given be a correct one, would certainly be an occurrence of almost unprecedented ornithological interest. I would respectfully suggest that the claims of science, and of that accuracy which is the only true basis of science, imperatively demand that the following particulars should if possible be ascertained and published; namely:—

1. The exact species of the bird in question.
2. The name and address of the person who shot it.
3. The name of the parish where it was killed.
4. The exact date when it was killed.
5. The name and address of the person who stuffed it.
6. Whether any note was taken of the sex of the specimen, or of the contents of the stomach.
7. Whether anything was observed as to the habits or movements of the bird at the time it was shot.

And I trust that Mr. Spode will kindly exert himself to procure, for our information, such additional evidence as will enable him to supply these desiderata; by doing which he will establish a claim to the sincere thanks of his fellow ornithologists. I take this opportunity of adding a few short remarks on Mr. Tristram's very curious notice of the occurrence of a specimen of *Galbula ruficauda* in Lincolnshire, (Zool. 3906). I certainly consider this notice as one of very great ornithological interest, and only regret that Mr. Tristram should have been induced, by any consideration, to delay its publication. Will that gentleman allow me to suggest, as a fellow-contributor to the 'Zoologist,' that he has set us rather a bad example in this respect?—as it is obvious that the more promptly such occurrences are published, the greater will be the facilities for making such further inquiries as may be necessary to elucidate

the circumstances under which rare stragglers may reach our coasts, and the less risk there will be of the minor collateral incidents (which are always interesting and often important) being omitted or mis-stated. I agree with Mr. Tristram, that such extremely accidental visitors as the bird in question, or as the two others to which he refers, can scarcely be called "British birds," even in the widest sense of the term; but, at the same time, their occurrence at so great a distance from their native countries, is always a very interesting event, as showing the extent to which some species stray beyond the boundary of their natural and normal habitat: and this is especially the case where the species, like the jacamar or the Australian spine-tailed swallow, is either insectivorous, or so nearly so as to be incapable of being kept in confinement, or of being brought over in that state by any vessel. — *J. H. Gurney; Easton, Norfolk, June 3, 1853.*

Occurrence of the Kite at Horndean, Hants.—A pair of these now rare birds were observed, a few Sundays ago, hovering about over the woods near here; they eventually went off in a northerly direction. — *William Henry Hawker; Horndean, Hants, June 11, 1853.*

Capture of the Blue-throated Warbler (Sylvia Suecica) in Kent.—A fine old male bird was taken in a nightingale-trap on the 16th of May, 1845, in the county of Kent. I had it alive for several months; and both Mr. Hewitson, and Mr. John Hancock of Newcastle-upon Tyne, saw it while alive. The latter gentleman now has it in his collection.—*James Green, Naturalist; 1, East Road, City Road, June, 1853.*

Nest and Eggs of Savi's Warbler.—I have now by me the nest and five eggs of Savi's warbler, which I took at Erith, in Kent, on the 28th of May, 1853.—*Id.*

Occurrence of the Rose-coloured Pastor at the Land's End.—I observed a female specimen of this bird just now in the hands of Mr. Vingo, who received it from the immediate vicinity of the Land's End, yesterday. I examined the ovary in the body, and found a mass of undeveloped eggs, which, I should think, would not have come to maturity for a month at least. Whether the bird had hatched an early brood I cannot say; but it appears, by the result of the anatomical inspection, that the bird at least continues to breed until the summer is far advanced. I observe that nothing is said by Hewitson, Selby, Montagu, or Jenyns, as to its nidification, eggs, &c. In Mr. Hewitson's work there is no figure of the egg; and so little being known as to this department of the bird's history, I have ventured to state what I have observed, thinking it probable that it might have bred in this country.—*Edward Hearle Rodd; Penzance, June 11, 1853.*

Note on a Partridge's Nest in a Stubble-rick.—I am just returned from witnessing a partridge's nest in a curious place, *viz.*, in a stubble-rick, or, as it is here called, a "stubb-stack." It is about six feet from the ground, and so well concealed in the stubble, that it cannot be seen by any one unless on horseback; and was accidentally discovered by the owner of the farm, Mr. Hillier, of Winterbourne Monctou, as he rode past. On the occasion of my visiting it, the old bird was on her nest, but was off again immediately I went near her. The nest contains fifteen eggs. What renders it the more extraordinary that the bird should have fixed on such an exalted position is, that she is surrounded on all sides by hundreds of acres of corn of every description, of clover and turnips, the rick fixed upon being situated in the middle of the open downs, so that there was no lack of choice of such positions as partridges are wont to select for their nurseries. It is clear that no motives of protection from inclement weather and rude winds (which not unfrequently prevail in these downs) can have

actuated the partridge in this strange choice; as the nest is placed on the N.E. side of the stack, and on the shelving side near the top. I believe Col. Hawker gives an instance of a partridge's nest in a pollard tree; and Mr. Yarrell, in his 'British Birds,' quotes another instance from Daniel's 'Rural Sports,' of a partridge's nest on the top of an oak pollard: but with these exceptions I have never heard of the partridge varying so much from the usual habits of its species in its choice of a place for nidification. — *Alfred Charles Smith; Yatesbury Rectory, Calne, June 11, 1853.*

Young Ducks nursed by a Cat. — The following remarkable circumstance has just been detailed to me by an eye-witness. A duck, having hatched out a brood of young ones, was, with all her progeny, placed by her careful owner in a basket lined with flannel, by the kitchen fire. Now it chanced that a cat was in the habit of sleeping away much of her days, as cats are wont to do, by the same fire; the new arrival seemed to interest her mightily, and so great an attachment did she conceive for them, that nothing would suffice but the ejection of their natural parent, and the substitution of herself as their mother. To this end she was seen to go quietly to the basket, and after gently expelling the old duck, a work of little labour, to place herself with great care and gentleness on the young ones, warming them with her body, quietly replacing them with her paw when they attempted to clamber up the sides of the basket, and otherwise playing the part of a kind foster mother. This continued during a period of three weeks at least, during which time my informant occasionally saw them; but I regret that he could not give me the sequel of their history, whether the cat continued faithfully to discharge her self-imposed office, and whether the young ducks thrived under her care; or whether, as some malicious persons might suggest, like little Red Riding-hood, and the supernumerary victims of the man-eating ogres in the fairy tales, and the companions of Ulysses in the cave of Polyphemus, they were but nursed for slaughter when they became more worthy of the appetite of their friend. — *Id.*

Note on the occurrence of the Knot Sandpiper (Tringa cinerea) on the Norfolk Coast, in the Summer Plumage. — Specimens of the knot, in its nuptial dress, frequently occur on the Norfolk coast in spring, during the northward migration of this species; but during the past month they were, for a few days, unusually numerous, particularly about the 13th of May, on which day a single gunner at Yarmouth procured seventy-three knots, all in full, or nearly full, summer dress, besides several others which were obtained by other individuals. — *J. H. Gurney, Easton, Norfolk, June 1, 1853.*

Occurrence of the Caspian Tern (Sterna Caspia) in Lincolnshire. — A very fine specimen of the Caspian tern, in summer plumage, was shot on the 17th of May, at Caythorpe, Lincolnshire, many miles from the sea. It was in good condition, and threw up three or four fish upon being shot. It was brought to Newark to be stuffed, when I had the pleasure of seeing it in the flesh. — *W. F. Foottit; Newark, Notts, June 4, 1853.*

Occurrence of the Sandwich Tern (Sterna Boysii) &c. near Oxford. — Three fine adult specimens of the Sandwich tern (*Sterna Boysii*) were shot on the Isis near Oxford, on the 23rd of April last. This is the first occurrence of this bird so far inland with which I am acquainted. About the same time, two specimens of the lesser tern (*S. minuta*) and a razor-bill (*Alca Torda*) were killed near Oxford. — *T. L. Powys; 10, Grosvenor Place, June 13, 1853.*

Occurrence of a Petrel new to Britain on the West Coast of Ireland.

By WILLIAM YARRELL, Esq., F.L.S., &c.

Ryder Street, St. James's,

June 14, 1853.

DEAR SIR,

In answer to your request on the subject of the petrel exhibited at the meeting of the Linnean Society on the 7th of June, I send you the following particulars.

This interesting bird, new, as I believe, to the British Islands, was brought to me by B. Blackburn, Esq., of Valentia Harbour, in the county of Kerry; who afterwards sent me the following note of its occurrence.

“The petrel which I left with you this morning, flew on board a small sloop off the Island of Valentia, on the South-west coast of Ireland, late in the evening of the 11th of May last. Mrs. Blackburn had never observed it before on our coast, and we concluded it to be the *Puffinus obscurus* of Temminck and Gould.”

“It made no attempt either to run or fly away, and suffered itself to be handled without exhibiting alarm; and though apparently strong and vigorous, manifested quite an Oriental resignation to its fate.”

The *Puffinus obscurus*, or dusky petrel, is included by the late William Macgillivray in his ‘Manual of British Ornithology,’ (part 2, Water Birds, p. 263); with the following remark:—“This species belongs to the Southern and Tropical regions of the globe, although individuals have sometimes been found far North.” Reference is also made to his ‘History of British Birds,’ vol. v., but no page is given. The fifth volume of this latter work was not published until ten years after the publication of the Manual, and does not contain any notice of this bird.

The Dusky Petrel of Latham (Syn.) and Pennant (Arct. Zool.) is not the *Puffinus obscurus* of more modern authors, since they give it a length of 13 inches; and is probably the Manks Petrel (*Puffinus Anglorum*) of Ray: but Latham, in his Synopsis (vol. vi. p. 417), refers to a petrel without a name, measuring less by 2 inches in length, in the Leverian Museum, said to have come from King George's Sound; and mentions also that it inhabits Christmas Island. The *Puffinus obscurus* measures 11 inches in its whole length, and $6\frac{3}{4}$ from the bend of the wing to the end of the longest quill-feather. Six specimens examined gave the same results.

Professor Savi includes this species in his 'Ornitologia Toscana' (vol. iii. p. 40), from an example obtained in Piedmont; and it has a place also in the 'Faune Française' (p. 405), from specimens killed in Brittany and Picardy.

It is therefore included in the 'Birds of Europe' by M. Temminck, Mr. Gould, M. Degland, and Prince Charles Lucien Bonaparte: — the author of the first work observing that "it is rare in the Mediterranean, but common on the coast of Africa to the Cape of Good Hope." And it may be mentioned in proof of the first part of this statement, that the name of this bird does not appear in the catalogues of the birds of Sicily, Malta, Tunis, Algeria or Tangiers.

Messrs. Webb and Berthelot include the *Puffinus obscurus* in their work on the Natural History of the Canary Islands; and Edward Vernon Harcourt, Esq., to whom I am indebted for a specimen of the bird and its egg, has particularly referred to this species in his published 'Sketch of Madeira,' (pp. 122 and 165). Eight or nine species of the birds of this family breed on, or frequent, the Dezertas, a group of small islands about eighteen miles from Madeira. "The Dusky Petrel is a very tame bird, and will live upon almost anything; it runs along the ground on its belly, and uses its curious-shaped bill in climbing up the rocks. Those I had in my possession alive, were some of them caught with fish-hooks baited with meat, by the Portuguese, and some taken by the hand in the day-time from underneath stones, where they hide from the light." The egg, and they lay but one, measures one inch and seven-eighths in length, by one inch and three-eighths in breadth, rather smaller at one end than at the other, and pure white.

Audubon, in his 'Birds of America' (vol. vii. p. 216), and in his 'Ornithological Biography' (vol. iii. p. 620), gives an interesting account of the habits of this petrel on the water. He found it abundant in the month of June, in the Gulf of Mexico and off the coast eastward to Georgia, some of them wandering from Cape Florida as far North as Sandy Hook and Long Island. Audubon's friend, Thomas Nuttall, in his 'Manual of the Ornithology of the United States and of Canada,' among other localities already quoted, mentions the Northwest coast of America.

Captain Cook met with this species at Christmas Island, only 2 degrees North of the Equator, and about 158° W. longitude. This island was so named by Cook, who landed there on Christmas-day, in 1777.

Having carefully examined specimens of this bird from Australia, others from Madeira, and these with the recently acquired example from Valentia Harbour, I am induced to consider them but as one species; and that the *Puffinus obscurus* of Mr. Gould's 'Birds of Europe,' and the *Puffinus assimilis* of his 'Birds of Australia,' are, accordingly, identical. Several examples of equally extensive geographical range will hereafter be quoted. Of the *Puffinus assimilis* Mr. Gould observes: — "All the specimens of this species that I have seen were procured on Norfolk Island, where it is said to breed; consequently the seas washing the eastern shores of Australia may be considered its native habitat: it is evidently the representative of the *Puffinus obscurus* of Europe, which it so much resembles, and to which it is so nearly allied, that *assimilis* appeared to me to be the most appropriate specific appellation I could apply to it. On my homeward voyage I saw numerous examples flying off the North-eastern end of New Zealand, and this, I regret to say, is all the information I have to communicate respecting it." Two specimens of this bird are in the collection at the British Museum, presented by Sir Thomas Mitchell from Eastern Australia, and the occurrence of this species at King George's Sound, on the South-west coast, has been already noticed.

Birds of great and enduring powers of flight; able, moreover, to take their rest, and obtain their food on the surface of the sea, may reasonably be expected to have a wide geographical range; and of these powers the birds belonging to the families of the petrels and the terns are remarkable examples.

Procellaria mollis of Mr. Gould's 'Birds of Australia.' "Abundant in the Atlantic and Pacific, but more numerous in the former than the latter." A skin of this petrel, obtained at Madeira, was compared with one of Mr. Gould's birds, and found to be exactly similar.

Procellaria Pacifica of Audubon, who received it from the North-west coast of America. This species I have seen from Madeira.

Procellaria hæsitata. This petrel is so rare, that only four or five examples are known. One from the Indian seas; one from the seas of Australia; one from Hayti; and one taken in Norfolk, (Zool. 3691).

Thalassidroma Wilsoni. Taken in four counties of England; seen in the Bay of Biscay, near the Azores and Madeira, Australia and the Southern Atlantic, and northward from thence towards Charlestown.

Sterna stolidæ. Has been obtained in Dublin Bay, in France, and at St. Helena. Very common over great part of the southern hemisphere.

Sterna fuliginosa. Abundant at Houtman's Abrolhos, on the west-coast of Australia; equally so at the Tortugas, South America, and has been killed in England, (Zool. 3755).

These and other instances might be cited of the same species being found many degrees on both sides of the Equator.

I am, Dear Sir,

Yours very truly,

WM. YARRELL.

To Edward Newman, Esq.

Catalogue of the Fishes of Orkney and Zetland.

By WILLIAM BALFOUR BAIKIE, M.D.

(Continued from page 3847).

Order VI.—ACANTHOPTERI.

Lophiidae.

Fishing Frog, *Lophius piscatorius*. Tolerably frequent.

Blenniidae.

Yarrell's Blenny, *Blennius Yarrellii*. Frequent at times, especially in Kirkwall Bay, where it was first detected by Dr. Duguid.

Spotted Gunnell, *Gunnellus vulgaris*. Very abundant.

Gobiidae.

Black Goby, *Gobius niger*. Rare.

Double-spotted Goby, *Gobius Ruthensparri*. Not unfrequent.

Freckled Goby, *Gobius minutus*. Not common.

One-spotted Goby, *Gobius unipunctatus*. Rare.

Callionymidae.

Gemmeous Dragonet, *Callionymus Lyra*. Rare.

Sordid Dragonet, *Callionymus dracunculus*. Rare.

Cyclopteridae.

Cornish Sucker, *Lepidogaster Cornubiensis*. A specimen obtained in Scalpa Flow in the winter of 1850, by Mr. J. Syme.

Bimaculated Sucker, *Lepidogaster bimaculatus*. Not rare.

Lump Sucker, *Cyclopterus Lumpus*. Not unfrequent.

Unctuous Sucker, *Liparis vulgaris*. Common.

Montagu's Sucker, *Liparis Montagui*. A specimen, upwards of 3 inches in length, was obtained by Mr. J. Syme in 1850-51.

Anarrhichadidæ.

Viviparous Blenny, *Zoarces viviparus*. Very common.

Wolf Fish, *Anarrhichas Lupus*. Not unfrequent.

Gymnetridæ.

Deal Fish, *Trachypterus Bogmarus*. First added to the British Fauna by Dr. Duguid, from a mutilated fish cast ashore in Sandey. Upwards of twenty specimens are known to have occurred at different times: one recently caught was lately exhibited at the Zoological Society by Mr. Yarrell.

Zeidæ.

Opah or King Fish, *Lampris guttatus*. Upwards of a dozen specimens have been procured at different times. One, nearly 6 feet in length, was captured in Sandey by the late William Strang, Esq.

Centronotidæ.

Horse Mackerel, *Caranx trachurus*. Tolerably common.

Scomberidæ.

Mackerel, *Scomber Scomber*. Abundant during the herring-season.

Gasterosteidæ.

Rough-tailed Stickleback, *Gasterosteus trachurus*. Common.

Smooth-tailed Stickleback, *Leiurus aculeatus*. Rare: first detected in a small pool in Orphir by Mr. R. Heddle.

Ten-spined Stickleback, *Leiurus pungitius*. Said to have occurred in Zetland.

Fifteen-spined Stickleback, *Spinachia vulgaris*. Common.

Mugilidæ.

Thick-lipped Gray Mullet, *Mugil Chelo*. Tolerably frequent from June to September.

Sparidæ.

Common Sea Bream, *Pagellus centronotus*. One specimen obtained by Dr. Duguid in Scalpa, near Kirkwall.

Sciænida.

Maigre, *Sciæna Aquila*. One captured in Zetland in 1819, and another in Orkney by Dr. Duguid, in 1852.

Triglida.

Gray Gurnard, *Trigla Gurnardus*. Not unfrequent.

Red Gurnard, *Trigla Cuculus*. Two caught in Orkney in the winter of 1850-51.

Scorpænida.

Norway Haddock, *Sebastes Norvegicus*. Occurs in Zetland.

Trachinida.

Lesser Weever, *Trachinus Viperæ*. Two specimens have lately been obtained in Orkney, one in Kirkwall Bay.

Cottida.

Short-spined Cottus, *Cottus Scorpius*. Very common.

Long-spined Cottus, *Cottus bubalis*. Common, but not so much so as the last species.

Pogge, *Aspidophorus Europæus*. Not common.

WM. BALFOUR BAIKIE.

Haslar Hospital, May 18, 1853.

(To be continued).

An Introduction to the Study of the Nepticulæ.

By H. T. STANTON, Esq.

1. *WHAT is a Nepticulæ?* In the good old times when Nepticulæ were Microsetiæ, and Lithocolletides were Argyromiges, a very similar question was put by an incipient entomologist to the most indefatigable collector (in those days) of these pygmy tribes. "But, my dear Sir, how am I to know a Microsetia? What is it like?" "It is something like an Argyromiges, but *more robust*." And however much one may be inclined to smile at the idea of a Nepticulæ being a *robust* insect, this description does at once convey an idea of the short thick-set figure of these insects. They do not approximate closely to any of the other genera of Micro-Lepidoptera.

In repose, the wings are nearly flat, being but slightly elevated where they meet over the back. The anterior wings are short in comparison with their breadth. The antennæ are not nearly half so long as the anterior wings. The more delicate characters not easily visible to the naked eye, are the rough head and *face*, and the enlarged basal joint (eye-cap) of the antennæ. To conclude, the answer to the question, "What is a *Nepticula*?" would be as follows:—*A Nepticula is a very small moth, which in repose keeps its wings flat (its anterior wings being short in proportion to their breadth), which has remarkably short antennæ, and runs with extraordinary agility.*

2. *What are the habitats of Nepticulæ?* These small insects have attacked a great variety of plants, and from the lordly oak of the forest to the lowly *Hypericum* on some sandy bank, there are probably few plants of which they are not consumers. But at present, in speaking of their habitats, I wish to confine myself to the localities frequented by them as perfect insects. In the first place, they frequently swarm on palings, and here they are caught with comparative ease. In the second place, they are at times numerous on the trunks of trees; but here, to see is not to catch. You examine the rugged trunk of an oak, and see none: look again,—look in that crevice,—do you not see a black speck between two white ones?—that black speck is the head of *N. atricapitella*, the two white specks are the eye-caps at the base of his antennæ. Now, to catch him, you must dislodge him from that convenient nook; poke him gently with a blade of grass. Ah! he has jumped away. This is often the case in attempting to catch *Nepticulæ* on the trunks of trees. In the third place, many species may often be beaten out of the plants on which they feed. Thus, *N. subbimaculella* from the oak, and Mr. Sircom used to obtain *N. intimella* from the shallows by sweeping the ends of the branches. In the fourth place, they may sometimes be found flying freely, of their own accord: it was thus that I found *N. pygmæella* had a penchant for early rising, and was generally on the wing from 5 to 6 A.M. *N. gratiosella* sometimes flies freely on a sunny afternoon.

3. *Where do the Larvæ of the Nepticulæ feed?* They feed on the parenchyma of leaves, not, however, distorting the shape of the leaf, as the *Lithocolletides* do,—the leaf remains flat, only the mined place becomes discoloured. The discoloration is, at first, hardly perceptible, but becomes more evident in the process of time, until, at the expiration of several months, it is sufficiently conspicuous to strike the

most superficial observer. A young collector is often annoyed by the circumstance of the uninhabited leaves being more conspicuous than those in which the larvæ are feeding. He looks around him, and observes leaf after leaf in which the larvæ *have been*; but though there are many leaves before him in which the larvæ *are feeding*, he passes them over, the discoloration being so slight.

The generality of the species mine the leaves in circuitous wavy paths, of which examples may easily be seen on the leaves of the bramble. Yet some mine in large blotches, as the species on the sloe, and some in wavy tracks, so closely applied as to form a blotch, — no unmined portion of the leaf lying between the folds of the serpentine path: an example of this kind may be met with on the elm. Others mine in numerous concentric circles, as the species on the Hypericum, and that which Mr. Shield discovered last autumn, on the sorrel.

In searching for the larvæ of Nepticulæ, the young collector must not be misled by the numerous mining larvæ of Dipterous insects, of which an example may easily be found in the leaves of the buttercup, sow-thistle, primrose, &c. The larvæ of Nepticulæ leave behind them in their narrow mines, a continuous track of excrement; whereas, in the Dipterous mines, the excrement is scattered here and there. In the case of the blotch-miner of the sloe, the excrement is usually in a heap at the lower end of the blotch; and in the leaves of the Rhamnus catharticus and Clematis Vitalba, which have been mined by the larvæ of Nepticulæ, the excrement appears to have been nearly of a fluid nature, and does not form the ordinary series of little black grains.

4. *Where do the Larvæ of the Nepticulæ assume the Pupa state?*

In one solitary instance the larva does not quit the mined leaf, but spins its cocoon therein, and changes to the pupa; this is the species that mines the Hypericum. All the other species yet observed, when full fed, emerge from the leaf, and, I believe, usually descend to the ground, where in all probability they spin their cocoons among the withered leaves. The gallery-miner of the rose is the only species of which we have yet learned to collect the pupæ; these may frequently be found in the hollow of the footstalk of the leaf, or upon the stem, sheltered by some projecting thorn or branch. Instances do occur, though very rarely, of gallery-miners of the rose changing to the pupa inside the leaf; the cause of this departure from the usual habit of the species is yet unexplained.

5. *To obtain Specimens of Nepticulæ, should we collect them in*

the Larva, Pupa, or Imago state? Certainly in the larva state. However simple and easy it may appear to a beginner to collect the perfect insects by scores off some favourite paling, yet, when he has collected them, pinned them, and set them, what is he to do with them? Put them in his collection. Very well; but as what? As specimens of the *genus Nepticula*; for he must be a bold man who would offer to assist him to the names of the *species*, thus taken at large. Some few conspicuous species may indeed be identified with tolerable ease; but there will probably always be a sufficient quantity of nebulous matter to render the identification of all the specimens caught in the perfect state almost an impossibility. Yet I do not deny that some conspicuous new species may occasionally be found in the perfect state, so that looking on palings may still be of *some* use; though to collect from them ordinary-looking species, might be of *no* use.

As, except in two instances, we do not know where to find the pupæ of *Nepticulæ*, it is manifestly of no use attempting to collect them in the pupa state; but even if we could find the pupæ, and could ascertain from what tree or plant they had come, unless that tree or plant produced only one species, we should still be deficient of our chief means of identifying the species. By collecting the *Nepticulæ* in the larva state we can distinguish the species; and frequently we can collect them in a wholesale manner, of which we could have no chance if collected in any other state. Thus, in less than a quarter of an hour, one morning last October, I collected about 500 of the larvæ of the small miner of the nut.

6. *How are we to proceed to collect the Larvæ of Nepticulæ?* These larvæ are so plentiful that, when once observed, the wonder is that they should not sooner have attracted our attention; only the matter is, they require to be looked for: you must not expect to find them unless you stop, stand still, and examine attentively the plant or bush that is before you. I will mention a striking instance that happened to myself, which may be of use as illustrative of the necessity of continuing to look, and not despairing because a first glance is not productive of any results. About the middle of last October I paid a visit one morning to a bush of *Rhamnus catharticus*, on which I expected to find the autumnal brood of the larvæ of *N. Catharticella*. To my surprise, on carefully examining the bush I could not find a single larva: however, I was so satisfied that they must be there, that I continued to look, and as my eyes gradually became more accus-

tomed to the indications of those objects for which I was searching, I found that, so far from there being no larvæ before me, they were really there in hundreds. This was a lesson which I resolved should not be lost upon me, and I hope it will also be useful to others.

Having thus urged the necessity of continued search, I will take it for granted that the collector has succeeded in finding the objects of his pursuit, but he sees before him some full-grown, and some very small, and probably wishes to know whether he should collect all. Unless the small ones be indeed very small, he may safely collect them, as these larvæ feed up in a very few days, and if he keeps his leaves from drying, they will be able to feed up after he has collected them. It is not necessary to gather the branches, to pick the leaves is quite sufficient; only bearing in mind to put them at once into the collecting-tins, and to keep them where they will be rather moist afterwards. We will imagine the collector to have proceeded from bush to bush, till he has collected a tin-full of leaves of various sorts, inhabited by a variety of larvæ of *Nepticulæ*. He then returns home, and the question might be asked, "Are the larvæ to be left in the tin, as collected?" By no means; for if so, will not all the species become mixed? The most pressing thing to be done directly the collector returns home, is to turn over the leaves he has collected, and to sort them very carefully, putting each kind of leaf by itself; and where two or more species of larvæ occur in the same sort of leaf, to subdivide those leaves according to the different species of larvæ, and then each separate batch should be carefully rolled up in some soft paper, and put into a tin or glass jar.

It is not advisable to leave the larvæ unsorted in the collecting-tins a moment longer than can be avoided; otherwise some of the larvæ will have become full-fed, and have crept out of some of the leaves, and then how is the collector to know to which sort they belong?

At the expiration of a week after the larvæ have been collected, it may be taken for granted that they will all have assumed the pupa state, and the rolls of soft paper should be carefully opened, and the cocoons of each roll, which will be found either attached to the paper, or to the leaves, and generally in little clusters, should be then put into little glass tubes, and labelled according to the plant from which they came, and the mode in which they mined that plant.

7. *At what time of the year should we look for the Larvæ of Nepticulæ?* Probably all the species are double-brooded, (*N. aurella* has indeed many broods in the year, there being few months in which its

larvæ may not be met with); and the summer brood may be looked for from the middle of June to the middle of July: but the great harvest is from the middle of September, until the trees and hedges are bare. The collector has then comparatively no other game in view, and the larvæ are in far greater abundance than in the summer; besides, by keeping the pupæ in a warm room, he breeds a considerable number during the winter months, when he would otherwise have no insects to set: and this very circumstance of his continuing to set these little moths uninterruptedly throughout the winter, will give him that knack and dexterity in handling them, of which we are all so much in need.

8. *On what Plants is the Collector to look for the Larvæ of Nepticulæ?* On all. Probably there are few trees or bushes on which some species does not feed; and though we can hardly expect all the low-growing plants to be fed upon by species of this genus, it is only by continually looking on these plants that we can hope now and then to detect a new species of larva.

9. *On what Plants have the Larvæ of Nepticulæ been found?* The following is a list of those plants at present known to serve as food to the larvæ of Nepticulæ:—

- | | |
|-----------------------------------|--------------------------|
| * Apple. | * Hornbeam, (2 species). |
| Beech. | * Hypericum perforatum. |
| Birch. | † Mountain ash. |
| * Bramble. | * Nut, (2 species). |
| * Buckthorn, (<i>Rhamnus ca-</i> | * Oak, (3 species). |
| <i>tharticus</i>). | * Rose, (2 species). |
| † Cherry. | * Sallow. |
| † Clematis. | * Sloe. |
| * Elm, (2 species). | Sorrel. |
| * Geum urbanum. | † Strawberry. |
| * Hawthorn, (3 species). | † Teucrium Scorodonia. |

The perfect insects have been bred from the plants marked thus, *. On those plants marked † no larvæ of Nepticulæ have yet been found, but the leaves that had been mined by them have been observed, and I have specimens of the mined leaves, which I can show to those curious in such matters.

Should any collector fall in with any larvæ of Nepticulæ upon any plant not mentioned in the above list, I should be most thankful for the information. The number of species is in all probability far from

exhausted ; and there are several conspicuous species which we have not yet succeeded in breeding. For instance ; *N. argentipedella* (if a birch-feeder, must make a larger mine than those I have yet found), *angulifasciella*, *argyropeza* (in all probability on some species of poplar), *intimella* (from Mr. Sircom's observations should be expected on sallow), *Louisella*, *quinquella* (most probably an oak feeder), and *tramaculella* (which should occur on the Lombardy poplar).

Of those species that have been already bred, some may be at once named specifically ; others appear to form parts in groups of closely allied species, which, to discriminate accurately, require the careful examination of a series of each individual composing the group : and it is therefore hardly advisable rashly to give a name, while we are uncertain what the distinguishing characters are.

Apple. The species bred from the apple forms one of the *Ignobilella* group.

Bramble. This is the well-known large species, *N. aurella*.

Buckthorn. To this species, closely allied to *N. Septembrella*, and not hitherto described, I have given the name of *Catharticella*.

Elm. Two larvæ were distinguished, one yellow and the other green. The imago of the green one is not closely allied to any previously known species ; from the gut-like appearance of its mine, Mr. Douglas has proposed for it the name of *N. viscerella*. The imago produced from the yellow larva is the *N. centifoliella* of my Catalogue, but clearly not the continental *centifoliella*, which is a rose feeder. From the tendency of the larva to mine at the edge of the leaf, going even in and out all the serratures of the leaf, I propose to call it *marginicolella*.

Geum urbanum. Closely allied to *N. aurella*, if, indeed, it be truly distinct.

Hawthorn. Two larvæ only were distinguished, one green, the other yellow ; it would however appear that there are two kinds of the latter, as, from yellow larvæ I obtained *N. pygmæella* and *gratiosella*. The green larvæ produced a species allied to *N. ruficapitella*.

Hornbeam. Two species of larvæ mine in the leaves of this tree, but they are not distinguishable by colour, only one is considerably larger than the other. The imago of the large larva is one of the *Floslactella* group ; that of the small larva belongs to the *Ignobilella* group.

Hypericum perforatum. This is the no longer unique, but still scarce, *N. Septembrella*.

Nut. Two species, a large and a small larva ; the perfect insects are parallel to, if not identical with, the two species from the hornbeam.

Oak. Two species of larvæ were distinguished, a pale-coloured and a dark-coloured one. It would, however, appear that there are two species of the latter, as from them have been bred both *N. ruficapitella* and *atricapitella*, which can no longer be considered as sexes, since several pairs of the latter were taken *in copulâ* last summer. The pale larva produced *N. subbimaculella*.

Rose. From the mode of mining, and the colour of the cocoons, there is little doubt that two species feed on the rose : — one, which had always been confounded with *ruficapitella* (see Lewis, in *Ent. Mag.* i. 422), but of which one sex has the tuft of the head black, was observed by De Geer, and Goeze has given to his insect the name of *anomalella* ; the other species, which I have not yet bred, may probably be the continental *centifoliella*.

Sallow. Only one species of larva has been observed, the perfect insect from which belongs to the *Floslactella* group.

Sloe. From the rather common blotch-miner of the sloe, I have bred a species of the *Ignobilella* group. I have a single leaf mined in a different way, but have not yet bred the moth from it.

10. *If the Species are so numerous, and so very closely allied, how are they to be distinguished?* This, no doubt, is a difficulty, and if we collected only the perfect insects, it would be one not easily answered ; but by collecting and observing the larvæ, we ascertain beforehand the distinctness of a species, even if the imago should afford us no character.

If you wish to separate *Acronycta Psi* from *tridens*, you must breed them both ; so it is with the *Nepticulæ*.

The points to be borne in mind with a view of distinguishing the species, are : — 1. The food-plant. 2. The mine. 3. The larva. 4. The cocoon. 5. The perfect insect.

1. *The Food-plant.* However much we may ultimately find it necessary to qualify the assertion, it is no doubt advisable to assume that no species feeds on two different kinds of plants. The bramble, strawberry, and Geum are allied plants, and *may* all be fed upon by *N. aurella* ; but to assume that because they are allied plants, the miners in them are without doubt *aurella*, would be jumping to a conclusion, and probably retard the discovery of species. The apparent identity of the two species

mining the nut, with those mining the hornbeam, is a matter of considerable interest, as the plants are not so closely allied as others in which we find no apparent identity of the miners.

2. *The Mine.* The variety in the modes of mining is very considerable: there is the long wavy gallery, as in *N. anomalella*; there is the long gallery so closely twisted as to form a blotch, as in *N. viscerella*; there is the short gallery returning into itself and forming a blotch, as in *N. subbimaculella*; there is the short rather broad gallery, as on the *Teucrium*; and there is the complete blotch, as that on the sloe. Besides the still more distinct mines of concentric circles on the sorrel, and of numerous extremely fine mines round and round the same small space, as done by *N. Septembrella* on the *Hypericum*.

3. *The Larva.* This may differ in colour, size, or marking; frequently when two species feed on the same plant, one is yellow and the other green; and this difference of colour is sufficiently apparent through the cuticle of the leaf.

4. *The Cocoon.* This may differ in size, shape, substance, and colour. The difference of size will generally be proportionate to the difference of size of the larvæ, and in the case of the species of the nut and hornbeam is considerable, one being about twice the size of the other. The difference of shape will frequently help to point out different species; some are oval, others shaped like mussel-shells; the cocoon of *N. aurella* has the edge rather flat and scalloped. In substance, cocoons differ in being more or less tightly woven, some having a flossy texture. In colour, the differences are very considerable; the species from the apple-leaves makes a bright yellow cocoon; one of the hawthorn-miners makes a beautiful pink cocoon. Continued observation might thus enable a collector to distinguish many species by the cocoon alone.

5. *The perfect Insect.* It is not necessary here to enter into the different characters by which these may be distinguished; and really, the quantity of paper I have filled reminds me, that unless I wish to be considered a bore by your readers, I must conclude this somewhat lengthy, but, I hope, not tedious "Introduction to the Study of the Nepticulæ."

H. T. STAINTON.

Mountsfield, Lewisham, April 30, 1853.

Proceedings of the Entomological Society.

June 6, 1853.—EDWARD NEWMAN, Esq., President, in the chair.

The following donations were announced, and thanks ordered to be given to the donors:—The 'Zoologist' for June; by the Editor. The 'Athenæum' for May; by the Editor. The 'Literary Gazette' for May; by the Editor. The 'Proceedings of the Zoological Society,' No. 201—226, and the 'Transactions of the Zoological Society,' Vol. vi. part 3; by the Society. The 'Proceedings of the Royal Society,' Vol. vi. No. 95; by the Society. 'Revue et Magasin de Zoologie,' 1853, No. 3; by M. Guérin Ménéville. 'Entomologische Zeitung' for February and March; by the Entomological Society of Stettin.

Mr. Waring exhibited a fine pair of *Notodonta trepida*, bred by Mr. B. Standish from larvæ found on oaks.

Mr. Bond exhibited some beautiful specimens of *Anticlea Berberata*, bred from larvæ found on the berberry, in Cambridgeshire, last year.

Mr. Wilkinson exhibited *Lithocolletis Stettiuensis*, *Nicelli*, a new species bred from caterpillars found in the leaves of alders last year.

Mr. Stevens exhibited a fine pair of *Notodonta Carmelita*, and part of another specimen found in a mutilated condition, all taken at Black Park, Bucks, on May 8th.

Mr. Douglas exhibited *Catoptria Albersana*, and a drawing of the larva from which it was bred. The latter he found at Wickham, in September last, in a leaf of honeysuckle, which it had converted into a dwelling by making a fold along its entire length.

Mr. Boyd brought for distribution specimens of *Tephrosia consonaria*, recently captured in Buckinghamshire.

Mr. Westwood mentioned some curious circumstances that had lately occurred amongst his bees. About ten days since a hive threw off a swarm, which settled at the entrance of the next hive, the inhabitants of which resisted the intruders, and much fighting occurred. Mr. Westwood interfered, and removed the queen; having released her, she immediately led the swarm to the entrance of another hive, where the same scene of confusion again occurred: a second time he took her away, and placed her upon a rose-bush, whence she took flight, and, he supposed, returned to the hive from which she originally came, for the swarm soon returned to its parent abode, and from this hive today a fine swarm came forth.

Yesterday another hive sent out a swarm, which joined a swarm from a neighbouring hive settled about forty yards distant, and both of them remained in one hive. There was much fighting, and as many bees were killed as would fill a pint measure; but today they seemed to be amicably settled, whence he presumed that one of the queens had been put to death. The junction of these swarms seemed to imply the influence of some attraction upon one of them by the other, or a communication between them.

Mr. Waring knew an instance in which four swarms joined and remained together, the hive having to be greatly enlarged to hold them. In the Exhibition of 1851, was a case containing six swarms, but these had been artificially brought together.

Mr. Wallace read a paper "On the Insects used as Food by the Indians of the Amazon," enumerating species of five Orders which are sought for and eaten with avidity.

Mr. Douglas read a continuation of his "Contributions to the Natural History of British Micro-Lepidoptera," consisting of illustrations of the transformations of the genera *Bedellia* and *Elachista*.

The President announced the publication of Part 5 of the current volume of the Society's 'Transactions,' and that the Prize Essay on the duration of life in the Honey Bee was reprinted for separate sale.—*J. W. D.*

Proceedings of the Dublin Natural History Society.

Friday, May 13, 1853.—ROBERT CALLWELL, Esq., M.R.I.A., in the chair.

The following donations were announced, and thanks ordered to be given to the donors:—Two specimens of the rock pipit (*Anthus petrosus*), a bird which breeds in great numbers in Rockabill, off the Skerries, in the month of June: also, a specimen of the snow-bunting (*Plectrophanes nivalis*), shot in the county of Kerry: presented by Mr. Andrews. A 'Treatise on the Climate of Nottingham,' by Edward Joseph Lowe, Esq.; presented by the Author.

Mr. J. R. Kinahan read the continuation of his paper "On the Autumnal Songs of Birds," commenced at the April meeting. We here give the first part in full.

"When I commenced this paper, it was my intention to have confined myself to a record of those birds which sing during the latter months of the year about Donnybrook, but on reviewing my notes on this subject, I find it impossible to separate them from their congeners, for, in fact, most of our songsters sing nearly the whole year round. The remarks I am about to submit to the meeting, are an abstract of nearly daily records, extending over a period of at least five, and, in some instances, seven years, and in every case were made by myself, and their value, if they have any, depends solely on this. With but few exceptions, which I have noted, they relate entirely to the birds of Donnybrook, and therefore, to a general naturalist, are only useful as compared with similar records made in other quarters, as, during the time I was making them, I have found a few miles sufficient entirely to alter my list.

"Our earliest songsters are the robin, the wren, pied wagtail (*Motacilla Yarellii*), gray wagtail (*M. Boarula*), and hedge-fauvette (*Accentor modularis*). These commence their autumn song pretty much in the order here set down. The robin begins in the second week in August or the first week in September. Twice during the last five years do I find him noted before the former date, *viz.*, on the 1st of August, 1851, and, in 1852, when he commenced on the 7th of August. He is, without exception, our most indefatigable songster. Every weather is alike to him,—sun, fog, frost, snow, wind, or rain. He sings all the year round, except for about six weeks in summer, *i. e.*, from about the last week in June till the second week in August. He generally sings every day, morning and evening, till about the middle of December, after which time he does not sing, except in the morning, until about the middle of January, when he recommences singing in the evening, and also changes his autumnal song for that of the breeding-season. Sometimes the song is not so regular as is here stated. In 1849 he commenced in September, and sang regularly till the middle of November: last autumn he recommenced on the 7th of August, and continued in song almost daily up to the present date: in 1851 he commenced on the 29th of August, but sang most irregularly, as I find him noted only four times between that date and the 1st of January,

1822. This did not arise from the harshness of the season, for the winter of 1850 was a great deal more severe than either of the other two, and yet we find him singing more regularly than in the comparatively milder winter of 1851. White, in his comparative list of the song-birds of Selborne, states that he 'sings all the year round, except during frost.' Frosty weather does not affect his song in this country, as I have heard him singing even during snow. The song is delivered from an elevation, and also when flying. This bird possesses also a singular faculty of singing with the bill closed, even with a worm between his mandibles—a faculty I have observed only in one other native bird, *viz.*, the lesser willow-wren. He is also one of our nocturnal warblers, generally preferring a frosty moonlight night for this purpose. In the winter of 1847 we had several such nights in close succession; and a robin used to sing under my window every night, beginning generally about twelve and ceasing at two. I have heard him once or twice in the beginning of July.

"The wren, though commencing later than the robin, is more regular as regards the period of commencement of his song; once only, during the last five years, did he commence earlier than the beginning of November. He sings most vigorously during frosty weather, but is not at all so regular a daily singer as the robin, as he seldom sings in open weather. In Scotland, Mr. Hepburn records that he does not sing in winter; and White says 'all through the winter, except in frost:'—singularly enough, the very time I have oftenest heard his song about Donnybrook. He sings generally, if not always, from an elevation, using a great deal of action and with quivering wings. His song ceases about the middle of June, but is sometimes continued into July; the earliest date I ever heard him was August 18, 1851.

"The wagtails occasionally sing all through the winter, on fine days, but are not such regular songsters as any of the others. For the most part they sing on the wing, rising for a short distance into the air, and in summer and spring, even on a bush or wall. Early in the season, they sing oftener on the ground than anywhere else. Their song is continued late into summer, as they may be heard occasionally even as late as the 20th of August. The earliest date I have heard them singing was the second week in November.

"The winter fauvette, or dunnock, is a more delicate bird than any of those yet mentioned, and therefore not so regular in his song till spring. He delights in a soft, drizzling morning, but may be heard also during frost; I only once heard him singing during high wind. He generally commences about the third or fourth week in November, and sings till about the second week in July; in some seasons he does not commence till the middle of January, this was the case in 1851. Early in the season he chooses a low bush for his station while singing; but as the season advances, he mounts higher and higher, even to the tops of high trees; in the height of the breeding season he even sings on the wing. He is recorded as one of our night-singers, but I have never heard him myself at that period. Mr. Hepburn states that in Scotland he sings 'from the second week in February till the first in August, and occasionally in winter and autumn.' White's record is, 'early in February till July 10.'

"The next in order, if we look to regularity of period in commencing their song, are the thrushes; but it will be more convenient to consider first some of the other songsters which, though more irregular, generally begin earlier. These are, the chaffinch, the tits, skylark and gold-crest. The first (*Fringilla caelebs*), sings occasionally on soft mornings, as, during the seven years over which these notes extend, I find him recorded in every winter month except November, though the regular time for his song

is about the 14th of February. Singularly enough, in three several years, although previously to this day he had only sung occasionally, and a single bird here and there, on the 14th of February the groves, as though by common consent, were filled with his sprightly song. He often sings till late into July, though, generally speaking, the third week in June ends his season. The earliest date I ever heard him was on the 20th of October. He sings from a bough, generally at middle height from the ground. In Scotland, he is recorded as beginning the fourth week in January and ceasing on the 2nd of July, and as singing occasionally through the autumn and winter. White records him as 'beginning in February and ceasing in June.'

"The tits found about Donnybrook are *Parus major*, *P. cæruleus*, *P. ater*, *P. longicaudatus*, and *P. palustris*. Of these, the two last may be excluded from my list of singing birds of that locality, as the first of them is merely an occasional winter visitant, and the second a very rare one, having occurred there only twice to my knowledge, once in the latter end of autumn, and once in the summer. Of the other three, the great tit (*Parus major*) begins earliest; once I find him recorded in August and twice in September: he does not generally begin till the middle of January. He is the most indefatigable songster of his race; in the beginning of February and through the month of March, generally commencing his harsh song some hours before daybreak, and then keeping it up for three or four hours. He ceases in the middle of June, sings at an elevation, and while in pursuit of food. The nun (*P. cæruleus*) generally commences towards the latter end of January, and continues in song until towards the end of July. The cole tit (*P. ater*) commences about the same time, but ceases a little earlier. The songs of all the tits are much alike, both in note, and in delivery, duration, &c. They all sing at an elevation, and, if the season be open, do not mind a little frost. The long-tailed tit (*P. longicaudatus*), though not a resident in Donnybrook, is plentiful enough about Miltown and Rathfarnham. It has more pretensions to song than any of its congeners. It commences singing about the beginning of February, and ceases in June. The song is delivered on a bush, and may be heard even in frost.

"The lark, as a winter songster, is very irregular, and generally harsh and unmusical until the spring suns have warmed it; some years, however, it sings in autumn as merrily as in summer or spring. Last autumn it was singing as sweetly as ever, even as late as October and November. It seldom, however, commences its song till about the beginning or middle of February; and generally sings earlier in the morning than any other bird, and later in the evening. Weather exercises little influence on its song when once it has commenced, singing as merrily in the midst of the pelt-ing shower or driving sleet as in the bright sunshine; snow or high winds alone affect it. It sings late into July, but remains silent during August. Its method of singing I need not describe, as it must be familiar to all; sometimes, especially in the breeding-season, it sings on the ground. I have shot the females in the act of singing.

"That little fairy-like bird, the gold-crest (*Regulus cristatus*), comes next in order, but is only an occasional winter songster. His legitimate time for song is early spring, commencing in January and ending in the beginning of June: on frosty days, however, he may be heard singing even as early as the 18th of November. The song is always delivered from an elevation, is short, and to some might even appear harsh, much resembling that of the tit-mouse.

"The most regular autumn songsters we have, excepting the robin and the wren, are those of which we now come to speak,—those peerless songsters, the thrushes, or at least the two great types of the genus here, the common thrush and the blackbird.

The former of these I find commences either early in November or December; the earliest note I find is the 12th of November, 1830. Its song is of course familiar to all; early in the season it sings either in a low bush, or else on the ground, and only in the morning; as the season advances, it sings in the evening and chooses a higher station, till, in the height of the season, it sings from the highest trees: earlier, however, it prefers close brush-wood, and hence may be heard singing most regularly in such places as abound in thickets. The low bushes on the Donnybrook road, near Wellington road, are a favourite station for them, as are also the lowlands about Tal-laght and Crumlin. Later in the season their song may be heard in great perfection at Lough Bray, and in the valley of the Dodder, part of which, Glen-as-Moil, gets its name from the numbers of these birds found in it. They cease singing about the third week in June. The weather that seems most congenial to them is soft, open mornings, although they may be heard singing sweetly during frost. They are our most beautiful night-singers, and I have often heard them. One instance I will transfer from my note-book: — ‘March 5, 1852, moon very bright, though the night was misty and soft, the thrushes (*Turdus musicus*) were singing as sweetly as though it were morning.’

“The next member of the group, the blackbird, generally begins his song in November, though sometimes he may be heard even as early as September; he is never so regular a songster as the thrush, but ceases about the same time. Though a very common bird, the peculiar charms of his song are known but to few, for though of far less compass and fewer notes than that of the thrush, it far surpasses it in plaintive mellowness. Indeed, we have no word in the English language which can convey a notion of it; that usually adopted, namely, ‘whistling,’ giving about as much idea of it as it does of the sound of the trumpet. The thrush’s note may surpass it in power, but there is a melody in the blackbird’s song much more pleasing than all the polished execution of its rival’s elaborate strain. To hear it in perfection, you should hear it in early spring, on a calm, misty, soft morning; or, better still, in early summer, in that stillness which precedes or follows a summer thunder-storm, when the skies are black with lowering clouds, all things else silent, save, perchance, the chirping of frightened sparrows in a neighbouring hedge; then may the blackbird’s song be heard, like some good spirit’s voice, breaking through the solemn silence, and bidding us not despair, for that though the storm may rage, it cannot utterly destroy. As far as my observations go, it invariably sings from an elevation, and in spring its song is generally the precursor of wet. It sings at first only in the morning or at mid-day; but about February or the beginning of March, may be heard singing in the evening.

“Our other native thrush, the missel-thrush, is not a regular resident in Donnybrook, I can therefore only state that I have heard him in January, February, and March, uttering his unmusical song in the tops of the tallest poplars.

“The water-ouzel is not found about Donnybrook; I have heard him, however, singing in the valley of the Dodder, about Bohernabreena, during every month but July. They always, I believe, sing perched on a stone with quivering wings: it is a night-warbler; the song is soft, low, and pleasing.

“The titlark is the next bird which comes before us, and is truly a summer songster. Its song is hardly ever commenced earlier than the second week in February, and ends before the end of July. The song, which is short, is uttered on the wing; the bird, rising from the ground after the manner of the common lark, takes a short circular flight, and concludes its song on some tree or other elevated position: it

occasionally sings on the top of some high tree. You seldom hear this bird in early spring, unless the day be soft and open, though he may sometimes be heard singing even in raw frosty mornings. This season (1853) was a most unpropitious one at the period when the bird generally commences, and I do not find him in my notes until March. As the season advances, frost does not exercise much influence on his song, a remark which applies to songsters in general. The females of this bird sing, as I have proved by actual dissection. It rarely sings on the ground.

“The next group we shall consider — the buntings — contains three species, *viz.*, *Emberiza Miliaria*, *E. citrinella*, and *E. Schœniclus*. Their songs very much resemble each other in character. That of the common bunting (*E. Miliaria*) is the most varied and powerful; it has been not unaptly compared to a bunch of keys drawn rapidly round a notched ring. It may be heard, with very little intermission, from the beginning of February till the end of August. This bird sings at all times of the day, but particularly during the bright hours of noon. The song is always delivered from a slightly elevated position, such as the tall stems of the cow-parsnip, or on some bush slightly higher than the rest of the hedge. He is not a very common bird about Donnybrook.

“The black-headed bunting (*E. Schœniclus*) has a very feeble harsh song. He commences about a fortnight or three weeks later than the last, and ceases as soon as the breeding-season is over. He sings either on the top of a high tree, or in a bunch of rushes: he also sings at night.

“The yellow-hammer (*E. citrinella*) has the same range of season as the common bunting, and sings either from a bush or a wall, or from a high bank; he, too, sings at noon; the song is shorter, but not so harsh: it was in song on the 25th of January, 1852.

“The linnets found about Donnybrook are three—*Linota minor*, *L. montium*, and *L. cannabina*: but owing to their not being regular permanent residents there, I cannot speak fully about them. They are all generally in song about the second week in February, and cease to sing in June or July; they all sing from an elevation.

“The greenfinch (*Fringilla Chloris*) generally begins his discordant song in the latter end of February, and ends it in June, but may occasionally be heard in August and September. They usually, at least in the commencement of the year, sing in concert; they always sing from a height, and, as well as the true linnet, may be heard in autumn recording for hours.

“The only other native songsters heard about Donnybrook are three — the common starling, the woodlark and the stonechat. The starling (*Sturnus vulgaris*) sings from the beginning of January to the end of May, and chooses some elevated spot for his orchestra. The woodlark (*Alauda arborea*) I had the good fortune to come across only during one season, that of 1851, and he commenced his song in the middle of February, and ceased in the beginning of June. I remarked that he sung on wing, not rising up into the sky in rapid spires like the skylark, but sweeping round in wide circles, and ended his song on the ground. Whether this is its common method of singing or not I do not know, as it never, to my knowledge, bred in Donnybrook since. The stonechat (*Saxicola rubicola*) conducts us to the migratory birds; as the same remarks apply to it and to its allies, the whinchat and wheatear. The latter bird (*Saxicola Œnanthe*) is not a resident in Donnybrook, only visiting us at its entrance into and departure from this country. It is, however, very common about Bohernabreena; so that I have had copious opportunities of watching its habits. They all generally

begin their song on Patrick's day; and cease to sing before the end of June. They sing either on a bush or on wing, rising for a short distance into the air. As the whinchat (*Saxicola rubetra*) is supposed to be only a summer visitant, I might as well mention that I have killed or observed this bird in the months of October, September and February.

“The chiff-chaff (*Sylvia rufa*) generally arrives here the latter end of March, and sings as soon as he comes. The earliest date I ever observed him on was the 10th of March, 1849, near Templeogue, and I find him noted in every month until the 15th of September. The song is delivered from some bush or tree, but generally among the branches, at about middle height from the ground. It has two songs, one of which is peculiar to the breeding-season, the other to the remainder of his sojourn here.

“The lesser willow-wren (*Sylvia Trochilus*) arrives here a fortnight or three weeks later than the last, and ceases to sing at about the end of July. He sings either on the topmost boughs or on the wing; his song is much more prolonged than that of *S. rufa*. This bird sings with its bill closed, similarly to the robin; I have remarked this trait only while he was feeding.

“The whitethroat (*Curruca cinerea*) arrives here in the beginning of May and sings till August, with an interval of three weeks in July. Its song is a melancholy wail, intermixed with a queer scolding note. It sings thus:—rising from the top of some bush with a great deal of action, fluttering wings, &c., it takes a short flight upwards, and then, wheeling back to the point it started from, it ends its song perched. The earliest record I have of it is the 2nd of May, and the latest the 29th of August, 1850.

“The three swallows (*Hirundo urbica*, *H. rustica* and *H. riparia*) all make an attempt at song. They generally do not commence singing until three weeks after their arrival in this country, which usually takes place at this side of the bay in the following order:—The sand-martin the last week in March or the first in April; the earliest record I can find is the 20th of March, 1849: they are generally all gone by the first week in October. This bird has very little pretensions to song; it sings on the wing, or on a bank. The chimney-swallow comes on the first or second week in April; the earliest I have noted occurred on the 4th of April, the latest date I find recorded in Donnybrook is the 20th of October, 1849. It has more pretension to song than the rest of the genus, and sings more sweetly in autumn, even as late as the month of September: it does not sing during the latter weeks of July. The window-swallow scarcely sings at all: it arrives here generally later than the other two; the earliest date I find recorded is the 13th of April, 1852. It leaves us about the middle of September, although last year a pair of them were feeding their young, which were in the nest, as late as the 3rd of October.

“That polyglot, the sedge-warbler (*Sylvia Phragmitis*), concludes the list of summer songsters. He arrives here the first or second week in May: the earliest date I find for him is the 2nd of May, 1851. He is the most perfect of our migratory songsters, and might most aptly be called the ‘Irish mocking-bird,’ as, hidden in some brake of briars or bunch of reeds, he pours forth a mingled imitation of the songs of almost all our other warblers, mixed with his own harsh song. Two years ago a bird of this species frequented Donnybrook, which closely imitated the blackbird, whitethroat, wag-tail, titlark and bunting. He almost always sings in the closest retirement; and his melodious strains are not confined to the day-time, but may also be heard during the stillness of our summer and autumn nights. The latest date I have heard him was on the 5th of September, 1851.

“This ends all I have been able to collect concerning the songsters of Donnybrook individually. The only other songsters I have met with are the goldfinch, which only occasionally visits Donnybrook, or at least those parts to which I have access: I have however heard him singing in August and September in the counties Kilkenny and Waterford, and in early spring about the brakes of Ballinascorney. The bulfinch has only occurred to me once in Donnybrook, and then in the depth of winter. The ring ousel I have heard singing in May, at Lough Bray, county Wicklow; the song harsh, short, and delivered from the top of a rock: I never met with them in the county Dublin save once, in a stream-glen in the hills between Killakee and Dundrum. The redwing and fieldfare, although recording here in early spring, I have never heard singing.”

In the second portion of his paper Mr. Kinahan made some remarks on the natural and other causes which appear to control and influence the duration of the song of birds, which he prefaced by a few observations on various irregularities in their manner and time of singing. These he classed under three heads, giving examples of each from his note-book:— 1. Night-warblers, including the sedge-warbler, robin, song-thrush, blackbird, dipper and chaffinch. 2. Birds whose females sing, including the skylark and titlark. 3. Birds which sometimes sing with closed mandibles, as the robin and lesser willow-wren. The positions chosen by birds while singing were next noticed, as well as the periods of the day when they commence their song, all which appear to vary greatly according to season and the state of the weather; but as a general rule, however, he finds that “birds sing oftener and more regularly in the evening in the spring and autumn than in either summer or winter.” To prove that no month is utterly songless, Mr. Kinahan gives the following analysis, showing the number of birds out of the total of forty-one songsters that he has heard singing in each month in Ireland:— January, 16; February, 25; March, 32 (including two summer visitants); April, 37 (summer visitants 7); May, 39 (summer visitants 8); June, 38 (summer visitants 9); July, 18 (8 of which were summer visitants); August, 14 (summer visitants 3); September, 8 (summer migrants 3); October, 9 (summer visitant 1); November, 10 (3 very regular); December, 11. After adverting to the influence of the weather, and the abundance or scarcity of food as tending to regulate the commencement and continuance of the song of birds, Mr. Kinahan thus concludes his interesting paper:—

“That the song of birds was the language of love, and as such only to be heard during the pairing season, is an old theory, but not the less incorrect for its age, as, indeed, the foregoing notes have amply shown; for out of many species which we find singing after July, but three, or four at most, build second nests. I believe myself that song is mainly, if not entirely, dependant on a joyousness and lightness of spirit, whether produced from genial weather, abundance of food, love, or any other cause; and, in fact, that a bird sings under the influence of the same natural impulse as that which causes the yelping of the gambolling pup, or the whistle of the idle schoolboy. Witness birds in confinement; supply them with sufficiency of warmth and light, and you may have them singing at any period of the year, and by day or night; the thrush singing as clearly and sweetly by the glare of the gas lamp as in the bright sunshine.”

Observations on the General Colour and the occasional Variations in the Plumage of Birds. By the Rev. ALFRED CHARLES SMITH, M.A.

MY attention having been directed last year to the remarkable change in the colour of the plumage of a blackbird, as detailed by me (Zool. 3576), and commented on in a subsequent number (Id. 3665); I have pursued my inquiries on the subject a little further, with regard to the general colour of the plumage of birds, and the varieties so often met with. The subject is one of exceeding interest; and though I cannot pretend to have elicited any new facts, or to have made any new discoveries, I will submit my observations (such as they are) to the readers of the 'Zoologist,' together with a list of such varieties as I have been able to ascertain; hoping that the former may induce some one to work out and more thoroughly investigate this subject, and that the latter may be serviceable to him in so doing.

In my former paper, above referred to, I had occasion to describe the growth of a feather, as detailed by Malpighi and other anatomists, and I then looked forward to this season of the year, when I might have excellent opportunities for more closely watching, than I had hitherto done, the gradual but very rapid development of feathers in the nestlings which now abound in our shrubberies and gardens. The nests to which I have chiefly confined my attention are those of the blackbirds and thrushes, both on account of their abundance and easiness of access, and especially on account of the superior size of their young inmates; and I have been extremely interested in watching the nestlings from the first hour of hatching to the time of quitting the nest. To those unaccustomed to note these things, it is quite astonishing what a rapid increase the feathers make in a single day, and how very short a time elapses from the moment when the chick emerges from the egg, a blind, naked, shapeless creature, to the first covering of down, and the development of that down to the perfect feather, and the increase of that feather until the young bird is fully fledged, and able to shuffle off from the nest and hurry into the thickest cover, when the intruder rudely comes to pry into and examine his new clothing. But now the young bird, whose wings have already enabled him to flutter away out of our sight, though well covered with feathers, has by no means come to his full plumage, nor rivals his father's colours: some birds there are, indeed, so precocious, that very soon it would be difficult to distinguish them from their parents; but

for the most part their colours are less defined for the first year, and many do not attain to their full plumage till the second or third, and some not till the fourth year, or even later than this; of which the golden oriole, the roller, the bee-eater, the capercaillie, the common heron and the Skuas, are conspicuous examples. Mr. Yarrell, in speaking of this, says, "though not believed formerly, it is now very well known that many birds build nests and produce young before they have attained their own adult plumage. Baron Cuvier has stated, that when the adult female bird differs from the male in the colour of her plumage, the young birds of both sexes, in their first feathers, resemble the female; the young males afterwards putting forth the colours that indicate their sex. When the adult male and female are of the same colour, the young then have for a time a plumage peculiar to themselves. The pheasant may be quoted in illustration of the first law, and the partridge as an example of the second. To these two, a third law may be added: whenever adult birds assume a plumage during the breeding season decidedly different in colour from that which they bear in the winter, the young birds of the year have a plumage intermediate in the general tone of its colour compared with two periodical states of the parent birds, and bearing also indications of the colours to be afterwards attained at either period." But whatever may be the first plumage given to the young bird, his time of moulting will come, when the old feathers are discarded and new ones come up in their place: I have elsewhere described how this takes place, and how the old feather does not drop out until it has led its successor into the hollow it is about to vacate. This regular annual moult takes place in the autumn, when the work of nidification is over, and before the general migration begins: at that moult the plumage assumed, though thicker and warmer, is not usually so brilliant in colour as the one thrown off; but again in the spring, the bird assumes his bright nuptial dress, not by throwing off his old feathers and assuming new ones, but by the "gradual wearing off" of the lengthened lighter-coloured tips of the barbs of the feathers on the body, by which the brighter tints of the plumage underneath are exposed." And this is the method by which, as Tennyson sings,—

"In the spring a fuller crimson comes upon the robin's breast;
 In the spring the wanton lapwing gets himself another crest:
 In the spring a livelier iris changes on the burnish'd dove."

And now that our bird is arrayed in the full dress assigned to his species, let us remark how beautifully Nature usually assimilates his

prevailing colour to the general hue of his own locality. I cannot better exemplify this than by quoting the words of Blyth, in his Notes on White's Selborne. "The wood-snipe," he says, "is of the exact tint of the dead leaves over which it runs, the snipe that of the marsh, and the rail that of coarse and decaying vegetation in the ditch." "The ptarmigan," observes Mr. Mudie (and he might have added the mountain hare), "is lichened rock in summer, hoar frost in autumn, and snow in winter; red grouse are brown heather, black game are peat-bank and shingle, and partridges are clods and withered stalks the whole year round:" a provision of course intended to furnish them with some means of eluding the piercing ken of their winged enemies. I might adduce farther instances of this, but it will be needless. Of course, the above statement does not apply to *all* birds, many of which delight the eye with their brilliant hues in direct contrast to the haunts in which they dwell; some of these do not need such a means of concealment, and others are compensated for their want of it by other methods of escape from their foes; but to every one its own peculiar garb is assigned. Nature, usually so uniform and undeviating in all her ways, has given to every species of bird its own particular colours, and this law is for the most part very strictly kept, insomuch that from a thousand specimens of any particular species, the probability is that in all the plumage would be exactly alike, even to the faintest and most minute markings. It will, however, be necessary to qualify this assertion by the addition of certain provisoes. 1. That the birds to be compared be of the *same sex*; because, in so many cases, the plumage of the males and the females of the same species is totally different: as in the kestrel, the chaffinch, the pheasant, &c. 2. That they be of the *same age*; because, as we have seen above, there are many birds which do not attain at first to their mature dress, but are often clad in less defined colours, and young males are frequently habited as females: as the sparrow-hawk, the bullfinch, and most of the duck tribe. 3. That they be compared at the *same season*; because there are many birds to whom Nature, in her wisdom and goodness, has assigned a summer and a winter dress, clothing them with dark or bright hues in the summer, and as winter draws near, assimilating their plumage to the snowy landscape, by a greater or less infusion of white in exchange for their dark clothing: of this the whole family of divers, the snow-bunting, and the ptarmigan are examples. So that in making a comparison of birds of the same species, we must see that it be at the same season, and that the birds to be compared are of the same sex and the same age; and then we

shall almost invariably find that their plumage is identically the same in every individual.

To this rule, however, there are certain exceptions, of which the crossbills and the ruffs are very remarkable examples. Of the crossbills Bewick says, "their colours are extremely subject to variation; amongst a great number, hardly two of them are exactly similar:" and other authors, in describing different individuals, show that red, yellow, green, orange, and brown are the various liveries assumed by this very cameleon of a bird. Again, the ruff is another species of which Yarrell states "that scarcely any two of these males can be found of the same colour, which is very unusual among wild birds." But both the crossbills and ruffs are very peculiar birds in other respects, besides their diversity of dress; and perhaps, on another occasion, I may have something more to say of them. I adduce them now merely as striking examples of some *constant* exceptions to the law generally observed by Nature, in assigning to every distinct species its own peculiar garb, from which the individuals composing it would no more think of deviating, than would a soldier of one regiment of usurping the facings of another.

There is yet another peculiarity which may occasionally be seen, when the one sex assumes the dress of the other, to which it is not naturally entitled. This is more frequently seen in the hen pheasant, than in any other bird, which, scorning her own plain homely garb, aspires to the splendid dress of the cock, but these females are invariably barren. Another bird which occasionally delights in the same vagaries is the female of the black grouse; and more might be mentioned. On the other hand, there are certain effeminate male birds which array themselves periodically in female costume: this is the case with many of the duck tribe, as related in a very interesting paper by Mr. Gurney, (*Zool.* 3116).

But though the despised sparrow never presumes to adopt the dress of the gay goldfinch, nor the proud goldfinch condescends to the dismal robes of the ignominious sparrow; yet we certainly do see occasional departures from Nature's ordinary rule, when certain individuals of various species seem to ignore the universal law, and, putting aside the colours usually assigned to them, array themselves in white, or some unwonted hue. Now these unnatural birds are, in my opinion, far from pleasing specimens of their species; I look upon them, in all cases, as miserable deformities. If they are so clothed from the nest (and, on inquiry, I find this is the case with by far the greater part of them), I consider them as no other than wretched

abortions, the offspring of weak parents, unfit to rank with their fellows: and if they have assumed an unusual colour in after-life from any cause, this, too, must be from constitutional debility, whether superinduced by accident or any other cause. For I hold that in all these anomalous cases, an unwonted variety of colour betokens physical weakness, no less certainly than bright well-marked plumage usually betokens good health and strength. To pretend to account for these freaks of Nature, thus deformed from their birth, is to attempt to account for all deformities in the animal kingdom; these are the exceptions which prove the rule, how uniform and undeviating Nature's laws are.

There is a difference of opinion among naturalists as to whether or no these white or party-coloured varieties transmit their colours to their offspring. Mr. Waterton, in writing of the pheasant, says that he has never been able to perceive this; on the other hand, a correspondent in the 'Zoologist' states his conviction that such is the case, and brings very strong proof in support of his opinion, (Zool. 873): the fact (I suppose) being, that in some cases, though not always, the variety in colour is handed down from the parent to the progeny. In proof of this, Bishop Stanley also gives an account of some rooks which, for several successive years, occupied the same nest, and invariably produced two white ones, proving not only the hereditary colour, but also the weakness of the parent birds, four or five being the usual complement for a nest. Blyth goes still further than this, and states that "when creatures are taken from their particular natural haunts, a disposition in the next generation to vary in hue is commonly evinced more or less, according to the species; efforts, as it were, of Nature to accommodate the offspring to the change: and so remarkable is this in some species, that the breeders of white and pied pheasants declare that albino or mottled individuals may almost always be raised from an ordinarily coloured pair, by merely confining the latter in a room whitewashed, or splashed with whitening."

I confess I am not yet quite prepared to assent to this, to me, rather startling statement, though I do not forget the marvellous results of Jacob's somewhat similar experiments; and am well aware what almost incredible efforts Nature often makes to overcome obstacles, and produce her customary results. Of one thing I am quite convinced, that be this variation in colour hereditary or no, attainable at will or no, I should be far more inclined to destroy such innovators as degenerate, than to encourage them for the sake of variety.

With regard to those birds which, being at first of the natural hue,

have afterwards assumed, either wholly or in part, a white or otherwise unwonted dress, there is much variety of opinion; and, indeed, much mystery seems to involve this change of plumage. The effect is frequently seen in different species, but the causes producing that effect in many cases lie hidden, although I think there can be little doubt that these changes spring from a variety of causes, not one having yet been started which will apply to any considerable number of the cases I have investigated. Amongst the many causes proposed by different naturalists for this occasional and unnatural change of colour, Montagu and Bewick unite in thinking that confinement is the chief; and it seems consonant with reason that this may sometimes be the case, as a caged bird necessarily loses all his natural habits, and is constrained to use only the prison diet, whatever that may chance to be. Again, in the case of a bullfinch which gradually became coal-black, Gilbert White attributed it to the hemp-seed upon which he was fed, concluding his account of it with this reflection,—“such influence has food on the colour of animals;” a conclusion, the universal truth of which I must take leave to dispute: for certainly this is not the invariable effect of that seed, inasmuch as birds fed entirely on hemp have retained their wonted colour, while others have become completely black, when fed upon canary-seed alone. A third cause, proposed by others in some cases, has been fright; and I have already stated my firm persuasion that a variation in colour has ensued upon great and sudden terror. In this I have been supported by many naturalists, and by no more conclusive proof (though it escaped my notice at the time) than the account related by Mr. Fennell (Zool. 565).

“*Zoologists certant, et adhuc sub iudice lis est.*”

But although we may prove that one bird is terrified until his hair turns white, and another eats hemp-seed till he's black in the face, and another is imprisoned till he's purple with rage or white with passion, yet we cannot imagine that any of these are the *usual* causes of the variations in colour which so frequently come under our notice; especially as the greater part of these instances relate to birds always at liberty, with which sudden fright can have little, and hemp-seed and confinement nothing at all to do. And even of birds kept in cages, numbers are daily frightened and fed with hemp-seed, and yet retain their usual dress; the variation in colour ensuing from either of these causes is the exception, not the rule. We must then look

beyond them for the true cause. Now I have said above, that constitutional weakness seems to me to be the real root of the matter. I conceive that on a strong and healthy bird, none of the supposed causes above named would operate to the variation of its colour; but that on birds of peculiar weakness, these or any other external accidents or derangements of their natural habits do sometimes induce such unwonted hues, which perhaps are still oftener the result of debility alone, without any other particular promoting cause. Mr. Yarrell seems to be of this opinion; for in speaking of the common linnet (Brit. Birds, i. 554), he says, "males do not, in confinement, acquire the fine red colour which pervades the breast of a mature wild bird;" "the particular plumage assumed during the breeding season by many species, being a periodical indication of constitutional and sexual vigour." And again, in vol. ii. p. 101, in speaking of a young rook of a light ash-colour, mottled over with black, and with the quill and tail feathers elegantly barred, he says that upon the bird moulting, all its mottled plumage vanished entirely; and also adds, "this agrees with my observations: accidental varieties will generally be found to be smaller and weaker birds than those which are truly characteristic of the species; as these young birds increase in age, and gain constitutional powers, the secretions become perfect, and the plumage assumes its natural colours: the assumption of white feathers by old birds is probably the effect of the converse operation of this physiological law."

Presuming then that physical weakness is the radical origin of the varieties in colour so often seen, whether they are developed with or without any farther exciting cause, I come now to enumerate those instances of varieties in colour which I have been able to gather, with some few particulars regarding them; and I have been at some pains to collect all the instances of varieties for which I could find good authority, because I conceive, that if resulting from weakness, such deformities must occasionally occur in *every* species of bird: and I have little doubt, that if we had equal opportunities of observing them, we should find albino and mottled varieties among our rarer birds, no less than among the thrushes, blackbirds, sparrows, robins and rooks, which come so frequently under our notice.

Golden Eagle. "White varieties have been seen and recorded,"
Yarrell.

Peregrine Falcon. White varieties were so frequent as to cause, among naturalists, the introduction of a new specific name for them, under the impression that they were a distinct species

from *Falco Peregrinus*; and hence they were called *Falco albus*.
See Selby *in loco*.

Goshawk. "White varieties have been sometimes met with," Selby.

Sparrow-hawk. An example of a white sparrow-hawk was killed some years since in this county, and is now in the collection of a neighbouring gentleman. Another instance of a white sparrow-hawk occurring in Norfolk, is recorded by Mr. Edward Newton, (Zool. 3276).

Marsh Harrier. "Varieties of this species, with more or less white, are frequently found," Selby.

Tawny Owl. A curious variety of this bird, of a pale gray colour, is mentioned as having occurred near Worcester, (Zool. 2411).

Red-backed Shrike. Mr. Ellman records the occurrence of a specimen of this bird, of a uniform pale fawn-colour, at Lewes, (Zool. 2698).

Missel Thrush. White varieties are common, others are occasionally found with the wings and tail white; see Selby, Temminck, the 'Naturalist,' i. 189.

Song Thrush. White, cream-coloured, black and white and fawn-coloured thrushes are occasionally seen; see Yarrell, and Zool. 496, 2453.

Redwing. "White and cream-coloured varieties are sometimes found," Selby, Yarrell.

Blackbird. White, ash-gray, and cream-coloured varieties are often met with; see Yarrell, Selby, 'Zoologist.'

Ring Ouzel. "Varieties are sometimes found similar to those of the blackbird," Selby, Yarrell.

Hedge-sparrow. White, reddish buff, and piebald varieties have occurred; see Yarrell, and 'Zoologist.'

Robin. This little favourite is also very subject to variation in the colouring of its plumage: white, pink, bluish gray, and mottled specimens have been noticed; see Yarrell, and 'Zoologist.'

Redstart. A milk-white variety of this bird is recorded by Mr. Curtler as having been killed by him, (Zool. 2699.)

Wheatear. Two instances of buff and white varieties of the wheatear are noticed in the 'Zoologist;' one shot near Worcester, (Zool. 1496), the other at Thetford, (Id. 2923).

Blue Tit. A white variety is recorded, by Messrs. Gurney and Fisher, as having occurred in Norfolk, (Zool. 2027).

Cole Tit. A variety of this bird, with the white mark on the nape of the neck continued over the head, is noticed (Zool. 3055).

Meadow Pipit. An albino variety, in the same nest with several of the usual colour and markings, is mentioned by Mr. Gray, as having occurred near Glasgow, ('Naturalist,' i. 116).

Sskylark. Black, white and cream-coloured varieties are mentioned in the 'Zoologist' (2463), Stanley's Birds (ii. 15), and White's Selborne.

Woodlark. A black variety is recorded by Blyth; a pure buff-coloured variety by Mr. Tombs, as having occurred in Devonshire, (Nat. ii. 19).

Common Bunting. "Varieties in colour of this species are not uncommon, and I possess one which in colour resembles a golden yellow canary," Yarrell. (Zool. 2453).

Yellowhammer. A white specimen is recorded by Mr. Cordeaux, as having occurred near Canterbury, (Zool. 2851); and a buff one, by Mr. Clarke, as having occurred near Woburn, (Nat. i. 142).

Ortolan Bunting. "M. Temminck, M. Vieillot, and others well acquainted with this species, refer particularly to the variations that are occasionally found in the colours of its plumage," Yarrell.

Chaffinch. A beautiful and extraordinary variety of this bird, in which white, brilliant golden yellow, and cream-colour are the prevailing hues, is recorded by Mr. Newman, (Zool. 2298).

House Sparrow. White varieties must be known to every one: I have one which was sent me in the flesh. Black, cream-coloured, buff-coloured, and mottled varieties are also common; see Yarrell, Selby, 'Zoologist,' 'Naturalist.'

Greenfinch. A white variety is mentioned by Mr. Jesse in 'Scenes and Tales of Country Life.'

Goldfinch. Black varieties are mentioned by Bishop Stanley, (ii. 15); white varieties are also recorded.

Common Linnet. A cream-coloured variety, and another white and brown, are recorded in the 'Naturalist' (i. 210).

Twite. A pair of these birds, perfectly white, are recorded in the 'Zoologist,' (2953).

Bullfinch. No bird seems more liable to become black than the bullfinch. Gilbert White, Montagu, and Bewick give instances of this, as also do Bishop Stanley, and the 'Zoologist,' (2390, 2454, 2568). White and rose-coloured varieties are also often met with; see Yarrell, Selby, Bewick.

- Starling.* "Albino and buff-coloured varieties are not uncommon," *Yarrell.* See also Zool. 1550, 2229; Nat. ii. 20.
- Raven.* White and pied varieties are occasionally seen; see *Yarrell, Macgillivray.*
- Carrion Crow.* "Partially white ones have been seen," *Stanley, (Birds, i. 84).*
- Hooded Crow.* "Sometimes this bird varies in colour, and is found entirely white or black," *Selby.*
- Rook.* This bird is remarkable for the numerous varieties so often seen in its species; its large size, sable hue, and familiarity, rendering every such instance very conspicuous: white, pied, cream-coloured, gray, ash-coloured, light yellow, and maroon-coloured varieties have been recorded; see *Yarrell, Selby, 'Naturalist,' 'Zoologist,' (2953, 3034, 3278).*
- Jackdaw.* "White varieties are sometimes met with: others entirely black, or black and white, are mentioned by different authors," *Selby.* See 'Naturalist,' i. 159, 170.
- Magpie.* "Specimens varying in the colour of their plumage occur occasionally," *Yarrell.*
- Jay.* "Accidental varieties are sometimes found of a pure white, with the wing-coverts pale blue," *Selby.*
- Nuthatch.* A specimen perfectly white was killed in Norfolk in December, 1846, as recorded by Messrs. Gurney and Fisher, (Zool. 1601).
- Swallow.* "White and buff-coloured varieties are not uncommon," *Yarrell.* See also Zool. (2021, 2392, 2700), *Selby.*
- Martin.* "White varieties of this, as well as of the other species, sometimes occur," *Selby, Yarrell.* A pale fawn-coloured martin is also recorded; see Zool. 2021: Nat. i. 212, ii. 7.
- Sand-martin.* "White and yellowish white varieties of the sand-martin are occasionally obtained," *Yarrell.* See Nat. ii. 7.
- Ring-dove.* "Varieties spotted over the body with white are not uncommon, and are generally very handsome birds," *Yarrell.*
- Common Pheasant.* White, pied, and buff varieties are very common; see *Yarrell, Selby.*
- Red Grouse.* "Varieties of a cream-colour, or with different degrees of white, are often met with," *Selby, Yarrell.* See Zool. 361.
- Partridge.* "Varieties in colour are very common; some exhibiting only patches of white; others are wholly white; and cream-

coloured, or very pale buff-coloured varieties are also common," *Yarrell, Selby.*

Red-legged Partridge. A nearly white variety of this bird is recorded as having occurred at Wolverston Park, Ipswich, in 1850; (Nat. i. 142).

Peewit. "White, cream-coloured, and mouse-coloured varieties have occasionally been obtained," *Yarrell.*

Woodcock. "Varieties in plumage are not uncommon, sometimes with a portion of white, or entirely of a dull yellowish white or buff colour," *Yarrell*: and Bishop Stanley says, "woodcocks are now and then shot, of a delicate and uniform fawn-colour," (Birds, i. 83).

Common Snipe. A cream-coloured variety is recorded in the 'Naturalist,' i. 137.

Knot. A white specimen of this bird is recorded by Mr. Newman, as having been shot in February, 1851, near Maldon, in Essex, (Zool. 3116).

Land-rail. Varieties of this bird, with white feathers on the breast and wing-coverts, and with white wings, are mentioned, (Zool. 2772).

Water-rail. "A variety has been taken, which was pure white," *Yarrell.*

Moorhen. "The Rev. Mr. Lubbock mentions a curious variety, in which the back and wings were mottled with white," *Yarrell.*

Common Coot. "Varieties entirely white, and others only partially white, have been seen both in Norfolk and Lincolnshire," *Yarrell.*

Puffin. "White varieties occasionally occur," *Selby.* "Varieties in colour have been known to occur," *Yarrell.*

The foregoing list enumerates fifty-seven species of our British Birds, the varieties in whose plumage have been recorded, and, no doubt, the readers of the 'Zoologist' can in some cases add others from their own observations; proving that white, pied, and mottled varieties are not confined to a *few* only of our commoner birds. I might have adduced many other examples of these varieties in the commoner birds, both from personal observation, and from the testimony of ornithological friends; but I have preferred, as far as possible, to quote from Mr. Yarrell, Mr. Selby, and other ornithologists, whose authority is undoubted, and whose books bear witness to the instances adduced by me.

The above list refers to wild birds alone, or I might add to them the *pea-fowl*, which is occasionally seen to change to a white dress, an instance of which has occurred in my immediate neighbourhood: and the *common hen*, whose strange and periodical alternations of a snowy and a sable dress are recorded (Zool. 667, 726). But domestication, we well know, is the cause of many strange freaks in the colour of plumage. Thus, from the gray lag goose is descended our *domestic goose*, whose dress is more often white than any other colour: and Yarrell tells us that from the wild duck are descended two white varieties of *domestic ducks*. In the case of *pigeons*, too, descended from the rock dove, what a variety of colours has not domestication produced! But these are scarcely parallel cases; we cannot put wild and domesticated birds side by side, and apply the same arguments to both; for as our cultivated garden flowers bear no resemblance to their wild ancestors, or our grafted fruit-trees to the stocks whence they first came, so our domesticated birds soon lose all characteristics of their original forefathers.

ALFRED CHARLES SMITH.

Yatesbury Rectory, Calne,
June 30, 1853.

Note on the Singing of Birds in Spring and Summer in Ireland.— In the spring, choose one of those calm, clear, frosty days we so often have towards the end of February:— not a breath abroad; a dead unearthly stillness in the air; a clear blue sky overhead; a sun shorn of his heat, but not of his brightness. Now the wren revels, singing on the top of some bush, or darting from bough to bough with quivering wings; the robin pours out all his soul; the lark, as the poet hath it,—

“ Higher still and higher, from the earth now springeth,
Like a cloud of fire the deep blue he wingeth,
And singing still doth soar, and soaring ever singeth;”

the thrush excels in melody; the tender fauvette dares to trust himself with song on some spray, all diamond-tipped by the frost; the yellow-hammer utters his spring strain; while in the tops of the fir-trees the various tits keep up an incessant sawing; and between whiles, from some deep sheltered glade, the blackbird's mellow note is heard. For summer songsters, choose we a day opposite in many characters to this—a true summer's day—a sun almost vertical, a sky cloudless, or, at least, its azure broken but by a few small fleeces of a snowy whiteness, not a breath stirring, a blue glimmering haze, which might almost be handled, rising in waves all over the country; all the insect tribes disporting and dancing in the sun's beams; a balmy lazy feel in the air, a stilly calmness all around. Then take your station in the gorge of some mountain stream, the sides of the hill clad with trees, the streams fringed with bushes and brambles; on its banks, meadows studded with occasional tufts of yellow furze—from some rock in the stream you will hear the soft low song of the dipper, and the

pleasing strain of the wagtails; from the brakes along its sides, the sedge-warbler incessantly warbles a rich medley; on the low meadows near the river-banks, you will see the titlarks rising and falling, singing merrily; the whitethroat in the hedges keeps up its miserable wail, changed, if disturbed, into a scolding note of alarm; on the tops of the bushes the buntings are ringing, ringing, revelling in the genial heat, and in the pastures below you will see the chats rising and falling in the air, at times pursuing their insect prey, then uttering their short song on wing, or perched upon the summits of the bushes; while the wheatear may be seen, now feeding on the ground, now rising for a short distance singing, and anon, perched on some old bank or wall, perking his tail, and scolding you for disturbing his solitude. In the woods above, you hear the sprightly song of the chaffinch, or the blackbird's mellow strain, floating softly on the summer air; in the tops of the trees you have the gentle song of the lesser willow-wren, or the harsh note of the green linnet; lower down in the branches the chiffchaff ceases not chip-chopping incessantly; there, too, may you hear the soft low coo of the ring-dove; and above your head, the swallows, gliding along, utter their low note of contentment. From the corn-field comes now and again on your ear the monotonous creak of the rail, or the plaintive twit-twitter of the quail; from the corn, too, springs the lark, and, as he rises higher and higher, redoubles his song. On the bluffs above, the ring-ouzel gives utterance to his simple strain; and high over all the towering song of the thrush is heard in all its surpassing melody. There is, or rather was, such a glen on the Dodder, where you might, with few exceptions, hear all these songsters. There, oft have I enjoyed this treat, when all things—the purling stream, the glorious scenery (magically softened by the glimmering haze), the calmness, the sweet songs, the solitude,—might almost make you fancy that you were in fairy land, or the far-famed Elysium of the ancients.—*J. R. Kinahan, in Report of the Proceedings of the Dublin Natural History Society.*

Unknown Eggs lately found in the neighbourhood of Norwich.—On the 5th of June, some boys, out for a trip on the Norwich river, observed a hole in the bank, between Coldham Hall and Woodsend, about 8 miles below Norwich. Supposing it to contain a nest, from some loose materials protruding from the aperture, they searched it, and discovered ten pure white eggs, deposited at some distance from the entrance. Three of these were broken in getting them out, and the rest were taken the next morning to a bird-preserver in this city; but, unfortunately, the boys could give no account of the nest itself. In shape, the eggs closely resemble those of the common swift, but differ from them in being much smaller, and in having a smooth shining exterior; and, before they were blown, the yolk appearing through the shell gave them a delicate flesh-coloured tint. They measure about $8\frac{1}{2}$ lines in length, by $5\frac{1}{2}$ in breadth, tapering towards the smaller end. The unusual number, and general appearance of these eggs, lead one to assign them to some bird hitherto unknown to breed in England.—*H. Stevenson; Norwich, June 25, 1853.*

Note on the Red-backed Shrike destroying Small Birds.—This morning a bird-catcher was following his vocation near Norwich, when a red-backed shrike pounced on one of his call-birds (a linnet), and attempted to carry it off, but being prevented from doing so by the linnet being fastened to the ground with a string and wooden peg, the shrike tore off the head of its victim, with which it made its escape. The bird-catcher then drew out from the ground the peg which held down the dead linnet, and left the dead bird lying in the net. In about half an hour the shrike again appeared, pounced upon the body of the dead linnet, and carried it off in its beak, with

the string and peg hanging to it; the weight of the latter probably was the cause of the shrike not carrying its prey quite away, as it dropped it after flying about fifteen yards, when the bird-catcher again picked up the dead linnnet and replaced it in the net. The shrike in the mean time retreated to some neighbouring bushes, from which it soon made a third pounce upon the nets, this time attacking the second call-bird, which was a sparrow. On this occasion, however, the bird-catcher was on the watch, and drawing his nets, captured the shrike, which proved to be an adult female of *Lanius Collurio*.—*J. H. Gurney; Easton, Norfolk, June 28, 1853.*

“*Could’nt! Cos he Sung so!*— Leaning idly over a fence, a few days since, we noticed a little four-year-old ‘lord of the creation’ amusing himself in the grass by watching the frolicsome flight of birds which were playing around him. At length a beautiful Bob-o-link perched himself upon a drooping bough of an apple-tree, which extended to within a few yards of the place where the urchin sat, and maintained his position, apparently unconscious of the close proximity to one whom birds usually consider a dangerous neighbour. The boy seemed astonished at his impudence, and after regarding him steadily for a minute or two, obeying the instinct of his baser part, he picked up a stone lying at his feet, and was preparing to throw it, steadying himself carefully for a good aim. The little arm was reached backward without alarming the bird, and Bob was within an ace of damage; when lo! his throat swelled, and forth came Nature’s plea:—‘A link—a link—a l-i-n-k, Bob-o-link, Bob-o-link! a-no-weet, a-no-weet! I know it—I know it! a-link—a-link—a-link! don’t throw it!—throw it, throw it, throw it,’ &c.; and he didn’t. Slowly the little arm subsided to its natural position, and the despised stone dropped. The minstrel charmed the murderer! We heard the songster through, and watched his unharmed flight, as did the boy, with a sorrowful countenance. Anxious to hear an expression of the little fellow’s feeling, we approached him, and inquired, ‘Why didn’t you stone him, my boy?—you might have killed him and carried him home.’ The poor little fellow looked up doubtfully, as though he suspected our meaning, and with an expression, half shame and half sorrow, he replied, — ‘*Could’nt! cos he sung so!*’ Who will say that our nature is wholly depraved after that, or aver that music hath no charms to soothe the savage breast? Melody awakened humanity, and humanity—mercy! The angels who sang at the creation whispered to the child’s heart. The bird was saved, and God was glorified by the deed. Dear little boys! don’t stone the birds.”—*Clinton (U.S.) Courant.*

[From an American newspaper. Communicated by Mr. Yarrell, who adds that “the Bob-o-link of the Americans is the Rice-bunting (*Emberiza oryzivora*) of Wilson and Audubon.”—*E. N.*]

Occurrence of the Mountain Finch (Fringilla montifringilla) near Dorchester.— This exceedingly elegant finch is seldom, so far as I can discover, seen anywhere but in the North of England, it being a native of the northern portion of Europe; but as one was lately shot in this county, I think it worthy of record in the ‘*Zoologist*.’ The specimen I allude to, a very fine male, and in good condition, was shot during the cold weather last winter, at Herringstone, near this town, the seat of Thomas Davis Bayly, Esq., and is now in the possession of a friend of mine in Dorchester.—*John Garland; Dorchester, July 9, 1853.*

[The brambling certainly occurs occasionally near London, and that sometimes in great numbers: during last March I found several frozen to death in my garden.—*Edward Newman.*]

Jackdaws taking the Eggs and Young of other Birds to feed their own Young with. By W. H. SLANEY, Esq.

IN the tenth volume of this journal (Zool. 3475), is an account of the destruction of eggs by two individuals of Montagu's harrier, in one of them the yolk, and in the other, the greater part of the egg and shell of a thrush having been discovered : but I have to bring a charge of a similar nature, and even of a more villanous character, against another bird, usually, I believe, not thought to commit such depredations, namely, the jackdaw. The noisy, chattering, and thieving propensities of this bird are well known, as well as the trouble it often occasions by building its nest down chimneys, which it frequently entirely fills up, so as to fill the whole house with smoke when an attempt is made to light a fire : but were this the only accusation against the jackdaw, or even pilfering a few stray articles to form its nest with, it might be forgiven ; but the following acts are of a more serious nature.

Numerous pairs of jackdaws have taken up their abode about this place, and every year have built in the hollows of the old trees quite close to the house, more especially one pair, which took possession of a hole in an elm tree, but a few yards from the ground, and there, for several successive summers, hatched their young. This year, however, having previously had suspicions of their depredations, I desired that the hole in the tree might be closed up ; on this being done, the jackdaws established themselves in an old ivy, a little further off, and there made their nest, in which might very shortly be heard the almost constant clamour of the young ones crying for food. Very near to the tree from which the daws had been ejected, and within a few feet of the stable-door, was a privet hedge, which, on being trimmed, disclosed the nest of a poor thrush, which the bird had to quit eight or nine times a day, owing to persons passing to the stable ; but still she continued laying, and afterwards sitting, until she had hatched four eggs. The young thrushes were quite open to view ; and though no accident befell the eggs, yet, early one morning, within a few days after their birth, the four little callow birds were all missing, although late the night before they were quite safe, and on the same morning the jackdaws had been seen pretty near the spot, though several hundred yards from their own nest, then full of young. I feel convinced, from the inquiries I made, and the caution I had previously peremptorily given, that no servant or other person had taken them ; and it

was only a short time before I found that the eggs and young disappeared as mysteriously from other nests, without a mark or vestige of the depredator being left. Still, there was no proof against the jackdaws; but the gamekeeper having stated he had no doubt of the fact, I desired that some traps should be baited with eggs: but in the first place I ought to relate some other circumstances connected with the subject.

Immediately under the spot containing the nest and young of the jackdaws, was a dry pit, at the bottom of which a pheasant had made her nest. This nest was perfectly open to view, and without even a bush or a nettle to hide it, although within a few yards there was plenty of rough stuff to have concealed it; the pheasant however preferred sitting in the most open spot, and had eleven eggs. For some time the pheasant sat on without interruption, the jackdaws above her keeping up a constant clamour, and flying backwards and forwards to their nest all day long. But shortly after the young daws were hatched, I one day perceived the pheasant's nest without the old bird upon it, and many tail and other feathers lying close by, as if she had been forcibly taken or driven away, which I at first suspected had been done by the foxes. Shortly after this, however, she again made her appearance, and resumed her sitting; but the next day but one she was again missing: there had evidently been a buffeting and scuffling, for many more feathers were left behind, and two eggs broken. The old bird once more returned to her nest, and hatched the remaining eggs. This mischief I conceive to have been the work of the jackdaws in trying to rob the poor pheasant of her eggs; and as she was near her time, and sat very close, hardly ever quitting her nest except for food, the jackdaws probably did not like to wait for her absence, but, as I suppose, attacked her on her nest.

Still I had only supposition to go upon; but in consequence of what the keeper had said, and the evil name he gave the jackdaws for stealing eggs, declaring them to be quite as bad as magpies and crows, I directed that several traps should be set on the tops of the cropped hedges and other elevated places, and covered over; with a number of small upright sticks stuck round the concealed trap, so that any bird coming to the eggs placed on it as in a kind of nest, would be compelled to alight on the trap. These traps had not been set many days before not only magpies, crows and jays were caught therein, but several jackdaws as well; thus proving their propensity to steal eggs, as the keeper had stated he knew to be the case.

After this, I desired the keeper to take the young jackdaws, four in

number, and when he had done so, to wait for and kill the old ones, but not until he had secured the young ones, lest they should be left to starve. This he soon accomplished; and on shooting the old ones while returning to the nest, he found their mouths and throats filled with the mashed up remains of young birds,—pieces of legs, wings, beaks and feathers. These circumstances leave no possible doubt of the fact that jackdaws take the eggs and destroy the young of other birds, in order to feed their own young.

The depredations committed by crows, magpies, jackdaws, and other assailants of the eggs and young of game, and of various other birds, is so great, that it is quite surprising the destruction which thus takes place, and how numerous are the nests plundered before the eggs arrive at maturity. It is constantly the case that day after day accounts are brought in that such and such a nest has been destroyed; and yet partridges and pheasants seem to take a special delight in selecting the most dangerous places to form their nests in, frequently by a path or public road-side; and it is equally astonishing how they sometimes contrive to sit out their time and hatch their eggs, although the place is passed twenty times in the course of the day, and the hen bird but little concealed from observation, and almost always leaving a track up to her nest, thereby discovering the place she is sitting in. But occasionally a nest is robbed in so mysterious a manner, that it is impossible to discover by what means it is done, even when made in the most secluded places. I have lately lost several nests of wild-ducks' eggs, in a way not to be accounted for. The first had eight eggs, and was built amidst some fern and gorse, on a dry bank close at the back of the keeper's house, in a private spot, away from any thoroughfare. Here, after the duck had sat for a considerable time, six out of the eight eggs were one morning found to be gone, and the other two quite concealed beneath some dry leaves and grass; but not a mark of any kind could be traced near the nest, and the old duck was seen associated with some mallards and other wild ducks, which had succeeded in rearing their broods on a pool close by.

A few days after this, in looking near the same spot for the nest of one of the keeper's hens, another wild duck's nest was found, containing twelve eggs, on which the old one was sitting; this she continued to do for about ten days, when, upon the keeper's going to see how matters were going on, having previously put some tarred cording on four sticks around the nest in order to keep off the foxes, and after the placing of which the old duck continued safe on her nest, he found every egg gone, and not a bit of the shells, or the slightest mark, left

near the spot. Shortly afterwards the old duck was seen on the pool with the other duck, mourning over their mutual disappointment, as, no doubt, their nests having been made so near to each other, and the two old ducks, often meeting when going in search of food, had talked over the anticipated affairs of the nursery, and the relative merits and beauty of their expectant broods; but, like other fond mothers, they were both in this instance doomed to find their hopes destroyed. I know not to what cause to attribute the destruction of the last lot of eggs, for upon those in the first nest being missed, I had directed that traps might be set upon some boards elevated above the ground; the traps were covered over, and a kind of nest made on the top of the trap, and baited with eggs: I therefore fully expected that I should shortly find a felon magpie, crow, or jackdaw in some of them, but after waiting for more than ten days, nothing whatever came to the traps.

Now, when the weight of a wild duck's egg, containing a young one just ready to be hatched, is considered, it seems almost impossible for any bird to have carried away every one of the twelve eggs, without leaving some marks behind, but nothing of the kind was to be seen; and from the bait in the traps not having been touched for so long a time, I am disposed to think that the depredator must have been some creeping animal that could not reach the eggs placed in the nest on the trap. But yet, how could such a number as eighteen eggs have been carried away without any being broken, or any track to the nests discovered? The extraordinary performances attributed to rats in stealing and carrying away eggs are well known; but I think they could hardly have taken so many without some being broken, or the place to which they were conveyed being discovered; though certainly there were a good many of both the common house-rat and the brown water-rat, not far off, and both kinds will take eggs, and have frequently been caught in traps baited with eggs. Again, many hedgehogs are frequently found in the bank where the wild ducks' nests were made, and in the adjacent covers; and these animals will not disdain to feed on eggs. For although I have said so much on their behalf, as innoxious animals, in a former number of this journal (Zool. 715), I felt obliged at last to give up their defence; but the same difficulty presents itself as to their being able to remove the eggs without leaving some marks behind.

Of the several broods of young wild ducks already hatched and on the pools, I have not unfrequently to lament the loss of one or more of the ducklings taken by rats and pike; but the destruction of whole

nests of eggs in the mysterious manner before mentioned, is a calamity requiring great fortitude of mind to bear calmly.

WM. H. SLANEY.

Hatton Hall, Salop, July 4, 1853.

On the Reproduction of the Greater Spotted Cuckoo, (Cuculus glandarius, Linn.) By A. E. BREHM.*

IT is well known to have been hitherto undecided whether *Cuculus glandarius* sits upon its own eggs or not. Even I myself, notwithstanding my somewhat lengthened sojourn in Africa, could for a long time learn nothing certain on the subject. I was well acquainted with the bird, its laughing magpie-like cry, and all its habits; and I knew that it usually dwelt among the thick, low, Mimosa-woods in which it is to be seen, generally in battle with another individual of its own species, as it flies, quick as an arrow, through the thickest bushes.

On the 5th of March, 1850, my deceased brother, Dr. Vierthaler, and myself, collected seven examples of the greater spotted cuckoo in a Mimosa-wood near Siut, in Upper Egypt. Among them was a female, with a fully-developed egg in the oviduct. Unfortunately, this egg was destroyed by the shot, and exhibited only broken fragments; these, which we sorrowfully contemplated, were bright green in colour, with darker brownish spots.

Here, however, was a slight advance towards a knowledge of the eggs, at least towards ascertaining the breeding-time, which, in Africa, varies so greatly, and is not confined to any particular month. Yet two years more went by ere I became clearly acquainted with the history of the mode of reproduction of this bird. On the 2nd of March, last year, I for some time attentively watched the motions of a greater spotted cuckoo in a garden near Thebes, in Upper Egypt. At last, I saw it slip into a large nest, placed upon a rather low *Salicaria* tree. After rather more than a quarter of an hour out it flew again, and straightway departed from the garden. I climbed up to the nest, and

* Translated from Dr. Cabani's 'Journal für Ornithologie,' part 2, for the present year, and communicated by Philip Lutley Selater, Esq., who observes that the article "is worthy of the attention of British ornithologists, as, according to Mr. Yarrell, 'every ascertained fact in the reproduction of the species among the cuckoos is a matter of interest.'"

found it to belong to the Egyptian *Corvus Cornix*, and containing altogether six eggs. One of the crow's eggs had been recently broken. Among them I at once recognized two smaller eggs, belonging to some other bird, but nearly resembling those of the crow in size and colour. When I arrived at the boat, I perceived that these agreed well with the pieces of the egg extracted from the oviduct of the female cuckoo before mentioned: and, at the same time, in this respect, they confirmed the observations of Herr Pffarr Baldamus, namely, that the egg of the cuckoo (speaking of *Cuculus canorus*) is always of the colour of the eggs of the nest in which the parasite lays her own; for the eggs of the greater spotted cuckoo were quite the same in colour, though not in size, as those of the crow. They were like the eggs of our magpie, only more rounded and not quite so long.

This discovery would have been quite sufficient to settle the question of the mode of reproduction of this cuckoo, but on the 12th of March it was still further confirmed. In one of the village gardens, thickly planted with trees, as is particularly the case in Egypt, I was summoned to the chase by the clear-sounding, but, at the same time, inharmonious cry of an old cuckoo,—“kiekkiek—kiek—kiek.” I obtained both the old birds, and soon found a young one also, which was being *fed* and *provided for* by hooded crows. After this, I began to ascend to all the crows' nests, and in one of them, in the before-mentioned wood near Siut, was really so fortunate as to find another cuckoo's egg on the 19th of March. Herr Apotheker Bae-decker, of Witten, will forthwith figure these eggs.

After what I have stated above, every oologist will believe me that the eggs which I have described as those of *Cuculus glandarius* are genuine; and, should any one think otherwise, I may perhaps be allowed to ask him to publish his reasons for doubting it.

A. E. BREHM.

Notes on the Habits of the Green Sandpiper, (Totanus ochropus).—An adult female green sandpiper was killed at Saham, on the 14th of June last, after having been noticed in the vicinity for several days. As this bird was alone, and the breast not denuded from incubation, nor were the eggs at all larger than hemp-seed, it may be inferred that this species breeds very late. This case might be thought an exception, but I have noticed them at Saham and elsewhere, in this county, every month in the year except July, June 14th being the latest date, and August 15th the earliest, that I have observed them. Where they go to breed seems not yet to have been ascertained: the nest has been noticed once in Norfolk, and (as far as I am aware) there is no account of their breeding habits in any ornithological work. As far as my own observa-

tions go, it is a shy and solitary bird, more than one seldom being seen except in August, and then six is the largest number that are usually seen together. They resort to small streams more than to large rivers and stagnant pieces of water; and if they are in an open place, it is almost impossible to obtain a shot, as they fly up when you are within about a hundred yards, and settle again a little further away from the spot they are disturbed from. They appear to be much more common than they are usually supposed to be, being more frequent in August and May than at any other time; but yet are often seen in the winter months. As "the habits of this bird appear to be but imperfectly understood," I thought the above observations might be worth recording, as each fact that is observed tends to elucidate the subject. — *L. H. Irby; Saham, July 9, 1853.*

Note on the late appearance of the Common Scoter (Anas nigra) in Norfolk.—A few days since I had the opportunity of examining in the flesh a male specimen of the common scoter, shot at Hickling on the 20th of June. The bird was in good condition, and exhibited no symptoms of having been previously wounded, to account for its unusually late appearance. By reference to my note-book, I find that one was killed at Burlingham on the 11th, and another at Scottow on the 22nd of May, last year; but the present is the latest instance of its occurrence that has come under my notice.—*H. Stevenson; Norwich, June 27, 1853.*

Note on the Reproduction of the Frog (Rana temporaria).—Mr. Lowe's paper in the 'Annals and Magazine of Natural History' (see Zool. 3871) having attracted considerable attention, as the startling novelty of the positions laid down by him would naturally lead one to expect, I have waited patiently for some person more competent than myself, either to refute or satisfactorily corroborate such statements. With the exception however of Mr. Alfred Merle Norman, who has come forward in support of the fifth position, and Mr. Newman's very prudent and properly cautious observation at the end of Mr. Norman's statement (Zool. 3913), I see no remarks in reference to the matter. I therefore think I am bound to state that I can in many respects corroborate Mr. Lowe's and Mr. Norman's statements as to the reproduction of frogs without the presence of water; which I do, not giving any opinion on the doubts suggested thereby, but merely to aid the inquiry, in accordance with Mr. Newman's permission granted in the observation above mentioned. I had a wine-cellar, about 10 feet by 8, at the end and leading out of a back kitchen, below the level of a small garden, situate in the High Street in the midst of this town. There was only one door to the cellar, and one small window, opening on a little square space with a railing over it upon the level of the garden, the path of which was flagged with large paving-stones. I had a wooden shutter fixed on the inside of my cellar, to increase the facility of obtaining an equable temperature for the wine, and which was constantly kept up and fastened. I found some large frogs in it the first year I went to the house; these I had taken out and the cellar thoroughly cleaned. I am quite sure no others could have obtained access thereto through the window, and, of course, they could not through the two kitchens; yet, to my great surprise, the next year I found frogs in considerable numbers and of different degrees of size, some very small. They were again got rid of in like manner, and the cellar cleaned; but the same occurrence happened the next year. There was no saw-dust kept, the wine being packed on laths. I never could account

for this, and leave it for any suggestions the readers of the 'Zoologist' may make on so generally interesting a subject.—*John Garland ; Dorchester, June 20, 1853.*

Capture of the Spiny Cross-fish (Uraster glacialis) in Dalkey Sound, Ireland.—I have to record the capture in Dalkey Sound of the spiny cross-fish (*Uraster glacialis*, Linn.) The specimen was taken on the 19th instant, in a lobster-pot; its dimensions were as follow:—Length of rays in inches, $6\frac{1}{2}$, $7\frac{1}{2}$, 8, $7\frac{1}{4}$, and $6\frac{1}{2}$; first and second rays, from eye to eye, 15 inches, third and fourth $16\frac{1}{4}$ inches: disk, 1 inch by $1\frac{1}{8}$. Colour:—back of rays bluish green, with purple patches; around the eyes and ends of the rays purplish; spines at end of rays purplish, near the disk white at their tips, at the base bluish green. In Forbes's 'British Star-fishes' I find this species recorded as occurring only on our western shores, if we except Belfast; I therefore thought this notice of its occurrence so far East would be acceptable to some of the readers of the 'Zoologist.' The specimen is at present in my possession, and is intended to be placed in the collection of the Dublin Natural History Society.—*John Robert Kinahan ; Sea-view Terrace, Donnybrook, June 22, 1853.*

Occurrence of Muller's Top-knot (Rhombus hirtus) in Dalkey Sound.—I have also to record the occurrence of Muller's top-knot (*Rhombus hirtus*), captured in the same place on the 21st instant. The specimen was $5\frac{1}{2}$ inches long, and has been presented to the same collection.—*Id.*

On the Geographical Distribution of the British Mollusca.

By WILLIAM F. TEMPLER, Esq.

I WAS much pleased on perusing the 'Zoologist' for the past six months, to observe the increase of local collectors and local lists of British land and fresh-water Mollusca. While the above may be considered as affording signs of an increasing interest in terrestrial Malacology, the absence of any notes on the marine Testacea indicates an indifference in those residents by the sea-side, who may happen to be correspondents of the 'Zoologist.'

If this does not arise from indifference, to what cause is it to be attributed? Is it owing to a supposition that the marine Mollusca are not to be procured without the trouble and expense of dredging? If so, I hope to prove the fallacy of such an idea. It is true, that many species cannot be obtained without dredging; but of even the deep-water species, many may be found thrown up in our sandy bays after heavy gales. The littoral zone, however, is at all events accessible; and during the periods of spring tides the higher regions of the laminarian zone may be explored. The mollusks inhabiting these zones,

although for the most part small, are possessed of much beauty, and for that reason a larger share of interest than the mollusks of a larger growth. They likewise occupy a most important station in the marine Fauna of the British Isles. In some localities the minute Rissoas, as *R. parva*, and some of the Skeneas, as *S. planorbis*, are to be found in the greatest profusion. The best way for collecting them is to cut the weeds from the rocks and carry it home in bags; the weed having been well washed in fresh water, may be then thrown away, and the shells, mud, &c. at the bottom should be placed in a current of air to dry, after which they may be examined and sorted in a black tray, the minute shells being removed with a hair pencil. Two or three fine sieves will much assist the operation and save time.

Within the last few months the magnificent, and, to the collector, most invaluable work on the 'British Mollusca,' by Messrs. Forbes and Hanley, has been brought to a conclusion, and affords ample material for the extensive deductions so ably drawn in the Introduction. The peculiar geographical situation of Great Britain, and consequently its temperate climate, combined with its varied and extensive line of coast, tend to produce a list of the marine Testacea equally varied and extensive.

The following extract from the Introduction to the work expresses all I wish to bring before the conchological readers of the 'Zoologist.'

"Were a person desirous of accumulating personally and rapidly a collection of British mollusks, he would fail in his object if he confined his researches to any one locality, even though it embraced a considerable reach of coast and variety of sea bottom. Four districts at least would have to be visited. To the Channel Islands he would have to go for several forms almost extra-British: on the South-west coasts he would find not a few mollusks that he would seek for in vain in more northern or eastern seas: only on the West coasts of Scotland many species of great interest and peculiarity could be readily obtained. In the extreme province of the Zetland Isles he would gather some of our most remarkable rarities: and possibly after all he would have to visit as much of the northern half of the German Ocean as may be claimed for our Natural-History province, and the West coasts of Ireland, before his cabinets could be fairly filled."

This extensive system of dredging, which but few if any one person has accomplished, being completed, and the ponds, rivers, and running streams, and the hilly limestone ranges having been searched for the species frequenting such situations, the results would be as follows:—

Acephala Tunicata,	75 species.
Acephala Lamellibranchiata,	181 „
Acephala Pallibranchiata or Brachiopoda,	5 „
Pteropoda,	4 „
Gasteropoda Prosobranchiata,	221 „
Gasteropoda Opisthobranchiata,	113 „
Pulmonifera,	101 „
Cephalopoda,	14 „

Questions now naturally arise, as to the best way of obtaining a complete collection, and as to the advisability of seeking a British series of specimens, to the exclusion of extending our researches to the whole European Fauna.

A British collection must be more expensive than one formed from a wider range, inasmuch as many of the Mollusca, both Boreal and Lusitanian, attain their extreme limits in our seas, and are consequently much more rare. For example: *Tellina balaustina* may be procured from the Mediterranean at a much cheaper rate than a well-authenticated British specimen; and for the purposes of science and classification would be equally instructive. Again, a British collection, supposing it to be complete as such, would present many gaps in the classification, and, without the aid of foreign species, would be far from satisfactory to a scientific mind. Many also of our British genera are represented by only one species; and there is nothing more interesting than an extensive series of shells, all constant to the general features, and presenting so great a variety of specific differences: to me this is one of the most delightful portions of Natural History, to perceive order and regularity springing out of apparent chaos and confusion of forms.

I refer again to the work of Messrs. Forbes and Hanley, who, under the *Conidæ*, allude to an instance illustrative of my meaning.

“To a person unacquainted with exotic, and at the same time unversed in fossil Conchology, the association of the fusiform shells often called *Pleurotoma* with *Conus* will appear unnatural. There is really a very complete passage between them and the true cones; although the extremes of each have little besides the possession of a spire and the canaliculated aperture in common.”

I will now conclude with a few words as to the remedy for the above disadvantages. I propose that collectors should endeavour to form a European instead of a mere British collection. This would greatly extend the number of species, and would lead to a much more correct

knowledge of the habitations and classification of the Mollusca. The continent of Europe, especially France, the Rhine, Belgium, Holland, Switzerland, and Italy are as well if not better known than many parts of our own country, and to naturalists offer much greater advantages. The wet and gloomy gorge of the Tamina in Switzerland, all the way from Ragatz to the baths, abounds in various mollusks, and the *Clausilias*, hanging from some of the walls in thousands, apex downwards, quite fringe them with a drapery of living forms. Again, at Nice, in Italy, I have been informed, that during the winter months, a constant system of dredging is carried on in the bays; and Dr. Johnston, in his 'Introduction to Conchology,' alludes to more than one species of mollusk being sold in the markets for food, in some of the Italian towns.

If British naturalists, during their visits to the continent, would collect all the shells that they could procure, and a Society were formed for exchanging the peculiarly British forms of Mollusca and marine shells with continental naturalists, I have little doubt that ere long the beneficial results arising from such a Society would be witnessed in the more extensive collections, and by the presence of finer specimens and more abundant forms of many of the genera now either poorly represented or altogether wanting; until at length our cabinets would approach to a perfect blending of colours in the prismatic scale, and it could not be said, here the genus *Buccinum* ends, and here begins the genus *Fusus*; but rather that *Fusus* should be the link, as it is, leading from *Buccinum* to *Trophon*. Nature abhors gaps, as much as she has been said to abhor a vacuum.

WILLIAM F. TEMPLER.

Ilfracombe, July 8, 1853.

Notes on the Habits of Sepiola vulgaris. By P. H. Gosse, Esq.

My notions of the Cephalopoda, derived from figures of the various species in books, were anything but agreeable. I thought of them as hideous, repulsive, fierce, atrocious creatures, hated and feared whenever seen. But an acquaintance with the pretty *Sepiola vulgaris* has not a little modified these ideas; and its beauty, sprightliness, and curious habits have made it quite a favourite pet among the denizens of my aquarium. I take it in considerable numbers in Weymouth Bay, by means of the net known as a "keer-drag," which rakes the

bottom. It is a little creature, rarely exceeding an inch in length; though the extensibility of the arms somewhat varies its dimensions.

When we turn out two or three from the net into a pail of sea-water, they are at first restless and active. They shoot hither and thither, as if by a direct effort of will, but in reality by the impulse of rapid and forcible jets of water, directed towards various points from the mouth of the flexible funnel situated beneath the body. After a few moments they suspend themselves in mid-water, hovering for many seconds in the same spot, scarcely moving a hair's breadth either way, but waving their large circular swimming-fins rapidly and regularly up and down, just like the wings of an insect. Indeed, the resemblance of the little Cephalopod, in these circumstances, to a brown moth hovering over a flower, is most close and striking, and cannot fail to suggest an interesting comparison. The body is held in a horizontal position, the large protuberant eyes gazing on either side, and the arms, grouped together into a thick bundle, hang freely downwards. If you essay to count these organs, you find only eight; and even if you are aware that one of the characters of the genus is to have ten, of which two are much longer than the rest, you may search for these latter a long time in vain. Of course I mean during the life and health of the animal, when its impatience of being handled presents obstacles to a very accurate investigation; you may then turn it over and over with a stick, and look at the bundle of arms from above and below in turn, now grouped together, and now thrown all abroad in anger at being teased; still you can make out but eight. It was not until after many trials that I at length caught a peep at the missing organs — the pair of long arms, and discovered that it is the animal's habit to carry them closely coiled up into little balls, and packed down upon the mouth at the bottom of the oral cavity. If we manage to insert the point of a pin in the coil, and stretch out the spiral filament, the little creature impatiently snatches it away, and in a twinkling rolls it up again. A zealous votary of the circular system would seize on this analogy with the spirally folded tongue of a moth, and triumphantly adduce it as additional proof that the Cephalopoda represent, in the Molluscan circle, the Lepidoptera among insects.

While thus hovering motionless in the water, the *Sepioloa* presents a fair opportunity for observing its curious transitions of colour, which are great and sudden. We can scarcely assign any hue-proper to it. Now it is nearly white, or pellucid, with a faint band of brown specks along the back, through which the internal viscera glisten like silver. In an instant the specks become spots, that come and go, and change

their dimensions and their forms, and appear and disappear momentarily. The whole body, arms, fins, and all, the parts which before appeared free, display the spots, which, when looked at attentively, are seen to play about in the most singular manner, having the appearance of a coloured fluid, injected with constantly varying force into cavities in the substance of the skin of ever-changing dimensions. Now the spots become rings, like the markings of a panther's skin; and as the little creature moves slightly, either side beneath the fin is seen to glow with metallic lustre, like that of gold leaf seen through horn. Again, the rings unite and coalesce, and form a beautiful netted pattern of brown, which colour increasing, leaves the interspaces a series of white spots on the rich dark ground. These and other phases are every instant interchanging, and passing suddenly and momentarily into each other with the utmost irregularity. But here is a change! One is hovering in quiescence, his colour pale, almost white; one of his fellows shoots along just over him; with the quickness of thought, the alarmed creature turns from white to an uniform deep brown, the rich full colour suffusing the skin in a second, like a blush on a young maiden's face. The hue is very beautiful; it is the fine, deep, sienna-tint of tortoise-shell; a substance which, indeed, the mingling clouds of brown and pellucid horn closely resemble in the intermediate phases of colour.

Hitherto we have seen the *Sepiola* only in the pail of water into which it was turned out of the net. After a little while it drops upon the bottom, and, crouching up, remains motionless; if you rouse it, it will again swim for a few moments, but presently seeks some corner, into which it thrusts its rear, and huddles up as before. This is all that you will see of its habits under such circumstances, for in all probability the morning will reveal your little *protégé* a lump of white jelly, dead and stiff, with uncoiled arms, on the naked floor of his prison. But introduce him while in health into an aquarium, where living sea-plants are perpetually revivifying the water, and where the bottom, varied with sand, gravel, and pieces of rock, imitates the natural floor of the sea, and you will soon see other particulars in the economy of our little friend, which will, I doubt not, charm you as much as they have pleased me.

The *Sepiola* is a burrower; and very cleverly and ingeniously does it perform a task which we might at first suppose a somewhat awkward one,—the insertion of its round corpulent body into the sand or gravel. Watch it as it approaches the bottom, after a season of hovering play, such as I have described. It drops down to within an

inch of the sand, then hangs suspended as if surveying the ground for a suitable bed. Presently it selects a spot; the first indication of its choice being that a hollow about the size of a silver fourpence is forcibly blown out of the sand immediately beneath the group of pendent arms. Into the cavity so made the little animal drops; at that instant the sand is blown out on all sides from beneath the body backward, and the abdomen is thrust downward before the cloud of sand which has been blown up settles, but which presently falls around and upon the body. Another forcible puff in front, one on each side, and another behind, follow in quick succession, the fine sand displaced at each blast settling round the animal, as it thrusts itself into the hollow thus more and more deepened.

I was not at first quite sure by what agency these blowings, so admirably effective and suited to the purpose, were performed. The jet in front I readily attributed to the action of the fleshy funnel projecting from beneath the mantle on the breast; but I did not see how this could blow a stream directly backwards. I therefore put one of my pets into a vessel with glass sides, which was furnished with the requisite sand and water. I at once saw that the funnel was indeed the organ employed, and the only one in every case; and perceived its beautiful adaptation for the work it had to do, in its extreme flexibility. This organ is very protrusile, and being perfectly flexible, its orifice can be, and is, at will pointed in any direction, so as to blow the jet of water forward, backward, or to either side at pleasure.

It frequently occurs, of course, that small stones are mingled with the sand, or the animal may find it convenient to burrow in the loose gravel. In either case the arms come to the aid of the funnel, the sucking disks with which they are furnished being made to adhere to the stones, which are dragged out and thrown aside. You may suppose this to be a clumsy expedient, but you would think differently if you saw it: the rapidity with which the arms are thrust under the body, and drawn out, bearing pieces of stone of comparatively large size, and the graceful ease with which they are then thrown forward, discharging and dropping the burden, impress the mind with admiration of the beautiful fitness of the organization for the requirement.

This use of the funnel, and of the sucking arms, so different from their normal purpose, affords additional examples of that Divine economy in creation, which, when a new function is ordained, does not always form new and special organs for the necessity, but adapts some already employed in other service for the new work; while, still, both the one and the other function are fulfilled with such perfection, as

shows that every emergency was foreseen and provided for in the mighty plan, and that it was not for want of resources that distinct actions are performed by the same instrumentality. We admire the skill of the artisan who can effect different operations with the same tool, especially when we see that each kind of work is of faultless excellence.

The ordinary employment of the sucking arms is no doubt the same as in other Cephalopoda, the capture and retention of prey. Of this I saw an instance in the case of one of my *Sepiolæ* which had seized a shrimp (*Crangon trispinosus*), a sand-burrower like itself, and was, when I saw it, holding it firmly against the horny jaws, which were devouring it. The discharge of ink through the funnel I have also witnessed, though this is far from being a frequent action with this species. One of them that had been for a day or two in an aquarium, and was evidently at home there, I put into another vessel. No other animal was present, but the strangeness of the new abode evidently frightened it; it darted about in manifest alarm and excitement, and presently shot forth from its funnel a cloud of inky fluid to a distance of several inches; another and another discharge succeeded in rapid sequence, and it was not for some time that the animal recovered its equanimity. It did not appear to me that this fluid could be of much service to the little creature in the way of concealment; for although the matter was tolerably copious and densely black, it did not diffuse itself in the water, but remained in masses, and when moved with a stick was drawn into slimy strings.

Perhaps the facts above recorded may not possess to others the novelty that they had to me. Dr. Johnston, in his admirable 'Introduction to Conchology,' has not included any species of Cephalopoda in his enumeration of burrowing Mollusca; nor have I ever read of any that were known to possess the habit. I ought to have said that it takes place to no greater extent than to bring the animal just level with the surface of the sand, which is generally thinly spread over the posterior part. The eyes and the dorsal edge of the mantle are always exposed; and if we carefully heap the sand over these parts, it is in a moment blown away by the action of the funnel, or removed by the undulation of the mantle-edge.

Among the many hundreds of marine animals which have stocked the aquarium at the Zoological Gardens in the Regent's Park, I have sent up a dozen or more of the *Sepiola*, where I hope they may live long, and entertain many visitors with their amusing habits and pretty appearance.

P. H. GOSSE.

Weymouth, June 28, 1853.

Entomological Localities. By J. W. DOUGLAS, Esq.

(Continued from page 3690).

SCOTLAND.

“ O Caledonia ! stern and wild,
 Meet nurse for a poetic child !
 Land of brown heath and shaggy wood,
 Land of the mountain and the flood,
 Land of my sires ! what mortal hand
 Can e'er untie the filial band
 That knits me to thy rugged strand ?
 Still, as I view each well-known scene,
 Think what is now, and what has been,
 Seems as, to me, of all bereft,
 Sole friends thy woods and streams were left ;
 And thus I love thee better still.”

Scott : — ‘ Lay of the Last Minstrel.’

“ Hear Land o' Cakes and brither Scots,
 Frae Maidenkirke to Johnny Groat's ;
 If there's a hole in a' your coats
 I rede ye tent it :
 A chield's amang you taking notes,
 And, faith, he'll prent it.”

Burns.

It was in the beginning of August, 1838, that I yielded to the solicitations of a friend, and my own cherished desires, to visit the Scottish land of mountain and of flood. We were impelled to make the tour by an undefined romantic notion of seeing hills and lakes, more especially that district rendered classical by Scott's ‘*Lady of the Lake* ;’ and once determined to go, our enthusiasm rose so high, that if the antipodes had been our destination, the impulse we had received would have carried us there. On my part, there was, in addition, a strong desire to see something of the land of my fathers, — men who, if viewed by the light of our civilization, appear to have been little better than powerful ruffians, yet, judged by the standard of their own time, show no cause why I should be ashamed to own them as my ancestors, but rather, make me regret that so noble a stock should have produced such a degenerate scion. At any rate, they were earnest men, doing what they had to do with all their might ;

in this, if in nothing else, affording a lesson to the best of us.* Entomology was beginning to obtain my attention, and, although in a very subordinate degree, had some influence in tempting me northward. The results in this respect, I having so many things besides insects to observe, were not much, the greatest of them being, perhaps, a strong impression of the value of Scotland as a hunting-ground for entomologists. I have mentioned these particulars to show that however much a tourist may be occupied with the sights and sounds of the country through which he is going, he may always keep his eyes open for any illustrations of its Natural History that *will* come in his way, whether he look for them or not. To a genuine lover of Nature, with but a limited time at his disposal, I can imagine nothing more enchanting or enticing than to sojourn for a summer month or two among the moors and forests of Perthshire. There would be now little variety of incident by the way; but the entomologist would have no difficulty in staying at places where he might collect to the best advantage, live like the natives, without wheaten bread, and with but little animal food, and find the change to a simple diet vastly to the benefit of his health.

Within the last few years several collectors have visited Scotland, and have discovered many species either new to our lists, or very rare. Among these pioneers Mr. Weaver deserves especial mention, not only for breaking ground in a new direction, but also for his discoveries. He evidently belongs to the Natural Order of "Hunters," which has Nimrod at one end and Gordon Cumming at the other, although, by force of circumstances, he has fallen upon one of the milder forms of sport; for, without any disparagement, the sporting phase of entomology may surely be said to be the most attractive to him, when we consider the years during which he had made collecting his occupation. He is a worthy example of what a man can do if the internal impetus be strong enough to carry him onwards.

But there is yet a vast deal to be done, both in the explored and unvisited districts of Scotland; the smaller Lepidoptera, for instance, being all but unnoticed: it is more than probable that among them, as well as the larger kinds, in Coleoptera and other Orders, many species known in the North of Europe, or alpine countries, or altogether new, are yet latent here. I need, surely, say no more, to tempt some of those who have time and means, to breathe for a few months the

*"And none at that time durst strive with a Douglas, nor yet with a Douglas's man, for if they did they got the worse."—Notes to '*Lady of the Lake*,' Canto V.

mountain air : I am satisfied the harvest reaped must be good, if not great.

As with a sparrow in a corn-field, it will be difficult for a visitor to such a rich country as Perthshire for instance, to decide whether to settle in one spot, or to move about. If he adopt the former plan, he will have the best chance of obtaining variety of species, and be able to attend to larvæ; but if he shift his quarters, he will be likely to find some insects that he would not get if confined to one locality. Either method has its advantages, but I would recommend the former.

My recommendation to explore Scotland for its entomological productions, may be addressed to her own sons even more than to the southern Saxons ; for, with few exceptions, all the *spécialité* of her insect Fauna has been discovered by English visitors. Whether the somewhat notorious dislike of Scotchmen for anything that does not pay, has to do with the neglect of their native Entomology, I am not prepared to say ; it cannot but be lamented that there is so much apathy in this direction. It may be only another phase of the spirit that induces most of us to neglect what is close at hand and easy of acquisition, and to patronise something else, because it is brought from the ends of the earth.

The following list of Lepidoptera may be deemed pre-eminently Scotch : a host of other species may be found, but I have restricted myself to mentioning some of the rarest or newest. Some of our finest Coleoptera have also been captured in Scotland by Weaver and others.

Polyommatus Artaxerxes	Thera variata
Erebia Blandina	Phæsyale flavicinctaria
Sphinx Pinastri	Melanippe tristata
Acronycta Euphorbiæ ?	Cheimatobia autumnaria
Luperina furva	„ filigrammaria
Spælotis catalauea	Emmelesia Ericetaria
Cryobia carnica (hyperborea, <i>Doub.</i>)	Eupithecia Callunaria
Hadena assimilis	„ cognata
„ rectilinea	Amphysa prodromana
Aplecta occulta	Leptogramma Scotana
Plusia interrogationis	„ Parisiana
Scopula alpinalis	Peronea Caledoniana
Eupisteria quinquaria	Penthina Grevilleana
Charissa obfuscaria	Sericoris Daleana
Coremia munitata	Euchromia Arbutana
	Sciaphila Penziana

Sciaphila octomaculana	Gelechia solutella
Coccyx cosmophorana	„ boreella
„ finitimana	„ galbanella
Pamplusia subsequana	Depressaria Ciniflonella
Stigmonota lunulana	Ornix Scoticella
Crambus Ericellus	„ Loganella
Tinea picarella	Elachista locupletella
„ ochraceella	Lithocolletis Caledoniella
Cecophora stipella	

J. W. DOUGLAS.

Lee, June 30, 1853.

Note on Acherontia Atropos.—With reference to previous communications on this splendid Sphinx (Zool. 3716, 3777), I beg to observe that its periodical plenty has been frequently observed by myself in this neighbourhood, and especially two years ago, when they were remarkably (comparatively) numerous near Sherborne, in this county. In Honeycombe Wood, Sherborne, on the estate of the Earl Digby, the gamekeeper residing there took a considerable number of them; but both before and since that time they have been looked upon as very scarce. In Wood's 'Index Entomologicus,' the habitat is given as "Yorkshire and Cambridgeshire:" to this must be added our county of Dorset, in which, also, by the bye, a very large number of Lepidoptera mentioned in that work are also to be found. In the same year I observed also the common rose-chafer (*Cetonia aurata*) at Sherborne, in far greater numbers than usual.—*John Garland; Dorchester, June 20, 1853.*

Capture of Diphthera Orion in Hampshire.—I have just had a fine specimen of this rare and beautiful moth presented to me by a young lady. It was caught last night by her maid, without being injured. I have never heard of its capture in Hampshire before.—*William Henry Hawker; Horndean, Hants, June 14, 1853.*

Occurrence of Psecadia Funerella in Yorkshire.—Both this summer and the last I have obtained Psecadia Funerella at Richmond, Yorkshire, but not in any number. I beat it out of hazel on both occasions.—*John Sang; Darlington, June 23, 1853.*

Occurrence of Hypercallia Christiernana at Castle Eden.—The year before last, about the end of June, I was fortunate enough to capture a fine specimen of Hypercallia Christiernana in Shotton Dean, Castle Eden. It was beaten out of grass on an exposed hill-side. I have since been unable to meet with it.—*Id.*

Note on a Monstrosity in the Earth-worm, (Lumbricus terrestris).—A man residing in this place has brought me a monstrosity in an earth-worm, (*Lumbricus terrestris*). The worm is two inches in length, and at about half its length, a second tail bifurcates: the two tails are of the same length and size, but the second leaves the original one at an acute angle, and is not of so bright a colour.—*William Thompson; Weymouth, July 5, 1853.*

Proceedings of the Entomological Society.

July 4, 1853.—EDWARD NEWMAN, Esq., President, in the chair.

The following donations were announced, and thanks ordered to be given to the donors:—The 'Zoologist' for July; by the Editor. The 'Athenæum' for June; by the Editor. The 'Literary Gazette' for June; by the Editor. The 'Journal of the Society of Arts' for June; by the Society. 'Entomologische Zeitung' for April and May; by the Entomological Society of Stettin. 'Journal of the Royal Agricultural Society of England,' vol. xiv. part 1, 1853; by the Society. 'Exotic Butterflies,' part 7; by W. Wilson Saunders, Esq. 'Monographie des Guêpes Solitaires,' par H. F. de Saussure, Cahiers 5 et 6; by the Author. 'Abhandlungen über eine neue Daphnieart, Daphnia aurita, und über die Daphnia laticornis, *Jurine*,' von Dr. Sebastian Fischer: 'Abhandlungen über die in der Umgebung von St. Petersburg vorkommenden Crustaceenans, der Ordnung der Branchiopoden und Entomostraceen,' von Dr. Sebastian Fischer: 'Ergänzungen, Berichtungen und Fortsetzung zu der Abhandlung über die in der Umgebung von St. Petersburg vorkommenden Crustaceen,' von Dr. Sebastian Fischer: all presented by the Author.

R. F. Logan, Esq., of Duddingston, near Edinburgh, was balloted for and elected a Member of the Society.

Mr. F. Smith exhibited a large box of insects, captured this season in Scotland by Mr. Foxcroft, and sent as a sample of the species to be distributed among his Subscribers. There were many fine and rare species, including Notodonta Carmelita among the Lepidoptera, and Lamia ædilis among the Coleoptera.

Mr. Janson exhibited some insects taken on the occasion of the Society's visit to Mickleham, on the 25th of June; including the very rare moth, Pachetra leucophæa (or the species known by that name in England), and the following rare Coleoptera:—Claviger testaceus, Baris picicornis, and Sphærosoma Quercus.

Mr. Tebbs exhibited Notodonta trepida, which was attracted to a light at Highgate.

Mr. Weir exhibited the scarce Aploa palpella, bred from Genista tinctoria, growing at Pembury, near Tonbridge Wells.

Mr. Hunter exhibited a living larva of Limenitis Sibylla, found on honeysuckle at Black Park.

Mr. Bond exhibited Hydrilla caliginosa, ♂ and ♀, lately taken in the New Forest.

Mr. Stevens exhibited the rare Curculionidous beetle, Plinthus caliginosus, from West Wickham; the exceedingly rare moth, Chariclea Delphinii, the larva of which he thinks he took last year near Arundel; and a specimen of Aplecta nebulosa, with a pollen-mass of a flower attached to each eye.

Mr. Waring exhibited two living mole-crickets; on which Mr. Douglas remarked that he once had two of these insects together in a box, and in a short time he found they were both dead, and greatly mutilated by each other.

Mr. Carter exhibited a Cucullia umbratica, with a number of flower-anthers attached to its head; and Aphelia pratana, with a Gordius? protruding from its abdomen.

Mr. Douglas exhibited Laverna ochracea, *Curtis*, bred from leaves of Epilobium hirsutum, in which the larvæ mine and make their cocoons,—a discovery of Mr. Jordan, of Teignmouth. He also exhibited the larva, pupa, and imago of Aræocerus Coffeæ, *Fab.*, a beetle belonging to the family Anthribidæ, which he had found in considerable quantity, feeding upon and doing great damage to mace imported from India.

Mr. Edwin Shepherd exhibited *Retinia Turionana*, from West Wickham; and *Madopa Salicalis*, *Spilonota simplana*, *Chrosis Audouinana*, *Eupithecia Succenturiata*, and *Röslerstammia perlepidella*, from Darenth Wood.

Mr. Westwood exhibited *Hylobius Abietis*, a beetle usually found on young pines, but this season discovered to be destructive to plum and peach trees in some districts; *Coleophora Lusciniæpennella*, reared from leaves of rose-trees, to which the larvæ had done considerable damage; *Ourapteryx Sambucaria*, with its pupa, directing attention to some peculiarities of the latter not hitherto noticed, as the dilation just above the very acute terminal point, and the number of small recurved hooks by which it attaches itself to the threads of its cocoon; and the imago and transformations of *Lampronia corticella*, *St.*, the larva of which feeds in the buds of raspberries, remarking especially upon the singular manner in which in the pupa the haustellum is rolled up laterally. He also read the following letter:—

“ Small Arms Office,

“ Birmingham, June 13, 1853.

“ SIR,

“ In the translation of that very interesting book of Kollar, on ‘Insects injurious to Gardeners and Foresters,’ I have sought for the history, habitat and description of those insects which infest and destroy the timber in our store-houses, and more especially those which attack walnut-wood in preference: but I find only a very slight reference to the *Anobium*, as being the cause of that I would proceed against. I am no entomologist, not from want of inclination, but of time; but being concerned in the care and conservation of a very large store of rough musket-stocks in the public magazines, every recurring season makes me more anxious to devise, if possible, some means of defence against the insidious enemies known amongst workmen under the general name of ‘the grub.’

“ It is upon these grounds that I trust you will pardon me for troubling you with a few questions. Some fourteen years ago I received valuable help and information from your Society upon the subject of an insect of the *Bostrichus* tribe, which I had unwittingly imported through Marseilles, and I am now induced to come again for help against our indigenous enemies.

“ The beetles that I send inclosed are some that were taken off piles of walnut-stocks at Weedon, last week; I found some of the larvæ also—small white maggots, not larger than a horse-hair—but these were lost on the way home.

“ 1. Will you have the goodness to give me the proper name of this particular insect, and the family that it belongs to?

“ 2. At what season of the year does the parent beetle deposit her eggs?

“ 3. In what period of time from that are the larvæ hatched?

“ 4. Do they (the maggots) penetrate into the wood *immediately* after coming out of the egg?

“ 5. How long do they remain feeding in the wood, or lying dormant in the pupa state, before emerging as perfect beetles?

“ 6. Does the course of transformation of this tribe of beetles take place more than once in the same year?

“ 7. My observation leads me to the conclusion that the first palpable external sign of the grub having been in the wood, is the hole made by the perfect beetle in coming out: is this opinion well founded?

"Trusting to your good offices, I pray you to believe me,

"Sir,

"Your very obedient Servant,

"GEO. LOVELL,

"H. M. Inspector of Small Arms."

"J. O. Westwood, Esq."

Mr. Westwood exhibited the beetle referred to—*Latridius lardarius*, and said that the habits attributed to it did not agree with its economy, for it was well known to feed upon dried animal matter and provisions, and never upon wood; so that he thought it was not the real depredator, and he now awaited a reply to a communication to this effect which he had made to Mr. Lovell.

Mr. Douglas read the following note:—

"In the 'Entomologische Zeitung' for May, is a note by Dr. H. Hagen, upon a work published in London in 1773, intituled 'A Decade of Curious Insects: some of them not described before, shewn in their natural size, and as they appear enlarg'd before the Lucernal Microscope, in which the Solar Apparatus is artificially illuminated: with their History, Characters, Manners and Places of Abode; on ten 4to plates and their explanations, drawn and engraved from Nature by J. Hill, Member of the Imperial Academy.' This work, Dr. Hagen says, has been rendered notorious by the remark of Fabricius in his 'Species Insectorum' (Pref. p. 8),—'at damnandæ memoriæ J. Hill, qui decadem Insectorum Londini 1773, 4to, figuris fictitiis edidit.' After quoting on this point a remark of Percheron, in his 'Bibliographie,'—'C'est une question que l'on peut examiner de nouveau, maintenant que l'on possède tant de matériaux que Fabricius ne connaissait pas,'—Dr. Hagen goes on to say, for reasons which he gives, that he does not think the figures are fictitious; at the same time allowing, that even for the period at which they appeared, they are very bad, and that the descriptions are no better. As an example, he gives the remark upon *Alucita pallida*:—'A studious gentleman, very subject to the headache, sneezing one day with violence, as he was writing, saw some atoms a moment afterward upon a sheet of white paper that lay upon his table,' &c. This, he says, 'Westwood, in his 'Introduction' (vol. ii. p. 5), quotes without further remark, so that he does not seem to have suspected any deception. Stephens, and all the other English authors, entirely ignore Hill's work, and yet his figures are not worse than fig. 3, tab. 6, in Harris's 'Exposition,' from which Stephens, without any remark, makes out *Cænitis Harrisella*, a new, and, to him, unknown species.'

"Dr. Hagen gives the following remarks upon Hill's figures, and adds that he should be happy to hear the opinions of other, and particularly English, entomologists, on this matter:—

"Tab. 1. *Tenthredo luctuosa*, from Uxbridge. (A small Hymenopteron).

"Tab. 2. *Tenthredo variegata*, from England. (A small Hymenopteron).

"Tab. 3. *Sphex pectinipes*, from Ireland. (Not to be made out).

"Tab. 4. *Myrmeleon Fornicarium*, from France and Italy. (Doubtless *M. tetragrammicum*).

"Tab. 6. *Cynips Quercûs-folii*, from Norway. (Bad, but a Hymenopteron).

"Tab. 7. *Ephemera Culiciformis*, from Esher, in England. (Very bad, but certainly a small species of *Perlida*).

"Tab. 8. *Ephemera rupestris*, from London. (Very bad, but doubtless a small Phryganea).

"Tab. 9. *Alucita pallida*, from England. (A very small Thrips).

"Tab. 10. *Alucita fulva*, from England. (A Phlæothrips)."

Mr. Westwood said the figures were very bad, and that it was scarcely possible to recognise the species; and with regard to the insects which "the studious gentleman" sneezed, he thought it probable that he had previously drawn them into his nose by smelling flowers.

Mr. S. Stevens mentioned that one evening, at Mickleham, he saw many Noctuæ attracted to one particular thistle, and upon investigation he found it covered with Aphides and their sweet secretion.

Mr. Wing said he had seen both Noctuæ and Geometræ attracted by the secretion of Aphides on gooseberry-bushes; and Mr. Westwood alluded to the well-known attraction to bees of the honey-dew deposited by Aphides on the leaves of trees.

The President announced that a second field-day excursion of the Members of the Society and their friends, would be made to West Wickham Wood, on the 9th of July.—*J. W. D.*

The Entomological Society has had two field-meetings,—one on the 25th of June, at Mickleham, the other on the 9th of July, at West Wickham. On both occasions the weather proved wet, and only about half the usual number of Members attended; nevertheless some good captures were made, and the meetings passed off very pleasantly. One of our rarest Lepidoptera, — *Pachetra leucophæa*? — was taken by Mr. Janson, at Mickleham, on the former date.—*J. W. D.*

Proceedings of the Dublin Natural History Society.

June 10, 1853.—*J. R. KINAHAN*, Esq., in the chair.

After the preliminary business, Mr. Andrews said that he had a variety of eggs, obtained on the west coast, to present to the Society, which, as soon as they were prepared, would be placed in the Museum.

Mr. Kinahan begged to present, from James Haughton, Esq., of Moorfield, Roebuck, the egg of the chiff-chaff, (*Sylvia rufa*); and from Thomas Barry, Esq., of Wexford, a species of shrew, which Mr. Kinahan considered to be *Sorex rusticus*. Also, an undescribed species of Entozoa, taken from the pectoral muscles of *Tetraodon Pennantii*. The discovery of that rare fish, taken at Ardmore, Waterford, had been recorded by Mr. Sargent. The Entozoon belonged to the genus *Echinorhynchus*. Mr. Kinahan also begged to present a bat, obtained at Feacle, county Clare, in August, 1852. He referred it, though in doubt, to the species *Vespertilio Daubentonii*, which has already been once obtained in this country, in Londonderry. The species now exhibited was captured by a cat, and is a male. Mr. Kinahan referred it to *Daubentonii*, for the following reasons:—1. The number of false molars, 6 and 6, refer it to that division of the genus *Vespertilio*. 2. Its dimensions agree pretty well; they are:—length of head and body, 2 inches; tail, 1½ inch; spread of wings in a straight

line, 8 inches; following the curvature of the wings, $10\frac{1}{2}$ inches; length of ear, $\frac{3}{8}$ inch. The points of difference are: — ears somewhat oval, deeply notched on the inner side, beneath the notch a fold, and another on the outside of the ear; tragus two-thirds the length of the ear, somewhat lanceolate, lobed at base on the outside: fur on the back black at the roots, reddish at the tips; underneath, roots of fur dark, tips light grayish; interfemoral covered with light hair; lines very numerous, and as well as membranes of wings, dark, without any mixture of reddish; upon the upper lip, on each side, is a distant moustache of soft, velvety, black hair, mixed with long bristles, which are also found beneath the chin.

Doctor Farran then gave the following notes on the discovery of *Bulla hydatis*. He said: — “ I find that there is a notice of this shell in the ‘Fauna of Cork,’ compiled by Mr. Humphreys, as occurring in sand at Belgrove, East Ferry, Cork Harbour; but on making inquiries of that gentleman, he acknowledged that he had seen the shells, but never in a living state: and as to the specimens in the Institution, their locality was not noted, as he was not certain whence they were procured. I have it in recollection seeing this shell in the collection of Mr. O’Kelly, the intimate friend and associate of the late Dr. Turton; it was marked as English, and as the collection was made during the life-time of the Doctor, had it been Irish, I have no doubt it would have been remarked as a notable addition to the Zoology of Ireland. Until the occurrence of the incident to which I have alluded, I was under the impression that the shell was only to be found in the English seas: but having been met with on the west coast of Ireland, we may expect that not only the English shells, but others, will be obtained by a diligent search, and amply repay the labours of the conchologist.

“ In the year 1844, accompanied by Mr. M’Alla, I dredged Roundstone and Birterbie Bays with a success far beyond my most sanguine expectation: however, there was a spot in Birterbie Bay, which we both agreed should be re-investigated, although holding out but little prospect of adding anything new to our collection, inasmuch as we had gone over the ground before, and found that the floor of that part of the bay was covered with a great thickness of dead and decomposed *Nulliporæ*, and this again coated over by a thick deposit of slimy mud. We had observed that wherever this peculiar formation occurred, our search for shells was fruitless. As we had, in tacking, only crossed this ground, we were determined now to take it in the length, and accordingly gave our steersman orders to commence at the tail of the bank, and bring us up to the head of the inlet. Throwing the dredge overboard, and running it out for a short time, we found on raising it that it was filled to the utmost with the mud and nullipore, which was, as usual, spread on the deck, and into which Mr. M’Alla at once plunged. After having been occupied in examining this fœtid mud for some time, he handed me a fragment of shell very similar to the paring of a human nail, and, in rather an excited manner, asked me what I thought it was. On looking at it, and examining it as well as the uneasy motion of the boat permitted (the wind being fresh), I replied that I conceived it to be a fragment of *Bulla Akera*. ‘No, Sir,’ was his prompt reply, ‘it must be *Bulla hydatis* — it will prove a fine addition to the Fauna of Ireland.’ On again letting down the dredge, we obtained larger fragments, which you see placed on the card precisely as we found them; and by continuing the course to the head of the inlet, we had the good fortune to obtain the perfect shell, as seen in this bottle, with the animal; it contained about twenty specimens. We were unable to return by the same course from the shoaling of the water, otherwise I could have ascertained the exact locality of our prize; and I have no hesitation in saying,

that if ever I am permitted to revisit Birterbie Bay, I shall be able to find *Bulla hydatis*. This circumstance brings to mind the wonderful perception recorded of some palæontologist, who, from seeing a fragment of a tooth, was enabled to construct and bring to life, as it were, an animal of gigantic frame, which inhabited the surface of our earth in bygone ages; but this was accomplished in the calm and quiet of the study. Poor M'Alla made a near approach to this marvellous act of induction, but under very different circumstances—immersed in a mass of mud and slime, and tossed about by the swelling of an angry sea; however, it is to him alone that the credit of making this interesting addition to the Fauna of Ireland is due.

“On the last occasion when I had the pleasure of bringing before the notice of the Society some notes on the turnstone, the subject was so intimately associated with the memory of the late William Thompson, that I availed myself of the opportunity of recording the high estimation in which it is held by the lovers of Natural History; a similar melancholy task now falls to my lot in mentioning the name of William M'Alla, a most distinguished and enthusiastic naturalist, who, with indomitable zeal, unaided by fortune, has achieved a reputation in the science of Natural History seldom equalled, certainly never surpassed—the several recent standard works on the various branches connected with that science attest this most amply. I select the foregoing incident from a multitude, to exhibit the wonderful quickness of his perception. I had, with Mr. M'Alla, visited the various collections, both private and public, of native shells in the metropolis and elsewhere, and in all we found specimens of *Bulla hydatis*; but never could obtain from the proprietors or collectors the locality from whence procured, in fact, when pressed, the answer given was that the specimens were English. It is true that Mr. Thompson, in his ‘Fauna of Ireland,’ indicates the point where this mollusk is to be found; but on asking him for the precise spot, he was unable to point it out, and candidly stated that he had never seen the shell with its animal alive; at the same time he remarked that it would be a great desideratum to obtain it.”

Mr. Andrews observed that the indefatigable researches of Dr. Farran, and of the late William M'Alla were well known. They had obtained from the west coast, particularly from the bays and inlets of Connemara, a larger number of the Mollusca and Crustacea, many new to the Fauna of the country, than any other naturalists. The beautiful *Melobesia Agariciformis* owed its discovery to Dr. Farran. He trusted that as the Museum of the Society was in progress of arrangement, some of his discoveries would be contributed by Dr. Farran.

Mr. Kinahan read a paper “On the Classification and Nomenclature of Ferns.”

Wm. M'Dougall, Esq., of Howth, was nominated as a member.

Proceedings of the Society of British Entomologists.

June 7, 1853.—Mr. HARDING, President, in the chair.

It was remarked by several members, that in consequence of the backward state of vegetation, owing to the coldness of the weather, many of our early insects did not appear at all, and others were at least two or three weeks later than usual.

The President observed that he could corroborate these remarks from his own experience. For example, he took some fine specimens of *Semiophora gothica* at the

end of May, and many others were at least a month later than at other seasons, and some common species he had not observed at all; while some of the scarcer kinds had made their appearance in greater numbers than usual, for instance, *Macaria notaria*, *Bapta taminaria*, and some others. The butterflies seemed unusually scarce; he had seen but one specimen of *Hamearis Lucina*, although he had been in the woods nearly every day. He had no doubt, from what he had heard, that entomologists generally had met with great disappointment this year up to the present time.

Mr. Harding exhibited a box of insects taken during the past month, containing, among others, the following:—*Trochilium Cynipiformis*, *T. Culiciformis*, *Sesia Bombyliformis*, *Lobophora sexualisata*, *Melanippe hastaria*, *Bapta taminaria*, *B. temeraria*, and *Ephyra Omicronaria*.

Boxes of insects were likewise exhibited by several other members.

Mr. Miller was proposed as a member by Mr. Dalman.

In the Report for May (Zool. 3924), for *Lithocolletis alnipaliella* read *L. alnifoliella*.—*J. T. N.*

The Entomological Club.

The usual annual field-day of this little Association was held at Birch Wood, on Thursday, the 7th of July. The following Members and Visitors dined together, Mr. S. Stevens presiding:—Mr. Bennett, Mr. Bevington, Mr. Birkett, F.L.S., Mr. Bowerbank, F.R.S., &c., Mr. Collingwood, Mr. Cuming, F.L.S., Mr. Deane, Pres. Pharm. Soc., Dr. De la Rue, F.R.S., &c., Mr. W. De la Rue, Mr. George, Mr. Gratton, F.R.B.S., Mr. Hanson, Mr. Hirst, Mr. R. Hudson, F.R.S., &c., Mr. Hutchinson, Mr. Janson, F.L.S., Mr. Keddell, Mr. Marchant, Mr. Marsh, Mr. Marshall, Mr. Newman, F.L.S., Pres. Ent. Soc., Mr. Powle, Mr. Salmon, F.L.S., Mr. Saunders, F.R.S., V.P. Ent. Soc., Mr. Scott, Mr. Smee, F.R.S., Mr. Stevens, F.L.S., Mr. Tebbs, Dr. Tyndall, F.R.S., &c., Mr. Wakefield, F.L.S., &c., Mr. Wenham, Mr. Harrison Weir, Mr. Woodward, F.R.S., &c., Mr. Van Voorst, F.L.S., &c., and Mr. Yarrell, V.P.L.S., &c.

Note on the Carnivorous Propensities of the Hedgehog.—The following anecdote, for the accuracy of which I vouch, is not much in accordance with the term “harmless hedgehog” which occurs in the Rev. A. C. Smith’s paper in the June number (Zool. 3903). Attached to the foreman’s cottage, on the farm of a relative of mine, is the hen-house. Not long since, hearing a very unusual commotion amongst the inmates of the latter, the man went to ascertain the cause; and on entering the place, he found it to proceed chiefly from a nearly full-grown pullet, which was struggling on the ground. On closer inspection, he found that the thigh of the fowl was firmly held by the jaws of a hedgehog, which was very unwilling to relinquish its hold. I scarcely need add that the latter suffered the penalty of death for its temerity.—*J. Catchpool, jun. ; Colchester, June 16, 1853.*

Observations on the Harmlessness of the Hedgehog.

By the Rev. ALFRED CHARLES SMITH.

MR. CATCHPOOL, in his note on the hedgehog (Zool. 4008), seems to take exception to the epithet "harmless" as applied by me to that animal; and, in support of his opinion, gives a strong instance of the carnivorous propensities of Master Piggy. Fearing, therefore, lest silence should imply consent to the inferences derived by Mr. Catchpool from his discovery that a hedgehog dined on fowl,—first, that he was therefore anything but harmless; and, secondly, that he was in consequence worthy of death,—I must ask leave to say a few words in his defence, as I should be extremely sorry to see so interesting an animal doomed to even greater persecution than he already receives at the hands of the thoughtless and ignorant.

Now, when I called the hedgehog "harmless," I was perfectly aware that he was occasionally carnivorous. I believe his appetite embraces a great variety of food; he is well known to eat snakes, worms, slugs, snails, frogs, toads, beetles, insects and mice, in addition to various roots, acorns, and other wild fruits, when they have fallen to the ground. These things I consider to form his every-day diet; but I acknowledge, at the same time, that he will *occasionally* eat a young rabbit, and, it seems, a young fowl, when he can find one; perhaps, too, we must *sometimes* add to his bill of fare, a few eggs, and, in one case, even bees, (Zool. 2637): though his most bitter foe will hardly desire the destruction of his race for this peculiar propensity in an individual.

Assuming then that noxious reptiles, insects, roots and fallen fruits form his customary food, I would beg his accusers, in condemning him for an occasional error, not to lose sight of his virtues. There are many notices of him in the 'Zoologist,' proving him to be a determined destroyer of venomous reptiles; and though, in all honesty, I must own there are also therein several records of his carnivorous habits, these seem to be exceptional cases, occurring from lack of his ordinary food, and only proving how omnivorous an animal he is. Indeed, even Mr. Catchpool, had he considered the hedgehog as essentially a destructive carnivorous animal, and viewed him in the same light in which we are apt to look upon the fox, the weasel, and the polecat, would scarcely have thought it necessary to record his invasion of the hen-house, and his sanguinary attack on the pullet. But I do hope that an occasional fault will not alone be remembered, and

his many good deeds be forgotten. Surely, it would be hard to condemn his race, and take from him his good name, because he has been known to have satisfied his hunger with forbidden food! Why, at this rate, what living creature can escape? Certainly not man, who from the days of Adam has transgressed through greediness; and there is scarcely a species of beast, bird, fish, reptile or insect, but has occasionally been guilty of atrocious cruelty, amounting sometimes to murder, and sometimes even to cannibalism, and all the effect of ungovernable hunger.

I own that the hedgehog is a great favourite with me. As a boy, I have on several occasions carried one home from the woods, and confined him in a rabbit-hutch for a time, where he would soon lose his natural timidity, and come out of his dark corner to be fed: and I now have a family group of old and young, stuffed, and forming a very pretty case. I know no animal which always gave me a greater idea of innocence than the much maligned and persecuted little hedgehog. To see him come trotting down the path in a summer evening's ramble through the silent woods, to stand aside and watch him, ignorant of your presence, smelling, and snuffing, and poking his nose among the leaves and grass, and jogging on in his quiet way; and then to call to mind the absurd tales of his cow-sucking propensities, still firmly believed by most of our labourers, and his persecution consequent thereon, is surely enough to excite compassion in his accusers, and pity, "near akin to love." And then, if you suddenly make him aware of your presence, his only defence is to retire within himself: he has no notion of doing battle in self-defence; he knows he cannot escape by flight; so he rolls himself into a ball and awaits the result. It is said that even the worm when trodden on will turn on the aggressor, but not so the hedgehog; he meets the heavy blow, the deadly kick, the murderous attack of his cruel persecutors, with an enduring patience and silent resignation enough to cause remorse in the breast of his foe.

Respecting this curious habit of rolling himself up into a ball, and presenting on all sides a bristling array of spines, Pliny tells us that hence he derives his Latin name "Echinus":—"Nomen habet ἀπὸ τοῦ ἔχειν ἑαυτὸν, quòd convolutus ita se condat et contineat, ut nullæ carnes appareant; vel ἀπὸ τοῦ μὴ δύνασθαι ἔχεσθαι, quòd teneri minimè possit ob aculeos, quibus totus inhorrescit et contegitur: unde echinum vocârunt spinosum castaneæ operculum."—Plin. lib. 27, cap. 9.

But to return once more to his defence. Surely, when we consider his retiring disposition, for he is essentially a crepuscular animal, seldom

making his appearance till evening ; the locality he prefers, a thick wood, from which he rarely emerges but to trot round the hedge-rows in search of food ; his natural timidity, never venturing out till all is still, and ever and anon stopping to listen ; his *customary* diet, such as I have above described, and with which no one can find fault, I think he well deserves to be called “harmless,” although an instance may here and there occur of his forgetfulness of his natural shyness, and his intrusion into the hen-house.

The barn-owl and tawny owl were once supposed to be guilty of endless enormities, and were ranked amongst the most destructive and noxious of birds ; but since Mr. Waterton’s admirable Essays in their defence, no naturalist can be found so bold as to question their innocence, though in those very Essays one is shown to have occasionally varied his diet with game and the other with fish. I wish the hedgehog had been treated to a whole Essay to himself from the same inimitable pen ; but, as it is, I would draw attention to the phrase, “*harmless* little creature,” as applied to the hedgehog by that prince of naturalists : and the author of the ‘Journal of a Naturalist’ describes it as “*the most harmless* and least obtrusive creature in existence.”

In conclusion, let me remark of the latter part of Mr. Catchpool’s account, that though perhaps the death of the hedgehog was the only result to be expected from the man when he discovered the attack on his poultry, yet it is refreshing to find that such dire vengeance does not always follow the discovery of poor piggy’s peccadilloes ; for in a former number (Zool. 1634) we read that when caught in the act of devouring eggs, he was only removed from the scene of his festivities, but was still permitted to enjoy his liberty. This humane sparer of the poor hedgehog in the midst of his many foes, was a very Hypermnestra among the Danaides : and when he carried forth the prickly ball to a distance from his house, he may have addressed him in the words of that exemplary young lady : —

“ I ; velut nactæ vitulos lænæ
Singulos (eheu !) lacerant ; ego illis
Mollior, nec te feriam, neque intra
Claustra tenebo.
I, pedes quo te rapiunt, et auræ,
Dum favet Nox, et Venus: i secundo
Omine.”

And we may conceive with what a grunt of satisfaction the poor hedgepig must have listened to these immortal lines of the poet, and with

what alacrity he must have bustled home and related his adventures to his family, when he found that the coast was clear, and he might venture to unroll.

ALFRED CHARLES SMITH.

Yatesbury Rectory, Calne,
August 10, 1853.

Vespertilio emarginatus. — In Mr. Couch's interesting paper on bats (Zool. 3936), this species is incidentally mentioned without any comment on its rarity, or rather, on its slender claim to a place in the British Fauna. It is said by the original describer, M. Geoffroy, that M. Alexander Brongniart took a single specimen in the English Channel; and he adds, on this very insufficient evidence, that the species is "assez commune en Angleterre." The species which has received this name in Mr. Jenyns' 'Manual,' is *V. Daubentonii* of Leisler; and Mr. Bell, at the time of publishing his 'British Quadrupeds,' had no further information on the subject. Its claim to rank as a British species has therefore been generally ignored; and as its reintroduction by Mr. Couch is a matter of great interest, perhaps that gentleman will obligingly give some further particulars respecting it.—*Edward Newman*.

Occurrence of the Reddish Gray Bat (Vespertilio Nattereri) in Ireland.—I have to record the occurrence of the reddish gray bat (*Vespertilio Nattereri*) at Levitstown, on the confines of the counties of Kildare and Queen's; at which place I was fortunate enough, in company with F. Haughton, Esq., to procure no less than nine full-grown specimens of this bat, and one of *Vespertilio Pipistrellus*. Seven of them, and the pipistrelle, were captured with a butterfly-net when coming out of a hole in the abutment of Tankardstown Bridge, which here crosses the Barrow: the other two specimens were shot by Mr. Haughton, as they were flying down the river. The following notes of their capture may be useful. The hole out of which the specimens were procured is situated about 4 feet above the water's edge, and seems to contain a large colony of these interesting little animals, as the edges of all the stones around the hole are polished with their running over them. I was led to watch the hole by my friend's saying he had been told that fifty-three bats were seen coming out of the hole at one time, and that he himself had counted thirty-five and upwards. Accordingly, on the 23rd of June, at half-past 8 o'clock in the evening, we repaired to the bridge, and even at that early hour the squeaking and chirping that proceeded from the hole was astonishing. This evening we captured two specimens of *V. Nattereri* and the pipistrelle. The former began to fly at about half-past 9, the pipistrelle about half an hour later. We counted forty-one bats coming out, and even then there were numbers remaining in the hole, if we might judge from the chirping coming from it. The next evening was harsh and cloudy, and only twenty-nine bats came out: all those captured this evening were *V. Nattereri*, as *V. Pipistrellus* was too cunning, and dodged the net. The first bat came out of the hole at about half-past 9: about half an hour previously, however, bats came up the river, doubtless either from the ruins of an old church, or from Levitstown mill. The evening becoming more tempestuous, *V. Nattereri* began to return to the nests at 10, flying about and almost striking us. It was quite possible to distinguish *V. Nattereri* from *V. Pipistrellus*, both on wing and when coming

out of their nests, — the former flying nearly straight out, while the latter crept to the edge of the stones, and letting himself fall from thence, flew off. When flying, *V. Nattereri* did not make such rapid turns as the pipistrelle, nor did it appear so wary: I also remarked that when *V. Nattereri* was struck into the water, he floundered there for awhile so as to allow me to catch him, whilst the pipistrelle just touched the water and was off. The cry of the pipistrelle is much shriller than that of the other species, and there is an unmistakably offensive smell arising from it, which I did not perceive from *V. Nattereri*. The next evening was rainy and stormy, and only one bat came out, but a strange one was seen on the river: all was quiet at the hole when we left at about half-past 10. The 27th was a wet day, but cleared up towards evening: only seventeen bats came out. We found that they had grown very wary, and would not come out unless all was quiet; and every time the gunwale of the boat touched the pier of the bridge, there was heard a cry of alarm, very different from their ordinary chirp. They had also learned how to dodge the net, and took a good look out before they ventured to emerge, in several cases running back into the hole as soon as they perceived the net. Whilst the bats were in my possession, I remarked that the tempers of the two were very different, — *V. Nattereri* being gentle, and more quickly reconciled to confinement, allowing me to handle it without any attempt to bite, whilst the pipistrelle was both more restless and impatient, and, when handled, it squeaked and bit furiously; he also squealed whilst running over the side of the net, which I did not notice *Nattereri's* bat doing. Both bats, when climbing, used the exerted portion of the tail as an additional hand. I should say, that of the bats which I saw coming out of the hole, the proportions of the two species were as follow: —

June 23.	<i>Vespertilio Nattereri</i> ,	27.	<i>Vespertilio Pipistrellus</i> ,	14.
„ 24.	...	20.	...	9.
„ 25.	...	1.	...	
„ 27.	...	11.	...	6.

So that it would appear that *V. Nattereri* is the commoner of the two. Description and dimensions:—Dentition:—Incisors, $\frac{4}{8}$; Canines, $\frac{2}{2}$; False molars, $\frac{6}{6}$; Molars, $\frac{6}{6}$. Dimensions in inches and twelfths of an inch:—Head and body, male, 2; female, 2.1: tail, male, 1.4; female, 1.3: humerus, 1: ears .7: tragus, .3: breadth of ears across the under surface, .4: spread of wings, male, 9.10 $\frac{1}{2}$; female, 10. Tragus narrow-lanceolate, with a lobe at the base: ears naked half way down. Back, head, shoulders and face dark reddish gray, base of hairs bluish gray: along the angle of the jaws dark reddish gray: belly whitish gray, roots of hairs nearly black, lightest in the centre: around the anus white: interfemoral light dusky, lines *very numerous*, covered with scattered hairs, and fringed with a margin of stiffish hairs. Claws large and clumsy, ciliated with strong white hairs. Whiskers long and stiff; a slight moustache of dark, nearly black, velvety hairs on the upper lip. All the specimens, with the exception of two, were females: the male specimen in my possession is smaller than any of the females, it is also darker on the under surface, especially along the wings; one of the females had a full-grown fœtus in her uterus. This is the second record of the occurrence of this bat in Ireland, one specimen having been captured by G. Maryan, Esq., in 1844, near Enniskerry, Wicklow, and by him presented to the Dublin Natural History Society, in whose collection it now is, (see Report of the Society, 1844, p. 18). —*John Robert Kinahan; Dublin, July, 1853.*

Inquiry respecting the unknown Eggs lately found near Norwich.—Allow me to ask your correspondent who supplied the note on the above eggs (Zool. 3981), whether the common kingfisher (*Alcedo Ispida*) is found on the Norwich river, as the description of the eggs given by him tallies exactly, except in number, with a nest of eggs of that bird taken near Miltown, on the Dodder, and which I saw. Their identification is rendered the more difficult from your correspondent's not being able to describe the nest; but perhaps further inquiry might procure this information. — *J. R. Kinahan; Sea-view Terrace, Donnybrook, August, 1853.*

Occurrence of the Golden Oriole (Oriolus Galbula) at Eltham.—A beautiful example of the golden oriole was shot on the 14th of this month, at Eltham, in Kent, by Mr. Joiner, of Crown Manor Cottage, Eltham, and is now in my possession. Colour of bill dark red; head and back yellow; tail-coverts rich yellow; throat and breast yellowish white; tail yellowish black, tipped with rich yellow. Length 10 inches. — *James Bramley; 9, Winchester Street, Waterloo Town, Bethnal Green, June 19, 1853.*

Note on the Thrush Warbler, (Sylvia turdoides).—The specimen of the thrush warbler which you saw in the flesh, was caught at Dagenham, in Essex, on the 16th of June, 1853.—*J. Green; Naturalist, 1, East Road, City Road, July, 1853.*

Correction of a previous Error respecting the Fire-crested Regulus.—I am anxious to correct at once a mistake into which I had fallen when I recorded the fire-crest as having been shot in the Isle of Wight in July, (Zool. 2526). This correction is the more desirable, since all the birds of this species hitherto seen in England, with the single exception of the young bird recorded by Mr. Jenyns, have occurred in the winter months, from November to March; and my erroneous record might seem to favour the opinion that the bird builds in this country, a fact scarcely yet established. My mistake arose from finding a bird, apparently young, from the yellow skin at the gape, and yet with a crest more brilliant than that of an adult male gold-crest with which it was compared, while the form and character of the bill and tail appeared to agree with the description of the young fire-crest. From what I have since learned, I believe my bird to have been a young gold-crest in its second plumage. — *A. G. More; Bembridge, Isle of Wight, August 6, 1853.*

Note on the Nest of the Great Tit (Parus major) built in a Pump.—A pair of great tits built their nest this spring in the hollow of my pump, which is a bored tree, with the handle let into a slit in the side, and at about 6 inches from the top, over which is nailed a flat piece of wood as a permanent covering. The birds gained access to the inside of the pump by means of the slit which admits the handle, and formed their nest nearly 2 feet down the bore, so that it could be barely reached at arm's length. I had known of the existence of the nest for nearly a fortnight, as the birds were continually seen passing in and out of the pump, but I wished it to remain undisturbed, until so many complaints were made that the water always contained particles of dirt and weeds, and was unfit for use, that I was compelled to remove the nest. It was found to contain twelve fine full-fledged birds, three of which escaped during its removal; the others being put into a basket, with the idea that the old ones would continue to feed them while in confinement, but they all escaped through a very small aperture in the basket early on the following morning. The nest was sustained in its place in the pump, which is 6½ inches in the bore, by a mass of vegetable matter, such as twigs, dried grass, and especially the somewhat elastic roots of the couch grass (*Triticum repens*), of which it chiefly consisted. These appeared to have been

dropped into the pump piece by piece, and allowed to mingle together; but as they approached the nest they were gradually more firmly arranged, and at length much interwoven, so as to form a firm resting-place for the nest itself. There was nothing whatever in the pump to which they could be attached, but the bore was rather roughly executed; and this circumstance, together with the elasticity of the roots employed, appear to have been all that the birds relied on for the support of their nest and young ones. The whole structure must have occupied nearly 3 feet of the bore, as a hooked walking-stick was necessary to reach and extract the mass of roots. The strangest part of the affair is, that at every stroke of the pump, which is in constant use for household purposes, the rod passes up and down by the side of the nest, and being a common single action, it oscillates towards the centre of the nest fully an inch at each stroke, so that it must have materially disturbed the birds during the period of incubation. They were very bold, and would freely enter the pump in the presence of any member of the family. The spot is retired, and much shaded by yew-trees and other foliage.—*Geo. Fitt; Ipswich Road, Norwich, July, 1853.*

“*On the Habits and Structure of the Great Bustard, (Otis tarda, Lin.)*” — A paper by Mr. Yarrell, bearing the above title, was read before the Linnean Society on the 18th of January, 1853, of which the following is an abstract: — “The particulars relating to the habits of the bustard are derived from the communications of several friends, who have had opportunities of observing it both in England and elsewhere. The first notice is from C. A. Nicholson, Esq., of Balrath Kells, in the county of Meath, and furnishes remarks on the habits of the bird as observed by him in the neighbourhood of Seville, where it appears to be extremely abundant, the males beginning to arrive in the cultivated country at the beginning of February, in flocks varying (according to Mr. Nicholson’s observations) from seven to fifty-three; the old birds always associating together, and those of a year old, which are much smaller, never mixing with them: the young birds have neither beard nor pouch. The females do not arrive till the beginning of April, and come singly, or at most in pairs; the flocks of males then break up, and are met with in parties of three or four, or even singly, spreading their tails on a fine day like turkey-cocks, drooping their wings and expanding their pouches. The sexes appear to live quite separate. In May, the cocks entirely disappear from the cultivated lands, retiring to the extensive grass marshes on the banks of the Guadalquivir, and leaving the hens behind them. The young are hatched in the corn-plains about Seville, and are able to take care of themselves when the corn is cut in July, after which the young birds and hens follow the cocks to the marshes. The birds are very difficult to shoot: the heaviest shot by Mr. Nicholson weighed 28 lbs.; and the largest measured 7 feet 3 inches from tip to tip of wing. Those of a year old weigh from 8 to 10 lbs., and are much the best eating. Their stomachs were found crammed with barley, both leaves and ears, with the leaves of a large-leaved green weed, and with a kind of beetle. When flushed, they generally fly for two or more miles, and sometimes at least 100 yards high. They never try to run, and Mr. Nicholson cannot imagine greyhounds being able to catch bustards, as they are reported to have done. Mr. John Wolley, jun., states that he had never seen the great bustard, or received its eggs, from the neighbourhood of Tangier. While ascending the Guadalquivir, about the month of September, he saw several flocks of four or five birds each, on the level plains which extend along the banks of that river, walking apparently in file, some with their heads down. They did not appear to be timid, or very cautious; but once, as the boat came suddenly round a corner, several of them rose

together, springing hastily to the height of 40 or 50 feet, and then turning suddenly and somewhat clumsily, after a few more rapid strokes, sailed along with the arched form of wings so general in game birds. Mr. Yarrell's next notice is derived from a letter in the possession of John Britton, Esq., giving an account of two bustards seen on Salisbury Plain in the summer of 1801, within a fortnight of each other, both of which attacked mounted horsemen, and one of which was captured and kept for some time by Mr. J. Bartley, of Tilstead, by whom it was eventually sold to Lord Temple. The letter gives numerous details of the habits of this bird from the information of Mr. Bartley. J. H. Gurney, Esq., of Norwich, states in a letter to Mr. Yarrell, that, as far as he can learn, the last bustard killed in Norfolk was a female, which was shot at Lexham, near Swaffham, towards the end of the year 1838. The small flock of which this was one, had for several years consisted of females only, the eggs of which were frequently picked up, having been dropped about at random in consequence of the absence of male birds, the latter having become extinct at an earlier date. Fredk. J. Nash, Esq., of Bishop's Stortford, has several times informed Mr. Yarrell, that when taking the field as a young sportsman, he once saw nine flights of bustards in one day, not far from Thetford, in Norfolk. And Gilbert White, of Selborne, mentions in his Diary, under date of November 17, 1782, that being at a lone farm-house between Whorwell and Winchester, the carter told him that about twelve years before, he had seen a flock of eighteen bustards at one time on that farm. Three instances only of the appearance of the bustard in England have been noticed by Mr. Yarrell since the publication of the second edition of his 'History of British Birds;' one, a female, recorded by G. R. Waterhouse, Esq., of the British Museum, as occurring to him in August, 1849, on Salisbury Plain; a second, also a female, shot at Lydd, in Romney Marsh, in January, 1850, and now in the possession of Dr. Plomley, F.L.S.; and the third, shot on the 31st of December, 1851, in Devonshire, and now in the possession of J. G. Newton, Esq., of Millaton Bridestow. Mr. Yarrell proceeds to state that he had long wished to have an opportunity of examining the body of a male bustard, for the purpose of inspecting the gular pouch described by Daines Barrington in his 'Miscellanies,' 1781, and by Edwards in his 'Gleanings of Natural History,' 1811, and thence copied both by Bewick and himself; but no opportunity for so doing occurred until recently. About four years ago the Zoological Society obtained from Germany six or seven young bustards, and one of these (a male) died within a year. The body was examined by Mr. Mitchell and himself, and no gular pouch was found, but this was then attributed to the youth of the bird. In December last another male of this flock, believed to be four years old, died at the Zoological Gardens, and was also examined by Mr. Yarrell. The neck was carefully dissected; but there was no opening under the tongue, and he entirely failed in various attempts to distend any part of the membranes either by fluid or by air. Thus disappointed in his expectation of finding what had been so minutely described, Mr. Yarrell turned to the translation of the anatomical descriptions of the animals dissected by the Royal Academy of Sciences at Paris at the end of the seventeenth century, and found the results of the dissection of six male bustards there given to correspond entirely with his own observations. He found also that Cuvier, in his 'Leçons d'Anatomie Comparée,' refers to no peculiarity in the neck of the male bustard. Professor Owen also entirely confirmed the fact of the absence of any gular pouch by his own dissection of a full-grown bustard, made with the view of obtaining a preparation of that supposed structure for the Museum of the College of Surgeons. Mr. Yarrell is therefore disposed to consider that

there must have been some mistake on the part of the writers quoted, as to the species of bird in which that pouch was observed."—*From the 'Proceedings of the Linnean Society,' p. 207.*

Note on Woodcocks nesting in Sutherlandshire, and carrying their Young in their Claws.—“As I know the interest you feel in birds, I send you a statement of what I saw among the woodcocks in Sutherland, where I was during the month of May; and though I have seen as much of woodcocks in Norfolk as most men, I saw more of them in one month in Scotland than I had ever seen before. The wood where they were most common was a birch-wood, of large extent, on the side of a hill sloping down to the river Sheen: there were a good many marshy places in it, but generally speaking it was dry, and the under-cover mostly heather. My first introduction to them happened thus:—On crossing a grassy plain in the centre of the wood, I saw an old bird fly up with a young one in her claws. I was so near that there could be no mistake about it; and on going to the place whence she rose, I found two more young ones squatting together, but no signs of a nest. The young birds were about half grown, and unable to fly. On taking them up they uttered a very shrill note, almost as sharp as that of a bat, which was answered by the mother; and on putting them down they ran to a short distance, where they were joined by the old bird. At three different times I saw the old bird carrying a young one. Her flight was always low and heavy, and exactly like that of a hawk with a bird in its claws. On one occasion, late in the evening, I saw a woodcock cross the road where I was walking, carrying a young one down the hill-side to the river, and return almost immediately alone. As I thought that probably she was going to fetch the rest of the young ones, I watched carefully, but owing to the darkness most probably missed seeing her, though after a few minutes I saw a bird return from the river-side to the hill, in the same track as the former bird had followed, and have little doubt she had taken down another young one, though I had failed to see her pass. It is the common opinion among the keepers &c., that the old birds carry their young ones regularly to feed, and bring them back again in the morning. Woodcocks are very abundant, and almost every evening, at dusk, I saw a considerable number flying off to feed. They generally flew round the wood once or twice before they went off, making a most extraordinary rumbling sort of noise, the last one would suppose a woodcock capable of making. The keeper told me that he constantly found nests of the woodcock, and seemed to think about as much of them as we do of a blackbird's nest.”—*E. C. Buxton.**

Note on a Wingless Bird said to inhabit the Island of Tristan d'Acunha.—My friend Mr. F. Strange, of Sydney, lately mentioned to me in a letter which he wrote from Sydney, that he had recently met a person who was conversant with the island of Tristan d'Acunha, and who stated that a wingless bird was found on that island, which was eaten by sailors and others visiting it, and who called the bird the “Island-hen.” Mr. Strange's letter gave no further particulars; but should any of the readers of the ‘Zoologist’ at any time have the means of making inquiries on this curious subject, I trust the opportunity will not be neglected, either by them, or by any ornithologists who may chance to have communication with this remote island.—*J. H. Gurney; Lowestoft, July 25, 1853.*

* In a letter to J. H. Gurney, Esq., by whom, with Mr. Buxton's kind permission, it has been communicated to the ‘Zoologist.’

Note on a Large Viper.—In a “Note on Large Snakes” inserted in the April number (Zool. 3849), I mentioned that the largest viper I had ever measured was 2 feet 1 inch in length. On the 24th of this month I captured one with my butterfly-net, in the Holt, near here, which proved to be exactly 2 feet 3 inches long: its girth also exceeded that of any other viper I have ever seen. I have stuffed it as a curiosity.—*William Henry Hawker; Horndean, Hants, June 28, 1853.*

Catalogue of the Fishes of Orkney and Zetland.

By WILLIAM BALFOUR BAIKIE, M.D.

(Concluded from page 3952).

Order VII.—ANACANTHINI.

Sub-order.—*Thoracici.*

Pleuronectidæ.

Plaice, *Platessa vulgaris.* Abundant.

Flounder, *Platessa flesus.* Very common.

Common Dab, *Platessa limanda.* Tolerably frequent.

Lemon Dab, *Platessa microcephala.* One obtained by Dr. Duguid in August, 1848.

Holibut, *Hippoglossus vulgaris.* Common.

Turbot, *Psetta maxima.* Not rare.

Brill, *Psetta vulgaris.* Rare.

Muller's Top-knot, *Psetta hirta.* Several specimens have been obtained in Orkney.

Bloch's Top-knot, *Psetta punctata.* One specimen procured in Zetland by Professor Fleming.

Sole, *Solea vulgaris.* Rare.

Brosmiidæ.

Torsk, *Brosmius vulgaris.* Rare in Orkney, abundant in Zetland.

Merlucciidæ.

1. *Merlucciina.*

Hake, *Merluccius vulgaris.* Not common.

2. *Lotinæ.*

Ling, *Lota molva.* Common.

Three-bearded Rockling, *Motella vulgaris*. One specimen obtained at Stromness a few years ago.

Five-bearded Rockling, *Motella Mustela*. Very common.

Gadidæ.

Cod, *Morrhua vulgaris*. Very abundant.

Haddock, *Morrhua Æglefinus*. Common.

Whiting Pout, *Morrhua lusca*. Occurs in Zetland.

Poor Cod, *Morrhua minuta*. Two specimens obtained at Kirkwall in August, 1851.

Whiting, *Merlangus vulgaris*. Not common.

Coal-fish, *Merlangus carbonarius*. Extremely abundant.

Pollack, *Merlangus Pollachius*. Common.

Sub-order.—*Apodes.*

Ophidiidæ.

Sand Eel, *Ammodytes Tobianus*. Rare.

Sand Launce, *Ammodytes Lancea*. Common.

Order VIII.—PHARYNGOGNATHI.

Sub-order.—*Acanthopterygii.*

Cyclo-Labridæ.

Ballan Wrasse, *Labrus maculatus*. Not common.

Gilt-head, *Crenilabrus melops*. Rare.

Small-mouthed Wrasse, *Acantholabrus exoletus*. Two specimens caught in Kirkwall Bay in December, 1850.

Sub-order.—*Malacopterygii.*

Scomberesocidæ.

Gar-fish, *Belone vulgaris*. Not uncommon.

Saury Pike, *Scomberesox Saurus*. Rare.

Order IX.—MALACOPTERI.

Sub-order.—*Abdominales.*

Salmonidæ.

Salmon, *Salmo Salar*. Rare.

Gray Trout, *Salmo eriox*. Rare.

Salmon Trout, *Salmo Trutta*. Abundant.

Common Trout, *Salmo Fario*. Abundant.

Charr, *Salmo Salvelinus*. Rare. Three specimens obtained in Waas, in 1832, by J. E. Heddle, Esq.

Argentine, *Scopelus Humboldtii*. Several specimens have been procured during the last few years by Dr. Duguid and Mr. R. Heddle.

Clupeidæ.

Herring, *Clupea Harengus*. Abundant.

Sub-order.—Apodes.

Murenidæ.

Sharp-nosed Eel, *Anguilla acutirostris*. Common.

Broad-nosed Eel, *Anguilla latirostris*. Less common : first identified in Orkney by Dr. Duguid.

Conger, *Conger vulgaris*. Common.

Order X.—DERMOPTERI.

Sub-order.—Cyclostomi.

Petromyzontidæ.

Sea Lamprey, *Petromyzon marinus*. A specimen occurred several years ago at Stromness, and one has since been obtained by Dr. Duguid.

WM. BALFOUR BAIKIE.

Haslar Hospital, July 20, 1853.

Note on Tench and Pike. — It is generally considered amongst keepers and fishermen that the tench is a fish which all others of a voracious nature, such as pike, perch, trout, and eels, equally avoid feeding on ; and the reason given is, that the slime of the former possesses a healing quality of which other kinds of fish are aware, and that, when wounded or ill, they resort to this physician of the waters, and, by rubbing themselves against the tench, extract a remedy for their ailments, for which, instead of paying any fee, they all agree in considering the former so great a benefactor that it ought to go free, and be protected from all harm. How far it becomes one to doubt the truth of this belief, is unnecessary to state ; but I may be excused in relating the following circumstance which I witnessed a few days since, and leave the conclusion to be drawn from it to others, as to the *sentiments* imputed to the other kinds of fish in abstaining from feeding on the tench. In a pit or small pool at the back of the house, it is the custom to put such fish of different kinds as are likely to be wanted for the

table during the summer, and consequently there is a pretty good store of fish kept in the pit, amongst which are some carp, and many good tench, varying from 1 to 4 lbs. in weight; and there are also a few pike put with them, of from 4 to 9 lbs., as well as some perch, and but a few roach, for the pike to feed on. These different kinds of fish can be easily seen swimming about in the clear water, and the loud splash of the pike indicates that he has seized some victim, and brought it to an untimely end. The other day I saw, at some distance from the side of the pit, and deep in the water, a bright shining substance slowly moving about, and which I could by no means satisfactorily make out; but after watching it for some considerable time, and endeavouring to discover its nature, I at last perceived that across the middle portion projected a dark band, looking as if it were fastened to it and pushing it along: and this turned out to be the head of a large pike. The latter, having seized a tench, of about 3 lbs. weight, crossways, which it was totally unable to swallow, was gently swimming about with its head somewhat elevated and its tail sunk lower in the water, vainly endeavouring to get the tench down its throat, or to twist it round so that the head of the tench might the more easily lead the way for the rest of its body further into the capacious jaws of its captor; but this could not be effected. The latter therefore continued to carry its prize slowly about the pit, as a dog would a bone. After watching the two fish for some time while engaged in this way, I saw the pike approach the side of the pond, and the keeper, happening to be near at hand, brought a casting-net and threw over both; but unfortunately a bough in the water kept the net from closing, so that the two fish escaped, and were afterwards seen in the pit still in the same position as before, the pike retaining a firm hold of the physician. At last, however, I thought I perceived the latter freed from the tenacious grasp of the pike, who probably finding it impossible to devour so large a prize, let it go free, and the tench, no doubt, rejoicing at its timely escape, considered the attack of its foe a most ungrateful return for favours conferred. This is the only instance I ever met with in which the tench was attacked by any other fish, though I have constantly had them put, together with pike and perch, in small stews and other places, where the absence of food for the predatory species has induced them to seize upon almost every other living thing: all other kinds of fish, rats, young ducks and moor-hens have fallen a sacrifice to the all-devouring pike, but not the tench; and keepers always avoid setting their trimmers or trolling for pike with a tench for a bait, alleging as a reason that no other fish will touch it.—*W. H. Slaney; Hatton Hall, August 10, 1853.*

Note on Uraster glacialis and Muller's Top-knot.—Since I sent the notice of the occurrence of *Uraster glacialis* in Dalkey Sound (Zool. 3990), I have learned that it was obtained from a rock called the Corrig, off Dalkey Island, in from 8 to 10 fathoms water. For the notice of it, and of Muller's top-knot, I am indebted to D. J. Corigan, Esq., M.D., by whom they were both captured.—*J. R. Kinahan; July 16, 1853.*

Catalogue of the Land and Fresh-water Shells inhabiting the Neighbourhood of Dublin. By WILLIAM WHITE WALPOLE, Esq.

QUITE coinciding in the sentiments expressed by Mr. Taylor, in his Catalogue of the land and fresh-water shells of Aberdeenshire and Kincardineshire (Zool. 3878), as to the utility of such local lists, I beg to forward a list of those land and fresh-water Mollusca which I have found inhabiting the neighbourhood of Dublin.

It would, I doubt not, have been more perfect, had not the marine Conchology of our interesting island engaged most of my attention. I have heard of other species having been found near Dublin, but have included in my Catalogue none but those I have found myself, living in the various localities specified, which are mostly within eight miles South of our metropolis.

The nomenclature is according to Gray's edition of Turton's 'Manual of Land and Fresh-water Shells.'

Valvata piscinalis. Shangannagh river, near Killiney.

Arion ater. Common.

„ *hortensis.* Damp gardens at Monkstown.

Limax maximus. Common.

„ *flavus.* On walls near Booterstown and Blackrock.

„ *carinatus.* Damp gardens at Monkstown and Killiney.

„ *agrestis.* Common.

Helix aspersa. Common. A most curious elongated variety of this species was found near Killiney Castle.

„ *hortensis.* Very local in this neighbourhood; on brambles near Loughlinstown.

„ *nemoralis.* Common.

„ *pulchella.* Old walls near Loughlinstown, and in some like situations through this neighbourhood.

„ *pulchella* var. In a damp meadow near Killiney.

„ *fusca.* Little-river marsh, Killiney.

„ *aculeata.* Among dead leaves and moss near Loughlinstown.

„ *hispida.* Common.

„ „ var. *concinna.* Killiney, and other places through the neighbourhood.

„ *rufescens.* Common.

„ *virgata.* Very fine along the sea-coast; those found inland much smaller.

„ *ericetorum.* Local; not found at Killiney, but I have obtained it North of our capital, at Portmarnock and elsewhere.

- Zonites rotundatus*. Common.
 „ „ var. *alba*. Killiney.
 „ *pygmæus*. Little-river marsh, Killiney.
 „ *cellarius*. Common.
 „ *purus*. Rare, Killiney.
 „ *radiatulus*. Rare; in a shady wood near Loughlinstown.
 „ *crystallinus*. In a damp meadow near Killiney.
Succinea putris. Common.
 „ *Pfeifferi*. Killiney.
Bulimus obscurus. Rare; on trees near Cherry-wood, and in an old wall near Loughlinstown.
 „ *acutus*. Abundant along the sea-coast.
 „ „ vars. *b*, *c*, and *d* of Turton found at Killiney.
Zua lubrica. In moss, Little-river marsh, Killiney, and elsewhere.
Pupa umbilicata. Common.
 „ *Anglica*. Rare; Little-river marsh, Killiney, and Loughlinstown.
 „ *marginata*. Rare; in an old wall near Loughlinstown.
Vertigo edentula. On the fronds of ferns in a shady situation, Killiney.
 „ *pygmæa*. Rare; under limestone boulders, Loughlinstown.
 „ *substriata*. Very rare; Little-river marsh, at the roots of rushes, &c.
 „ *palustris*. Rare; same locality as the last species.
Balea perversa. Scarce; on beech-trees, Killiney.
Clausilia nigricans. Common.
Carychium minimum. Common in damp situations.
Limnæus pereger. Very common.
 „ *auricularius*. Not common.
 „ *stagnalis*. Pond at Portobello.
 „ *truncatulus*. Rare; Killiney.
Amphiplea glutinosa. Rare; Loughlinstown.
Ancylus fluviatilis. Shangannagh river.
Physa fontinalis. In a stream at Fox-rock, and at Killiney.
Aplexus hypnorum. Loughlinstown, and Little-river marsh, Killiney.
Planorbis carinatus. Pond at Portobello, near Dublin.
 „ *marginatus*. Loughlinstown.
 „ *contortus*. Rare; Loughlinstown.
 „ *vortex*. Common.

- Cyclas cornea. Ponds at the Ballycorns lead-works.
 „ lacustris. Same locality as the last, but rare.
 Pisidium nitidum. Fox-rock, Killiney and Shangannagh.
 „ pulchellum. Ponds at the Ballycorns lead-works.

WILLIAM WHITE WALPOLE.

Windsor Lodge, Monkstown,
 Co. Dublin, July 8, 1853.

Note on Niphargus stygius, Schiödte, and other Members of the Subterranean Fauna.
 “Mr. Westwood, F.L.S., communicated a notice of the discovery in England of a new genus and species of Amphipodous Crustacea, the *Niphargus stygius* of Schiödte, an animal hitherto only found in the caverns of Adelsberg, celebrated as the locality of the *Proteus anguinus*. The Crustacean in question has been found in great numbers in a well near Maidenhead, the water of which was in consequence rendered unfit for use.* Mr. Westwood took occasion to remind the members of the opinion entertained by some naturalists of the existence of a distinct subterranean Fauna, of which the *Proteus* was an example: the members of which Fauna hitherto discovered were remarkable for their general want of colour, and for their being destitute of eyes,—two physiological conditions dependent on the dark and gloomy places where they have hitherto been found. Mr. Kirby, in his ‘*Bridgewater Treatise*,’ was one of those writers who contended that such animals formed no part of the Fauna now in existence on the surface of the earth, but belonged to a distinct subterranean race of animals. M. Schiödte, in a remarkable memoir recently published in the ‘*Transactions of the Danish Academy*’ (which Dr. Wallich has kindly translated for the Entomological Society of London, in whose Memoirs the translation has appeared), has described a number of singular animals belonging to the class of Annulosa, exhibiting all the characteristics of such a Fauna, being destitute of sight, and also almost or quite colourless. Amongst them are the Crustacean in question, a species of spider and false scorpion, a species of the family Poduridæ, and several Coleoptera, all of which were found in the caverns of Adelsberg in Carniola. Mr. Westwood also noticed that animals very closely related to those described by Schiödte had been found in the Great Mammoth Cave in Kentucky, including also a blind species of cray-fish, and one or more species of fishes destitute of eyes, at least wanting the transparent external cornea, although the optic nerve was present, which would probably allow a certain sensibility to the presence of light; and M. Schmidt had noticed that two newly discovered species of beetles, belonging to one of Schiödte’s singular genera, although destitute of all external rudiments of eyes, had exhibited a sensibility to light by retreating under stones and towards the darker parts of the cavern when brought towards its entrance. A remarkable new genus of shrimps had also been recently described by Professor Bell in his work on the British Crustacea, dredged at a very great depth of the ocean, of which the eyes, although present, were destitute of the usual hexagonal facets.”—From the ‘*Proceedings of the Linnean Society*,’ April 19, 1853, p. 218.

* See also Proceedings of the Entomological Society, (Zool. 3923).

A Glance at the present state of our knowledge of the Coleophoræ.

By H. T. STAINTON, Esq.

IN the sciences of observation, it becomes absolutely necessary to collect together, from time to time, all recorded observations, so as readily to show the extent of our knowledge, and to indicate the particular points where further investigation is required.

Reaumur, who in 1737 wrote the Introduction to the Study of these insects, in the 4th, 5th and 6th Memoirs of his third volume, makes the following remark:—“Though pretty common, as I have just mentioned, I was for several years unable to find more than three or four a year. It is, however, not uncommon to meet with elms and oaks, on which, during the spring and summer, one can in a few hours collect them by hundreds, *when one has learnt to know them, and where to look for them.*”

The truth of this maxim is continually being confirmed by our own experience; and therefore, information which tends to show what to look for, and when and where to look, becomes an essential step in the progress of our acquaintance with these interesting insects.

The larvæ of the genus *Coleophora* all live in cases formed of the epidermis of leaves previously mined by them, or of silk; the larvæ feed on the parenchyma of leaves, attaching the case to the under side of a leaf, and mining between the cuticles. Some species feed on *seeds*; and to this latter habit I am particularly anxious to direct attention, as the seed-feeders are far more likely to escape observation, not betraying themselves by the discoloured blotches as the leaf-feeders do, and only therefore liable to be observed from the case protruding more or less from the seed-heads, seed-pods, or seeds which they are devouring.

I shall divide the species into British, and continental which have not yet been detected here; and shall further subdivide them as follows:—1. Those of which the transformations are ascertained. 2. Those of which the transformations are suspected, or, resting only on single observations, require further investigation. And 3. Those of which the preparatory states are not yet recorded as having been observed. I trust the day is not far distant, when the two last subdivisions will be merged into the first.

A. 1. British species of which the transformations are ascertained.

Alcyonipennella, *vibicella*, *conspicuell*a, *Pyrrhulipennella*, *Tiliella*,

palliatella, Currucipennella, discordella, Onosmella, Troglodytella, Inulæ, lineolea, argentula, Hemerobiella, Laricella, albirtarsella, nigricella, fuscadinella, Lusciniæpennella, viminetella, solitariella, and lutarea.

Alcyonipennella. The larva is found in April and May, on *Centaurea nigra*. It is local, but widely dispersed. For figures of the larva, case, and discoloration of the leaf, see *Ent. Trans. n. s. vol. ii. pl. 11, f. 2.*

Vibicella. The larva is found in May and June, on *Genista tinctoria*. For description of the case and habits of the larva, see the note by Mr. Weaver in the '*Zoologist*' (1845), p. 947. A figure of the case is given in Westwood's '*Introduction to the Modern Classification of Insects*,' vol. ii. p. 405, No. 22.

Conspicuellæ. The larva feeds in May and June on *Centaurea Scabiosa*, (on the Continent on *Centaurea Jacea*; see Zeller, in *Breslau Zeitschrift für Ent. 1850, Lepid. p. 31*). Mr. S. Stevens has twice found the larva in the hilly field at Headley Lane: the perfect insect, as British, is still unique in Mr. Bedell's collection.

Pyrrhulipennella. The larva feeds in the autumn and spring on *Calluna* and *Erica*. I have found it at Dartford Heath, and Mr. Grant has found it at Wimbledon Common. For description of the larva and case see *Linn. Ent. iv. 255.*

Tiliella. The larva is polyphagous; I generally find it on sloe in May. Reaumur has given a long account of the mode in which this larva constructs its case of pure silk, in the 6th Memoir of his 3rd volume; and has figured the case in pl. 16, f. 1, 2, 3.

Palliatella. The larva of this is also polyphagous; Mr. Bond, some years back, obtained them plentifully from willow. The case is the most singular yet observed in this genus, and is fully described by Reaumur in the 6th Memoir of his 3rd volume; he also figures it, pl. 16, figs. 6—12: (a copy of his f. 7 is given in Westwood's *Introd. to the Mod. Classif. of Insects, ii. 405, No. 21*).

Currucipennella. The larva feeds on oaks in May. Mr. Doubleday occasionally meets with it at Epping. Mr. Douglas bred a specimen in 1842, as recorded in the '*Entomologist*' (385) under the name of *ornatipennella*. Reaumur was acquainted with this species, and has figured the case, pl. 16, f. 13, 14.

Discordella. The larvæ feed on *Lotus corniculatus* in May, and has been found in tolerable plenty by Mr. Shield, near Dublin.

Mr. Shield discovered the larva in the spring of 1852, and this year supplied me with 300 of them, of which, having reared a fair per-centage without obtaining a single specimen of *Saturatella*, I feel convinced that the latter is a distinct species.

Onosmella, so named by Brahm, because he found the larva upon *Onosma echioides*; here we find it in May and June on *Echium vulgare*, and Professor Zeller finds it at Glogau upon *Anchusa officinalis*. Tischer states (Treitschke, ix. 2, 219) that it feeds on *Hieracium Pilosella*, but in this I imagine there must be some error, arising either from his mistaking the young plant of one of the Boragineæ for a *Hieracium*, or from a full-fed larva having quitted its food-plant, and attached itself to *Hieracium*, or from the larva on *Hieracium* (at present we know of none on that plant) belonging to some other species.

Troglodytella. Under this name we have, not improbably, several species mixed. Zeller, in the 'Linnæa Entomologica,' gives *Artemisia* (*vulgaris*?), on Herr Mann's authority, as the food of the larva of this species, and also observes that Senator v. Heyden found two cases, *probably* on *Tanacetum vulgare*, which produced var. *b*. In a letter however which I had from Professor Zeller in January last, he mentioned that Herr Schmidt, of Laybach, had sent him specimens of *Troglodytella*, with cases, which he had found abundantly on *Eupatorium Cannabinum*, but that these cases exactly resembled those which Herr Mann had found on *Artemisia*. In June, of this year, Mr. C. J. R. Jordan found at Teignmouth some larvæ of *Coleophora* feeding on *Eupatorium*, and also on *Inula dysenterica*; their cases were similar in form to those of *C. Inulæ*, but twice the size, and from them have been reared several specimens of an insect allied to *Inulæ*, but distinct. Mr. Weir, when at Pembury in June last, found the larvæ of *Coleophora* on *Eupatorium*, and also some on *Inula*; the cases were quite similar, but all small, the size of the ordinary cases of *C. Inulæ*. Mr. Weir imagined that he had here the larvæ of two species, but unfortunately he did not succeed in rearing any. Reanmur was acquainted with the larva of a *Coleophora* on the *Eupatorium*, of which he has figured the case, pl. 10, f. 1, 2, 3, and 6.

Inulæ. The larva in May and June on *Inula dysenterica*, growing in the shelter of hedges. Mr. Douglas has found this on the road from the Norwood Station to West Wickham Wood.

Lineolea. The larvæ feed in April and May on *Ballota nigra* and on *Stachys sylvatica*: on the former plant frequently abundant, on the latter more sparingly. Von Heyden's *Stachydella* (Linn. Ent. iv. 327) is certainly only this species.

Argentula. The larva feeds on the seeds of the yarrow (*Achillea Millefolium*) in September and October, not however changing to the pupa state till June: hence the insect is difficult to rear.

Hemerobiella. The larva feeds on fruit-trees in May: not uncommon in gardens at Hammersmith, Putney, &c. Fischer-von-Röslerstamm has figured the transformations of this species in his pl. 69.

Laricella. The larva in April and May on larches. The case and discoloration of the larch-leaves are figured by Hübner (Larvæ, vol. iii., Tineæ, vi., Alucitiformis, A. a.), and by Ratzeburg, (2 Theil, pl. 15, f. 3).

Albitarsella. The larva feeds on *Glechoma hederacea* during the winter and early spring months. According to Bruand it feeds also (*lividella*, Bru.) on *Origanum*. For figures of the larva, case, and discoloration of the leaf, see Ent. Trans. n. s. ii. pl. 11, f. 1.

Nigricella. The larva feeds, in May and June, on hawthorn, apple and pear: a case on the pear is figured by Reaumur, (pl. 7, f. 7, 8, 9). In many localities the species is excessively abundant on the hawthorn. This insect, or an unnamed species closely allied to it, also feeds on the birch.

Fuscedinella. The larva feeds in May and June on elm and alder. The case and mode of mining are figured by Reaumur (pl. 8, f. 1—11). Either this same species, or others very closely allied to it, feed on hornbeam and nut.

Lusciniæpennella. The larva feeds on roses in May. This had been observed by Reaumur (iii. 99, "C'est sur des rosiers," &c.), and a description of its transformations occurs in Bouché's 'Naturgeschichte der Insekten,' (p. 131, under the name of *Gryphipennella*). An account of the larva and case appears in Köllar's 'Insects injurious to Gardens,' (see Loudon's translation, p. 180), under the name of *Rhodophagella*.

Viminetella. The larva feeds on osiers and sallows in May. This species is first alluded to by Zeller in the Linn. Ent. iv. in a note at pp. 393, 394. The perfect insect closely resembles some of the other unicolorous species, but the larva-case is very different.

Solitariella. The larva in May and June on *Stellaria holostea*, and occasionally on *S. uliginosa*. For figures of the larva, case, and discoloration of the leaves, see Ent. Trans. n. s. ii. pl. 11, f. 3.

Lutarea. The larvæ abundant in May, on oaks. I have sometimes found it on birch. The case is figured by Reaumur, pl. 7, f. 1, 2, 3.

A. 2. British species of which the transformations are suspected, or, resting only on single observations, require further investigation.

Deauratella, *paripennella*, *Wockeella*, *lixella*, *ochrea*, *cæspititiella*, *alticolella*, *lacunicolella*, and *badiipennella*.

Deauratella. This insect was bred in 1850, by Mr. Gregson, of Liverpool, who wrote to me as follows:—"Mr. Allis and I took some by sweeping" at Bowness, early in June, "and I bred it amongst yellow clover which I brought home with me." I presume the "yellow clover" was *Trifolium procumbens*.

Paripennella. This was bred abundantly from cases found on an old fence at Kennington, by Mr. Thomson, in April and May. I have observed larvæ, in cases of similar construction, feeding in July, August and September, on sloe, nut, birch, bramble, &c.; but not having hitherto succeeded in persuading these larvæ to live through the winter, I have no certainty that they really belong to *paripennella*.

Wockeella. Mr. Weir has this year bred this species from a case he found at Pembury, in June, attached to a leaf of *Genista tinctoria*; he could not, however, observe that the plant had been anywhere eaten by it.

Lixella. Professor Zeller states that the larva feeds on the leaves of *Holcus lanatus*. Mr. Douglas found in April, this year, the larva of a *Coleophora* feeding on a smooth-leaved grass, in the hilly field at Headley Lane: the larva however unfortunately died.

Ochrea. Of the larva of this, Herr Mann writes to Professor Zeller, "the cases occurred in plenty, on dry, sunny slopes, on the capsules of a plant." He sent dried specimens of the plant to Professor Zeller, who found it to be *Potentilla argentea*. The cases should probably be looked for in autumn on the receptacles of this plant.

Cæspititiella, *alticolella*, *lacunicolella*. I have now bred the larvæ which feed from September to June on the seeds of the common rush, and they prove to be *C. alticolella*. Should *cæspititiella* and *lacunicolella* be distinct species, their larvæ may be expected

to feed on other kinds of rush. Mr. Almond, of Birkenhead, found in May a case which would probably belong to some allied species. I do not however know on what plant it was found, further than that the Lancashire collectors call it "the star grass."

Badiipennella. I have bred this from a larva which fed on ash in May. The perfect insect appears very partial to elms, on which probably the larva also feeds. My case on ash, which was found by Mr. Preston in 1851, was smooth, and much smaller than a case of *C. fuscadinella*.

A. 3. British species of which we have no record of the preparatory states having been observed.

Spissicornis, *Frischella*, *albicosta*, *Vulnerariæ*, *niveicostella*, *saturatella*, *therinella*, *murinipennella*, *annulatella*,* *juncicolella*, *orbitella* and *olivaceella*.

Spissicornis. Mr. C. S. Gregson imagined that he had bred this in 1850, from *Centaurea nigra*, but the experience of subsequent years shows that it was really *C. Alcyonipennella* that he had bred. The perfect insect being so common in many places, it is strange that the larva has not ere this been detected.

Frischella. Mr. Curtis and Mr. Dale both represent the perfect insect as being partial to clover, hence probably the larva feeds on that plant.

Albicosta so continually occurs among furze, that I cannot but suspect the larva feeds on that plant.*

Vulnerariæ. The larva of this has not been detected; the heliiform case of the larva which Professor Zeller had observed on *Anthyllis Vulneraria*, and which he imagined probably belonged to this species, is the case of *Psyche helicinella* (see Ent. Trans. n. s. i. 238).

Niveicostella. The perfect insect occurs at the end of June in the hilly field at Headley Lane, where much *Hippocrepis comosa* grows. Does the larva feed on that plant?

Saturatella. This being now certainly a good species, it is worth making some effort to find the larva. I have always found the perfect insect in the vicinity of broom.

Therinella, *murinipennella*, *annulatella*,* *juncicolella*, *orbitella*, and *olivaceella*. We have at present no clew to the larvæ of these species.

* See Postscript, p. 4036.

Here I should mention some larvæ of *Coleophora* which have been observed in this country, but from which the perfect insects not having been reared, we are unaware to what species they should be referred.

1. A larva in a cylindrical case, feeding on the seeds of *Atriplex** and *Chenopodium* in September and October. I have found this plentifully here, and sparingly in Sussex and Devonshire; Mr. Grant finds it at Putney, and Mr. Shield near Dublin. The larvæ continue in that state until the following June, hence the difficulty in rearing them. This species has been mentioned by Zeller in the *Linn. Ent.* iv. 354, as *perhaps* the larva of *flavaginella*. The cases on *Atriplex* did not escape the acute observation of Reaumur, who says "I have found a species attached to the seeds of the *Atriplex*," (iii. 121).
2. A larva feeding on elm in June and July, in a case much larger than that of *fuscedinella*. Mrs. Stainton found it at Sutton, June 23rd and July 6th. I have subsequently found it here, though by no means common. It is probably the larva of *limosipennella*.
3. A larva in a most singular case, on hawthorn and apple, in July and August. I first observed this last summer, but did not succeed in rearing the perfect insect. The case is generally formed of *an entire leaf*, but as the larva only inhabits a narrow cylindrical fold in the middle of it, the sides of the leaf project, and one side is generally more or less turned over; we thus see a withered brown leaf endowed with powers of locomotion, and becoming a true *folium ambulans*. I have doubted whether it could indeed be the case of a larva of this genus, but Professor Zeller, to whom I showed some when he was here last summer, was unable to imagine that it could belong to any other.
4. A larva feeding on birch, in autumn, in a case much like that of No. 2. I found this in Devonshire last September, and Mr. Wilkinson found it at West Wickham; all our larvæ died, and hence the name of the perfect insect has not been ascertained.
5. A larva feeding on meadow-sweet (*Spiræa Ulmaria*), found by Mr. Douglas at the beginning of July, in a case somewhat similar to that of *fuscedinella*.
6. A larva mentioned by Mr. Rennie in 'Insect Architecture' (p. 226), on stinging nettle? (*Urtica*?). "We have just discovered (Nov. 4, 1829) upon the nettle, a tent of a very singular appear-

* See Postscript, p. 4036.

ance in consequence of the materials of which it is made. The caterpillar seems indeed to have proceeded exactly in the same manner as those which we have described; mining first between the two membranes of the leaf, and then uniting these and cutting out his tent. But the tent itself looks singular from being all over studded with the stinging bristles of the nettle, and forming a no less formidable coat of mail to the inhabitant, than the spiny hide of the hedgehog." From the use of the words "stinging bristles," I conclude a species of *Urtica* is here meant, otherwise I should have imagined the case alluded to was that of *lineolea*, on *Stachys* or *Ballota*.

B. 1. Continental species, which have not been detected here, of which the larvæ are known.

Onopordiella, *Ballotella*, *Cœlebipennella*, *Astragalella*, *Coronillæ*, *serenella*, *Onobrychiella*, *auricella*, *Saponariella*, *Otitæ*, *Gnaphaliella*, *Millefolii*, *limosipennella*, *ochripennella*, and *Goniodoma auroguttella*.

Onopordiella has been bred by Herr Mann, from larvæ found on *Onopordon Acanthium*, a not uncommon British thistle.

Ballotella. The larva in July and August, on *Ballota nigra* and *Lamium purpureum*, in cases similar to those of *lineolea*. Fischer-von-Röslerstamm has figured the transformations of the species, pl. 58. Bruand says that it also feeds on *Teucrium Scorodonia*.

Cœlebipunctella. The larva feeds on *Artemisia campestris*, in a case similar to that of *Pyrrhulipennella*.

Astragalella. "The larva feeds on *Astragalus* abundantly, but is difficult to rear; the male larva is rosy red, the female pale yellow."—Mann. Linn. Ent. iv. 244.

Coronillæ. The larva feeds on *Coronilla varia*.

Serenella. "Formerly the larvæ were very abundant in a garden at Vienna, on *laburnum*."—Mann, Linn. Ent. iv. 270.

Onobrychiella. "This species occurs in June and September, near Vienna, in dry places, where its food-plant, *Onobrychis*, grows. Several years back, they were bred plentifully."—Mann, Linn. Ent. iv. 272.

It seems impossible to imagine any species of *Coleophora* double-brooded, so that this species must keep out for a very long time, or the "June and September" must apply to two different species.

Auricella. The larva feeds on *Stachys recta*, (Linn. Ent. iv. 288).

According to Bruand (Cat. des Lépid. de Besançon) it is not rare on *Teucrium Scorodonia*.

Saponariella. The larva feeds on soap-wort (*Saponaria officinalis*) in the autumn, and again towards the end of spring. A circumstantial description of it is given by Heeger in the 'Isis,' 1848, p. 342.

Otitæ. The larva feeds on the lower leaves of *Cucubalus Otitæ*, (*Silene Otitæ*, *Babington*, p. 34) in the spring. Professor Zeller found in the autumn small cases on the *capsules* of this plant, which he imagines must be those of the young larvæ.

Gnaphalii. The larva feeds on the leaves of *Gnaphalium arena-rium*, at the beginning of June.

Millefolii. The larva feeds on *Achillea Millefolium*, in May and June; the case somewhat resembles that of *Onosmella*, but has long white hairs. It is thus totally different from the case of *argentula*.

Limosipennella. The larva feeds in July, on elms, in a case much larger than that of *fuscedinella*. (As before mentioned, I have found larvæ which I imagine belong to this species).

Ochripennella. The larva feeds on *Ballota nigra*, in a case similar to that of *C. lineolea*, and at the same time, (May).

Goniodoma auroguttella. The larva feeds on the seeds of *Atriplex* in September, in a case shaped exactly like one of the seeds: when full-fed, the larva attaches its case to the stem of the plant, and, boring into it, remains there as larva the whole winter; in May it spins a cocoon, still inside the stem of the *Atriplex*, and changes to a pupa, leaving its three-cornered case attached to the outside of the stem, as if to attract the attention of the passers by. (See Fischer-von-Röslerstamm's account of its discovery, and his beautiful figures of this species, pl. 86 and 87).

B. 2. Continental species which have not been detected here, of which the transformations are suspected, or, resting only on single observations, require further investigation.

Colutella, *ditella*, *vicinella*, *Ibipennella*, *albifuscella*, *flavaginella*, *directella* and *unipunctella*.

Colutella. Zeller gives as a reference for this species Reaumur's pl. 11, f. 1—4, which represent the very curious case termed by Reaumur *à falbalas*, observed by him on the *Astragalus* in June. These furbelowed cases were of a dirty white. Fabricius, who described the species from an insect bred from a larva found

on *Colutea arborescens*, gives the same reference to Reaumur. Further, the peculiar case figured by Reaumur does not belong to the larva of any species with which we are acquainted, unless indeed it be that of *Astragalella*, the form of which I do not find mentioned.

Ditella. "Discovered by Von Heyden, at Frankfort; the larva-cases are found on *Artemisia campestris*." — Zeller, Linn. Ent. iv. 248.

Vicinella. Herr Mann sent one specimen of this, and one of *partitella*, to Professor Zeller, with the information, "near Szexard, in Hungary, the larva-cases on *Coronilla*, from which the moths came out in July." — Linn. Ent. iv. 252. The cases resemble those of *palliatella*.

Ibipennella. The larva-case, exactly similar to that of *Tiliella*, was found on an oak-leaf at Frankfort.

Albifuscella. The larva-case was found by Senator von Heyden, in July, attached to the lower part of the capsule of *Lychnis viscaria*, with only a small portion of the end projecting. Reaumur has figured (pl. 8, f. 21—24) the case of a larva feeding on the leaves of a species of *Lychnis*.

Flavaginella. Madame Lienig found the larvæ on walls, fences, and trunks of birch-trees, from March to the end of June ('*Isis*,' 1846, p. 295). Zeller suspects that the larvæ which feed in autumn on the seeds of *Chenopodium* and *Atriplex* should be referred to this species.*

Directella. Dr. Wocke found about eighty cases of the larvæ on *Artemisia vulgaris*, on the 26th of May, 1848, after a thunder-shower. "The larvæ however did not take to the food offered them, and nearly all died; probably they had only crawled on to the *Artemisia* out of the wet. Only two of the perfect insects came out towards the middle of July." — Linn. Ent. iv. 368. The cases were cylindrical, clothed with thick, short, whitish-gray down. Mr. Douglas and myself have taken the perfect insect of a *Coleophora* among *Artemisia*, which may, perhaps, when we obtain bred specimens, prove to be this species: but hitherto we have found no larvæ on the *Artemisia*. A singular case, found by M. Bruand of Besançon on *Artemisia*, was forwarded by him to Mr. Doubleday this spring. The case is extraordinarily broad, and looks more like a withered bud; the

* See Postscript, p. 4036.

larvæ crawled about without feeding, and finally attached themselves to the stem of the *Artemisia*, where they still remain, in all probability dead.

Unipunctella. Herr Mann says of this, "the species flies near Vienna, in mountainous localities, in July and August, and its larva is abundant on *Chenopodium*, but generally dies in captivity during the winter."—Linn. Ent. iv. 306. The form of the case is not mentioned, nor whether it feeds on the seeds or the leaves of the *Chenopodium*.

B. 3. Continental species which have not been detected here, of which we have no record of the preparatory states having been observed.

Hieronella, *cuprariella*, *fuscicornis*, *Vulpecula*, *binotatella*, *squalorella*, *ornatipennella*, *valesianella*, *vibicigerella*, *partitella*, *fuscociliella*, *trifariella*, *Oriolella*, *Gallipennella*, *bilineatella*, *stramentella*, *albicostella*, *virgatella*, *chalcogrammella*, *leucapennella*, *crepidinella*, *Fringillella*, *rectilineella*, *tractella*, *nubivagella*, *fretella*, *striolatella*, *derivatella*, *lineariella*, *præcursella*, *obtectella*, *versurella*, *Motacillella*, *punctipennella*, *granulatella*, *albicans*, *punctulatella*, *Binderella*, *lithargyrinella*, *deviella*, and *Milvipennis*.

Here is indeed a wide field of research !!

In conclusion, I wish to impress upon collectors the necessity of making themselves acquainted with the larvæ of this genus. The perfect insects never appear to fly of their own accord, and excepting in the instances of tree-feeding species, such as *fusedinella*, *lutarea*, &c., which in windy weather may be observed flying back to the trees in little swarms, none of them are ever met with plentifully in the perfect state. When disturbed, they fly for a short distance, and then speedily settle: from their disinclination to fly, it is rare to meet with flying specimens in good condition, hence specimens taken on the wing are more or less wasted, and thereby become extremely difficult to name. This difficulty is increased by the great similarity of many species; and those who wish to have their collections named, should breed their specimens.

There are one or two points in the natural history of the larvæ, which it would be desirable to clear up. Some of the larvæ make their cases of leaves, and some of silk; but we cannot always speak confidently as to which species belong to each class. (*C. Tiliella* and

palliatella have two of the most singular *silken* cases with which we are acquainted). Some of the larvæ have when young the case of a different form to that which they afterwards bear; thus the case of fuscadinella or of nigricella is curved when very young, the case of the adult larva being straight. In other species we *imagine* that the form of the case does not vary with the age of the larva.

All the species with which we are acquainted seem to pass the winter in the larva state; but there is this difference, that some are very small at the time of their hibernation, some are half grown, and some are full grown, and do not take any food subsequently. Fuscadinella and nigricella may be instanced as species which pass the winter in the very young state, in their curved cases: albitarsella, discordella, and viminetella may be mentioned as species which pass the winter when more fully grown, (indeed, last year I bred a specimen of viminetella in November, and though no doubt this was forced, I imagine it shows that some of these larvæ are completely fed up, and perhaps changed to the pupa before the winter sets in). The seed-feeding species, argentula, and that on the Atriplex, no doubt attain their full growth before hibernation. Of some of the species, the larvæ are found more freely in the autumn; and although it is not easy to keep them alive in-doors all the winter, it may be desirable to put the larvæ on convenient individual plants, leaving them to shift for themselves during the winter, and to collect them again in the spring. Last autumn I transplanted a number of larvæ of viminetella to some willow bushes that were more conveniently situated for me, but unfortunately I quite forgot having made this preserve, until I found in July the empty cases and marks where the larvæ had been.

H. T. STANTON.

Mountsfield, Lewisham,
July 27, 1853.

P.S. — Since the above was written, Mr. Douglas and I have bred the Coleophora from the seeds of the Atriplex, (No. 1). Mr. Douglas's specimen appears to approximate to flavaginella, whereas mine appear to be annulatella. Mr. Boyd has this month found at Lyndhurst, the larva-case of a Coleophora on the *pods* of furze; (*Ulex*); this is probably that of albicosta. — H. T. S.

August, 16, 1853.

Note on Lepidoptera bred from Larvæ. — I have lately bred the following insects from larvæ taken by myself last summer: —

- Notodonta trepida, two, larvæ beaten off oak in July, Herts.
 „ Chaonia, two, larvæ beaten from oak in July, Herts.
 „ Dromedarius, three, from larvæ on birch in September, Derbyshire.
 „ Dictæa, four, from larvæ on poplar, Herts and Derbyshire.
 „ Ziczac, two, ditto.

Pterostoma palpina, three, from larvæ on poplar, Herts.

Ceropacha ridens, one, from a larva beaten off oak in July, Herts.

„ Or, one, ditto.

Dianthæcia carophaga, five, from larvæ on seeds of *Silene inflata*, July and August, Herts, Bucks, and Derbyshire.

„ Cucubali, five, from larvæ on *Silene inflata*, July and August, Herts, Bucks.

„ capsincola, three, from larvæ on seeds of *Iychnis dioica*, August, Derbyshire.

Thyatira batis, two, from larvæ on raspberry, July, Herts.

Acronycta Ligustri, one, from a larva on ash, July, Herts.

Eurymene dolabraria, one, from a larva beaten off oak in July, Herts.

I have also bred, but unfortunately in too deformed a state to be of any use, *Dianthæcia conspersa*, from a larva found on seeds of *Iychnis dioica* in Derbyshire; and *Platypteryx falcula* from larvæ on birch, in September, in Derbyshire. — *H. Harpur Crewe*; 17, *Cavendish Road, St. John's Wood, June 18, 1853.*

Captures of Lepidoptera at Chorley. — I have lately taken four specimens of *Dianthæcia? conspersa*, three sitting on trees, the other on a *Rhododendron*; also *Deilephila Elpenor*, *Hadena gemina*, *Cucullia umbratica*, *Abrostola triplasia*, *Plusia Festucæ*, *Iota*, *inscripta*, and many other common Noctuæ. — *E. C. Buxton, jun.*; *Adlington Hall, Chorley, Lancashire, June, 1853.*

Additional Note on Ichneumon Atropos, Curt. — At a meeting of the Linnean Society on the 15th of February, 1853, there was read “an ‘Additional Note’ to Mr. Newport’s Memoir on *Ichneumon Atropos, Curt.*, in reference to the changes which take place in the alimentary canal after the parasite has ceased to feed, and while assuming its imago state. These changes, which are very considerable both as regards form and condition, are minutely described; and every part of the canal is shown to be supplied with tracheæ, the trunks of which, one in each segment, passing transversely inwards, divide into branches, which, again subdivided, penetrate into and ramify through the structure. These, like all other tracheæ, are formed, as described by Sprengel, of three tissues, an external membranous and an internal mucous, inclosing between them a strong spiral fibre. The nature and origin of the external tissue have been shown by Mr. Newport in previous memoirs; but he has since found that the ramifications of the tracheæ which penetrate the structure of the canal, or of any other organ, become denuded of this external covering, and then seem to be formed only of two tissues, the spiral and the mucous, if indeed there be not also, as he has some reason to think, an extremely delicate serous, or basement membrane, closely adherent to and uniting the coils of fibrous tissue on its external surface. The ultimate divisions of the tracheæ are always distributed separately, and do not anastomose, ending, as noticed by Mr. Bowerbank, in extremely minute, filiform, blind extremities; and this Mr. Newport finds to be their condition in all structures, in the nervous

and tegumentary, equally as in the glandular and muscular. These facts, the author observes, may perhaps assist us to understand the nature of the injection of the tracheæ by M. Blanchard, and also the mode of nutrition in insects; the ultimate branches of tracheæ in the tissues of the alimentary canal operating, possibly, as absorbent structures, and inducing the chylic fluid elaborated around them to flow, in its transit outwards, along the channels formed by their loose peritoneal covering into the regular circulatory currents. Further, they may assist to explain the mode of coloration of the tracheæ in the experiments of MM. Alessandrini and Bassi, and of M. Blanchard, and also in others, yet unpublished, made by himself on the larvæ of *Clisso-campa Neustria*, in July, 1837."—From the 'Proceedings of the Linnean Society,' 213.

Note on the Ocelli in the Genus Anthophorabia, Newp.—At a meeting of the Linnean Society on the 19th of April, 1853, Mr. Newport "remarked that since the publication of his observations on these insects in the 'Transactions' of the Society, his attention had again been directed to the peculiarities of the organs of vision in the male sex. He had already shown that these individuals possess only ocelli at the sides of the head as well as on the vertex, but that these structures exist at precisely the same parts of the head as the ocelli and the compound eyes in the female, and consequently that there can be no doubt of their homology. These appearances, however, having led some to question the correctness of this, it became necessary, in order to judge aright of their nature, to consider what are the essential conditions of a structure which is specially destined for the appreciation of light. This consists, as already pointed out in fishes, of a follicle or pit in the tegument of the head, coated with dark pigment, and receiving the distal termination of a particular cerebral nerve, conditions which are precisely those of the ocelli, both of the sides of the head and of the vertex, in *Anthophorabia*. The various modifications of the eye in insects, with regard to the form of the cornea, the depth of the chamber, and the presence of the choroid, and of the lens, with reference to the extent of field, and the focal distance, of vision, were pointed out, and the degree in which they exist in *Anthophorabia* mentioned, as coinciding with the peculiar habits of the insect. The structures in the male were thus shown, by the presence of cornea, chamber, choroid, and nerve, to be most indisputably organs of sight. The author referred also to the binary origin of the nerve of the middle ocellus of the vertex, as formerly pointed out by him in his paper on *Pteronarycs*; to the origin of ocelli in the same way as other dermal tubercles; and to the imperfect eye-spots in the *Scorpionidæ* being supplied with nervous filaments from the same optic nerve which supplies the recognized organs of vision in those animals."—From the 'Proceedings of the Linnean Society,' p. 219.

Capture in the North of England of six Species of Coleoptera new to the British Fauna.—Having some few Coleoptera, principally small species, which I was unable satisfactorily to name, I availed myself of M. Javet's kindness, and sent them to Paris for examination. By his and Dr. Aubé's courtesy, I am enabled to record the following, which have not, in so far as I am aware, hitherto been taken in Great Britain:—

Oxypoda maura, *Erichs.* A pair taken on the herbage of a pond at Gosforth, May.

Ephistemus globosus, *Waltl.*, *Erichs.* One on a hot-bed at Long Benton, June.

Cryptophagus badius, *Sturm.* Newcastle.

„ *acutangulus*, *Gyll.* Newcastle.

„ *dentatus*, *Herbst.* By sweeping herbage, Gosforth, June.

„ *subdepressum*, *Gyll.* Newcastle.

—Thos. John Bold; *Angas' Court, Bigg Market, Newcastle-on-Tyne, August 19, 1853.*

NOTICES OF NEW BOOKS.

'*The Annals and Magazine of Natural History*,' Nos. 66—68,
dated June, July, and August, 1853.

No. 66 contains the following papers : —

'Description of Orbitolites Malabarica (H. J. C.), illustrative of the Spiral and not Concentric Arrangement of Chambers in D'Orbigny's Order Cyclostègues.' By H. J. Carter, Esq., Assistant Surgeon, Bombay Establishment.

'Remarks upon British Plants.' By Charles C. Babington, M.A., F.R.S., F.L.S., &c.

'Further Observations on the Animal of Diplommatina, (including a Note by Capt. T. Hutton).' By W. H. Benson, Esq.

'On the Genera of the Tribe Duboisieæ.' By John Miers, Esq., F.R.S., F.L.S.

'Notes on some British Zoophytes.' By Wyville Thomson, F.R.P.S. &c., Lecturer on Botany, Univ. and Marischal College, Aberdeen.

'Observations on Relative Position ; including a new Arrangement of Phanerogamous Plants.' By B. Clarke, F.L.S. &c.

'On some points relating to the Structure and Mechanism of the Wolf-fish, (*Anarrhichas Lupus*).' By Edwards Crisp, M.D.

Proceedings of Learned Societies : — Zoological Society—Botanical Society of Edinburgh—Entomological Society.

Miscellaneous : — On the Reproduction of Frogs and Toads without the intermediate stage of Tadpole ; by the Rev. L. Jenyns. Researches on the Fecundation and Formation of the Embryo in the Hepaticæ and Ferns ; by H. Philibert. Mode of determining the Optical Power of a Microscope ; by Prof. Harting, of Utrecht. Marine Vivaria ; by William Thompson. Labidocera magna ; by J. Lubbock. Observations on the Anatomy of the Antennæ in a small Species of Crustacean ; by John D. M'Donald, M.D., Assistant Surgeon to H.M.S.V. Torch. Meteorological Observations.

Mr. Wyville Thomson describes *Reticularia immersa*, a new genus and species of British zoophytes allied to the Sertulariadae, which "differs from Coppinia and approaches the other Sertularians in having its polyp-cells springing from a common horny tube." Found at Newhaven ("usually investing *Sertularia abietina*") and Aberdeen.

In the letter 'On the Reproduction of Frogs and Toads without the intermediate stage of Tadpole,' the Rev. L. Jenyns refers to his

‘Observations in Natural History,’ wherein he has “recorded the circumstance of toads inhabiting the cellars at Bottisham Hall,” whence there is no escape, where “they may often be noticed in the spring *in copulâ*, and where” he says, “I have also seen young toads, though I never noticed any spawn-deposits.” He also refers to his ‘Manual of British Vertebrate Animals,’ wherein he alludes to the circumstance of the common newt or eft being found on land, of all sizes, but ever in a perfect state, as observed by Sheppard and Shaw. At one time, Mr. Jenyns could not account for their occurrence, otherwise than on the supposition that the efts had been bred in “the merest puddles caused by rains, which soon drying up, obliged them to exchange their native element as larvæ for another, before they would have ordinarily attained the perfect form; and that this led to the gills being cast prematurely to enable the animal to accommodate itself to its new circumstances:” now, however, he thinks it more probable, “after what Mr. Lowe has stated in the case of frogs and toads, that these individuals may have been *born on land in the state in which they are found*, and that in fact gills never existed, or disappeared almost immediately after birth.”

No. 67 contains the following papers:—

‘Remarks on some Algæ belonging to the Genus *Caulerpa*.’ By R. K. Greville, LL.D., &c.

‘On the Genus *Truncatella*.’ By William Clark, Esq.

‘On the Operculum of the Genus *Diplommatina*.’ By Dr. J. E. Gray, F.R.S., V.P.Z.S., &c.

‘Description of a new Species of *Rhododendron* from Bootan, in India.’ By Thomas Nuttall, Esq.

‘On Relative Position; including a new Arrangement of Phanerogamous Plants:—Part IV. On Dorsal Placentation.’ By B. Clarke, F.L.S., &c.

‘On the Phosphorescence of some Marine Invertebrata.’ By M. A. De Quatrefâges.

‘On the Structure of the Leaves of Palms.’ By M. A. Trécul.

Proceedings of Learned Societies:—Linnean Society—Zoological Society—Botanical Society of Edinburgh.

Miscellaneous:—On the Fecundation of the *Fucaceæ*; by M. Gustave Thuret. Time of Spawning of British Crustacea; by William Thompson. Experimental Researches on Vegetation; by M. Georges Ville. On the Priority of the Discovery of the Mode of Action of the *Pholades* in the Perforation of Stones; by M. Vrolik. On Sun

Columns observed at Sandwick Manse, Orkney; by the Rev. C. Clouston. Meteorological Observations.

Professor Vrolik, of Amsterdam, states in the 'Comptes Rendus' for May 2, 1853, that the perforation of stones by the mechanical action of the shells of Pholades, without the aid of an acid, was described more than seventy years ago by Léendert Bomme, a Director of the Commercial Company of Middlebourg, in a memoir published in the 'Transactions of the Scientific Society of Flessingen.'

The papers in No. 68 are intitled: —

'On the Genus Cercyon, with a short Monographical Synopsis of the British Sphæridiidaë.' By Andrew Murray, W.S. Edinburgh.

'Characters of New Land Shells, collected by Edgar L. Layard, Esq., in Ceylon.' By W. H. Benson, Esq.

'Notes on the Ornithology of Ceylon, collected during an Eight Years' Residence in the Island.' By Edgar Leopold Layard, C.C.S.

'On the *Rissoa rubra*.' By William Clark, Esq.

'Description of several new Species of British Crustacea.' By William Thompson, Esq.

'On two new Species of Calanidæ, with Observations on the Spermatic Tubes of *Pontella*, *Diaptomus*, &c.' By John Lubbock, Esq., F.Z.S.

'Notes on some new or little-known Marine Animals.' By P. H. Gosse, A.L.S.

'On the Teeth of the Genus *Mitra*, *Lamarck*.' By J. E. Gray, Ph.D., F.R.S., V.P.Z.S., &c.

Bibliographical Notices: — 'Système Silurien du Centre de la Bohême. 1ère partie, Recherches Paléontologiques. Trilobites,' par J. Barrande. 'Popular Physical Geology.' By J. B. Jukes, F.R.S.

Proceedings of Learned Societies: — Royal Institution—Zoological Society.

Miscellaneous: — Observations on the Breeding of the Nightingale in Captivity; by H. Hanley. *Eucratea chelata*; by William F. Templer. On a new Species of *Bulimus*; by Lovell Reeve, F.L.S. *Johnstonella Catharina*, *Gosse*; by J. E. Gray, F.R.S., &c. On a new Genus of *Anomiadæ*; by J. E. Gray, F.R.S., &c. Meteorological Observations.

In his paper on the *Rissoa*, Mr. Clark proposes to constitute a new genus—*Barleea*—for the reception of the *R. rubra* of authors, living specimens of that animal, sent to him from Penzance by Mr. Barlee, being found to differ greatly from the published descriptions.

The new species of Crustacea described by Mr. Thompson are the following:—*Hippolyte Whitei*, *H. Yarrellii*, *H. Grayana*, and *H. Mitchelli*; all from Weymouth Bay.

Mr. Gosse describes the following new and rare marine animals:—*Sipunculus punctatissimus*, from Weymouth; *Spadix purpurea*, Lulworth and Weymouth; *Actinia miniata*; *Act. clavata*, *Thompson*, var. *rosea*; and *Iluanthos Mitchelli*.

Proceedings of the Entomological Society.

August 1, 1853.—SAMUEL STEVENS, Esq., F.L.S., in the chair.

The following donations were announced, and thanks ordered to be given to the donors:—The 'Zoologist' for August; by the Editor. The 'Athenæum' for July; by the Editor. The 'Literary Gazette' for July; by the Editor. The 'Journal of the Society of Arts' for July; by the Editor. 'Bulletin de la Société Impériale des Naturalistes de Moscou,' Nos. 3 and 4, 1851, No. 1, 1852: 'Die Coleopterologischen Verhältnisse und Käfer Russlands,' von Victor v. Motschulsky: both by the Soc. Imp. Nat. Moscou. 'Bericht über die wissenschaftlichen Leistungen im Gebiete der Entomologie während des Jahres 1851,' von Dr. H. Schaum; Berlin, 1853: by the Author. 'Catalogue of the Coleoptera of Scotland,' by Andrew Murray; Edinburgh, 1853: by the Author. 'Abhandlungen der Mathemat.-Physikal. Classe der Koeniglich Bayerischen Akademie der Wissenschaften,' 17 Band, 1st abth., Munchen, 1853: Bulletin ditto, No. 25: 'Ueber den Chemsismus der Vegetation,' von Dr. A. Vogel jun., Munchen, 1853: all by the Akademie. 'Transactions of the Linnean Society,' Vol. xxi. part 2, 1853: 'Proceedings of the Linnean Society,' Nos. 48—51: 'List of the Linnean Society,' all by the Society. 'Proceedings of the Royal Society,' Vol. vi. No. 97; by the Society. Two specimens of *Boletophagus crenatus*; by Mr. Foxcroft.

Viscount Goderich, M.P.; Captain Cox, Queen's Body Guard; and Henry Evans, Esq., Darley Abbey, near Derby, were balloted for and elected Members of the Society.

Mr. Stevens exhibited a female of the rare *Pachetra leucophæa*? taken flying at Mickleham, in July; and an almost black variety of *Hadena dentina*, from the same place.

Mr. Wilkinson exhibited living larvæ of *Incurvaria masculella* in their cases, feeding upon leaves of beech and hornbeam externally, having in a young state fed within the cuticles, of which the cases were formed.

Mr. Smith exhibited a very large *Boletus*, found by Mr. Foxcroft on an old birch-tree in the Black Forest, Rannoch, from which he had extracted *Boletophagus crenatus*. He also exhibited a large quantity of Mr. Foxcroft's captures of Coleoptera, Lepidoptera, and Hymenoptera in Perthshire, including many rare species, and among the Coleoptera, *Noctiluca splendidula*? a new British species.

Mr. Douglas exhibited *Ino Globulariæ*, taken at Cheltenham in July, being a new locality for this species; also *Heliothis marginata*, and twelve other species of *Noctuidæ* captured at the same time and place, flying at dusk about the flowers of *Silene inflata*.

Mr. Bond exhibited some leaves of parsnep from Cambridgeshire, affected with the same disease as the potatoes, which the growers think is caused by insects. He however had only found on them a few minute Aphides, Psoci, &c., which he now handed to Mr. Westwood for examination.

Mr. Edwin Shepherd exhibited a remarkable variety of *Anticlea rubidata*, in which the ordinary broad band on the fore-wings had been converted into a narrow fascia.

Mr. Stainton exhibited an insect, captured by Mr. Boyd in the New Forest, closely resembling a Lepidopterous *Nepticula* or *Elachista* in its size, brilliancy, colour, and marking, but which was in reality Trichopterous, and probably of a new genus.

Mr. Westwood exhibited a new entomological product from the interior of Tropical Africa, near the Bight of Benin, consisting of a mass of the cocoons of one of the Lepidoptera, probably allied to *Galleria*, which was found loosely attached to trees. It formed a spongy-looking silky body, which, from the agglomeration of the multitude of cocoons, could not be wound off like ordinary silk, but had to be carded, like wool. He also exhibited the material as it appeared in two subsequent stages of manufacture, in which it resembled floss silk; from this it was spun into threads, and woven into articles of different kinds, which had a strong and cotton-like texture. This substance would probably be turned to account, for several silk-manufacturers had seen it, and thought it might prove a desirable addition to our materials for textile fabrics. He also exhibited some dyed silk from the same country, which he thought was the product of another insect.

Mr. Westwood read from the 'Gardeners' Chronicle' a recommendation of chloroform as an agent for stupefying bees, when such a proceeding, for the purpose of taking honey, or from any other cause, was necessary in the apiary, in preference to sulphur or fungus.

Mr. Westwood then read from the Boston (U. S.) 'New England Farmer' of July 2nd, the following account, headed "A new Enemy in the Field;" stating that Dr. Harris had not noticed this caterpillar in his writings on injurious insects:—

"Within the past three days, we have noticed on our apple-trees a small worm, which threatens destruction to our most valuable crop. His manner and size are much after the style of the canker-worm, but his personal appearance is different. Like the canker-worm, he devours the leaf all but the tough fibres, and if you suddenly shake the tree, spins down on his thread like a spider, and he leaves the tree looking as if seared by fire."

"The canker-worm, if I recollect aright, when he visited New Hampshire twenty years ago, was always of a dark colour, and moved soberly *by measure*, while these creatures are of all colours, black, brown, green and striped, and they slip off your hand with a sort of *waltzing* step, in a second."

"I have travelled from Chester, through Raymond and other towns, home today, and have observed them all along. They are abundant, not only on the apple-tree, but on the plum, and on the white and red oak. The peach, which promises a great crop this season, seems to be free from them. Probably Professor Harris can tell us all about the animal in a moment."

"H. F. FRENCH."

"Exeter, N. H., June 20, 1853."

Another communication was as follows :—

“ In our vicinity an enemy has appeared upon our fruit-trees, the apple and the cherry, which threatens to destroy our entire crop. So far as I can learn, the foe is a stranger to our fruit-growers ; it is spread upon all parts of the tree, and, when it is shaken, drops from it suspended by a web, then winds up its web, and again gains its position on the tree. The trees, when badly eaten, present a dry and sere appearance. In all these points it is like the canker-worm, as it is also in size, and to a casual observer it would be pronounced their work ; but in many respects it is dissimilar. The canker-worm is brown, this is nearly white, with two longitudinal stripes running its whole length ; the canker-worm is slow of motion, this is very quick, and moves rapidly from place to place in all directions, to escape an enemy ; the canker-worm moves forward by doubling or opening and throwing forward its head and fore part, this is provided with 16 legs,—6 near the head, 8 near the middle, and 2 at the tail, and uses them with great celerity in running. The canker-worm has no shelter upon the tree, but lies out upon the leaf or branch ; this forms itself a house by webbing the corner of a leaf, into which it retreats on the first appearance of danger : the canker-worm rarely eats the fruit, if it can get leaves ; this is now eating into and spoiling and disfiguring the fruit. Of the insect which produces them I know nothing. My neighbours say that about three or four weeks since they noticed an abundance of small millers, of an ash colour, and they may have proceeded from them. If the insect, with its habits, are unknown, we have before us a work of careful observation, as the first descent of these depredators threatens more injury to our fruit than any other insect which has attacked our trees. If there are not enough to spoil my trees and fruit entirely now, I am sure that double the present number on those of my trees most eaten, would not leave me an apple or a leaf remaining.

“ R. C. STONE.”

“ Sherburne, June 21, 1853.”

The Editor adds :—“ Shaking the trees pretty freely dislodges them. We advise this practice, and also syringing the young tree well with whale-oil-soap, strong soap-suds, or even clear water. We understand that muriate of lime will destroy them, by sprinkling the ground with it, and shaking the worms down upon it.”

Mr. Wollaston communicated an extract of a letter from Dr. Schaum, informing him of the death of Dr. Germar on the 8th of July, from an attack of gout, at the age of 66.

Mr. Smith read some “ Observations on the Economy of *Pompilus punctum*,” showing that *P. petiolatus*, *Vander Linden*, is the female of that species, which fact he had ascertained by breeding both from one set of cells, found by the Rev. W. Delmar, at Elmstone Rectory, near Canterbury, and communicated to him by Mr. W. Thomson, Director of the Natural-History Department at the Crystal Palace.

Mr. Douglas read the following extract from Layard’s ‘ Discoveries in the Ruins of Nineveh and Babylon,’ 1853, page 338.

“ *Ruins at Konyunjik.*—The walls were panelled with sculptured slabs about six feet high. Those to the right in descending represented a procession of servants carrying fruit, flowers, gum, and supplies for a banquet, preceded by mace-bearers. The

attendants who followed carried clusters of ripe dates, and flat baskets of osier-work filled with pomegranates, apples, and bunches of grapes. They raised in one hand small green boughs to drive away the flies. Then came men bearing hares, partridges, and dried locusts fastened on rods. The locust has ever been an article of food in the East, and is still sold in the markets of many towns in Arabia. Being introduced in this bas-relief amongst the choice delicacies of a banquet, it was probably highly prized by the Assyrians."

Mr. Douglas also read the following translation from the 'Entomologische Zeitung' for April, of a "Report by Professors Goeppert and Cohn, of a Lecture by Professor von Siebold on Strepsiptera, at a meeting of the Silesian 'Gesellschaft für vaterl. Cultur,' at Breslau, on the 9th of February."

"The Strepsiptera form such a remarkable and isolated group of insects, that the oldest French and English entomologists, who were the first to draw the attention of the naturalist to these exceedingly rare insect-parasites, raised them into a distinct Order. In Germany they remained almost entirely unnoticed; indeed, the ignorance of this interesting group was so great, that up to a very late period no account of it exists in any German zoological hand-book. The lecturer, at different times, in journals and papers of scientific Natural-History Societies, has published his observations upon the very singular organization of the Strepsiptera, so different from that of all other insects, and upon the history of their wonderful propagation, without having had here in Germany these communications completed or extended by others; whilst in England, they appear to be peculiarly fortunate in discovering and observing these insects. Through the researches of English entomologists, we know up to this time 14 species of Strepsiptera, in 5 genera; among which are 11 European species. In order not to repeat what the lecturer published on the Strepsiptera some years since, he referred to the last paper on the subject in the 'Proceedings of the Naturforschenden Gesellschaft of Danzig,' Bd. iii. Heft 2, 1839; later in the 'Entomol. Zeitung,' 1843, p. 113, and in Wiegman's 'Archiv für Naturgeschichte,' 1843, Bd. i. p. 137. Herr von Siebold has continued, in Freiburg, the investigations into the Strepsiptera which he had commenced in Danzig and Erlangen, where it was easy for him to procure his materials: here in Breslau he laboured in vain to obtain Strepsiptera; and none of the many able Silesian entomologists could give him an idea where and how to procure these insects. Herr von Siebold hopes therefore, after his approaching return to South Germany, again to renew his researches, and to be able to complete his Monograph of the Strepsiptera. The reason why he now speaks about them is, that in the last 'Catalogus Coleopterorum Europæ,' published by the Entomological Society of Stettin, the Strepsiptera are presented as a family of beetles, under the name of 'Stylopites.' The Strepsiptera have had the fate to see themselves classified in all the hitherto known Orders of insects, by those entomologists who would not acknowledge them to be a distinct Order. The first proposition to bring the Strepsiptera among the Coleoptera, was put forth by Burmeister (in his 'Handbuch der Naturgeschichte,' 1837, p. 643), without giving any further reason for his supposition that they should occupy their natural position among the family Mordellidæ: he was merely led thereto by the idea that the larvæ of Strepsiptera are parasites on bees, and the larvæ of Symbius and Rhipiphorus, belonging to the Mordellidæ, also live as parasites, the former on Blatta, the latter on Vespa. This view of Burmeister has recently been supported

in England, by Newman ('Zoologist,' 1850, p. 2684), who endeavours to prove that the Strepsiptera are genuine Coleoptera. We find the grounds of his arguments stated in extracts in the entomological 'Jahrsbericht' of Wiegman's 'Archiv,' (1851, Bd. ii. p. 200). Herr v. Siebold is not convinced by the reasons given, that the Strepsiptera are beetles. The resemblance of the larvæ of Strepsiptera to those of Meloë is referred to, but that is only very superficial; the latter have the parts of the mouth distinctly developed, in the former they are entirely wanting. In both sexes of beetles the parts of the mouth are always developed into very perfect biting organs; in the male of the perfected Strepsiptera they are reduced to two rudimentary jaws, and in the female they are entirely absent. The prothorax in all beetles is seen very strongly developed, and the upper part forms a large surface, furnished with many characters indicative of genera and species; while, in the Strepsiptera, this upper side of the prothorax has almost entirely vanished. The reduced and somewhat spirally twisted fore wings of the Strepsiptera are very movable appendages, and occupy the position of anterior halteres (Schwingkolben), corresponding to the hinder halteres of the Diptera; in beetles, the fore wings are simply coverings for the hind wings, and in flight are merely lifted up and held immovable, whether they are diminutive or not. All the male Strepsiptera want the claws of the last joint of the tarsi, an apparatus so necessary for Coleoptera, which use their legs in running, climbing, and clinging, that all species are provided therewith; moreover, they live for months, and even years, after they have thrown off their pupa-covering, whereas the male Strepsiptera, from the moment they emerge from the pupa, flutter incessantly, and do not live longer than a day. Though Herr v. Siebold is now convinced that the Strepsiptera are not Coleoptera, he still thinks that the attempt made by entomologists to place them in that position, must be borne with, and even received with welcome, as it has very good practical advantages, from which science may very shortly derive benefit. Hitherto, the entire group of Strepsiptera has been neglected in an unprecedented manner by German entomologists, but now, since Coleopterists find the Strepsiptera incorporated into the Catalogue of Coleoptera, they will be induced to adorn their collections with these pretty little creatures. They will now pay attention to these insects, will capture and pin them, and so must study the circumstances of their existence; they will be compelled to observe them, and the insects in which they live, with the greatest attention, for this is absolutely necessary, if they wish to possess winged Stylopidae. In this way, observations and communications respecting these hitherto little known creatures will be amassed, from which hereafter the scientific position of these insects will stand out with greater certainty. As the lecturer has already been called upon by several Coleopterologists to indicate some means by which these Strepsiptera may be procured, he thinks it right to recommend the following method of rearing them, which has even now proved to be very useful; as it is only by breeding that one can obtain possession of the winged males, for, on account of their smallness, tenderness, and short, hidden life, they can only very rarely and casually be taken at large. In the first place, a spacious, light, and airy cage or apartment (Zwinger) must be prepared, in which flowering Umbelliferae (which are eagerly sought by Hymenoptera) may be placed, and kept fresh by water in glasses; then, nothing must be thought of the trouble of catching the Apidae and Andrenidae which frequent the flowers of the shallows, and examining whether they are Stylopized or not, and then carefully placing in the aforesaid cage those which are Stylopized, which may easily be distinguished from those that are not Stylopized. One proceeds in the same manner with the Stylopized

Vespidæ (*Polistes gallica*) and Sphegidæ (*Ammophila sabulosa*), which are found abundantly on Umbelliferæ. These insects, although as captives they at first miss their usual employment and care for their brood, live in their cage for several weeks, especially if they are from time to time supplied with fresh flowers of Umbelliferæ spread over with pounded sugar. Being accustomed to work, they are thus provided with employment; they busy themselves on the flowers, and lick up the sugar, and their life is prolonged as long as possible, so that the pupæ of the Stylopidæ contained in their bodies obtain time to develope, and (in the case of the males) emerge as winged insects. The Stylopized Hymenoptera are known in the following manner:—The larvæ of Strepsiptera living as Entozoa in the cavity of the hinder part of the body of Hymenoptera, eventually, when about to assume the pupa-state, with the fore part of the body pierce through the soft portion between the hinder segments of the body of their foster-parent, where they continue to remain, so that the ever wingless and footless females end their lives there; the males, after a time, thrust the prominent fore-part of their pupa-case out of the hinder part of the body of their foster-parents, and flutter out of their confinement. The Hymenoptera which are burdened with male pupæ, are known by the dark brown conical fore ends of the pupa-cases projecting between the segments of the bodies of the bees and wasps; the female Strepsiptera are distinguished by the light brown scale-formed projecting fore part of the body, which remains unchangeably fixed, whilst the conical fore part (cephalothorax) of the male pupa breaks off upon the exclusion of the perfect insect.”

Herr Schiödte, of Copenhagen, who was present as a visitor, made a few remarks in favour of the proposition that the Strepsiptera should be associated with the Coleoptera; observing that the characters of the latter Order are possessed generally by the Strepsiptera, though some are in a rudimentary state only, laying stress upon the form of the mouth and the metamorphosis, as more essential characters of the Coleoptera than the large prothorax; and arguing that in such a matter as the position of the Strepsiptera, the most essential characters of all the Orders, and not the minute detail, should be considered and compared: from which he was led to believe that the Strepsiptera, though apparently in some respects anomalous, were more nearly related to the Coleoptera than to any other Order; and that the opponents of this view should show that any of the characters of the Coleoptera are not represented in the Strepsiptera.

Mr. Waterhouse briefly opposed the junction of the Strepsiptera with the Coleoptera, confining himself chiefly to the different development of the prothorax in each Order, the form of which he considered very characteristic of different groups.

Mr. Westwood also made some similar observations: and argued that the Strepsiptera were more nearly allied to the coarctate Diptera.—*J. W. D.*

Anecdote of the Oared Shrew (Sorex remifer).—Walking in my garden a few days ago, I heard a faint, plaintive, wailing noise proceeding from a grass walk on the side of my orchard. Directing my attention to the spot, I saw a shrew, which, from its size, I at once knew to be the oared shrew (*Sorex remifer*), pulling at the hind leg of a large frog. Froggy evidently did not at all like his position, and what the issue would have been I can hardly conjecture, had not the shrew chanced to see me, which

caused him at once to quit his hold of his prey. The poor frog, "nothing loath," then made a spring into the nearest strawberry-bed, while mousey retreated into the orchard. I waited some time without stirring, in the hope that, like the weasel, the shrew might have again returned to the charge, as I felt interested in the manœuvres of a contest hitherto new to me; but I was disappointed:—I saw my black friend presently make a detour into some thick grass, evidently bent upon retreat. Any facts tending to throw light upon the carnivorous propensities of our insectivorous group of mammals is interesting, and therefore I record the above otherwise trifling incident. There is nothing in their dentition sufficiently distinct to separate them from the Carnivora, as any one may satisfy himself by examining the tripartite wedge-like molars, and the recurved sharp canines of the common mole. I believe that the acquiescence of naturalists in the opinion that the hedgehog, shrew, and mole feed exclusively on insects, has alone kept up the generic distinction of the two groups. If your readers will be kind enough to record every instance in which any of the above (so-called) purely insectivorous quadrupeds are known to feed upon animals higher in the scale than insects, they will do something towards the union of two orders, at present perhaps artificially divided. I do not remember seeing *Sorex remifer* before in my ground; *S. araneus* is common enough.—*C. R. Bree*; *Stowmarket, August, 1853.*

Occurrence of Limax Gagates near Tenby, S. Wales.—Only one instance of the occurrence of this slug has, as I believe, hitherto been recorded as a denizen of Great Britain, namely, that found by Mr. Derbyshire in the Isle of Portland: it is with much pleasure therefore that I have to record the capture of a second specimen, taken by myself in South Wales. Late in the evening of the 22nd of last month, I was strolling along the old Carmarthen road from Tenby, about a mile from the latter place, when I discovered my slimy friend taking his evening's airing on the damp hedge-bank. The following is a description of him:—*Specific character*: back carinated throughout; shield granulated, olivaceous black, with paler sides. *Head* bluish; tentacles darker, particularly the superior, which are deep violet. *Shield* ample, squarish, bilobed behind (being indented by the keel in the centre), granulated, same colour as the rest of the body. *General colour* very deep olive, or olivaceous black, becoming lighter at the sides, so that the *margin of the foot* is very pale, except near the tail, where it is darker; sole nearly white. *Keel* extending the whole length of the back, sharply edged; the edge somewhat darker than the rest of the body. *Mucus* colourless, abundant. *Length* rather less than 3 inches. The peculiar form when at rest, is the most remarkable characteristic of this *Limax*. In this state it assumes a more rounded form than any other slug I am acquainted with, and squeezes itself into so small a compass, that the height is but little exceeded by the length; for not only are the head and tentacles retracted beneath the shield, but even a portion of the foot also: while behind, *the tail is so much drawn in*, that that portion of the body assumes a *very truncated* appearance. This peculiarity is not mentioned by Messrs. Forbes and Hanley, nor is it at all conveyed by their figure.—*Alfred Merle Norman*; *Pyrton, Oxfordshire, August 15, 1853.*

Anecdote of the Power of Fascination as exercised by a Fox, with some Remarks on the exercise of a similar Power by other Predaceous Animals. By J. H. GURNEY, Esq.

I HAVE received the following interesting statement from a respectable gamekeeper in the county of Surrey :—

“ In May, 1838, I was very much annoyed by the constant visits of a fox amongst my poultry, as scarcely a night passed but I lost either a turkey or Guinea-fowl, sometimes partly eaten, sometimes taken quite away, and at other times left dead, but very little mutilated ; and as they roosted on a large spreading oak, I was at a loss to know how a fox could get at them, till one morning, just as day began to dawn, I heard a great noise among the poultry, and on looking out from my window, I plainly perceived a fox running round and round under the place where the poultry sat, and the poultry soon began to fall from the tree in great confusion. The fox immediately seized its prey, and I was no longer at a loss to know in what way I had lost my poultry. The fox was killed within a day or two after, in an adjoining paddock, and proved to be a very large male fox. I have not since lost any poultry in a similar way.”

This account confirms me in an opinion which I have long entertained, that many predaceous animals exercise a species of mesmeric influence over their victims, which greatly facilitates their capture. I recollect having heard of a cat, which would sit on the house-top, and catch sparrows which approached her too closely in their vain attempts to drive her from her post ; and it is well known that if a cat or an owl attacks a cage or aviary containing small birds, the latter constantly fly against the wires, thus enabling their enemy to strike them through the wire-work. Analogous to this is, in all probability, the power possessed by rattlesnakes, and some other serpents, of attracting small birds within their reach. And I doubt not that a similar law of Nature gives rise to the habit which small birds have of mobbing those birds and animals which make them their prey : as an illustration of which I may mention a circumstance that came under my own observation some years since.

A kestrel was flying lazily, slowly, and at but a slight elevation, by the side of a plantation, closely surrounded and angrily pursued by a flock of chattering sparrows. For some seconds, or perhaps minutes, the hawk took no notice of his tormentors ; but at length, suddenly turning on his side in the air, and striking out one foot with a lateral

motion, he clutched one of the sparrows which had ventured too close to him, and immediately darted off, carrying away his prey in his deadly gripe, and quickly distancing the other sparrows which still pursued him, and from which he seemed previously to have feigned that he could not escape.

I once saw a golden eagle, which appeared entirely to fascinate a rabbit that was put into the large cage in which the eagle was kept. As soon as the rabbit was introduced, the eagle fixed his eye upon it, and the rabbit intently returned the gaze, and began going round the eagle in circles, approaching nearer each time, the eagle meanwhile turning on his axis (as it were) on the block of wood upon which he was seated, and keeping his eye fixed upon that of the rabbit.

When the rabbit had approached very near to the bottom of the eagle's perch, it stood up on its hind legs, and looked the eagle in the face; the eagle then made his pounce, which appeared at once to break the charm, and the rabbit ran for its life, but it was too late for it to escape the clutch of the eagle, and the instant death which followed that tremendous squeeze.

It is well known that a hare or rabbit, if pursued by a stoat or weasel, soon becomes, first bewildered, and then almost paralyzed, by the consciousness of its pursuer's advance. May not this again be another development of the same principle?

To return to the point where I began, I will in conclusion repeat another story of turkeys and foxes which I know to be true, but which I believe has not yet been recorded.

A gamekeeper in Norfolk had under his care a flock of nominally wild turkeys, descended from some that were imported into Norfolk from America, during the last century, by the then Earl of Buckinghamshire.

These turkeys roosted in a wood which was frequented by foxes, and the gamekeeper, wishing to protect the turkeys from their attacks, moved his dog-kennels under the trees upon which the turkeys perched, in order that the dogs might act as their guardians against the foxes. This lasted for some months; after which, the foxes having been destroyed, the gamekeeper removed his dogs back again to his own cottage, which was distant about a mile from where they had been quartered in the wood. On getting up early the next morning, his surprise was great in observing that the turkeys had followed the migration of their protectors, and were all roosting on the trees which overhung the spot to which the dogs and their kennels had just been removed.

Should*these somewhat desultory remarks draw attention to the subject to which they refer, their insertion in the 'Zoologist' will perhaps be not altogether useless.

J. H. GURNEY.

Easton, Norfolk, August 26, 1853.

Notes on Squirrels. — Amongst the great numbers of these active little animals, which live here in quiet and security, is a variety which I have never met with elsewhere, although it may probably occur in other places. This variety, which is as numerous as the common kind, has the whole of the tail of a flaxen or straw colour; and this, when elevated above the head and waved about, gives the animals the appearance, when seen at a distance, of holding up a white plume or parasol. There appears to be no other difference between the two kinds, and whether this arises from any particular age, I am unable to say. The squirrels may be seen here both in summer and winter; even when snow is on the ground, they appear to be almost as much out and about as in the warmer months, feeding chiefly upon the beech-mast, of which there are great quantities hanging on and fallen from the trees, and serving as food not only for the squirrels, but also for large flocks of wood-pigeons which frequent this neighbourhood, and are then congregated together. The other day, whilst walking round the lawn, several squirrels crossed the path, and one, at some distance off, appeared to be encumbered with something it was carrying in its mouth, and which greatly impeded its progress. After trying to intercept the squirrel, I got near enough to see that it was a large mushroom it was carrying to a neighbouring tree, up which it ran in its usual spiral mode of ascent, and having reached a place of safety, began its repast. Of squirrels betaking themselves to such luxuries, I was not before aware, as there was such a superabundant quantity of their usual kind of food at hand; but on inquiring of the keeper whether he had before observed such to be the case, he informed me that when he had lately lived near a large wood some few miles distant, of which I had formerly rented the shooting, he had frequently seen the squirrels carrying up the trees the mushrooms which grew in the cover and adjacent fields, and which they seemed to eat with a proper degree of relish. But, as has been before observed in discussing the question of food in former numbers of the 'Zoologist,' it is strange what apparently unnatural food is resorted to, and the capricious appetite of various kinds of animals. In many places it is thought strange to see squirrels out of their drays in hard winter weather, but here, as I have before mentioned, they are constantly to be met with and tracked at all times, even in the snow, when they appear just as lively and free from suffering from the severity of the weather, as in the summer months. They come down the large beech trees, and scratch away the snow-covered moss at the bottom, where they find plenty of mast for their support, besides whatever other store of food they may have collected and put by for special occasions. They however do much mischief to growing fir and larch trees by biting off their leading shoots, as well as by destroying vast quantities of nuts and filberts before they are nearly ripe, and to obtain which they do not hesitate to run up the fruit-trees planted against the outer walls, and down the other side into the garden itself, making sad havock with

the supposed-to-be-protected filberts within. I have found it an excellent plan, in order to prevent this wholesale destruction, to have a piece of zinc made in the shape of an inverted basin, and nailed round the stem of the filbert-tree, taking care at the same time to have all the long pendant branches trimmed off, so that they cannot be reached from the ground, or from the over-hanging boughs of any adjacent tree,—a precaution often neglected by gardeners, who are often surprised to find all their care in vain, because they have left some pea-stick or rake-handle leaning against the tree, so as to enable the squirrels to reach what they are seeking to obtain, without ascending the stem of the tree, which the zinc basin will effectually prevent their doing. The same plan prevents their attacking walnuts. Squirrels do not seem much inclined, except at particular times, to take the green walnuts before the time for gathering has arrived; but not so with the nuts and filberts, of which great quantities may be seen every summer lying under the trees totally destroyed, so that scarcely a single nut or filbert is left on the tree, and this long before they are fit for gathering, as if the squirrels had tried them in mere wantonness one after another, and, finding them unripe, had cast them underneath, until bushels upon bushels are thus destroyed. This wholesale destruction is effectually prevented, and at a most trifling expense, by the method above mentioned; the same zinc cap or basin will last for many years, and may either be taken off in winter, or be left on altogether.—*W. H. Stacey; Hatton Hall, August 10, 1853.*

Note on the Vulture or Eagle which is said to attack the trained Falcons of the Asiatic Falconers.—In a former number (Zool. 3648) I called attention to the above circumstance, attributed by Lieut. Burton to a species of vulture, and by Mr. Jerdon to the Bonelli's eagle. Since that date, this curious subject has been touched upon in two other works, namely, Mr. Layard's 'Second Expedition to Nineveh,' and Mr. Barker's work on Cilicia, intitled, 'Lares and Penates.' In Mr. Layard's work (p. 299) occurs the following passage:—"Suttum came with us, carrying his hawk 'Hattab' on his wrists. * * * Game abounded, and the falcon soon flew towards a bustard, which his piercing eye had seen lurking in the long grass. The sun was high in the heavens,—already soaring in the sky was the enemy of the trained hawk, the 'Agab,' a kind of kite or eagle, whose name, signifying 'butcher,' denotes its bloody propensities. Although far beyond our ken, he soon saw Hattab, and darted upon him in one swoop. The affrighted falcon immediately turned from his quarry, and, with shrill cries of distress, flew towards us. After circling round, unable from fear to alight, he turned towards the desert, still followed by his relentless enemy. In vain his master, following as long as his mare could carry him, waved the lure, and called the hawk by his name,—he saw him no more. Whether the noble bird escaped, or fell a victim to the 'butcher,' we never knew. Suttum was inconsolable at his loss." Mr. Layard adds in a note, "Easterns never hawk, if they can avoid it, when the sun is high, as the bird of prey described in the text then appears in search of food." Mr. Barker, in his work on Cilicia (p. 294), speaking of a trained goshawk which he had in that country, says, "There was nothing he would not fly at, if I would let him go, and he once actually attacked a vulture, which had carried off one of his companions, a goshawk belonging to a sporting friend, who was out with me, and who had neglected his bird in pursuing the game his dogs were hot upon." At p. 297, Mr. Barker

also remarks, "The peregrine of the cliffs of Mount Taurus is smaller than the English peregrine, but more beautifully variegated in plumage. It is known as the 'Barbary falcon.' It is generally kept in the East by rich men, who can afford to have one man, or even two men, for each bird. The hand of the falconer should be its only perch. Thus treated, its natural wildness is conquered and it may be brought to take anything, although it is generally kept to protect the doghan (goshawk) from the attacks of its natural enemies, the eagle and vulture." I hope that the interest which must attach to this very curious subject, will be considered a sufficient apology for my requesting insertion of these extracts in the 'Zoologist.' — *J. H. Gurney, Easton, Norfolk, August 26, 1853.*

Occurrence of the Hobby (Falco subbuteo, Linn.) near Newcastle-on-Tyne.—A male hobby was shot on our town-moor on the 25th of July last, and is now in the collection of Mr. Geo. Balmer: another was seen and fired at, but without success. This, I believe, is the second example that has been obtained in this district, one having been killed by a boy with a stone, near Tynemouth, about the year 1838, and was in the possession of the late James Archbold, Esq.—*Thos. John Bold; Bigg Market, Newcastle-on-Tyne, August 15, 1853.*

Occurrence of the Hawfinch and Brambling at Selborne.—On Tuesday last I saw the hawfinch at Selborne. This is the third time I have seen it within the last six years, and it is well known to occur there occasionally. One of our farmers has two preserved, which were killed in my grounds. I have a beautiful brambling finch, which was taken at Selborne last winter.—*Thos. Bell; 17, New Broad Street, July 18, 1853.*

Note on the occurrence of the Rose-coloured Pastor (Pastor roseus) near Norwich.—I understand that a fine adult male bird of the above beautiful species was procured a few miles from Norwich in the course of last week.—*J. H. Gurney; Easton, Norfolk, August 26, 1853.*

Occurrence of the Dotterel (Charadrius Morinellus) near Dorchester.—This pretty bird seems more plentiful than usual in our neighbourhood this year. Last Monday, the 29th of August, two were shot by a gentleman, one in my presence, on the sea-shore at Church-hope Bay, in the Isle of Portland, and another on his way from thence to Weymouth, upon the Small-mouth Sands: I also saw another on that day. Both of those shot were young birds, in good condition, and very sweetly plumaged.—*John Garland; Dorchester, September 2, 1853.*

Occurrence of Temminck's Stint (Tringa Temminckii) near Penzance.—Temminck's stint appears to be by no means a rare bird in the salt marshes in this neighbourhood, during the autumnal migratory movement. On Saturday last I observed one flushed by the train passing over the Marazion Marsh; it rose and dropped precisely like a Jack snipe, and might have been mistaken for it, but for its smaller size. Three specimens were obtained from the same locality a few days since by Mr. Vingoe, and he observed at the same time a flock of at least a dozen. Independently of the difference in the length of the tarsus, Mr. Vingoe tells me that he can invariably distinguish this species from the little stint (*Tringa minuta*) by its call-note, which resembles more that of the common cricket, whereas the note of the little stint is like its own name,—“Stint, Stint.”—*Edward Hearle Rodd; Penzance, August 26, 1853.*

NOTICES OF NEW BOOKS.

'*A Naturalist's Rambles on the Devonshire Coast.*' By PHILIP HENRY GOSSE. London: John Van Voorst, Paternoster Row. 1853. Price 21s.

SCARCELY have we pronounced a most favourable opinion of Mr. Gosse's '*Naturalist's Sojourn in Jamaica,*' than we are called upon to review another book from the same pen, equally beautiful, equally amusing, and equally instructive. Mr. Gosse produces the beautiful, the amusing, and the instructive, with a rapidity we have seldom seen equalled, and never surpassed. This book is a fit companion to the '*Sojourn;*' like that it is a series of pictures which it must delight the lover of Nature to look upon: in the former we were introduced to the inhabitants of earth, in this we are made familiar with the denizens of ocean; we are bid to look upon the wonders of the deep; the plant-animals of the sea are revealed to us in all their loveliness, are presented to us in their most attractive forms; and not these only, but also mollusks and crustaceans, whose living and moving characters are here for the first time laid down.

The desultory manner in which Mr. Gosse has arranged his pictures is, we think, one great charm of the book: we are led onwards without any risk of being tired by scientific technicalities. Here is a picture of *Anthea*:—

“In a large vase of sea-water *Anthea's* actions are as peculiar as its appearance. It is fond of climbing up the sides of the glass, a feat which it accomplishes with a considerable measure of (comparative) activity. It glides up by the broad fleshy base, pretty much in the same manner as a *Gasteropod* does by its expanded foot; and yet the process is not exactly the same. The power which *Anthea* has of inflating portions of its body, swelling them out in large tumid lobes separated by deep sulci from the rest of the circumference, assists it in crawling. We will suppose the *Anthea* resting on the bottom of the vessel, when it feels a desire to mount the sides of the glass. Pushing out a great inflated lobe towards that side the sole of which is free from the surface, it takes hold of the glass with the edge of the lobe, and when the contact is firm, relaxing its former hold, it slowly drags forward the body, until the lobe is again lost in the general circumference, or even till the body projects in two smaller lobes one on each side of the principal one. The base being now made firmly to adhere, again the lobe is freed, and again protruded, and the same

process is repeated until the animal is satisfied with the position that it has gained. Sometimes this is at mid-height, the intertwined tentacles streaming loosely down by their own weight. At other times it rises to the very water's edge, and even thrusts out its base in an inverted position upon the surface of the water, as if it would float by the mere contact of the dry base with the air, just as the *Limnææ* and many other Mollusca do. It does not, however, so far as I can judge, appear capable of quite accomplishing this; but it can remain so suspended, if the slightest possible portion of the margin remain in adhesive contact with the side of the glass.* A little shaking of the vessel, however, causes the water to overflow the surface of the base, which had been hitherto dry, when the animal falls prone to the bottom."—P. 17.

Let us now learn the history of the Daisy Anemone.

"All along this line of limestone rock, in almost every tide-pool and hollow that retains the sea-water, from the size of one's hand upwards, we may at any time find colonies of the lovely daisy Anemone (*Actinia bellis*). In the sunshine of a fair day they expand beautifully, and you may see them studding the face of a rock, just beneath the surface, from the size of a shilling to that of a crown piece. Nothing seems easier than to secure them, but no sooner do the fingers touch one, than its beautifully circular disk begins to curl and pucker its margin, and to incurve it in the form of a cup; if further annoyed, the rim of this cup contracts more and more, until it closes, and the animal becomes globose and much diminished, receding all the time from the assault, and retiring into the rock. Presently you discover that you can no longer touch it at all; it is shrunk to the bottom of its hole, the sharp irregular edges of which project and furnish a stony defence to the inhabitant. Nothing will do but the chisel, and this is by no means easy of appliance. It is rare that the position of the hole is such as to allow of both arms working with any ease; the rock is under water, and often if your chisel is short, it is wholly immersed during the work, when every blow which the hammer strikes upon its head has to fall upon a stratum of water, which splashes forcibly into your eyes and over your clothes; the rock is very hard, and the chisel makes little impression; and what is frequently the greatest disappointment of all, the powdery *débris* produced by the bruising of the stone mingles with the water and presently makes it perfectly opaque,

* "I have seen one, however, floating quite freely on the surface of the vessel, base uppermost."

as if a quantity of powdered chalk had been mixed with it, so that you cannot see how to direct the blows, you cannot discern whether you have uncovered the Actinia or not, and frequently are obliged to give up the attempt when nearly accomplished, simply because you can neither see hole nor Actinia, and as to feeling in the pap-like mud that your implement has been making, it is out of the question. Supposing, however, that you have got on pretty well, that by making a current in the pool with your hand you have washed away the clouded water sufficiently to see the whereabouts, and that you perceive that another well-directed blow or two will split off the side of the cavity, — you have now to take care so to proportion the force, that at last you may neither crush the animal with the chisel on the one hand, nor, on the other, drive it off so suddenly that it shall fall with the fragment to the bottom of the pool out of reach.

“However, we will suppose you have happily detached and secured your Actinia without injury. But how unlike its former self, when you were desirous of making its closer acquaintance, is it now! A little hard globose knob of flesh, not so big as a schoolboy’s marble, is the creature that just now expanded to the sun’s rays a lovely disk of variegated hues, with a diameter greater than that of a Spanish dollar. It is moreover covered with tenacious white slime, which exudes from it faster than you can clear it away; and altogether its appearance is anything but inviting. You throw it into a jar of water, which of course you have with you when collecting living zoophytes, and thus bring it home, when you transfer it to a tumbler or other suitable vessel of clear sea-water freshly drawn. And here let us watch its changes; which however will not be effected immediately: for it will not expand itself in all its original beauty until it has taken a fresh attachment for its base, which will not in all probability be for a day or two at least.

“The body or stem of *Actinia bellis* is more or less cylindrical generally; though subject to some change in this respect, for it is occasionally a little enlarged, as it approaches the disk: the sucking base is slightly larger than the diameter of the body, which in specimens of an inch and a half expanse, may be about half an inch.

“The length of the body varies much, according to the depth of the cavity in which the animal lives, for it must expand its disk at the surface. In the open water in a vase, when it appears at home, it may commonly be about an inch from the base to the expansion of the disk, but I have a beautiful specimen before my eye at this moment, which has stretched itself to a height of three inches, expanding

at the extremity as usual: the thickness of the stem is in this case somewhat diminished. From the upper part of the cylindrical stem or body, the disk abruptly spreads around to the width above indicated. In this respect *A. bellis* differs so greatly from other littoral species of sea Anemones, that it can never be mistaken by those who have once seen it. In these, the disk is merely the termination of a short thick column, occasionally a little expanded over the edge; in *bellis*, however, the diameter of the disk is generally four times that of the body, at the point from which it expands. Its form, viewed externally, is that of a shallow cup, but its surface is in general almost flat, or a very little depressed to the centre. The whole bears a likeness closer than usual to a flower, with a foot-stalk. The disk is so thin and membranous, that it is continually changing its form; the margin is frequently bent over outwardly or inwardly in places; as it lies on the uneven rock, it accommodates itself to the roughnesses, and is hence often irregularly undulated; it very commonly bends inward at the edge in several places, so as to make puckers or frilled scallopings around the margin. And this surely must be meant by what writers describe and draw as 'lobes' to the disk; for of *lobes* proper it has none, not the slightest trace: the outline of the disk is most perfectly and beautifully circular; and I find it often expanded in this state, without any puckering or festooning.

"The tentacles are small but numerous: they are arranged in about six rows; the innermost series contains about twelve tentacles; the next about the same number; the third about twice as many; the fourth is again doubled; the fifth increases in the same proportion; and the sixth contains about thrice as many as the fifth. This ratio, if accurately carried out, would give a total of 768 tentacles to one *Actinia*, a number which is not far from the mark, although, as in other species, the rows are not quite regular. The inmost series of tentacles is usually erect, or even inclines inwards, the others decline more and more towards the circumference; until the outmost two or three rows lie quite flat upon the disk, to which the exterior one of all forms an exquisite fringe: all the rows are small, but they diminish outwardly in size, and more rapidly the nearer they approach the edge; those of the outmost row are very minute, the longest (for they are not equal) not exceeding the sixteenth of an inch in length, and some being only tiny tubercles: they are slender, and set so close together that I counted sixty in an inch.

"The mouth is oblong, sometimes contracted to a slit, at others showing a sub-oval, or lozenge-shaped opening, with the lips within

finely crenated. Delicate depressed lines diverge from the mouth to the circumference of the disk, by tracing which we shall find that the convex space included between two lines leads to and terminates in a tentacle; the disk may be in fact described as formed of the roots of the tentacles soldered together. Viewed from the outside, with a strong light behind, the substance of the disk is exquisitely beautiful, — the diverging but almost parallel fibres resembling the grain of a beautiful piece of wainscot, and each ending abruptly with a rounded point, where the tentacle springs up from the surface on the opposite side.

“The colours of this very lovely Actinia I have not found to vary much. The base is white, which as it ascends becomes flesh-coloured, then lilac, passing (at about the point where the disk expands) into a dull grayish purple, more or less tinged with brown. The upper part of the stem, and the whole of the outer surface of the disk, are studded with pale spots, which are the extremities of tubular glands, one use of which is to attach, by a kind of suction, minute bits of shell, gravel, &c., to the surface, for concealment as is supposed. I have not seen this habit *commonly* resorted to by this species, but I *have* witnessed it.

“The upper surface of the disk is of a rich, deep, umber-brown, often mottled with gray at the first row of tentacles, and merging into gray, lavender-colour or white, towards the third or fourth row. The tentacles are tapered to a point: they are grooved longitudinally on the upper side; they are commonly dark brown at the base, and yellowish brown through the rest of their length, blotched and speckled with white. Those of the inmost row, and frequently some of the others, have one or two broad rings of pure conspicuous white near the basal part, and a broad spot of white divided by a brown line lengthwise, on the disk just at their foot. There is some diversity in the proportions of brown and gray in different individuals, but the yellowish brown tentacle studded with whitish specks is, I think, characteristic.

“There is, however, a very marked variety; for although I at first was disposed to consider it distinct, it must, I feel sure, be referred to this species. In a specimen before me from Capstone Hill, Ilfracombe, the disk and tentacles are unrelieved by any trace of white or gray, being of an uniform dark brown, except that the tentacular ridges that cross the disk are bounded on each side by a fine line of scarlet, scarcely visible except with a lens; its effect is however to give a tint of chocolate to the surface. The outside of this specimen

differs not materially from the common state ; it is, however, of a particularly bright crimson, instead of purplish.

“ That this is a variety of *A. bellis* is manifest, because I have another on the table from the same locality, which beautifully connects the two states. This is a very handsome specimen : the disk is deep brown, almost black, with the fine lines of scarlet diverging from the centre as in that just described. The tentacles are some of them brown, with one or two specks only of white near the base, and others mottled in the ordinary manner with dark brown, light brown, gray and white ; what is strange is, that these varieties of colour are disposed in groups, a cluster of tentacles of the former hues, and then a batch of the latter. The scarlet runs up around the base of each tentacle, flushing its lower parts in a very elegant style ; and the oral aperture is marked around the very edge with conspicuous white tooth-like lines. This specimen was remarkable for the extent to which it was clothed with coarse gravel, and for the tenacity with which it held fast its strange stony garment, not dropping a fragment even after several days' captivity. In general, *Actiniæ* drop their gravel coats soon after they are put into a vessel of clear water.

“ It is for the most part a stationary species, and that not only in its own selected hole in the rock-pool, but even in captivity. It seldom leaves the spot in the glass vessel to which it has once attached itself. I have had a specimen, however, take it into his head to be a traveller, after several weeks' residence in one spot ; he walked off in a straight line to a distance of four inches, performing the feat, at a pretty uniform rate, in about eight hours, or half an inch per hour.

“ In order to examine the structure of the tentacles, I cut off with a fine pair of scissors the tips of one or two, and submitted them to the microscope upon the compressorium. As soon as the pressure began to flatten them, it became apparent that the tentacle was composed of rather thick gelatinous walls surrounding a tubular centre. The latter was filled with a vast multitude of very minute granules of a rich sienna-brown hue, and almost quite globular in form, all being quite alike in shape, colour, and dimensions. These escaped by thousands, on the increase of the pressure, from the tip of the tentacle, where there was evidently a natural orifice forced open by the pressure, but ordinarily, as I suppose, kept firmly closed by muscular action. The gelatinous walls of the tentacle contained, imbedded in their substance, a goodly number (not so immense as in some other species) of those highly curious organs known as the filiferous capsules. They are in this case very minute, being about one twelve-hundredth part

of an inch in length, almost linear, and slightly curved. The pressure being continued, each of these little organs suddenly shoots forth from one end to a great length, a slender highly elastic thread, which had hitherto been coiled up spirally within its cavity. The expulsion of this thread is effected by a proper organism, excited by the pressure on the tissues of the tentacle, but not forced out by the compression of the capsule itself, for this is much too minute to be compressed by the glass plates, under any power that can be brought to bear upon them. It is supposed that the adhesive touch of the tentacles resides in these little organs, and that a poisonous fluid accompanies the emission of the thread; since the mere contact of a tentacle with any small animal appears at once to paralyze it, however lively it may have been but a moment before. If this be so, what a highly curious example is here of the wondrously effective provision which the infinite resources of the Divine Wisdom have made for the wants of every creature! ”—P. 25.

Let us contrast with this a passage on the economical uses of these sea-flowers. We confess without reservation our entire previous ignorance of the esculent properties of an Actinia. There is something perhaps a little revolting in the idea of frying a sea Anemone in egg and bread-crumbs, but it is certainly only on a par with scalloping a living oyster.

“And now for a paragraph of cookery. Dicquemare’s testimony to the excellence of *Actinia crassicornis* for the table, tempted me to taste it, and I determined to take an early opportunity of cooking a few. In a few minutes I collected some half-dozen, of different sizes, at low water near Wildersmouth, and having rubbed them with my fingers in a tide-hole till the coating of gravel was pretty well got rid of, brought them home. I put them into a pan of sea-water for the night to cleanse them, and most beautiful and gorgeous was the appearance they presented when expanded; no two alike in colours, and yet all so lovely that it was difficult to say which excelled. Perhaps one with the tentacles partly cream-colour and partly white was as beautiful as any.

“The next morning, however, I began operating. As it was an experiment, I did not choose to commit my pet morsels to the servants, but took the saucepan into my own hand. As I had no information as to how long they required boiling, I had to find it out for myself. Some I put into the water (*sea-water*) *cold*, and allowed it to boil gradually. As soon as the water boiled, I tried one; it was tough and evidently undone. The next I took out after three minutes’ boil-

ing; this was better: and one at five minutes was better still; but not so good as one which had boiled ten. I then put the remaining ones into boiling water, and let them remain over the fire boiling fast for ten minutes, and these were the best of all, being more tender, as well as of a more inviting appearance.

“I must confess that the first bit I essayed caused a sort of lumpy feeling in my throat, as if a sentinel there guarded the way, and said ‘It shan’t come here.’ This sensation, however, I felt to be unworthy of a philosopher, for there was nothing really repugnant in the taste. As soon as I had got one that seemed well cooked, I invited Mrs. G. to share the feast; she courageously attacked the morsel, but I am compelled to confess it could not pass the vestibule; the sentinel was too many for her. My little boy, however, voted that ‘tinny was good,’ and that ‘he liked ‘tinny,’ and loudly demanded more, like another Oliver Twist. As for me, I proved the truth of the adage,—*Ce n’est que le premier pas qui coute*; for my sentinel was cowed after the first defeat. I left little in the dish.

“In truth the flavour and taste are agreeable, somewhat like those of the soft parts of crab; I ate them hot, with the usual crab-condiments of salt, pepper, mustard and vinegar, mixed into a sauce. The internal parts, including the ovaries and the tentacles, though from their mottled appearance rather repelling to the eye, were the most agreeable in taste; the integuments somewhat reminded me of the jelly-like skin of a calf’s head. I wonder they are not commonly brought to table, for they are easily procured, and are certainly far superior to cockles, periwinkles, and mussels. After a very little use, I am persuaded any one would get very fond of boiled Actinias.

“Some I had left with a little of the gravel still adhering, in order to see whether this would be thrown off, when life departed; but it was not so. They should be cleansed before cooking, which can be easily and quickly done with the fingers under water: the base also should be scraped, so as to remove any bits of slate, or rock, or dirt, that adhere to it. Attention to these particulars greatly improves the appearance when cooked. They are of a pellucid rosy hue, of a firm consistence; at least sufficiently firm to be readily cut with a knife.

“The next that I tried were prepared in a different manner, and, truth to say, the experiment was far more successful this time. I cleansed them more perfectly, carefully scraping the bases, until they were freed from every particle of extraneous matter and from slime. These I had fried in egg and bread-crumbs, and they were very far superior to even the best on the former occasion. All prejudice

yielded to their inviting odour and appearance, and the whole table joined in the repast with indubitable gusto. I know not if my readers are familiar with a dish which, in Newfoundland, during the cod-fishing season, we used to consider worthy of an epicure,—the tongues of the cod taken out as soon as the fish are brought on shore, and fried immediately. The Actiniæ fried as above described, I should scarcely be able to distinguish, either by the eye or by the taste, from fresh cods' tongues, except that perhaps my protégés are slightly firmer in consistence.”—P. 150.

(To be continued).

‘*The Annals and Magazine of Natural History*,’ No. 69, dated September, 1853. Price 2s. 6d.

THIS number contains the following papers :—

‘Notes on some new or little-known Marine Animals.’ By P. H. Gosse. The species mentioned are :—*Hippolyte fascigera*, Gosse, *H. Cranchii*, Leach, *H. Thompsoni*, Bell, and *Crangon sculptus*, Bell, all of them Crustaceans, of the family Palæmonidæ; *Mysis productus*, Gosse, a Crustacean of the family Mysidæ; and *Scholanthus callimorphus*, Gosse, a Radiate, of the family Actiniadæ.

‘On two new Species of Calanidæ, with Observations on the Spermatic Tubes of Pontella, Diaptomus, &c.’ By John Lubbock, Esq., F.Z.S.

‘Notes on the Ornithology of Ceylon, collected during an Eight Years’ Residence in the Island.’ By Edgar Leopold Layard, C.C.S.

‘On the Head of the Genus *Conus*, Linn.’ By J. E. Gray, Ph.D., F.R.S., V.P.Z.S., &c.

‘On the Animal of *Rotella*, Lamk.’ By J. E. Gray, Ph.D., F.R.S., V.P.Z.S., &c.

‘On the Phosphorescence of some Marine Invertebrata.’ By M. de Quatrefages. Extracted originally from the ‘*Annales des Sciences Naturelles*.’

‘On some new Carboniferous Limestone Fossils.’ By Frederick M’Coy, F.G.S., Hon. F.C.P.S., Professor of Mineralogy and Geology in the Queen’s University of Ireland.

Bibliographical Notices :—‘A Naturalist’s Rambles on the Devonshire Coast.’ By P. H. Gosse, A.L.S., &c.

Proceedings of Societies : — Zoological—Botanical of Edinburgh.

Miscellaneous : — On the Movements of the Blood in the Pulmonary Arachnida; by Emile Blanchard. Extracted from the 'Comptes Rendus,' June 20, 1853, p. 1079. The Tibetan Badger of Hodgson; by J. E. Gray, Ph.D. Note on the Germination of the Spores in the Uredines; by L. R. Tulasne. Extracted from the 'Comptes Rendus,' June 20, 1853, p. 1093.

'On the Duration of Life in the Queen, Drone, and Worker of the Honey Bee.' By J. G. DESBOROUGH, Esq. London: Longmans. 1853. Price 1s.

THIS is the Prize Essay of the Entomological Society of London for 1852, and also appears in the 'Transactions' of that Society. The author's facts appear to have been carefully observed and fairly recorded, and his essay is replete with information on many other points of bee history, besides the duration of life.

From a multitude of observations, the author is induced to believe the life of a queen bee to extend to three or four years; and those of a drone and a worker to vary from two to eight months: the life of a drone he regards as permissive only, the workers killing it whenever instinct so directs: the summer months, July and August, give more work, and consequently more wear and tear to the worker, than any others, consequently their life is then the shortest; while in winter, from an absence of exhausting causes, their life is proportionably longer. The essay is well worth reading.

'Shells and their Inhabitants. The Genera of Recent Mollusca arranged according to their Organization.' By HENRY and ARTHUR ADAMS. Parts III., IV., and V.; June, August, and September, 1853. London: Van Voorst. Price 2s. 6d. each Part.

THIS work continues to deserve all that we have previously said in its praise.

Part III. contains the Pteropodous genus Cymodocea, and the following genera of Gasteropoda: — Murex, Typhis, Trophon, Fusus,

Neptunea, Cassidulus, Hemifusus, Pisania, Metula, Cantharus, Clavella, Euthria, Turris, Drillia, Bela, Lachesis, Clavatula, Perrona and Defrancia.

Part IV. contains the following genera of Gasteropoda: — Daphnella, Cythara, Mangelia, Tritonium, Distortio, Bursa, Buccinum, Eburna, Cominella, Northia, Truncaria, Bullia, Pseudo-strombus, Phos, Desmoulea, Nassa, Neritula, Teinostoma, Nassaria, Cyllene, Chorus, Purpura, and Iopas.

Part V. contains the following genera of Gasteropoda: — Vexilia, Pentadactylus, Acanthina, Pseudoliva, Pinaxia, Conchopatella, Cuma, Ropana, Rhizochilus, Separatista, Melapium, Rapa, Leptoconchus, Campulotus, Harpa, Olivancularia, Agaronia, Dactylus, Peristernia, Leucozonia, Fastigiella, Vasum, Mazza, Cymbium, Melo, Aulica, Olivella, Dipsaccus, Ancilla, Fasciolaria, Busycon, Tudicla, and Latirus.

The figures of these shells, accompanied as they are by those of the living animals, by Mr. J. de C. Sowerby, are most admirable.

‘*Transactions of the Entomological Society of London.*’ Vol. II., New Series, Part V., published on the 1st of June, 1853; price 4s.: and Part VI., published on the 1st of September, 1853; price 3s.

PART V. contains 48 8vo. pages of Transactions, and 48 pages of Proceedings, together with 2 plates. The papers are intitled: —

‘Notices of some new Strepsipterous Insects from Albania, with further Observations on the Habits, Transformations, and Sexual Economy of these Parasites.’ By S. S. Saunders, Esq. (Concluded).

‘On the Duration of Life in the Queen, Drone, and Worker of the Honey Bee; to which are added Observations on the Practical Importance of this Knowledge, in deciding whether to preserve Stocks or Swarms; being the Prize Essay of the Entomological Society of London for 1852.’ By J. G. Desborough, Esq.

‘Descriptions of New Genera and Species of Curculionides.’ By G. R. Waterhouse, Esq., F.Z.S.

The plates illustrate the economy of the Stylopites: we decline calling them Strepsiptera, since entomologists are now generally agreed in considering them Coleopterous.

Part VI. contains 32 pages of Transactions and 8 of Proceedings, besides 2 plates. The papers are the conclusion of that by Mr. Waterhouse, the title of which is given above, and —

‘Contributions to the Natural History of British Micro-Lepidoptera.’ By J. W. Douglas, Esq.

The plates illustrate Mr. Douglas’s paper on the Micro-Lepidoptera.

It would be a work of supererogation to give any analysis of the contents of these parts, seeing how full an abstract of the several papers has already appeared in these pages; but we may nevertheless commend them most cordially to the notice of entomologists.

Proceedings of the Entomological Society.

September 5, 1853.—J. O. WESTWOOD, Esq., V.P., in the Chair.

The following donations were announced, and thanks ordered to be given to the donors:—The ‘Zoologist’ for September; by the Editor. The ‘Literary Gazette’ for August; by the Editor. The ‘Athenæum’ for August; by the Editor. The ‘Journal of the Society of Arts,’ for August; by the Society. ‘Smithsonian Contributions to Knowledge,’ Vol. V. Washington, 1853: ‘Sixth Annual Report of the Board of Regents of the Smithsonian Institution:’ Norton’s ‘Literary Register’ for 1853: ‘Portraits of North American Indians, with Sketches of Scenery, &c.’; all by the Smithsonian Institution. ‘A Treatise on some of the Insects of New England which are injurious to Vegetation,’ by Thaddeus William Harris, M.D. Second Edition. Boston, 1852; by the Author. ‘On two new Species of Calanidæ, with Observations on the Spermatic Tubes of Pontella, Diapotamus, &c.,’ by John Lubbock, Esq., F.Z.S.; by the Author. ‘Bibliotheca Stephensiana; being a Catalogue of the Entomological Library of the late James Francis Stephens, Esq., F.L.S., which has been preserved entire, and is now removed to Mountsfield, Lewisham, where it may be consulted by any Entomologist every Wednesday evening, as heretofore.’ One copy for the Library, bound, and fifty copies for distribution among the Members; by H. T. Stainton, Esq. ‘Revue et Magasin de Zoologie,’ Nos. 8—12, for 1852, and Nos. 1, 2, 4, 5 and 6, for 1853; by the Editor, M. Guérin-Méneville. ‘Catalogue des Larves des Coléoptères connues jusqu’à ce jour, avec la Description de plusieurs Espèces nouvelles,’ par M. F. Chapuis, Docteur en Médecine et en Sciences Naturelles, et M. E. Candèze, Docteur en Médecine. Liège, 1853; by the Authors. Three boxes of butterflies; by Thos. Jones Stevens, Esq., of Bogota, Corresp. M.E.S. Six specimens of *Aglossa cuprealis*, taken in an out-house belonging to a flour and oil mill in Cambridgeshire; by Mr. Bond.

Mr. Moore exhibited a box of Coleoptera and Lepidoptera, recently captured by him at New Brighton, Cheshire.

Mr. Weir exhibited *Coleophora Inulæ?* bred from *Eupatorium Cannabinum*, *Coleophora Wockeella* and its larva-case, found attached to a shoot of *Genista tinctoria*, and *Gelechia lentiginosella*, bred from *Genista tinctoria*, all from Pembury, Kent;

also the larva of a *Coleophora* found feeding on a capsule of *Silene inflata*, and *Tortrix dumetana* from Lewes.

Mr. Edwin Shepherd exhibited *Coleophora Vulnerariæ*, *Heliothis peltigera*, *Odontria dentalis*, *Pionea margaritalis*, and two specimens of an albino variety of *Eudorea pyralella*, all from the neighbourhood of Dover.

Mr. Stevens exhibited a remarkable dark variety of *Limenitis Sybilla* from Essex, and a new British species of *Simaethis* from Arundel, captured in August.

Mr. Edleston sent for exhibition the head of a *Plusia bractea*, which he had separated from the moth in order to ascertain the nature of a singular body firmly attached to each eye, and which he had ascertained to be an anther of honeysuckle, from the flowers of which the moth is known to feed. These anthers were strongly affixed by their viscid extremities; and Mr. E. mentioned that he had seen several other examples on this species of moth.

Mr. Wing exhibited *Ypsolophus Verbascellus*, a new British species, bred from leaves of *Verbascum floccosum*, from Norwich, and *Exæretia Allisella*, beaten from *Artemisia campestris* near Lowestoft.

Mr. Douglas exhibited some Lepidopterous larvæ mining in leaves of *Cornus sanguinea*, from which, when full fed, they cut out an oval case in which to pass the winter. These larvæ, he said, were destitute of true legs, and had only indications of eight ventral and two anal prolegs. The species of moth produced from them is unknown. He likewise exhibited *Gelechia Brizella*, a species hitherto known as British only by a single specimen, and *Coleophora binotapennella* (*F. v. R.*), *Dup.*, both taken by him on the coast at Brighton in August, having been previously discovered there by Mr. Hemmings; the former among *Statice Armeria*, the latter among *Chenopodium maritimum* and *Salicornia herbacea*.

Mr. Stainton exhibited some larvæ of *Gracillaria Phasianæpennella* in the curious cases formed by them in the leaves of *Polygonum Hydropiper*, received from Professor Zeller, of Glogau. These cases closely resemble the truncated cones figured by Reaumur on leaves of sorrel, which figures are copied in Rennie's 'Insect Architecture.' He also exhibited larvæ of *Cosmopteryx Zeiglerella*, feeding on leaves of the hop, and larvæ of *Elachista testaceella*, feeding on leaves of *Torilis Anthriscus*, *Sison Amomum*, and other Umbelliferous plants, observing that the larvæ of *E. Illigerella* probably feed in a similar manner on the under side of the leaves of some of the Umbelliferæ.

Mr. Waring exhibited a specimen of *Eudorea phæoleuca*, recently captured by him in the Isle of Portland. This species is probably identical with *E. Portlandica*.

The Secretary read an extract of a letter from Dr. Candèze of Liège, stating that he was about to commence a Monograph of the Elateridæ, and wished to enter into correspondence with English entomologists, with a view to exchange specimens of Belgian and French species for those of England and other countries.

Read the following note on a letter from Mr. Weaver to Mr. Douglas:—

"Mr. Weaver writes from Loch Rannoch, September 1st, that he has this year taken several larvæ of the *Lasiocampa* described by Dr. Palmer in 1847, under the name of *L. Callunæ* (Zool. 1665); and that he is more than ever convinced that it is distinct from *L. Quercûs*. He has now noticed that these larvæ changed their last skin in June, and spun their cocoons to assume the pupa state, from the middle to the end of August: and they will not appear as perfect insects till next year. He has invariably found that this moth takes two years to go through its changes, whereas *L.*

Quercus is perfected in one year; and he looks upon this fact, coupled with the period of the last moult of the larva, as the strongest proof of its being a distinct species."

Read an extract of a letter addressed to Mr. Douglas by Mr. Edleston of Manchester, in which that gentleman offers specimens of *Plusia bractea* to any entomologist who may apply for them.

Read also the following extract of a letter to Mr. Douglas, from Mr. John Scott, of Renfrew:—

"Before receiving your letter I had been making inquiries respecting *Gelechia cerealella*, and find that two years ago a cargo of grain (barley) was laid in the granary from Alicante, in Spain, but that since this there had been British barley also deposited; it might happen that the moths were first reared from foreign grain, and have gone on accumulating ever since. I have now upwards of a hundred specimens set, and observe in one of my glasses today, a male and female *in copulâ*. It has as much right to be considered British as the beetle, *Calandra granaria*."

The quarterly part of the Society's 'Transactions' was on the table.—*J. W. D.*

Proceedings of the British Association for the Advancement of Science.

Section C.—Geology and Physical Geography. Prof. SEDGWICK, President. A paper was read, intituled,

"On the Remains of the Hippopotamus, found in the Aire Valley Deposit, near Leeds," by H. Denny. The bones exhibited were obtained from the brick-field at Wortley, near Leeds, and consisted of a large humerus, an ulna and radius, and numerous portions of the skull and jaws, teeth, tusks, &c. They belonged to three individuals; two adults of different size, and a third younger animal, judging from the smooth and pointed canines and the separate epiphyses of the bones. They appeared not to have been drifted from a distance, but to have belonged to animals which lived and died on the spot: one of the skeletons was entire when first discovered, resting on its side, with the bones in their natural position. The clay in which the bones were found is part of a local deposit, consisting sometimes of sand and gravel formed from the neighbouring rocks of millstone grit; it is from ten to twenty feet deep, and ceases at a height of about ninety-five feet above the present level of the river. It contains trees and hazel-nuts, and remains of the red deer, horse, pig, and goat. A few remains of the elephant had been found lower down in the same valley, but they were broken and water-worn.

Prof. Phillips referred to two pieces of pottery alleged by the brick-makers to have been found with the bones; one of these was of a different colour from the clay, and the other was a glazed fragment, apparently of very modern date. Mr. H. E. Strickland referred to other valley deposits in which remains of the hippopotamus occur, and stated his belief that although more ancient than the historic period, they belonged to the most modern geological age,—to a time subsequent to the glacial period, and after the river valleys had assumed their present form.

Section D.—Zoology and Botany, including Physiology. C. C. BABINGTON, Esq., President. The following papers were read:—

“Notices of some Living Aquatic Birds at Santry House, near Dublin,” by W. C. Domville. This paper consisted of a list of birds, also of those which were desiderata in the collection. Mr. Allis, of York, observed that the collection contained no birds of great rarity.

“On some Discoveries relative to the Chick *in Ovo*, and its Liberation from the Shell,” by Dr. Horner.

“Notice of the Reproduction of the Lower Extremities in a Warm-blooded Animal,” by Mr. Allis. The case was that of a common song-thrush. In November, 1851, it moulted, and had every appearance of dying; was reduced to a skeleton and unable to walk; it lay on its back for six weeks, being fed by hand with raw beef, and occasionally with beef-tea and biscuit; early in 1852 an unusual protuberance appeared at the bottom and in front of the tibia above the ankle-joint; from these protuberances perfect tarsi and toes were developed, which came to maturity in about three weeks; this annoyed the bird greatly, and he destroyed the newly-formed members with his beak and by friction on the perch. He moulted again in September, 1852, and in November he lost his original tarsi, and new ones were produced; in January last fresh tarsi were again produced; these displaced those formed in November from articulation with the tibia, and the displaced tarsi are now visibly located on the upper edge of those produced in January last, which latter differ greatly from the normal form, being larger and flatter, and bearing a resemblance to the tarsi of aquatic birds; they have feeble though perfectly developed toes, which are sufficient for the purpose of locomotion, and to enable the bird to perch. The living bird, showing the one pair of tarsi overlying these subsequently produced, was exhibited to the Section by Mr. R. Cook, of York, its owner.

Mr. A. Strickland referred to an instance of additional feet growing from the fetlocks of a mare. Prof. Allman referred to the well-known fact of persons with supernumerary fingers as analogous to this case. Dr. Redfern regarded the production not as an extra limb, but as a substitute for one that was lost. Dr. Lankester pointed out the fact of its occurring after a diseased condition, as placing the feet in quite a different relation to the cases related,—which were congenital, and not a new or acquired organic action.

“On the Utricular Structure of the Endochrome in a Species of *Conferva*,” by Prof. Allman. The plant which constituted the subject of the communication, is closely allied to *Conferva Linum*, and the author showed that the deep green endochrome, when liberated from the cell, is seen to possess a very definite utricular structure. Each utricle is filled with homogeneous green matter, which surrounds one or more peculiarly formed starch-granules. In many instances, utricles were met with of a large size, and filled with a brood of secondary utricles, each containing homogeneous green contents, surrounding a nucleus-like starch-granule.

A long discussion followed the reading of this paper, which ultimately turned upon the distinctions existing between the animal and the vegetable kingdoms. Dr. Redfern dwelt on the importance of recognizing the function of cell-contents, as well as of cell-walls. Physiologists were too prone to recognize the cell-wall, to the exclusion of what it contained. Dr. Walker-Arnott stated that he had recently heard that starch had been found in the *Medusæ*. If this were the case, the existence of starch could be no longer claimed as characteristic of the vegetable kingdom. Prof. Allman agreed

with Dr. Lankester that the best expression to be found for animal and vegetable life at present was, the general fact of vegetable tissue giving off oxygen gas and absorbing carbonic acid, whilst animal tissue absorbed oxygen and gave off carbonic acid.

“On the Morphology of the Pycnogonidæ, and Remarks on the Development of the Ova in some Species of Isopodous and Amphipodous Crustacea,” by Spence Bate. The paper was read by Dr. Lankester, who also exhibited a series of drawings, made by Mr. Bate, of the more minute forms of Crustacea, and stated that the Committee had requested Mr. Bate to draw up a report on the present state of our knowledge of the lower forms of Crustacea, which would, he hoped, be presented at the next Meeting of the Association. He also expressed a wish from Mr. Bate to have sent to him any specimens or information that might be in the possession of naturalists in other parts of the country.

Prof. Allman drew attention to the analogies between the conditions of development in the Crustacea and Arachnida. Mr. Bate found but six legs amongst these lower Crustacea, and this was the case with some forms of Arachnida, more especially the Acaridæ.

Mr. J. D. Sollitt read a paper, prepared by himself, in conjunction with Mr. R. Harrison, “On the Diatomaceæ found in the Vicinity of Hull,” showing that the fresh-water and marine Diatomaceæ were exceedingly numerous in this locality; the beauty of the varied forms of which were such as to delight the microscopist, and, at the same time, some of them are highly useful as forming that class of *test objects* for microscopes which are the best calculated of all others for determining the excellence and powers of object-glasses. As test objects they were first discovered by the Hull microscopists, and have now been adopted as such by all the microscopists not only in this but in all other countries. Mr. Harrison and Mr. Sollitt discovered the markings on those delicate siliceous coverings as early as 1841. It was shown that the markings on those shells were so fine as to range between 34,000 to 130,000 to the inch; the *Plurosigma strigilis* being the strongest marked, and the *Navicula Acus* the finest. It was afterwards pointed out that a large bed of fossil fresh-water Diatomaceæ, of at least two feet in thickness, had been discovered in Holderness, and that in a submerged forest on the coast of Holderness numbers of fossil fresh-water Diatomaceæ had been discovered, although the sea flows over the part at every tide. The paper concluded by pointing out that upwards of 150 species of marine and fresh-water Diatomaceæ had been identified in the neighbourhood of Hull.

The reading of this paper was followed by a long discussion. 1. In relation to the microscopic powers and the structure of the instruments employed by the Hull observers. 2. With regard to the nature of the lines found on the surface of the Diatomaceæ. 3. On the question of the vegetable or animal nature of the Diatomaceæ. From the statement of Mr. Sollitt and Mr. Harrison, it appeared that the lenses which they had employed for the minuter markings, were object-glasses of Natchet’s manufacture, the one-sixteenth and the one-eighth of an inch focal distance, with angles of aperture of 115° and 105° diameter, and for the larger markings Smith’s one-fourth, with an aperture of 46° . With these glasses they had detected markings whose interspaces numbered 130,000 to the inch. Mr. Sollitt regarded the lines as consisting of rows of minute tubercles, which gave the appearance of continuous lines. Dr. Walker-Arnett considered that these curious beings must now be regarded as plants. Prof. Allman looked upon them as the starting-point of Nature, in which the mineral, animal, and vegetable laws of creation were struggling for ascendancy. Mr. Sollitt and

Mr. Harrison regarded them as animals, and quoted the opinion of Prof. Bailey, of New York. Prof. Balfour referred to their resemblance to Desmidiæ, and the conjugation observed amongst them, as conclusive proofs of their relation to the Confervæ, whose vegetable nature no one doubted. Dr. Lankester referred to Schleiden's objection, of their possessing a highly complicated structure, and pointed out their resemblance to the Foraminifera, which all agreed to be animals. It had, however, been asserted that the Diatomaceæ possessed starch, and as yet this had not been discovered as a secreted product in beings recognized as truly animals, whilst starch was universally present in true vegetable productions.

"On the Structure of Bursaria, a genus of Infusorial Animalcules," by Prof. Allman.

"On the Nature of Ciliary Motion," by P. Duncan. The author detailed what had been done by English observers on this subject, and came to the conclusion that the cause of the bending and returning of the cilium resided in the cell-wall of the cell which sustains the cilia, and that to a greater or less extent the whole of the cell-wall is contractile.

Prof. Allman and Dr. Redfern observed that the view taken by the author was undoubtedly correct, and had been recently fully developed by Continental physiologists.

"On a Species of Priapulus, a Genus of Echinoderms belonging to the Family Sipunculidæ," by Prof. J. Phillips. This genus was but little known to British naturalists, and from the descriptions he was inclined to doubt if the present species, which was taken off the coast of Scarborough, was identical with that described by Prof. E. Forbes in his work on British Starfishes.

"On the Structure of the Fresh-water Polyp (*Hydra viridis*)," by Prof. Allman. It had been stated by Ecker and Kölliker that these creatures possessed no cells, but were composed of a mass of granules between which occasional vacuolæ occurred. He had succeeded in observing that the whole of the structure of the Hydra was cellular, and no exception to the general law that regulated the existence of organic beings.

Dr. Lankester exhibited a series of drawings of the British fresh-water polyps, executed by Prof. Allman, which he stated were intended to illustrate a work on this subject to be published by the Ray Society. Among these were several new species, and he especially called attention to one of these, which seemed to be an exception to the general law that the polypidom of the polyp-bearing animals is fixed. In this case the polyp-stalk possessed the power of moving, as well as each individual member of the mass.—From the 'Athenæum,' September 17, 1853.

Proceedings of the Society of British Entomologists.

August 2, 1853.—Mr. HARDING, President, in the chair.

Mr. Miller was elected a Subscriber to the Society.

Mr. Harding exhibited a box of insects taken at Darenth Wood during the past month: among the Lepidoptera were *Ceropacha fluctuosa*, *Heliothis marginata*, &c., and the Coleoptera comprised *Leptura sex-guttata*, *Cryptocephalus Coryli*, *Pachyta collaris*, &c.

Mr. Harding said he took a strange-looking pupa in April, from the trunk of a holly, from which he had bred *Cryptocephalus flavilabris*.

September 6, 1853.—MR. HARDING, President, in the chair.

Mr. Dalman exhibited a splendid pair of *Plusia Orichalcea*, taken by Mr. Harding near Kingsdown, in Kent.

The President exhibited a box of insects from the Kentish coast, among which were *Lithosia quadra*, *L. pygmaeola*, *Setina irrorella*, *Lupirona albicolon*, *Agrotis Aquilina*, *A. valligera*, *Eremobia ochroleuca*, *Heliothis marginata*, *H. Dipsacea*, *Dosithea immutata*, *Acidalia perocharia*, *Timandria emutaria*, *Odontia dentalis*, *Phibalapteryx gemmaria*, *Cledeobia angustalis*, *Scopula ferrugalis*, *Anerastia Farrella*, *Nemotois Cypricellus*, &c.

The President read the following letter from Mr. Oxley, who emigrated to Australia in May, 1852:—

“ Forest Creek Diggings,

“ Victoria, March 5, 1853.

“ This colony is not a first-rate place for an entomologist. The Coleoptera are curious, and some few certainly handsome; I have succeeded in getting a few score of them, my collecting in this department being more extensive than in Lepidoptera. The colours of the Lepidoptera of this place have a strong resemblance to those of the English moths and butterflies, very few of them having the rich metallic tints of the tropical species. The markings of many of the insects are very pretty, but the colours generally obscure and dusky. From October up to last month we had *Cynthia Cardui*, or one very like it, in abundance; indeed it appears to be the commonest butterfly here, and lasts, as most of the insects do in this country, for a long time. If I were to pass my opinion on such of the Lepidoptera as have come under my notice, I should say that with one exception I have seen nothing here to equal our *Vanessa Atalanta*, *V. Io*, or *Limenitis Camilla*.

“ I live in the hope that the autumn now approaching may turn out something better than the past season, as on the 3rd instant I bred two insects, coming I think near the hair-streaks, only larger, having the borders of the wings indigo-colour, or nearly black, and their centres a metallic azure-blue, with red and black caudal appendages: the under side yellowish, beautifully lined and spotted with black. This is one of the most beautiful things I have seen; I hope to breed a dozen or two more of them.

“ You justly observed that I should find collecting difficult work, for many times of an evening I see insects and have no heart to take them, being so tired with the day's exertions; and as gold-digging was the primary object of my coming here, I can with difficulty spare time to do much in the day-time. I shall not be able to collect enough to make it worth while to send home, but hope to have some kind of a collection—an *olla podrida*, or a little of everything—to bring home on my return.

“ No country has been so much over-written as this; thousands who are here curse it from the bottom of their hearts. I am writing this under the shade of a red gum-tree; the sun is scorching all around, and perhaps at night it will be chilly cold: the changes are more extreme than at home. There is much dysentery, ophthalmia, and rheumatism amongst the people here. At the end of November or beginning of December there was a tremendous flight of grasshoppers for two days—millions and millions of them; and they still are with us in countless numbers. This is a great country too for ants, they are to be found of every size, and in nearly every place. Nor must all mention of fleas and flies be omitted, for the former will scarcely allow you to get a wink of sleep at night, and the latter are a perfect pest, getting into one's mouth, eyes, and nostrils, so as to render the wearing of veils indispensable.

“Within a month from this time I guess you will have commenced your entomological campaign for 1853: I should like to be with you at dear old Darenth Wood, but do not anticipate it this year, unless fortune’s favours are unexpected and speedy, but be assured I will leave this country as soon as I can conveniently. One day’s collecting, or one night’s mothing at Darenth, is worth more than a month’s collecting here, for comfort and real enjoyment.

“THOS. J. R. OXLEY.”

Mr. Dalman observed that the larvæ of *Acherontia Atropos* appeared to be rather plentiful this year; and several other members had seen or obtained some.—*J. T. N.*

Note on the unknown Eggs found near Norwich.—The remarks of your correspondent on this subject (Zool. 4014), seem to refer to some variety in the eggs of our common kingfisher much resembling those in question. The kingfisher (*Alcedo Ispida*) is certainly met with in many parts of the Norwich river; but even supposing the eggs of that bird to vary occasionally in form, I think the number of those lately found, is a sufficient reason for not assigning them to the kingfisher. As I stated before, they resemble the eggs of the common swift more than any other’s in shape, but instead of having a chalky exterior, they are smooth and shining. I am sorry that I can give no further information at present respecting the nest, as I have never been able to meet with the boys who found it; however, I question very much if they noticed it sufficiently to throw any fresh light on the subject.—*H. Stevenson; Norwich, September 17, 1853.*

Note on the late Nidification of Birds.—There is at the present time the nest of a goldfinch in an orchard here, which contains young only just hatched. Two days ago I saw some thrushes, which had just been taken from the nest, being still unable to fly or to feed themselves; and about a fortnight ago I found some hedge accentors in the same predicament, except that the latter were still enjoying their “mother’s love and father’s joy,” instead of being cooped up in a wretched little prison not six inches square, as the former were, to be crammed from the hands of their merciless gaoler. The above are remarkable proofs that the continued wet this season has induced the feathered tribes to delay their incubation till so late, that their offspring stand a fair chance of being frozen, if not drenched to death.—*Alfred Merle Norman; Pyrton, Oxfordshire, September 17, 1853.*

Occurrence of the Osprey (Falco Haliæetus) at Weybridge.—I have had brought me for stuffing a most beautiful specimen of the osprey. It was shot on Sunday last, at Weybridge. I should feel great pleasure in showing it to any one who may wish to see it.—*James Gardner; 426, Oxford Street, September 15, 1853.*

Note on the Grasshopper Warbler (Salicaria Locustella).—About two years since having a great desire to add to my collection an example of this rare little bird, I paid several visits during the summer to one of our smaller broads, always abounding with the more common reed and sedge warblers, and not unlikely, from the denseness of the herbage, to harbour the rarer species of the same tribe. For a long time I watched in vain, and had nearly given over my search as hopeless, when one still summer afternoon I heard distinctly, in a clump of reeds, that peculiar creaking note, which,

once heard, cannot be mistaken. But although my ears were greeted with such welcome sounds, the wary little fellow was far too cunning to trust himself for an instant within sight; and again was I obliged to leave without obtaining a specimen. I happened, however, to have with me a man whose employment keeps him almost entirely on the broad, both early and late, and making him observe the note well (which he said he had often listened to, but never supposed it to come from a bird), he seemed pretty sure of being able to shoot one. About a week after this, I was delighted at receiving from him a fine male specimen; and since then, including this year and the last, he has procured for me no less than seven. Of these birds one only proved to be a female, wanting entirely the little brown spots on the throat; another, a young male of the year, showed that they breed on the broad, though as yet I have been unable to discover either the nest or eggs. From these circumstances, I cannot help thinking that the grasshopper warbler, although visiting this country in far greater numbers than either the reed or sedge warblers, is still less rare than is generally supposed, and that, by careful attention to its habits, it may be met with in most localities as well suited to its shy mouse-like actions as our Norfolk Broads. The following remarks, from my own observations, and the shrewd descriptions of the broad-man, may not be uninteresting to your readers. The grasshopper warbler arrives later and leaves us earlier than either of the others. He is seldom heard in the middle of the day, and never in windy weather; but sometimes on a fine sunny afternoon, when scarcely a breath of air is stirring the feathery tops of the reeds, his loud creaking note may be heard in some neighbouring sedges: rarely however will he expose himself to danger, even by a short flight to some other hiding-place. Early in the morning, or on moonlight nights, appear to be the only certain times for seeing him, as he then seems to be much less cautious, and either hanging from the reed-stems, or perched on the topmost twig of some small bush, he may be heard creaking for a long time, constantly moving his head from one side to the other. If heard over-night, when too dark for anything to be distinguished, he will invariably be found in the same place at the first dawn of morning; and even if fired at and missed in the evening, he will still remain near the same spot. Though occasionally met with in hedge-banks away from any stream, he is always most certain of being found amongst reeds and sedges, in company with his kindred species.—*H. Stevenson; Norwich, September 11, 1853.*

Note on singularly placed Nests of the Pheasant (Phasianus Colchicus) and Red-legged Partridge (Perdix rufa).—The interesting account given by my friend, the Rev. A. C. Smith, of a nest of the common partridge on a stubble-rick (Zool. 3945), has reminded me that I ought to record two singular instances of game birds nesting in elevated situations. The first is that of a pheasant, which, although it happened full twenty years ago, yet I have it on the authority of two respectable eye-witnesses, and I do not doubt any of the particulars of the case, which is as follows. The nest was on the bough of a Scotch fir-tree, about, I suppose, fifteen feet from the ground, and was an adaptation of a squirrel's "drail." The old bird was seen several times while she was sitting on her eggs; and when, in due course of time, these were hatched, my informants tell me that two young ones were discovered dead at the bottom of the tree, and in the nest was found one addled egg, together with the shells of nine others, from which young birds had been hatched. There was a thick undergrowth of furze surrounding the clump of trees in which the nest was situated, so that the bird's breeding in so unwonted a position must have been quite the result of choice. The second instance is that of a red-legged partridge, a nest of which was found here this year on

the thatch of a stack of barley. The old bird was sitting on thirteen eggs when it was discovered, and would doubtless have hatched her young, had it not been necessary to remove the stack before that devoutly-to-be-wished-for consummation had arrived.—*Alfred Newton ; Elveden Hall, Thetford, September 1, 1853.*

*Correction of a previous Error respecting the Masked Gull, (Larus capistratus).—*In a note some time ago (*Zool.* 2825), I recorded the occurrence of a specimen of the masked gull on the river Dart. I had, during the past summer, an opportunity of examining this identical bird, which is now in the Museum of the Torquay Natural History Society, and I have no hesitation in saying that it is a specimen of the black-headed gull, (*Larus ridibundus*). Whether the masked gull is, or is not, a species, is a question I am not able to enter upon ; but this is evident, that nothing is more likely to bring discredit on the existence of such a bird, than a mistake like that which I have unfortunately made.—*Id.*

*Additional Note on the Spider that lived Twelve Months without Food.—*From the date of the article quoted in a former number (*Zool.* 3883), namely, October 6, 1852, up to the month of May, 1853, the habits of this spider were very similar to those already described ; towards the end of that month, however, he began to wander about very much. These wanderings were performed exclusively on the back, top, and sides of the box, and never on the bottom or on the birds, so far at least as could be seen by myself or any of my household, who were a goodly number, and always on the alert. About the middle of July his peregrinations became more frequent, and more protracted, he being absent for days together from his accustomed nook ; his whole manner too became altered, and his appearance a good deal changed for the worse. The birds were now taken out of the case, in order that his movements might be the better observed. Restless, seemingly much agitated, and doubtless pressed by hunger, he would often wander for hours and days together, up and down, and to and fro on the back and sides of his prison-walls. Every day bore testimony to his increasing weakness and his approaching end. Being now unable to support his own weight, he was several times observed to fall from various heights to the bottom of the case ; and on such occasions he was frequently unable to reascend for some considerable time thereafter. On looking into the case on the morning of the 3rd instant, I was not a little surprised to find that my prisoner had disappeared. See him I could not, although I scanned the whole box over and over again : all hands and all eyes were summoned, and though each had his turn, no one could find the little fellow. I may here mention that the bottom of the box, having been fitted up to hold sea-birds, has a rough covering, so as to resemble a rocky surface, and it was thought that the object of our search had fallen behind one of the stony projections, where he had died. However, on the evening of the 7th he was again seen slowly wending his way up the back of the box, and once more regained his lonely abode in the corner. On the 9th he was again lost sight of until the 11th, when he once more made his appearance. On the 14th he was again seen to leave his home, to which he never returned : having gained the extremity of his net, he was observed to fall to the bottom of the case, and though he made several attempts, he was quite unable to reascend. Fatigued and worn out by his endeavours to get up, he was finally observed to creep behind one of the rocky projections already alluded to, where, on the morning of the 25th inst., he was found dead

and reduced to a mere shadow. And so ends the history of my spider, after he had lived in his prison for a year and ten months, without food.—*Thomas Edward; Banff, August 29, 1853.*

Notes on a short Excursion to Rannoch.—I had heard so much of Rannoch and its surrounding country, of its entomological productions, and the very few who had taken advantage of its richness, that for a long time I had been very desirous of paying it a visit. Indeed, at last it came to be part of my dreams by night as well as of my thoughts by day; but circumstances always prevented me from taking the journey until the end of June, 1852. Of my progress thither it is needless to say anything, save that it occupied two days in its performance, the first of these by conveyances of all kinds, the second by walking over as rough a tract of country as could well be picked out. For miles there was no cultivation, no houses, nor anything but high frowning hills on either side, from the faces and down the sides of which huge blocks have been detached and rolled into the valleys below, diverting the small stream from its otherwise regular course, bending and twisting it into such fantastic curves, that one might fancy it some huge Hydra writhing in convulsions. Sometimes the road lay along the top of a great chasm, and now a rock interposed as if to prevent all further passage that way; now winding away far into the distance, as though it had no end, and then over a great hill, six miles across. After about twenty-three miles of this sort of country, I at last got a glimpse of the loch, with a few houses on its farthest shore. For miles and miles everything is covered with heather; whilst here and there stand a few aged firs, looking like monuments of the once great forest, or some birches, indicating that they also have had something to do in former days in crowning the now otherwise heathy district. Full directions from a kind friend who had been there previously, enabled me very easily to discover the place I sought; and so, after a few questions, I found myself established for the few days I was to stay there. After putting everything in order for work the next day, I went to bed, intending to be up betimes, and, thanks to my long walk, slept soundly; but when I arose on the following morning, the rain was falling in torrents. This was a sad disappointment, as I had along quite forgotten that the sun does not always shine: however, it cleared up a little about mid-day, when I set out to ransack the ants' nests, which are very plentiful and very large, and for the most part formed at the roots of the black fir-trees. *Tinea ochracea* I found in abundance: many of them were sitting on the heather and *Vaccinium* growing close by. Several of the females which I boxed, ejected a fine, yellow, cottony kind of substance over the eggs they deposited: this fine down was sent forth with great rapidity, until it attained the size of a large pea. In the centres of the ants' nests I found several larvæ of *Cetonia ænea*, which I brought away with me, and have since reared some of them. The ants did not seem to heed the *Tinea* while alive, but when I killed a few, and threw them on the hills, they were at once seized and carried off. From decayed ferns I beat a few specimens of *Cecophora stipella*; round about the firs swarmed *Stigmmonota coniferana*: and whilst I was boxing the latter, a single specimen of *Tinea fulvimetrella* came into my net. *Mixodia palustrana* was not uncommon amongst the heather. *Harpalyce ruptaria* was abundant amongst the birches, including some beautiful varieties. On the top of the highest hill, whither I went in search of *Psodos trepidaria*, I took a few specimens

of *Crambus lapponicellus* ; * I also beat *Tinea prælatelylla* from birch. I was surprised at the scarcity of Micro-Lepidoptera, but contented myself by attributing it to the very wet weather, as it was no uncommon thing for me to be wet through two and three times in a day. *Lithocolletis Caledoniella* was the only other thing of note which I took amongst these little gems : here I found it among birch ; at Renfrew I take it in company with *Dunningiella* and *Emberzapennella*, amongst oak and honeysuckle. With sugar I did nothing by night, it being both too wet and too windy ; I generally however examined the trees in the mornings, but my only visitors were *Carabus glabratus* and *Rhagium inquisitor*. I had hoped to capture thus *Cetonia aurata* and *C. ænea*, as well as *Trichius fasciatus*, but, I suppose, the absence of the warm sunshine kept them away. *Carabus glabratus* was by no means uncommon, either beneath stones, or running across the paths. Fairly embedded, "like a red-hipped humble-bee, on the top of a thistle," lay *Trichius fasciatus*, eagerly driving its long trunk with wonderful quickness to the bottoms of the flowers, in search of the sweets deposited there, too busy to offer any resistance to its capture : on being laid hold of, it emits a strong perfume not unlike that of otto of roses. *Pissodes Pini* was in great numbers under the felled timber. An occasional *Acanthocinus Ædilis* might be observed passing through the air, with its long antennæ gracefully thrown back : they are very destructive to each other, and when they meet, mutilation generally takes place. I was most desirous to obtain the larva of this insect, in order to throw some light on its transformations, but was unsuccessful. The felled timber had an occasional *Rhagium Indagator* resting upon it. I also took *Iamia textor*, and the specimens are certainly the largest I have seen. This insect I obtained on the road-side, near to where some old birch-roots had been grubbed up, and from this I concluded that it had been bred in them. In moving, their joints gave out a creaking sort of noise, as if the sinovia had dried up. *Asemum striatum* was very common ; I did not care to take it, as at Renfrew, before starting, I had captured a great number, and again, this season, have taken no fewer than seventy-five specimens. *Leiodes humeralis*, *Thanasimus formicarius*, *Hylesinus crenatus*, and one or two *Curculios* were plentiful. And now, in conclusion, I would fain recommend to all who can spare a few days in summer, especially to our northern collectors, a visit to this place. All classes of naturalists may be edified and enriched, since the locality abounds with scarce specimens not only in our branch, but in almost all branches of Natural History. It is, in many respects, a tempting spot. The hum of the city is all unheard ; and the stillness which for ever dwells here, only broken in upon at intervals by the cry of the golden plover or the curlew, which the traveller may chance to start from their resting-place, and which are his only companions, cannot fail to arrest attention. And it is glorious and heart-inspiring to roam about, freed from the cares of business and the yellow-eyed fever of money-getting, which for days and months previously have been weighing us down, with the broad face of Nature smiling upon us, and inviting us by her thousand charms to live with her, and forgetting for a time what we were, to

"Find tongues in trees, books in the running brooks,
Sermons in stones, and good in everything."

—*John Scott ; London Works, Renfrew, August 31, 1853.*

* The insect described by Mr. I. Gray in the 'Naturalist' as *Crambus radiellus* (*lapponicellus*, *Guen. in litt.*), is not that insect, but merely *C. margaritellus*, and pretty abundant on the heaths of Renfrewshire. *C. lapponicellus* is mountainous.

Capture of Plutella Dalella. — I have taken some fine and beautiful specimens of *Plutella Dalella*, and should be glad to make a few friendly exchanges with any gentleman who may require them. — *J. Johnson ; Denby Parsonage, near Huddersfield, September 15, 1853.*

Note on the Larva of Eudorea murana. — I have been fortunate enough to meet with the larvæ of this insect in abundance. The larva lives on moss growing on old walls, and may probably be obtained throughout the whole year. I have found it as early as February, and up to the present time. It is easily observed, from its constructing long tubular passages in which it lives during the day. When full grown, it is about an inch in length, brown, with a few spots and hairs on each segment: the head and shield pitchy. — *John Scott ; London Works, Renfrew, August 29, 1853.*

Notes on the Hymenoptera of Southend and its Vicinity. By FREDERICK SMITH, Esq., Assistant in the Zoological Department, British Museum.

SOUTHEND and its neighbourhood have long been known as a locality producing many rarities in the orders Coleoptera and Lepidoptera; the captures of Hymenoptera made by me during the last two weeks of August and the first week of September in the present year, will, I think, place this district in the highest rank as a locality for rarities in that order also. The late period of the season when I explored the district, precluded the possibility of giving any adequate idea of the species of Apidæ which may be found there; but in Fossorial insects it is fully equal in productiveness to any locality with which I am acquainted. As in the Apidæ our standard is the 'Monographia Apum Angliæ,' so in the Fossiores is Shuckard's Essay. I will therefore enumerate the species I met with in the order in which I find them in the Essay, making such remarks as appear to be necessary as I pass along.

I should, however, in the first place, point out the exact spot where my best captures were made. On arriving at Southend, the entomologist would be induced, by the seeming excellence of the situation, to search the slopes and shrubbery to the west of the pier: so far as Hymenopterous insects are concerned, the result of my experience would lead me to advise him to spare himself that useless trouble. I spent two days in a fruitless search at that spot, not capturing a single insect of the slightest rarity. My advice is, turn eastward, and then, leaving the town and the deceptive slopes behind, trudge merrily on for about a mile, until, in fact, you come within about a hundred yards of the slopes, which in some parts of their extent rise abruptly from

the beach to a height of thirty feet: here some short slopes and broken ground will be met with. Look about carefully, for this is the locality where the elegant *Dasygaster hirtipes* is to be found. Of this bee I captured some fine examples: the best time to take them is about 9 o'clock in the morning, on their first coming out, and before they are laden with pollen, which it is difficult to remove from the plumose scopa of their posterior tibiae. About this spot I also met with *Cilissa tricineta* and *Andrena pilipes*. Along the hedge-rows of the fields to the left of the slopes I found the male of *Bombus Latreillellus*, usually a rather scarce insect: *Bombus lapidarius*, however, was the most abundant of the genus, in fact occurring in greater profusion than I ever recollect to have observed any one species in a given locality. *Apathus rupestris* also abounded.

Having searched the spots alluded to, the best way, I believe, is to follow the path-way on the top of the slopes, carefully examining the foot-path and bank on the left; here, towards the further end, I picked up several specimens of *Mutilla ephippium*, which is not uncommon, as I captured ten specimens of the female, the other sex I was too late to meet with. In the hard trodden path-way will be found many burrowing Hymenoptera, and amongst others *Cerceris ornata*.

But I must proceed to enumerate the species in the order in which they are arranged in the Essay, just premising that at the extremity of the slopes you arrive at an open, barren, unpromising-looking piece of waste land, called Southchurch Common, the farther extremity of which is a rabbit-warren; this is the field of my campaign! Immediately on reaching the end of the slopes commences a raised mound, or wall of sand, which runs parallel with the foot-path to the end of the field which it bounds; on the south side of this bank most of my captures were made, others upon the flowers and bare spaces on the adjoining common. *Tiphia femorata* was found here, but I was too late to judge in what abundance it occurs. Of the genus *Pompilus* I captured the following: — *P. plumbeus*, *niger*, *rufipes*, *fuscus*, *gibbus*, *pectinipes*, *sepicola*, *affinis*, and *exaltatus*. *P. rufipes* I was glad to meet with, it being so very local, and having only once before captured it, in Sandown Bay, Isle of Wight: of this species I took eleven specimens.

Aporus bicolor. This was the first time I had taken the species. On examining this insect, I was at first led to believe that I had captured a new species, having, as I supposed, met with *Aporus* at Weybridge, and possessing four examples. After a careful investigation of the subject, I arrive at the following conclusions: — All the speci-

mens which I have seen in cabinets, including my own four, are only individuals of *Pompilus pectinipes* with the *second transverse nervure* obsolete; one example only in the collection of the late Mr. J. F. Stephens being the *true* *Aporus* of Spinola. The characters, both generic and specific, in Shuckard's Essay, belong to the variety of *P. pectinipes* (*crassicornis*, *Shuck.*); the wing figured is also that of *pectinipes*. On turning to Spinola's generic characters, the description of the *wing alone* is quite decisive: the superior wing is described as having one marginal, and two complete submarginal cells; the third being incomplete, the second submarginal cell receiving the *first* recurrent nervure, and the second recurrent nervure *uniting* with the transverse nervure which divides the *second* from the *third* submarginal cell. Such is Spinola's description; and yet, both in Shuckard and St. Fargeau, the second cell is described as receiving *both* the recurrent nervures: the relative proportion of the cells is also different. Other characters are given, which place the matter beyond a doubt: the form of the antennæ, as well as the oral organs, being most carefully described, and quite different from those of my supposed specimens of *Aporus*. I strongly suspect the genus *Evagetes* of St. Fargeau to be also the true *Aporus* of Spinola. The capture of this insect is therefore an event of considerable importance, since it has thrown a light on a genus hitherto misunderstood by many entomologists.

Ammophila sabulosa, *viatica*, and *lutaria*. The last-named species I never captured before; it is apparently rare in this locality. I took three males and two females.

Larra Pompiliformis was very plentiful.

Harpactus tumidus, scarce.

Cerceris arenaria, *ornata*, and *labiata*. The latter species I had previously always found rare. I have occasionally met with a specimen at Weybridge, and in parts of Hampshire, but always singly; here I captured about forty, including both sexes. What is its prey I could not detect, neither could I find any spot where they were gregarious like *C. ornata*. I occasionally saw one on the sand-bank, but most of my specimens were captured on the flowers of *Achillea Millefolium*.

Scattered about on the waste are plants of *Echium vulgare*, to the flowers of which the rare *Megachile argentata* pays its visits. I took both sexes of this little bee.

Many other rare Hymenoptera are probably to be found here at different periods of the season; sufficient however have, I trust, been

recorded to satisfy any one that my opinion of this being a *first-rate locality*, is pretty near the truth.

Various species of ants are also found : of the genus *Formica* the species *rufa*, *cunicularia*, *nigra*, *fusca*, *flava*, and *fuliginosa* ; and of *Myrmica*, *rubra*, *lævinodis*, *ruginodis* and *fuscula*.

Ichneumonidæ abound here. I took a splendid series of the beautiful *Ichneumon viridatorius* and *ornatorius* ; and from a connecting string of varieties I am led to suspect that these constitute but one species.

In the *Proctotrupidæ* I met with two scarce genera, — *Epyris niger* and *Sparasion frontale*.

Many nice species of *Diptera* also occur, — *Anthrax Hottentotta* in great numbers. I also captured a genus apparently rare in this country, the *Elachiptera brevipennis* of Macquart. I observed it hopping on a hot sand-bank, occasionally sliding down with the loose particles it had disturbed, and again dancing up in unceasing restlessness.

I took many good species of *Coleopterous* insects, but I leave these to be enumerated by those better acquainted with that branch of Entomology than myself. Neither have I thought it advisable to make mention of those species of *Fossorial Hymenoptera* which are universally distributed.

FREDERICK SMITH.

British Museum, September 18, 1853.

Death of Mr. H. E. Strickland. — “ We have to announce, with deep regret, the death of Mr. H. E. Strickland, who was killed on Wednesday by a railway train, whilst examining the strata of a railway cutting on the Manchester, Sheffield, and Lincolnshire line. The melancholy particulars are thus given in the daily papers : — ‘ Mr. Strickland arrived at East Retford on Wednesday from Hull, having attended the recent meeting of the British Association. He was attached to the Geological Section of the Association ; and in pursuance of his practical investigations in that science, he proceeded on Wednesday afternoon to examine the strata of the deep cuttings on each side of the Clarbrough Tunnel, about four miles distant from Retford. A little after 4 o’clock, a boy at work in the fields observed him standing between the two lines of rails, near the mouth of the tunnel, on the Gainsborough side, with a pocket-book in his hand, apparently engaged in making notes. At this time a coal-train was approaching on the down line, to avoid which he stepped off the “ six-feet ” on to the up line ; but unhappily he did so just at the moment when the Great Northern passenger train was issuing from the tunnel. The train dashed upon him, and the next instant he lay a shattered and shapeless corpse.’ ” — *From the ‘ Athenæum,’ September 17, 1853.*

NOTICES OF NEW BOOKS.

'*A Naturalist's Rambles on the Devonshire Coast.*' By PHILIP HENRY GOSSE. London: John Van Voorst, Paternoster Row. 1853. Price 21s.

(Concluded from page 4062).

WE return with pleasure to the coasts of Devonshire, and think our readers will participate in that pleasure, when we place before them the Naturalist, on his hands and knees, gazing into the wondrous rock-pool at Oddicombe.

"I took another look at my pretty little rock-basin at Oddicombe. It is a deep, oval, cup-like cavity, about a yard wide in the longest diameter, and of the same depth, hewn out, as it were, from the solid limestone, with as clean a surface as if a stone-mason had been at work there. It is always, of course, full of water, and except when a heavy sea is rolling in, of brilliant clearness. All round the margin are growing tufts of the common coralline, forming a whitish bushy fringe, reaching from the edge to about six inches down; a few plants of the bladder *Fucus* are scattered around and above the brim; and the arching fronds of the sweet *Laminaria*, that I before spoke of, hang down nearly to the bottom, closely resembling, except in their deep brown hue, the hart's-tongue fern that so profusely adorns the sides of our green lanes. Below the coralline level are a few small red sea-weeds, as *Rhodymenia palmata*; and the dark purple *Chondrus crispus* growing in fine tufts, reflecting a rich steel-blue iridescence. But all the lower parts of the sides and the bottom are almost quite free from sea-weeds, with the exception of a small *Ulva* or two, and a few incrusting patches of the coralline base, not yet shot up into branches, but resembling smooth pink lichens. The smooth surface of the rock in these lower parts is quite clean, so that there is nothing to intercept the sight of the *Actiniæ* that project from the hollows, and spread out their broad circular disks like flat blossoms adhering to the face of the interior. There are many of these, all of the species *A. bellis*, and all of the dark chocolate variety, streaked with scarlet; and they are fine in the ratio of the depth at which they live: one at the very bottom is fully three inches in diameter.

"There is something exceedingly charming in such a natural vivarium as this. When I go down on my knees upon the rocky margin,

and bring my face nearly close to the water, the whole interior is distinctly visible. The various forms and beautiful tints of the sea-weeds, especially the purple flush of the *Chondrus*, are well worthy of admiration; and I can see the little shrimps and other Crustacea busily swimming from weed to weed, or pursuing their instinctive occupations among the fronds and branches,—an ample forest to them. Tiny fishes of the blenny genus are also hiding under the shadow of the tufts, and occasionally darting out with quivering tail; and one or two brittle stars are deliberately crawling about, by means of their five long and flexible arms, in a manner that seems a ludicrous caricature of a man climbing up by his hands and feet,—only you must suppose an additional arm growing from the top of his head. The variety of their colours, and the singular but always elegant patterns in which they are arranged, render these little star-fishes attractive.

“Such a calm, clear, little well as this, among the rugged rocks, stored with animal and vegetable life, is an object well calculated to attract a poet’s fancy. The following description must have been drawn from just such a rock-pool, and most true to Nature it is :—

‘ In hollows of the tide-worn reef,
Left at low water glistening in the sun,
Pellucid pools, and rocks in miniature,
With their small fry of fishes, crusted shells,
Rich mosses, tree-like sea-weed, sparkling pebbles,
Enchant the eye, and tempt the eager hand,
To violate the fairy paradise.’ — *Montgomery*.”

—P. 54.

It is impossible to turn over the pages of this admirable book without finding abundance of matter that rivets the attention of the true naturalist; and such we hold to be not the mere preserver of the remains of beings that were once endued with life, and blessed with happiness and vigour, but he who marks well the varied phases of the moving creature, while, instinct-directed, it performs those acts with which the maintenance of its own life and the perpetuation of its kind are so indissolubly connected. In endeavouring to seek the best opportunity for prosecuting such studies, for keeping up a continued series of such observations, Mr. Gosse was led to attempt the bringing of animated Nature home to his fire-side, and thus to secure himself against those casualties and difficulties which distance and our changeable climate so frequently interpose between the naturalist and the objects of his research.

“ One prominent object that I had in view in coming to the coast, was the prosecution of a cherished scheme for the conservation of marine animals and plants in a living state.

“ For several years past I have been paying attention to our native Rotifera, and in the course of this study had kept fresh water in glass vases unchanged from year to year, yet perfectly pure and sweet, and fit for the support of animal life, by means of the aquatic plants, such as Vallisneria, Myriophyllum, Nitella and Chara (but particularly the former two), which were growing in it. Not only did the Infusoria and Rotifera breed and multiply in successive generations in these unchanged vessels, but Entomostraca, Planariæ, Naidæ, and other Annelides, and Hydræ, continued their respective races; and the young of our river fishes were able to maintain life for some weeks in an apparently healthy state, though (perhaps from causes unconnected with the purity of the water) I was not able to preserve these long.

“ The possibility of similar results being obtained with sea-water had suggested itself to my mind, and the subject of growing the marine Algæ had become a favourite musing, though my residence in London precluded any opportunity of carrying out my project. My notion was, that as plants in a healthy state are known to give out oxygen under the stimulus of light, and to assimilate carbon, and animals, on the other hand, consume oxygen and throw off carbonic acid, the balance between the two might be ascertained by experiment, and thus the great circular course of Nature, the mutual dependence of organic life, be imitated on a small scale.

“ My ulterior object in this speculation was two-fold. First, I thought that the presence of the more delicate sea-weeds (the Rhodospërms, or red families especially, many of which are among the most elegant of plants in colour and form), growing in water of crystalline clearness in a large glass vase, would be a desirable ornament in the parlour or drawing-room; and that the attractions of such an object would be enhanced by the presence of the curious and often brilliant-hued animals, such as the rarer shelled Mollusca, the graceful Nudi-branches, and the numerous species of sea Anemones, that are so seldom seen by any one but the professed naturalist.

“ But more prominent still was the anticipation that by this plan great facilities would be afforded for the study of marine animals, under circumstances not widely diverse from those of Nature. If the curious forms that stand on the threshold, so to speak, of animal life can be kept in a healthy state, under our eye, in vessels where they can be watched from day to day without being disturbed; and that

for a sufficiently prolonged period to allow of the development of the various conditions of their existence, it seemed to me that much insight into the functions and habits of these creatures, into their embryology, metamorphoses, and other peculiarities, might be gained, which otherwise would either remain in obscurity, or be revealed only by the wayward 'fortune of the hour.'

"Nor have these expectations been wholly unrealized. My experiments, though not yet entirely successful, and needing much more attention and time to complete them, have yet established the fact, that the balance can be maintained between the plant and the animal for a considerable period at least, without disturbance of the water; while my vivaria have afforded me the means of many interesting researches, the details of which form the subject of these pages.

"The first thing to be done was to obtain the Algæ in a growing state. As they have no proper roots, but are in general very closely attached to the solid rock, from which they cannot be torn without injury by laceration, I have always used a hammer and chisel to cut away a small portion of the rock itself, having ready a jar of sea-water into which I dropped the fragment with its living burden, exposing it as little as possible to the air. The red sea-weeds I have found most successful: the Fuci and Laminariæ, besides being unwieldy and unattractive, discharge so copious a quantity of mucus as to thicken and vitiate the water. The Ulvæ and Enteromorphæ, on the other hand, are apt to lose their colour, take the appearance of wet silver-paper, or colourless membrane, and presently decay and slough from their attachments. The species that I have found most capable of being preserved in a living state, are *Chondrus crispus*, the *Delesseriæ*, and *Iridea edulis*. The last-named is the very best of all, and next to it is *Delesseria sanguinea*, for maintaining the purity of the water, while the colours and forms of these render them very beautiful objects in a vase of clear water, particularly when the light (as from a window) is transmitted through their expanded fronds. Many of my friends, both scientific and unscientific, who have seen my vases of growing Algæ at various times during the present year, both at Torquay and at this place, have expressed strong admiration of the beautiful and novel exhibition.

"I have not as yet been able to preserve the water to an indefinite period. Sometimes the experiment has quite failed, the plants decaying and the animals dying almost immediately; but more commonly, the whole have been preserved in health for several weeks. The following are the particulars of the most successful of my efforts.

“ On the 3rd of May I put into a deep cylindrical glass jar (a confectioner’s show-glass), 10 inches deep by 5½ inches wide, about three pints of sea-water, and some marine plants and animals.

“ On the 28th of June following, I examined the contents of the jar as carefully as was practicable without emptying it, or needlessly disturbing them. It had remained uncovered on the tables in my study, or sometimes in the window, ever since, a little water only having once been added merely to supply the loss by evaporation. The water was perfectly clear and pure. A slight floccose yellow deposition had accumulated on the sides of the jar, but there was very little sediment on the bottom. I had taken no note of the plants or animals when I had put them in; but as none of them had died, and none had been either abstracted or added, the following enumeration gives the original as well as then present contents.

“ There were at this time in the jar the following Algæ, all in a growing state, and attached to the original fragments of rock : —

“ Two tufts of *Delesseria sanguinea*, each with numerous leaves.

“ Two of *Rhodymenia jubata*, one small, the other a large tuft.

“ A small *Ptilota plumosa*, growing with one of the last-named.

“ A *Chondrus crispus*, with

“ An *Ulva latissima* growing parasitically on one of its fronds.

“ These seven plants had supplied for eight weeks the requisite oxygen for the following animals, which were at this time all alive and healthy : —

“ *Anthea cereus*.

Actinia bellis, a large specimen.

„ *bellis*, a half-grown one.

„ *anguicomma*, large.

„ *anguicomma*, small.

„ *nivea*.

„ *rosea*.

„ *rosea*, a small specimen.

„ *Mesembryanthemum*, young.

„ *Mesembryanthemum*, young, another variety.

Crisia denticulata, a large tuft.

Coryne — ? young.

Pedicellina Belgica, two numerous colonies.

Membranipora pilosa.

Doris (bilineata ?)

Polycera 4-lineata, very small.

Phyllodon lamelligera, about 11 inches long.

A coil of small Annelides.

Several Serpulæ.

Acaridæ.

Entomostraca.

Infusoria.

Grantia nivea. And other smaller zoophytes and sponges, which I could not identify.

“Soon after this examination I went on a journey, and did not return till the 7th of July. The weather had set in very hot: whether this, combined with the closeness of the room, had had any effect, I do not know; but on my return I found the water beginning to be offensive, a sort of scum forming on the surface, and the animals evidently dying. Some were already dead, but most of the others recovered on being removed to fresh sea-water. This result, though it puts an end to my experiments at this time, I do not regard as conclusive against the hypothesis; for of course animals are liable to death under any circumstances, and the corrupting body of one of these in so limited a volume of water would soon prove fatal to others, even though there might be no lack of oxygen for respiration. It is possible that one of the large Actiniæ may have casually died during my absence, the timely removal of which might have averted the consequences to the others; but this is only conjecture. Perhaps there was too large an amount of animal life in proportion to the vegetable; but the maintenance of all these in health and activity for nearly nine weeks seems hardly to agree with such a supposition.

“Should these experiments be perfected, what would hinder our keeping collections of marine animals for observation and study, even in London and other inland cities? Such a degree of success as I have attained would admit of so desirable a consummation, for even in London no great difficulty would be experienced in having a jar of sea-water brought up once in a couple of months. I hope to see the lovely marine Algæ too, that hitherto have been almost unknown except pressed between the leaves of a book, growing in their native health and beauty, and waving their delicate translucent fronds, on the tables of our drawing-rooms and on the shelves of our conservatories.

“It is a curious circumstance that experiments exactly parallel to these, founded on the same principles, have been simultaneously prosecuted with the same results by another gentleman, whose name is well known in the scientific world. Mr. Robert Warington, of Apothecaries’ Hall, has now (December, 1852) at his residence in London, a marine aquarium with living Algæ and sea Anemones in a healthy

condition. I find, on comparing notes, that Mr. Warington has precedence of me in instituting these experiments; but the particulars that I have above detailed of my own success were fully recorded before I had the slightest knowledge that the thought of such a project had ever crossed the mind of any person but myself."—P. 228.

In continuation of this highly attractive subject, the author gives an Appendix of four pages, in which he recommends the production and introduction of a new chemical compound called *ozone*. We confess we are not prepared to admit the necessity of introducing any artificial chemical element into these vivaria, neither do we believe there is any advantageous result obtained from the so-called aëration of the water, as practised in the beautiful glazed tanks in the Zoological Society's Gardens in the Regent's Park. It is most true that turbidity and great apparent impurity is observable in the water of some of these tanks; but these defects in all probability result from a want of attention to the requirements of Nature. In the first place, it must be admitted that in attempting to imitate a rock-pool by a glazed tank, we abrogate a law of Nature in admitting the light laterally instead of vertically. Secondly, in crowding into a given quantity of water a greater number of living beings than Nature allows, we also abrogate a second law. Water to aquatic, and air to terrestrial animals, are as essential as food; and any stint in the supply interferes with the vitality of the animal. To insure success, it is not sufficient to adjust the scale adroitly and fairly between animal and vegetable life, but the supply of water and of light, must be made a matter of nice and careful experiment. By judicious attention to this, we shall achieve more successful and more certain results than by the adoption of any artifice that Nature herself ignores.

It is, however, abundant time for us to close this protracted notice. We are sorely tempted to give still further extracts, but must refer the reader to the book itself, and assuredly will he find that we have only given a fair and impartial sample of a work, which is uniformly excellent, amusing, and instructive. Our objection to the artificial management of the vivaria is rather an objection to a received usage, than to a peculiar hypothesis of the author's.

The most important portions of the work consist of detailed observations on the alternation of generations in the Hydroid polypes and the Medusæ, on the embryogeny and metamorphosis of these and the Polyzoa, and on the singular structure of the thread-cells of the Medusæ and the Actiniadæ. Copious details are given of the habits and economy of many species of the sea Anemones and madrepores, of the

Medusæ and Polyzoan polypes, which were before but little known ; as well as of some of the Annelidan, Molluscan and Crustacean classes. Six species of Zoophyta (including a beautiful new madrepora), six of Medusæ, one of Crustacea, and one of Annelida, are described as new ; and several of them are figured.

‘*The Annals and Magazine of Natural History,*’ No. 70, dated October, 1853. Price 2s. 6d.

THIS number contains the following papers :—

‘On some new Species of *Trigonia* from the Inferior Oölite of the Cotteswolds, with preliminary Remarks upon that Genus.’ By John Lycett, Esq.

‘Note on the Artesian Well at Colchester ; and Remarks on some of the Microscopic Fossils from the Colchester Chalk.’ By John Brown, Esq., F.G.S.

‘On the Mechanism of Aquatic Respiration, and on the Structure of the Organs of Breathing in Invertebrate Animals.’ By Thomas Williams, M.D. Lond.

‘Notes on the Ornithology of Ceylon, collected during an Eight Years’ Residence in the Island.’ By Edgar Leopold Layard, Esq.

‘Remarks on the Lias at Fretherne near Newnham, and Purton near Sharpness, with an account of some new Foraminifera discovered there : and on certain Pleistocene Deposits in the Vale of Gloucester.’ By the Rev. P. B. Brodie, M.A., F.G.S.

Proceedings of Societies :— Zoological—Royal.

Miscellaneous :— On the Monstrosity of a Rose ; by J. T. Arlidge, A.B. On the Change of Colour in a *Chamæleon* (*Chamæleo vulgaris*) ; by H. N. Turner, jun. Notes on a new Species of *Artamus* ; by Dr. Nicholson. The second and third of these are extracted from the ‘Proceedings of the Zoological Society’ for 1851 !

‘*Transactions of the Linnean Society of London.*’ Vol. XXI.

Part 1, price £1 1s. ; and Part 2, price £1 10s.

PART I. comprises 84 pages of text and 8 plates, in 4to. ; and contains the following papers :—

‘On the Genus *Atamisquea*, belonging to the Family of the Capparidaceæ.’ By John Miers, Esq., F.R.S., F.L.S., &c.

‘On the Development of the Ovule in *Orchis Morio*, *Linn.*’ By Arthur Henfrey, Esq., F.L.S., &c.

‘On the Australian Species of the Coleopterous Genus *Bolboceras*, *Kirby.*’ By J. O. Westwood, Esq., F.L.S., &c.

‘Descriptions of some new or imperfectly known Species of *Bolboceras*, *Kirby.*’ By J. O. Westwood, Esq., F.L.S., &c.

‘Experiments and Observations on the Poisons of Animals of the Order *Araneidea.*’ By John Blackwall, Esq., F.L.S., &c.

‘On the Œconomy of a new Species of Saw-fly.’ By John Curtis, Esq., F.L.S., &c.

‘On the Family of *Triuriaceæ.*’ By John Miers, Esq., F.R.S., F.L.S., &c.

‘The Anatomy and Development of certain *Chalcididæ* and *Ichneumonidæ*, compared with their special Œconomy and Instincts: with Descriptions of a new Genus and Species of Bee Parasites.’ By George Newport, Esq., F.R.S., F.L.S., &c.

‘Further Observations on the Genus *Anthophorabia.*’ By George Newport, Esq., F.R.S., F.L.S., &c.

Part II., comprising 100 pages of text and 11 plates in 4to., has the following papers:—

‘The Anatomy and Development of certain *Chalcididæ* and *Ichneumonidæ.*’ By George Newport, Esq., F.R.S., F.L.S., &c.

‘Further Observations on the Habits of *Monodontomerus*; with some Account of a new *Acarus*, *Heteropus ventricosus*, a Parasite in the Nests of *Anthophora retusa.*’ By George Newport, Esq., F.R.S., F.L.S., &c.

‘On the Development of the Spores and Elaters of *Marchantia polymorpha.*’ By Arthur Henfrey, Esq., F.R.S., F.L.S., &c.

‘The *Ternstrœmiaceous* Plants of Hong Kong.’ By Capt. Champion, 95th Regiment. Communicated by the President.

‘On the Development of Ferns and their Spores.’ By Arthur Henfrey, Esq., F.R.S., F.L.S., &c.

‘On two Genera of Plants from Chile.’ By John Miers, Esq., F.R.S., F.L.S., &c.

‘On two new Genera of Fungi.’ By the Rev. M. J. Berkeley, M.A., F.L.S., &c.

‘On the Habits and Structure of the Great Bustard, (*Otis tarda* of *Linnaeus.*)’ By Wm. Yarrell, Esq., V.P. and Treas. Linn. Soc., &c.

‘On the Ocelli in the Genus *Anthophorabia.*’ By George Newport, Esq., F.R.S., F.L.S., &c.

‘The Natural History, Anatomy, and Development of Meloë, (continued).’ By George Newport, Esq., F.R.S., F.L.S., &c.

It is impossible to give anything like an abstract of these important papers in the limited space to which we are confined. Should however an opportunity occur hereafter, we purpose extracting entire Mr. Newport’s record of the discovery of *Heteropus ventricosus*, an Acari-deous parasite on *Monodontomerus*, itself a parasite on the well known bee, *Anthophora retusa*.

‘*Shells and their Inhabitants. The Genera of Recent Mollusca arranged according to their Organization.*’ By HENRY and ARTHUR ADAMS. Part VI. *Demy 8vo., with the plates plain, price 2s. 6d.; Royal 8vo., with the Animals coloured, price 5s.* London: Van Voorst. October, 1853.

THIS part contains 42 pages of text and 4 plates: the genera described are enumerated below; they all belong to the Gasteropoda. *Zidona, Adams; Callipara, Gray; Cymbiola, Swainson; Scaphella, Swainson; Voluta, Linneus; Harpula, Swainson; Fulguracia, Schumacher; Lyria, Gray; Volutilithes, Swainson; Mitra, Lamarck; Volutomitra, Gray; Strigatella, Swainson; Turricula, Klein; Cylin-dra, Schumacher; Imbricaria, Schumacher; Columbella, Lamarck; Pyrene, Bolten; Amycla, Adams; Engina, Gray; Erato, Risso; Marginella, Lamarck; Perri-cula, Schumacher.*

‘*The Powers of the Creator displayed in the Creation; or Observations on Life amidst the various Forms of the humbler Tribes of Animated Nature; with Practical Comments and Illustrations.*’ By SIR JOHN GRAHAM DALYELL, Knight and Bart. In two volumes. Vol. II., containing 327 pages of text and 46 plates. London: John Van Voorst, Paternoster Row. 1853. Price £4 4s.

THE first volume of this work is well known: before the publication of the second, the amiable and accomplished author had paid the debt of Nature. The Preface, by that eminent naturalist and philosopher, Dr. Fleming, so fully explains the circumstances of the case, and is in itself so interesting, that we give it entire.

“ During the time in which the first volume of this work, published in 1851, was passing through the press, its estimable author was in a very delicate state of health. So reduced, indeed, was he by a lingering illness, that he felt himself unequal to the task of compiling an Analytical Index, according to the plan which he had followed in the two volumes on ‘ Rare and Remarkable Animals of Scotland ; ’ and a few weeks after the publication of the volume, his disease terminated fatally.

“ Sir John Dalryell had contemplated proceeding immediately with the preparation of the second volume, if his life had been spared; and towards the accomplishment of his object he had, to some extent, arranged his notes of descriptions of species, intending to correct and transcribe the whole for the press. Several plates had likewise been executed, and many drawings were in some measure assorted as materials ready to be placed in the hands of the engraver.

“ In this state of things it was considered by his sister, who always lived with him, as a duty, to make an effort and save for the public benefit a large amount of valuable information, the result of the continuous labour, through many years, of an acute, patient, and intelligent observer. This zeal to promote the author’s fame, and advance at the same time the interest of science, was naturally to be looked for from the individual referred to in the second volume of ‘ Rare and Remarkable Animals of Scotland ’ (p. 99), where, in reference to the *Cristatella*, he says, ‘ I am indebted to the sedulous care of an affectionate relative, the companion of all my excursions, the encourager of all my exertions, in so tedious, laborious, and difficult a work, for the finest of any—that exhibited to the British Association, taken by herself from the garden pond at Binns House, in Linlithgowshire.’ Another passage, dictated by the same grateful considerations, occurs in the same volume (p. 124), under *Plumatella repens*. ‘ Of these an admirable example occurred near a ruinous mansion called Fenton Tower, in the county Haddington, about twenty-one miles east of Edinburgh, for which I was indebted to that same affectionate companion of my excursions already noted, who takes the liveliest interest in all my pursuits, and who values the beauties of Nature as demonstrations of the Divine Essence vouchsafed to the gaze of admiring mankind.’

“ When this affectionate relative had somewhat recovered from the bereavement which deprived her of a valued companion, she resolved to undertake the task which he had contemplated.

“Difficulties, however, of a formidable kind at once presented themselves. The state of the manuscript was such, that independent of the almost illegible character, which the intelligent printers of the former volume could alone decypher, there were so many erasures and changes of nomenclature, as to render much caution requisite in judging of the latest views intended to be expressed. Many of the references to the plates, in consequence of the numerous alterations which had taken place in the text, required to be corrected. The unfinished plates, and the figures which had not been engraved, stood in need of assortment, and a careful revision. Much of this indispensable labour she only could perform, and here her efforts were above all praise.

“But there were portions of the task in which some assistance was needed. This Sir John Dalyell foresaw, should the work prove a posthumous one, and had expressed to his relative a hope that I might, perhaps, endeavour to give her the requisite aid; especially as I had for many years previous to the publication of the ‘Rare and Remarkable Animals,’ urged upon him the propriety of giving to the world those observations, in making of which he had expended so much successful labour. In proof that such efforts had repeatedly been made to rescue important results from private obscurity, and render them available to naturalists in general, the following note which accompanied the presentation of the first volume of that work may here be inserted.

“‘ My Dear Professor,

“‘ Have the goodness to accept a copy of my humble commentary on the works of Providence.

“‘ Though endowed with my own share of perseverance and resolution, I confess that the iniquitous obstructions I suffered in its progress, had nearly compelled me to abandon the prospect of completion.

“‘ But your kind indulgence always encouraged me to advance; therefore I may say the existence of my work is mainly owing to you.

“‘ Believe me ever yours, with infinite regard,

“‘ JOHN GRAHAM DALYELL.’

“‘ 14, Great King Street, August 21, 1847.’

“In these circumstances, I willingly furnished the little aid in my power towards the completion of the volume, interfering, however, in the smallest possible degree with the style, the nomenclature, and the materials employed. The publication, being a posthumous work, will of course be regarded with all the tenderness and generosity usually displayed on such occasions; while the numerous highly interesting

and original observations will be read with delight and gratitude by all philosophical naturalists.

“As several plates in a finished state have been found in the author’s repositories, together with descriptions of their contents, which are considered by his relative worthy of publication, it is intended to form these into a Supplement, to contain, at the same time, an Analytical Index of the two volumes, with a Biographical Sketch and Portrait of the Author.”

The present volume contains the following subjects:—

Chapter 1.—The Leech. *Hirudo muricata*, *vittata*, *anceps*, *campanulata*, *octo-oculata*, *sanguisuga*, *medicinalis*, *complanata*, *stagnalis*, *tessellata*, *vitrina*, *flava*. Peculiarities of the leech.

Chapter 2.—Vermes. *Gordius fragilis*, *maximus*, *Tænia*, *minor*, *minor-viridis*, *Guineensis*, *albicans*, *gracilis*, *albus*, *aquaticus*, *spinifer*, *viridis-spinifer*, *fragilis-spinifer*, *fasciatus-spinifer*, *simplex seu integer*, *integer-fuscus*. Remarks. *Gordius Anguis*; *Vermicellus crassus*, *rubens*, *lineatus*, *Coluber*, *variegatus*; *Ascaris Flustræ*, *Gadi*, *Leonis*.

Chapter 3.—Planariæ. *Planaria cornuta*, *corniculata*, *ellipsis*, *flexilis*, *maculata* (*atoma?*), *haustem*, *Hebes*, *lactea*, *fodinæ*, *Arethusa*, *variegata*, *alba*, *gracilis*, *exigua*, *Algæ*, *falcata*, *stagni*, *fœcunda*, *Flustræ*, *vorax*, *Graminea*, *cuneus*, *prasina*, *nigra*, *serpentina*, *fusca*.

Chapter 4.—*Nais lacustris*, *proboscidea*; *Lumbricus citratus*, *maximus*, *maximus var.*, *capitatus*, *littoralis*, *teres*, *hirsutus*.

Chapter 5.—*Nereis teres*, *hirsuta*, *lineata*, *bullata*, *parva*, *Aries*, *remes*, *ellipsis*, *fulgens*, *foliata*, *contorta*, *Monoceros*, *punctata*; *Spio seticornis*, *celata*.

Chapter 6.—*Aphrodita cirrhosa*, *squamata*, *varians*, *velox*, *arcta*, *aculeata*.

Chapter 7.—*Sabella alveolaria*, *Belgica*.

Chapter 8.—*Terebella littoralis*, *figulus*, *tuberculata*, *conchilega*, *maculata*, *tetrix*, *Pecten*, *Ostreæ*.

Chapter 9.—*Amphitrite ventilabrum*, *bombyx*, *floscula*. Miscellaneous:—*Fabricia*, *Amphitrite Luna*, *Filipora filograna*.

Chapter 10.—Miscellaneous. *Priapulul caudatus*, *Clymene borealis*, *Sophonostoma gelatinosa*, *Pherusa Mulleri*, *Nereis hirsuta*, *pectinata*, *Phasma*, *Octodactylus inhærens*, *Sphærule*, *Animalcula*, *Melicerta ringens*, *Carbasaria fimbriata*, *Animalculum cruciatum*, *Cercaria*.

Chapter 11.—*Gasteropodes*. *Aplysia depilans*, *Tritonia Hombergii*, *cervina*, *pinnatifida*, *punctata*, *divaricata*, *conifera*, *Doris verrucosa*, *Argo*, *nodosa*, *cristata*, *clavigera*, *Eolis plumata*, *racemosa*, *minor*,

deaurata, viridis, sanguifer, conspersa, inequalis, Monoceros, tenax, Hystrix, purpurea, papillosa, ventilabrum; Limapontia. The Nautilini.

A great number of these objects are represented in the plates, which are neatly and carefully executed. We regret to observe the price at which the volume is issued, since its usefulness, and therefore its value as a contribution to Natural History, is thus greatly diminished. The letter-press, as well as the plates, would have been more agreeable to the student in an 8vo form, and by judicious economy might have been produced at less than a third of the present price. Very high prices for books always cut both ways: the buyer and seller suffer equally, so that it is politic on all accounts to eschew them. If the expense of getting up the book be urged as a plea for its price, the plea is untenable, because the expensive getting up was needless.

Migratory Birds in the Isle of Wight.—The following are the dates of the arrival of the summer birds of passage, so far as they have been observed at Bembridge during the last four years:—

	1850.	1851.	1852.	1853.
Chiff-chaff	March 29	March 24	March 31	March 30
Wheatear	April 4	—	April 4	30
Yellow Wagtail	—	—	12	—
Wryneck	—	—	13	—
Blackcap	March 31*	April 16	13	—
Redstart	April 7	—	8	April 19
Willow Wren	11	April 13	13	7
Swallow	13	11	9	6
Sand Martin	18	15	15	7
Cuckoo	—	16	14	18
Whitethroat	—	18	—	—
House Martin.....	April 20	15	April 21	April 15
Nightingale.....	8	13	14	15
Swift	May 3	—	—	May 14
Fly-catcher	5	—	—	—

—A. G. More; Bembridge, September 10, 1853.

Occurrence of Montagu's Harrier (Circus cineraceus) in Woolwich Marshes.—I have a fine old female of Montagu's harrier, that was shot in Woolwich Marshes on the 16th of August last. — James Green, Naturalist; 1, East Road, City Road, October 11, 1853.

* Only a solitary individual was seen at this unusually early date: no others made their appearance until a fortnight later.

Correction of an Error in a Note on the Grasshopper Warbler.—Permit me to rectify an error which has crept into my "Note on the Grasshopper Warbler" (Zool. 4072). Instead of "they visit this country in far greater numbers than either the reed or sedge warblers," it should read "in far less numbers." — *H. Stevenson; Norwich, October 6, 1853.*

Note on the Nesting of the Reed-wren, (Salicaria arundinacea). — Perhaps the following account of the nesting of the reed-wren may be of interest, as showing the remarkable indifference of the parent bird to the handling of, and the rude substitution of other matters for, her eggs. When an Eton boy I had a certain love for Ornithology; and as every spring came round, I indulged my passion for birds'-nesting by rambling over all the adjacent country in search of hidden treasures. Now, as the school numbered between 700 and 800 boys, it may readily be supposed that mine were by no means the only eyes which were prying into every bush, hedge-bank and copse; accordingly, no sooner was an egg laid but it was pretty certain of discovery, and I have since often wondered how any birds ever reared their young within three or four miles of Eton. So inevitable seemed the discovery of every nest, than when we found a newly finished nest containing but one egg, it was never deemed prudent to leave that egg, in hopes of a larger number another day; the solitary egg was immediately seized, on the principle that "a bird in the hand is worth two in the bush." Now all down the river were certain aits, covered with osiers, and alders, and other bushes and low trees, and flanked with many a goodly bed of rushes and reeds; in these the reed-wrens loved to make their nests. There was also a small coppice adjoining one of the back streams of old father Thames, within a mile of the College, every bush of which I seem now as distinctly to recollect as at that time, when I was a daily visitant there: here I would find four or five nests of the reed-wren, close together, — long purse-like nests; and these were the first nests of that species which I had ever seen, accordingly to me they were a very great treasure. And when taking from one nest one egg, from another two, from another three, and from a fourth a single one again, I was not a little sorrowful to think, that could these four nests be left unmolested for a few days, my prize would be much greater than now: however, prudence overcame greediness, and the eggs were taken. As a forlorn hope, however, and without much idea of the plan succeeding, I picked up seven or eight little gravel-stones, of about the size of the eggs, and for every egg that I had taken, deposited a stone at the bottom of the nest. What was my delight, when, returning to the same spot the next morning, I found another egg laid in every nest! These were withdrawn, and other stones substituted for them: and now, every morning, as soon as our doors were unlocked, I might be seen bending my steps to my favourite coppice, quite alone, lest another should forestall me of my treasure, and, with small round stones in my pocket enough to have filled the nests of fifty reed-wrens, did so many unhappy birds choose that unlucky locality for their nursery. This plan of substituting a stone for an egg answered so completely, in the case of the reed-wren, that I never knew it to fail, or found the nest deserted before the full complement of eggs was laid; and yet, in some cases, from a lack of appropriate stones to be found in those muddy river-banks, I have been obliged to deposit stones of neither the shape, the size, nor the colour of the original egg. It may be supposed, that under the above circumstances, such signal success with the reed-wren made me try the same plan with other birds, but here I as invariably failed: wherefore I conclude that the singularly deep nest of the reed-wren prevented the parent bird from seeing the deception that had been prac-

tised upon her, which the more shallow nests of other birds would enable them readily to perceive. Often with my boat moored to one of the reedy aits of the beautiful river, did I watch for a considerable time the reed-wren sitting on her nest in a gale of wind; now bowed down nearly to the water's edge, now springing back, swinging to and fro, driven here and there, as a sudden gust seized the reeds to which the nest was suspended, or a lull left them time to regain their former position: nothing seemed to disconcert her, or to come amiss, and though often brought within a foot of the stream, and the nest half inverted, never did I see it touch the water, or any likelihood of real danger occur.—*Alfred Charles Smith; Yatesbury Rectory, Calne, October 10, 1853.*

Occurrence of the Nut-cracker (Nucifraga Caryocatactes) at Yarmouth.—I have a fine specimen of the nutcracker, which was shot by a fisherman, off Yarmouth, on the 7th of this month, (October, 1853): it is in a beautiful state of preservation.—*James Green; 1, East Road, City Road, October, 1853.*

[This bird was brought to me in the flesh.—*E. N.*]

Note on the occurrence in Sweden of Pluvianus Ægyptius.—I have lately seen a specimen of this bird, which I am assured was obtained in Sweden about four years since, by a gentleman from England who was shooting in that country. It is said to have been killed in the summer season, and to have been obtained not very far from the city of Stockholm. This statement is by no means so full as might be desired, but I think it worth recording, as I believe it to be correct, my informant being a party on whom I think reliance may be placed. The specimen is an adult bird, in full plumage. I believe this bird has not previously been recorded as having been obtained in Europe, its native country being Northern Africa, where it is found as far West as Senegal, and as far East as Egypt and Nubia, being a common species on the banks of the Nile; on which account, perhaps, it has been supposed to be the bird that feeds upon the insects which settle upon the mouth of the crocodile, and which acts as a friendly monitor to the gigantic reptile on the approach of danger. Some travellers, however, state that this office is performed by the spur-winged plover of Egypt (*Hoplopterus Persicus*), and possibly both birds may have the same habit in this respect. The *Pluvianus Ægyptius* is the only known species of its genus, and appears to hold a position intermediate between the coursers and the pratincoles, and also to be allied to some of the types of plovers. One peculiarity of the plumage of the bird is very curious, and unlike anything I know in the plumage of any other bird, namely, a tuft of elongated black feathers, which, if they grew from the head, would form a pensile crest, but which, instead of being situated in that locality, spring from between the shoulders, and reach down the centre of the back, between the wings, for two-thirds or more of the length of the bird's body. Trusting that ornithological observers will look out for other European examples of this interesting species, I take the liberty of calling the attention of the readers of the 'Zoologist' to the above circumstances connected with it.—*J. H. Gurney; Easton, Norfolk, September 22, 1853.*

Occurrence of the Red-necked Phalarope at Rottingdean.—On Tuesday last, the 4th of this month, a red-necked phalarope was killed here, it having been observed in the morning swimming with the ducks on the pond in the heart of the village. The bird had already so completely attained its winter plumage, that the head, neck, and breast, from the whiteness of those parts, resemble those of Bewick's figure of the gray phalarope, being totally unlike, in that respect, to Yarrell's red-necked, and having merely a faint tinge of colour from the tips of the feathers. It may be added, that Yarrell's representation of the leg and foot of the phalarope does not exhibit the

peculiarity of the latter member, which, in the specimen above referred to, is very distinctly *half-webbed*.—Arthur Hussey; Rottingdean, October 8, 1853.

Note on the Spawning of Frogs and Toads.—Whilst staying here in April last, I noticed the following curious circumstance. I was walking along the bank of a small fish-pond in the garden, which was swarming with frogs and toads busily engaged in spawning, and was astonished to notice great numbers of them promiscuously *in copulâ*. In every instance but one of those that came under my notice, the union was between the male frog and the female toad, but in that one instance it was *vice versâ*. I have mentioned the circumstance to my friend Mr. Wolley, and other naturalists, who have all agreed with me in considering it a singular fact, and worthy of record. I have frequently watched these reptiles during the spawning season, but never before noticed a similar occurrence.—H. Harpur Crewe; Rossway, near Great Berkhamstead, Herts, September 15, 1853.

Note on Toads devouring Hive Bees.—I have read the account related at the last meeting of the Entomological Society, of a nasty toad being caught on the alighting-board of a hive of bees, and devouring them wholesale. Coming from so authenticated a source, one cannot at all doubt the truth of it; but I will venture to say, that the hive in question must have been placed in a most awkward situation, against a bank, or touching some rough wall. There is not a more unlikely reptile in existence to be found crawling or *climbing*; no careful bee-master allows his hives to be placed so that such a clumsy creature as a toad, or even a hedgehog, could effect a lodgment at the entrance, for neither of these animals could walk up the post or props of the bee-hives or boxes. The story reminds me of a great man, of rather weak intellect, who was travelling on horseback in hot weather, and said to his friend,—“How these small flies annoy me by getting into my mouth and throat! Do you find it so?” “No,” said his friend; “I always keep my mouth shut.” “Very true: so must I in future.” The toad and the hedgehog devour insects of various sorts. I suspect that the hedgehog attacks wild bees’ nests sometimes, as I saw one last summer and traced his course to a moss-carders’ nest, which I had examined the day before, and the next day the little comb was gone, and the bees had deserted. A hedgehog got by chance into a stone trough at my house: the trough was only about 10 inches deep, and yet the animal could not climb up to get out, and was caught there. I believe a toad would suffer in this way also: I never even saw a toad on the top of a low wall.—H. W. Newman; New House, Stroud, October 10, 1853.

Description of a Specimen of the Lesser Forked Beard (Raniceps trifurcatus); with an Announcement of the Occurrence of that and two other rare British Fishes at Weymouth. By WM. THOMPSON, Esq.

IN announcing the occurrence of that very rare fish, the lesser forked beard (*Raniceps trifurcatus*, Flem., *R. Jago*, Flem. and Cuvier),

I have thought it advisable (bearing in mind the rarity of examining specimens fresh) to give a very full description, as taken by myself, immediately after the fish was caught.

The extreme length is $9\frac{1}{2}$ inches. The head is depressed, much flattened, and very broad. The under jaw 2 inches in width, much shorter than the upper, and curved upwards. The mouth very wide, round, and when opened measuring $1\frac{3}{4}$ inch in diameter. Lips large, fleshy, the edges brown, the folds of the lips quite white, and in the upper jaw very dilatible. A small conical barbule depends from the under jaw. The teeth in the lower jaw are sharp, bent backwards, and placed in two pretty regular rows. The upper jaw is similarly armed, but the rows of teeth are irregularly placed. On the palate there is a prominence, kidney-shaped, and covered with minute teeth. The tongue is very broad, the actual fleshy portion is very small. The eyes are half an inch in diameter, closely approximating, placed nearly on the top of the head, and three quarters of an inch apart, the pupils are black and the irides yellow. The nostrils are placed immediately in front of each eye, and not at the end of the muzzle; they appear to open backwards, and to be closable at pleasure with loose skin; the orifices are very small. The anterior part of the body is large, depressed, and tumid; its greatest size is at a point $1\frac{3}{4}$ inch from the snout, where it is 5 inches in circumference. The dorsal profile commences to rise immediately in front of the first dorsal, and so abruptly as to give that part of the body an arched appearance; almost immediately after attaining its highest elevation, it descends gradually to the tail. The body becomes compressed from the first dorsal to the vent, and from the vent to the tail so much as to be in fact almost riband-shaped. The resemblance of this fish to a tadpole strikes the most careless observer; and seldom have I seen a name more appropriately bestowed.

The fin-ray formula is as follows:—

1st D. 3: 2nd D. 62?: P. 23: V. 6: A. 59?: C. 36?

The second dorsal, anal, and caudal fins are given on the authority of Pennant, as I could not count their rays: I believe them to be accurate, and quote them with the less reluctance, as I find that in the other fin-rays that author is correct. The first dorsal is triangular and very small, and is composed of three rays, the longest of which measures a quarter of an inch, which is double the length of the other two: this fin commences at 3 inches from the snout. The second dorsal commences half an inch behind the first dorsal, and ends

almost close to the base of the caudal rays : it is nearly half an inch broad, and equal throughout its length ; the tips of the rays are free, and much deeper than the fin. The anal fin commences behind the vent, and about $4\frac{1}{4}$ inches from the snout, and ends in a direct line with the posterior margin of the dorsal, and, like those of the dorsal, the rays are produced beyond the membrane of the fin, and end in free points. The caudal is wedge-shaped, and not wide : the extremity is rounded. The pectorals are not very wide, rather wedge-shaped, of moderate length, and the rays have the same free character as those in the dorsal and anal fins. The ventrals are small : the two anterior rays are free and detached ; the first ray measures 1 inch, and the second $1\frac{1}{2}$ inch : both these free rays are white. The base of the dorsal, for some little distance up the fin, is covered with scales.

The branchiæ are four in number ; the branchial rays are five : the branchial opening is very large. I could not detect the lateral line. I noticed particularly the tubercles above the pectoral fins ; they are ten in number, and placed in a row. They appear to me to be quite independent of the skin, and, in fact, to be the heads of detached bones imbedded in the muscles of the body. When the fish was quite fresh and moist, these tubercles were not discernable ; as it became dry and the skin tightened, the tubercles became apparent both to sight and touch ; and on my thoroughly moistening the fish, they again disappeared.

The colour of the fish is a very dark brown ; the fins darker still, with the exception of the two long rays of the pectorals, which are white. The scales are small, and easily detached, when the skin appears white underneath. The belly and under part, from the snout to the vent, is of a paler brown.

The ova were contained in two small lobes, each about an inch in length, and the same in circumference in the largest portion ; that end which was nearest the tail very sharp and lengthened out. The stomach was very large and quite empty : the swimming-bladder exceedingly large, as in all the Gadidæ.

This fish was caught on the 8th of October, 1853, at a spot in Weymouth Bay, about five miles from shore, on the Wreck of the Abergavenny. It was caught on a whiting-line : the hook was baited with a lug-worm (*Arenicola piscatorum*) for whiting pout. No doubt this fish is equally ravenous with the rest of the cod family. From being badly hooked, I could not keep it alive, and I was thus disappointed of sending it to the Zoological Society's vivarium, for which it was obtained.

I consider my experiments on the tubercles quite conclusive as to the identity of Dr. Fleming's supposed two species, *Raniceps trifurcatus* and *R. Jago*.

The Blue-striped Wrasse, (*Labrus variegatus*). Three specimens of this beautiful fish have been brought me; they are in the vivarium of the Zoological Society.

The Red Wrasse, (*Labrus carneus*). A specimen was brought me alive on the 10th of October, and will be forwarded to the Zoological Society, where it may be seen. As this fish differs from the descriptions by authors, I will send my own description for the next month's 'Zoologist.'

WILLIAM THOMPSON.

Weymouth, October 12, 1853.

Further Note on Tench and Pike.—In the September number (Zool. 4020) I gave an account of a pike attacking a tench, an occurrence which is considered very unusual, from the disinclination which all other fish are said to have to destroy the tench, the presumed healing qualities of which are supposed by many persons to be the cause of this immunity. Since my former communication I have had additional evidence of the fallacy of this prevalent opinion; for in the pit alluded to, a few days after the occurrence of the event previously described, I saw another tench undergoing exactly the same process, being carried about in the jaws of a pike, and too large for the latter to swallow: and I afterwards found a dead tench floating on the water, which had evidently been killed by the bite of a pike. I have since had the pit dragged, and out of ten or twelve brace of rather small tench, of the size an 8-lb or 10-lb pike could swallow, I was only able to catch three or four, all the rest having apparently been destroyed by the pike, of which I took out several, some of them weighing 8 and 10 lbs. each. I therefore feel quite satisfied that any supposed immunity from the attacks of other fishes with which the tench may be favoured on account of its medicinal qualities, is totally unfounded, as well as that, for any other reason, it is neglected by the pike when in pursuit of food.—*W. H. Slaney; Hatton Hall, October 6, 1853.*

Note on a Variety of the Plaice (*Platessa vulgaris*).—A piebald variety of this fish was lately caught at Lossiemouth, in the Moray Firth, and sent to me as something worthy of notice. There was nothing peculiar about it either as to its size or shape, the length being 18 inches and the breadth 11: the upper or eye side also had the usual tints of the species. All that was remarkable about the fish lay in the colour of the under side, more than one half of it being of the same olivaceous brown as the upper side, and with the same proportion of orange spots, placed chiefly opposite those on the upper or eye side. The under lateral line was white throughout its whole length. The anterior or head end of the under side was of the usual white colour, but had on it three orange spots encircled by olivaceous brown, similar to the colour of the upper side. The brown colour extended farther upon the abdominal part of the under

side than it did upon the dorsal fin. The line of demarcation between the white and the brown was oblique and waved, but well defined, having little or no shading. The piebald under side of this fish shows that light could have had little influence in forming the colouring matter of the skin.—*G. Gordon ; Birnie by Elgin, August, 1853.*

Catalogue of Marine Mollusca inhabiting the Dublin Coast.

By WILLIAM WHITE WALPOLE, Esq.

I HAVE frequently thought that if a series of local lists of the Mollusca of the British seas were published, they would prove quite as interesting and useful for comparison with each other as those of the land and fresh-water species. I have therefore the pleasure of forwarding to you a list of such as I have taken on this interesting coast;—interesting, I say, because there is perhaps no part of the British Islands which can present such a naturally favourable situation for the study of marine Conchology; since it possesses many extensive strands, strewn with numerous rarities after an easterly gale, besides rich dredging-grounds, such as Dalkey Sound, and the bays of Dublin, Killiney, and Bray. Added to which, our trawlers, who profitably fish the deeper waters off this coast, occasionally bring in species which could not otherwise be obtained except by an expensive course of dredging, which but few conchologists can adopt. I need hardly say that the nomenclature is according to Messrs. Forbes and Hanley's truly valuable work on our Mollusca: those which I have not been able to procure alive, are marked with an asterisk (*).

Teredo megotara. Killiney Strand, after an easterly gale, December, 1849. The wood in which they occurred was pine.

**Pholas candidus.* Merrion Strand.

* „ *crispata.* Malahide and Portmarnock Strands.

* „ *dactylus.* Merrion Strand.

Xylophaga dorsalis. Trawled in Skerry Bay: I have observed it also in old trawl-beams.

Saxicava arctica. General.

„ *rugosa.* Common.

Mya arenaria and *truncata.* Both common, but difficult to be obtained in fine condition.

Corbula nucleus. General.

„ *rosea.* Very rare; a few have been taken off this coast.

Sphænia Binghami. Rare; inhabiting the thick valves of oyster-shells, Dalkey Sound.

Lyonsia Norvegica. Dalkey Sound and Killiney Bay, in about 10 fathoms.

Thracia convexa. Very rare : trawled off Skerry Bay.

„ *distorta*. Rare ; Dalkey Sound.

„ *phaseolina*. The strands of Merrion, Salthill, &c. ; Dalkey Sound, in about 9 fathoms.

„ *villosiuscula*. Dalkey Sound, at the same depth.

Cochlodesma prætenue. Very rare ; Dalkey Sound, Killiney Bay.

Solen ensis. Common.

„ „ var. *magna*. Occasionally with the common form.

„ *marginatus*. Rare, but obtained on all our sandy beaches.

„ *siliqua*. Common.

„ *pellucidus*. Occasionally driven ashore, but may be taken fine, and in some numbers, with the dredge, in 12 fathoms, Killiney Bay.

Solecurtus coarctatus. Rare ; Skerry Bay.

Ceratisolen legumen. Not common, but may be found on all our sandy beaches.

Psammobia Ferroensis. General.

„ *tellinella*. Dalkey Sound and Killiney Bay.

Tellina crassa. Scarce ; Dalkey Sound.

„ *donacina*. Same locality as the preceding species.

„ *fabula*. General.

„ *tenuis*. Common.

„ *solidula*. Common.

„ *incarnata*. Rare ; Blackrock, Salthill, and Portmarnock Strands.

„ *pygmæa*. Very rare ; Dalkey Sound.

Syndosmya alba and *prismatica*. Both very fine from the stomachs of fish.

Scrobicularia piperata. Inhabiting the mud-deposits at the mouth of the Liffy.

Donax anatinus. General.

Mactra elliptica. Dalkey Sound, and also obtained from the stomachs of fish.

„ *solidula*. Common.

„ *stultorum*. Common.

„ „ var. *cinerea*. Portmarnock Strand.

„ *subtruncata*. Merrion Strand ; I have also observed it on the South Bull.

„ *truncata*. Rare ; in the same localities.

- Lutraria elliptica.* General.
Tapes decussata. General.
 „ *pullastra.* General.
 „ „ var. *perforans.* Inhabiting the roots of *Laminaria.*
 „ *virginica.* Dalkey Sound and Killiney Bay.
 **Cytherea Chione.* An odd valve in Dalkey Sound.
Venus casina. Off Dalkey Island.
 „ *fasciata.* General.
 „ *striatula.* Common.
 „ „ var. *gallica.* Off Dublin Bay, Dalkey Sound, &c.
 „ *ovata.* General.
Artemis exoleta and *lincta.* Very fine in Dalkey Sound, and may be found on all the strands after gales.
Lucinopsis undata. The strands of Portmarnock, North and South Bull, Merrion, &c.
Cyprina Islandica. General.
Circe minima. Very rare; Dalkey Sound.
Astarte elliptica. Very rare; Dalkey Sound.
 „ *sulcata,* and var. *Scotica.* Scarce; Dalkey Sound.
 * „ *triangularis.* Scarce; Dalkey Sound.
Isocardia cor. Off Skerry Bay.
Cardium echinatum. General.
 „ *edule.* Common.
 „ *fasciatum.* Frequent; Dalkey Sound and Killiney Bay.
 „ *nodosum.* Ditto; ditto.
 „ *Suecicum.* Very rare; off Dublin Bay.
 „ *Norvegicum.* General.
Lucina borealis. Fine, and frequent.
 „ *spinifera.* Rare; off Dublin Bay.
 „ *flexuosa.* Rare; Portmarnock, Merrion, and other strands, and Dalkey Sound.
 **Montacuta bidentata* and **ferruginosa.* Portmarnock Strand.
Kellia suborbicularis. Dalkey Sound, &c.
 **Lepton squamosum.* Dalkey Sound, &c.
Mytilus edulis. Common.
 „ „ var. *pellucidus.* Occasionally.
Modiola modiolus. Common.
Crenella discors. Dalkey Sound.
 „ *marmorata.* Dalkey Sound, Killiney Bay; and I have observed it frequently at low water.
Nucula decussata. Rare; off Dublin Bay.

- Nucula nitida*. Dalkey Sound, Killiney Bay, &c.
 „ *nucleus*. General.
 „ *radiata*. Rare ; Dalkey Sound.
 „ *tenuis*. Ditto.
Leda caudata. Very rare ; Dalkey Sound and Killiney Bay.
Pectunculus glycimeris. Rare ; off Dublin Bay and in Dalkey Sound.
Lima hians. Very rare ; Killiney Bay.
 „ *Loscombii*. Rare ; Dalkey Sound.
Pecten maximus. Dublin, Killiney, and Bray ; also in Dalkey Sound.
 „ *niveus*. Very rare ; Kingstown, Dublin Bay.
 „ *opercularis*. General.
 „ *pusio*. Off Dalkey Island.
 „ *varius*. Dublin Bay, Dalkey Sound, &c.
 „ *tigrinus*. Bays of Killiney and Bray, and Dalkey Sound.
Ostrea edulis. Many fine oyster-beds are dispersed throughout our bays. I have found good pearls in those taken in Dalkey Sound.
Anomia aculeata. Dalkey Sound and Killiney.
 „ *ephippium*. Rare ; off Dublin Bay.
 „ „ *var. squamula*. Found in the interior of *Isocardia cor*.
 „ *striata*. Very rare ; Dalkey Sound.
 „ *patelliformis*. General.
Chiton asellus. Killiney Bay and Dalkey Sound.
 „ *fascicularis*. Scarce ; Killiney, &c.
 „ *cinereus*. General.
 „ *lævis*. Rare ; Dalkey Sound.
 „ *ruber*. Rare ; Dalkey Sound and Killiney.
 „ *marmoreus* ? Salthill.
Patella vulgata. Common.
 „ *athletica*. Killiney.
 „ *pellucida*. Killiney, in the roots of *Laminaria*.
 „ „ *var. lævis*. Ditto.
Acmæa testudinalis. Salthill.
 „ *virginea*. Dublin and Killiney Bays, and Dalkey Sound.
Dentalium entalis. General.
 * „ *Tarentinum*. Rare ; Dublin Bay and Dalkey Sound.
Pileopsis Hungaricus. Skerry Bay, Dalkey Sound, and off Bray.
Fissurella reticulata. Scarce ; Dalkey Sound.
Emarginula reticulata. Ditto.

- Trochus granulatus*. Rare ; off the Bays of Dublin and Bray.
 „ *ziziphinus*. General.
 „ „ var. *lævis*. Dalkey Sound, &c.
 „ „ var. *Lyonsii*. Ditto.
 „ *cinerarius*. Common.
 „ „ var. — ? Dalkey Sound.
 „ *umbilicatus*. General.
 „ *Magus*. Dalkey Sound.
 * „ *exiguus*. Very rare ; Dublin Bay.
 „ *Montagui*. Dalkey Sound and Killiney Bay.
 „ *tumidus*. Dalkey Sound, &c.
Phasianella pulla. Not uncommon.
Littorina littorea. Common.
 „ *rudis*. Ditto.
 „ „ var. *zonaria*. General.
 „ *tenebrosa*. General.
 „ *littoralis*. Common.
Lacuna pallidula. Rare ; Killiney, &c.
 „ *puteolus*. Ditto.
 „ *vincta*. General.
 „ „ var. *quadrifasciata*. General.
Rissoa costata. Not common.
 „ *striata*. Common.
 „ *inconspicua*. General.
 * „ *labiosa*. Rare ; Dublin Bay.
 „ *parva*. Common.
 „ *Ulvæ*. Ditto.
Turritella communis. Common.
 „ „ var. *nivea*. Killiney Bay.
Aporrhais pes-pellicani.
Cerithium reticulatum. General.
 * *Scalaria communis*. South Bull, &c.
 * „ *Turtonis*. Rare ; Merrion, &c.
Eulima polita. Rare ; off Dublin Bay and Dalkey Sound.
 * *Chemnitzia elegantissima*. Strands of Portmarnock, North Bull,
 &c., and Dalkey Sound.
 * „ *rufa*. Rare ; Portmarnock Strand, &c.
Natica monilifera and *nitida*. General.
Velutina lævigata. Not uncommon.
Lamellaria perspicua and *tentaculata*. Rare ; Dublin Bay.
Murex erinaceus. General.

- Purpura lapillus*. Common.
Nassa incrassata and *reticulata*. General.
Buccinum undatum. Common.
Fusus antiquus. Common.
 „ *Islandicus*. Not common.
 „ *propinquus*. Rare ; off Dublin Bay.
Trophon muricatus. Strands of Merrion, Sandy Mount, &c. ; and dredged in Dalkey Sound and off Dublin Bay.
 „ *Barvicensis*. Very rare ; Dalkey Sound.
 * „ *clathratus*. Off Dublin Bay.
Mangelia costata. General.
 „ *linearis*. Not uncommon ; Dalkey Sound, &c.
 „ *nebula*. Scarce ; Dublin Bay.
 „ *rufa*. Ditto.
 „ *septangularis*. Rare ; off Dublin Bay.
 „ *glacialis*. Ditto.
 „ *turriculà*. Off Dublin Bay.
Cypræa Europæa. Common.
Cylichna cylindracea. Rare ; Dalkey Sound.
 „ *obtusa*. Dublin Bay.
Tornatella fasciata. Dalkey Sound, &c.
Scaphander lignarius. Off the bays of Dublin, Killiney and Bray.
Philine aperta. Not uncommon.
 „ *catena*. Very rare ; Dalkey Sound.
 „ *scabra*. Rare ; Dalkey Sound.
Aplysia hybrida. Rare ; Dalkey Sound.

WILLIAM WHITE WALPOLE.

Windsor Lodge, Monkstown,
Co. Dublin, September 27, 1853.

Note on the occurrence of Caprella laevis in the Moray Firth.—Recently as I have sent you a list of Crustaceans found in the Moray Firth, there have already been a few additions made to it: the *Caprella laevis* is one of them. I take this opportunity of recording the habits of this animal, as observed by Mr. G. Murray, at Burghead; and this I could not do better than by quoting at length his letter to me on the subject:—“I sent to you last week a strange-looking Crustacean, discovered near low-water mark of a spring tide. I was prying under a huge stone in quest of Nudibranchs, when, amidst the Zoophytes with which its surface was thickly covered, I observed something performing a series of movements that denoted vitality, and that of the most active kind. Attached by its lower extremity, and having its long slender body entirely free, the creature bent itself into the form of an irregular hoop, bringing its head

into contact with its feet, and, after tugging for a few seconds at something that appeared to offer a formidable resistance, it erected itself with a sudden jerk and a nodding motion of two horn-like processes on its head, at the same time vigorously plying two strong-looking limbs on the upper part of its body. After watching it for some time, and seeing it frequently repeat these movements with the greatest energy, I managed to secure it, and found that the object on which it had been bestowing so much attention was a small Rissoa. With what design the tiny mollusk was thus treated I am unable to state; but, as it appeared to be uninjured, I think it probable that it was itself the tormentor, and that the Crustacean wanted to get rid of it. Whatever the creature may be, it does not seem to be very rare, as I have since found other four. I have sent you that first obtained, which is by far the largest. I shall be glad to learn the name of it, and any other particulars you may be disposed to communicate. Its griffin-like appearance, fiery eye, strange movements, and immense activity, would be terrific in a large animal. I have been much interested in observing it. After bringing it home, I put it into a bottle of sea-water containing some twigs of *Sertularia argentea*. I then found that it has two modes of progression: the first is similar to that of the *Hydra*, with which doubtless you are familiar, I mean that particular style in which the head always takes the lead; by this method it clambered over the zoophyte with surprising agility. The other is a swimming movement, effected by drawing up the feet towards the head, and then striking them out; this is done rapidly, but the process is slow and awkward." This was communicated to me by Mr. Murray in May last.—*G. Gordon; Birnie, by Elgin, N. B., October 7, 1853.*

Note on the occurrence of Sphinx Convolvuli at Bridgwater.—About two weeks ago I took in my garden, near Bridgwater, a fine specimen of the *Convolvulus* hawk-moth (*Sphinx Convolvuli*). This insect is, I believe, rare everywhere in Britain; it is so rare in this part of the country, that the only other specimen I remember to have heard of, is one taken by me more than twenty years ago, in a court-yard in Bridgwater.—*Thomas Clark; Halesleigh, October 10, 1853.*

[This insect was most abundant in England in 1846, and captures of hundreds of specimens were recorded in the 'Zoologist' for that year.—*E. N.*]

Larva of Acherontia Atropos feeding on the Tuber of the Potato.—The larvæ of the death's-head moth (*Acherontia Atropos*) have been unusually plentiful in our neighbourhood this summer. This larva appears to prefer for its food the tuber of the potato rather than the leaves; indeed, a friend of mine tells me he could never get it to eat the leaves, but meeting with one lately which, like the rest, refused the leaves, it occurred to him to offer it slices of the tuber, when the creature instantly seized them, and fed voraciously.—*Id.*

The Larva of Cerura Vinula using Fragments of Potato in its Cocoon.—An instance of the ability which caterpillars possess of forming their cocoons of a material foreign to their usual habits, occurred to my friend at the same time. He had a full-grown larva of the puss-moth (*Cerura Vinula*), which was placed in a glass vessel with slices of potato, and with these it formed a cocoon as complete and beautiful as it could have done with the material it usually employs, the willow-wood.—*Id.*

Occurrence of the Rosy Feather Star (Comatula rosacea) &c. at Weymouth. — On Saturday, the 3rd of this month, my dredgers brought me a specimen of the rosy feather star (*Comatula rosacea*). I carefully compared it with Forbes's description, and was not surprised at finding I had nothing to add. Mine had but seven arms, and the colour consisted of blotches of reddish brown and of white. It was caught attached to a stone, which was dredged in Weymouth Bay; I did not disturb it, as I had to send it to the Zoological Society, in whose vivarium at the Regent's Park it now is. I have also heard of their having been caught off the Devonshire coast. Among the many rarities which the Society have lately placed in their vivarium, may be mentioned Müller's top-knot, Jago's goldsinny, and the cork-wing, all from Weymouth.—*William Thompson; Weymouth, September 7, 1853.*

Proceedings of the Entomological Society.

October 3, 1853.—EDWARD NEWMAN, Esq., President, in the chair.

The following donations were announced, and thanks ordered to be given to the donors: — The 'Zoologist' for October; by the Editor. The 'Athenæum' for September; by the Editor. The 'Literary Gazette' for September; by the Editor. The 'Journal of the Society of Arts' for September; by the Society. Hewitson's 'Exotic Butterflies,' part 8; by W. W. Saunders, Esq. 'Entomologische Zeitung,' June to September; by the Entomological Society of Stettin. 'Versuch die Europäischen Spanner von J. Lederer,' Wein, 1853, and 'Lepidoptera Microptera quæ J. A. Wahlberg in Caffrorum terra collegit, descripsit P. C. Zeller,' Stockholm, 1853; by Professor Zeller, Hon. M.E.S. 'Proceedings of the Berwickshire Naturalists' Club,' 1852; by the Club.

Dr. Lankester exhibited some of the "flies" recorded in the public papers to have appeared in vast numbers at Newcastle during the prevalence of the cholera in that town last month: and read the following extract from a letter written by a gentleman residing at Newcastle, respecting them: —

"They appeared some days before the cholera broke out with such virulence. For many days we had a dense heavy atmosphere, very depressing to the spirits; and the flies came in such swarms as only to be compared to the time when God filled the land of Egypt with a grievous swarm of flies. They appear to be only creatures of a day, those of yesterday die off and are replaced by others, and in the morning I find thousands of them dead."

On examination by the President, these "flies" were found to be Aphides, of two or three species,* which feed on a great variety of plants. These Aphides have no local connexion with Newcastle; but at this season of the year the usual migration of the winged females occurs, often in immense swarms. The hot, moist, stagnant atmosphere, observed to be concomitant with the appearance of cholera, would probably favour their development, and would certainly cause them to be more noticed; for such frail creatures could not move about in windy weather.

* Mr. Walker has since pronounced them to be mostly *Aphis Rumicis*.

Mr. Saunders observed that vast numbers of Diptera were seen in India on hot, damp mornings, locally termed "cholera-weather:" and Mr. Baly added that in Warwickshire, in 1849, during the prevalence of the cholera, the people had noticed great swarms of flies called "cholera-flies." Of what kind they were he did not know; but neither in these, nor in the present appearance, could it be imagined there was any connexion between them and the disease.

Mr. Foxcroft sent for exhibition two boxes of his captures of insects of all Orders in Perthshire.

Mr. Edwin Shepherd exhibited a hermaphrodite *Alcis consortaria*, in which the right side was female.

Mr. Smith exhibited specimens of many rare Hymenoptera, taken at Southend; and a living specimen of the male of the parasitic *Anthophorabia nitida*, now eleven days old, although it had been stated by Mr. Newport, that it did not live more than eighteen hours. Mr. S. stated that he should make a further communication respecting this insect at the next meeting.

Mr. Ingpen sent for exhibition leaves of *Chrysanthemums*, greatly infested with Dipterous mining larvæ, which first disfigured and eventually destroyed them; but never to such an extent as during the present season. These larvæ were a second brood, the former having ceased their devastations two months ago. They are probably the larvæ of *Tephritis Onopordinis* and *Artemisiæ*, on which there is an article by Mr. Westwood, in Loudon's 'Gardener's Magazine' for 1839.

Mr. W. W. Saunders exhibited specimens of a *Xylocopa* from Port Natal, with its nest, consisting of several chambers formed in a reed: also a mud nest of a species of *Pelopæus*, which contained five living pupæ when he received it, but they had all produced only parasitic *Crypti*.

Mr. S. Stevens exhibited a collection of insects, of several Orders, just received from Mr. Bates, collected in the region of the Amazon, including many small Coleoptera, most of which were probably new.

Mr. Hemmings sent for exhibition *Asopia nemoralis*, Scop., taken June 26th, at Holm Bush, near Henfield, Sussex, and *Choreutes vibrana*, Hub., taken September 11th, near Hurst, Sussex; both being new British species: also *Phibalapteryx gemmaria*, taken at Hurst, September 11th, and *Coleophora binotapennella*,—a fine specimen, showing the characteristic markings,—taken at Brighton in August.

Mr. Douglas exhibited specimens of *Gelechia instabilella*, bred from *Chenopodium maritimum*, gathered at Brighton in August.

The President read the following note by J. Walter Lea, Esq., communicated in a letter from A. R. Hogan, Esq.

"*Parasitic (?) Moth found in the Pupa of Lasiocampa Trifolii.*—In the course of the early summer of 1848, I found a caterpillar of *Lasiocampa Trifolii* in the vicinity of Oxford, which thrived satisfactorily, and in due time entered the pupa state, having formed its cocoon in the regular compact oval form peculiar to it. Instead, however, of the imago appearing, as it should have done, in July or August, it continued in the pupa state the whole of the summer, autumn, and winter of that year, and also through the spring and summer of 1849. I then thought it must be dead, and opened the cocoon to ascertain the fact, when I found it not only alive, but quite lively, and apparently in perfect health. Having carefully closed the cocoon, I replaced it in the box where I was preserving it, and looked at it from time to time during the

autumn and early winter of the same year, always finding it alive and lively, and very carefully closing the cocoon and box after each examination, so that no mischief should happen to it. In the beginning of 1850, the pupa ceased to show signs of life when examined and handled, but not knowing what to make of it, I took redoubled care of it, and kept it by me all through the summer and autumn of the year; but towards Christmas, being persuaded that it must be really dead, I at last resolved to open it, which I did; and the first thing that I saw on making an opening in the puparium, was the head and eyes of a small moth, moving about rapidly, and in the most lively manner. A few moments sufficed to exhume the little creature, which was about the size and had very much the general appearance of *Margaritia hyalinalis*. It was very lively, and walked quickly about the table, moving its antennæ in all directions. The wings were all shrivelled and crumpled together, so that I could make but very little of them, nor did they in the least expand with exercise. The inside of the puparium of the *Lasiocampa Trifolii* was filled with a dry pale powder, and I could find no trace of any cocoon, or vestige of any kind, of the moth which I had just extracted from it. There was no evidence to show how long it had been there; and as it was manifestly far too small and feeble to make any opening in its prison by its own efforts, it must have remained there until it died, had I not opportunely set it free. It did not occupy more than one-sixth of the interior of the puparium, and lay in a reversed position, with the apex of the abdomen in the place of the head of the proper occupant. It was quite unable to turn itself round inside the case, as it was too long, and also the whole space which it did not fill, was well filled with the dry powder above mentioned. A rigid examination showed no opening in the puparium through which anything could have entered; and indeed the pupa had been too carefully preserved to be within the reach of accident or enemies. Most unfortunately, before I had completed my investigations, I was suddenly called away, and in my absence the whole was swept away and destroyed by a servant. I took no memorandum of it at the time, being exceedingly busy, but I have the clearest recollection of the circumstances, and can answer for the facts being in every particular correct. I cannot explain the matter, and should be very glad of any light that can be thrown upon it. — *J. Walter Lea; Ramsgate, September 7, 1853.*"

The President called the attention of the Society to three different subjects, as under; requesting observations from the members present.

1. *Bees destroyed by Toads.*—"A friend has lately communicated to me a fact relative to bees, which, having been mentioned to my highly esteemed and venerable friend, Dr. Bevan, and having been recommended by that distinguished apiarian to make it public, I beg to submit to the Society. My friend relates, that a stock of bees was observed to grow weaker day by day, until at last it became so pauperized that the hive was removed, and the bees turned adrift to shift for themselves: nothing amiss was detected in the interior of the hive. A second stock shortly afterwards exhibited similar symptoms of depopulation; and a suspicion was entertained that some nocturnal depredator entered the hive at night and devoured the bees. About two hours after dark, the hive was visited with a view to an inspection of the interior; but on arriving at the spot with a lantern, the owner found a large toad squatted on the alighting-board, and looking about him with bright and animated eyes. Presently, a night-roving bee returned home; there was a sudden movement on the part of the toad, and

the bee vanished. A long interval of patient watching ensued, when a second bee came home, a similar movement of the toad followed, and the bee again vanished: but the light of the lantern being this time thrown full upon him, he was distinctly observed to swallow. The toad was caught and killed, and eight still living bees were taken from his stomach. I attempt no explanation of the mode in which the toad attained his station at the entrance of the hive, or what antidote he possessed against the poison so likely to be conveyed by the stings of the bees; all I can do is to vouch for the veracity of my informant, which I do without any hesitation."

Mr. Weir, in reply to an observation made as to the difficulty of a toad's climbing, stated that he knew an instance in which a toad had climbed up an open door, and seated himself on the top.

2. *Oniscus Armadillo*. — "Finding this milleped extremely injurious to ferns and Lycopodiums, I have paid some little attention to its habits, with a view to arresting its increase. In pursuing this object, I have made a few observations that appear to me of some interest. *In the first place*, the female is strictly viviparous, and the young are perfectly developed while still in the ovary of the female: they are from sixteen to twenty-two in number, and after birth attach themselves to the legs of their parent, and are carried about by her. I found them first in this position; afterwards I observed the female in the act of parturition; and, lastly, I killed several females which appeared gravid, and found the young apparently ready for extrusion.* *In the second place* I find that the young, although possessing perfectly developed organs of locomotion, manducation, &c., have not the configuration of the adult: the second segment (? cephalothorax) being proportionately larger, and bearing the eyes, which are situated near its exterior margin. *Thirdly*, the similarity of these minute millepedes to the extinct trilobites, particularly to the genus *Asaphus*, is most striking, especially in the figure of the enlarged second segment, and the position of the eyes, which are elongate, linear, very distant, and have a reflexed external margin. The difference between the infant and adult *Oniscus Armadillo*, and the similarity of the infant *O. Armadillo* to a trilobite, would almost induce the conclusion that the trilobites were a lower form of Isopod Crustacea, rather than allies of *Limulus* and cognate genera. This similarity to a trilobite, is equally apparent whether the milleped be extended or rolled into a ball."

3. *Typhlocyba Filicum*. — "I beg to exhibit, under the provisional name of *Typhlocyba Filicum*, a minute Hemipterous insect, which a good deal resembles the *Typhlocyba Ulmi* of Germar, Walker, and other entomologists, but which seems to me to be specifically distinct. The anterior wings are bright yellow to rather below the middle, the apical portion transparent, irrorated with black; the head is yellow-green, with prominent black eyes; the prothorax is also yellow-green; the scutellum is an equilateral triangle, and yellowish green; the abdomen is intensely black, with the extreme margin of each segment yellow, thus giving it a distinctly annulated appearance. My object in desiring to attract the attention of the Society to this little creature, is to point out the excessive injury which it commits in ferneries. To ferns in a wild state it is highly injurious, often changing their delicate green

* Some of these were exhibited.

colour to a sickly yellow or whitey-brown; but its introduction into a glazed house in which ferns are cultivated, is quite fatal to the beauty of their appearance. It inserts its short, strong, and acute rostrum into the parenchyma of the frond, and remains for days in one position, apparently engaged during the whole time in extracting the sap, after the manner of an *Aphis*. The result of this abstraction of the juices of the plant is not, as in the case of the *Aphis*, a distortion of the leaf, but the production of whitish or yellowish spots or blotches, which increase in number and size until the entire frond is permanently although not uniformly discoloured. The injury is committed by the insect in all its stages; but as its growth to maturity is extremely rapid, and as its life in the imago state is usually prolonged, it follows that the injury caused by the insect in its perfect, is much greater than that in its preparatory states. It is worthy of remark, that all the species of ferns are not equally obnoxious to its attacks; for of our English ferns, *Osmunda regalis* and *Asplenium lanceolatum* are rarely touched; *Lastrea Filix-mas*, *L. spinosa*, *L. uliginosa*, *L. multiflora* and *L. rigida* are greatly injured; and *Asplenium Adiantum-nigrum* and *Polypodium vulgare* are sometimes absolutely killed. When disturbed, the insect leaps off the frond after the usual manner of the *Cercopidæ*; but when once committed to the air, it flies about, and even hovers, with all the facility of a *Musca*. The smoke of tobacco, if the greenhouse can be sufficiently closed, is fatal; but there is a great deal of difficulty in applying it effectually in a large or imperfectly closed house. The nuisance may also be in some degree abated, by burning the fronds in autumn, and thus, in all probability, destroying the eggs."

Read, a "Description of a new Species of *Lithocolletis*,—*L. irradiella*." By John Scott, Esq. It is very like *L. lautella*, but the anterior wings are darker, the streaks more slender, and the spot at the anal angle not on the inner margin. The specimen from which the description was made, was taken in July, in a damp wood near Renfrew, and was exhibited to the meeting.

Read the following extracts from a letter to the Secretary, by the Rev. Joseph Greene, of Wendover:—

"No genus of moths that I am acquainted with is so subject to *Ichneumon*s as *Notodonta*. Of *N. camelina*, I should say seven in every ten are pierced. I found five of *N. trepida* this year, four were pierced; and the same with *N. zic-zac*, which is common here in the larva state. *N. dictæa* and *dictæoides* are apparently more fortunate."

"The singular epidemic of muscardine? exists to a great extent among larvæ this year, arising, I imagine, from the extreme dampness of the season. The characteristics of the disease are, that when the larva is fully grown, it suddenly, and without the slightest apparent premonitory symptom, becomes stiff and rigid, with the fore part of the body extended, and in a short time dries up. I have found it in *zic-zac*, *Coryli*, *antiqua*, *angularia*, &c. My house being unfortunately very damp, I should not have thought much of this circumstance, but it has, I believe, been noticed by others."

The President drew the attention of the Meeting to the Rev. J. F. Dawson's prospectus of his 'Monograph of the British Geodephaga,' recommending the proposed work as worthy of their support, and stating that unless a sufficient number of subscribers was obtained, it would not appear.—*J. W. D.*

Proceedings of Natural-History Collectors in Foreign Countries.

MR. H. W. BATES.* — “Santarem, March 10, 1853. — The collection I now send, small in bulk, but numerous in minute species, will, I hope, reach you safely and in good condition. The unusually dry weather we had up to the middle of February, was unfavourable to the appearance of small Hymenoptera, Hemiptera and moths, of which, had it been otherwise, I know I could have collected great numbers, and of different species, as sent you last year, in May. My researches, which I recommenced as soon as I recovered from the effects of my Tapajos journey, since the beginning of December last have been chiefly in entirely new ground, — moist forests on banks of rivulets at two leagues distance from Santarem. I had begun to work the small Coleoptera before I received your letter of October 7, 1852, in which you recommend me to do so; and I wish to call your attention to them. You will find a number of small species of Cleridæ, curious species of Pelonium, especially one like a very small Telephorus, Platynoptera, Priocera, &c.: from what I can make out with the capital *resumé* of the 2nd vol. of Chenu, and the British Museum Catalogue, some of these must be *new*. They require *very close* searching for, most of them being very quiet, feeding on the under side of the leaves of spiny palms in swamps. There are several species of different genera of Pselaphidæ, Tyrus, Euplectus, Bryaxis and Scydænus, which, together with other things, I find at roots of trees on the borders of swamps. I have a unique specimen of a new species of Metopias, *Gory*, with spined thorax and elytra; only one was previously known, *M. curculionides*, found by Lacordaire at Cayenne. I have searched closely for further specimens, at present without success. In similar localities I found all the small Trechi, Bembidia, *Ægæ*, Lachnophori, and small Staphylinidæ, as well as the Dyschirii and Clivina; most of the latter do not belong to the European genera, but are very different, and curious in their forms. Then there is a variety of minute Curculionidæ and Bruchi, especially of genera allied to Baris, Mecinus, &c.; all are found at flowers of various kinds. I think I have still with me double the number of species now sent, which, by degrees, I shall sort out and remit. All these things follow pretty much the same rule as the larger Coleoptera; that is, individuals are not numerous, but species of endless diversity. There are

* Communicated by Mr. S. Stevens.

many small Buprestidæ too, many very pretty yellowish Lebiæ and Dromii; the species of these have a very similar facies, but are very distinct, especially in the form of the thorax. There are some pretty longicorns, Ibidoin, Necydalis, Chrysoprasis &c. The butterflies are few, only two or three species of Erycinidæ and Theclæ, *very* remarkable. The series of handsome Pepsis, even if not new, will perhaps please Messrs. F. Smith and Baly, as I have been careful to select very fine and perfect specimens. In the other box, one side has a number of duplicate specimens for myself, which I shall some day find useful for dissection &c. The fine Chlænius appears to be almost spoiled from the oil which exudes from the body.

“I am really sorry for Mr. Wallace’s loss. Had it been my case, I think I should have gone desperate, because, so far as regards the unique specimens, the journal &c., such a loss is irreparable. If he should visit the Andes, there is plenty of work to do. I have chalked out a route which I should like to undertake myself, but it must be after a visit to England. It is, to land at Guayaquil, cross the Cordillera to the settlements on the Napo, thence descending slowly this river, to make a stay at Nauta on the Upper Amazons: this is a route followed by many Spanish traders. At Nauta may be had repose, wholesome living, and good collecting: a European family resides there, one Mr. Cauper, who speaks English. What hosts of new Cybdeles, Catagrammas &c. one might expect! Thence it would not be difficult to go up the Huallaya, cross to Moyobamba, Chachapoya, to Truxillo: the great disadvantage is, that I do not see how one could forward the partial collections to England. At Nauta, if the Brazilian Government fulfils its promise, there will arrive a steamer from Parà once or twice a year; if so, it would be easy to remit to England. I intend to stay here working at the small species, until I see whether the steamer will be forthcoming for the Upper Amazons. The Barra steamer is fairly going, having made two voyages, but it is supported almost entirely by the bonus from government, as the whole freights &c. only reach one-sixth of its monthly expenses! As to getting from this place to Ega in one’s own canoe or as a passenger, it is *an utter impossibility*.

“The Tapajos collection, I hope, has reached you safely ere this; I sent it November 25th. The collection of Diurnes therein was fine. I see by Mr. Hewitson’s plate of Pieris, that there were three new species in the collections of this genus alone. If the Peru steamer comes it will be most likely in May and June, just the time to arrive in Ega for the rarer Cybdeles, Timetes, Eubages, Prioni, &c. As my health

is quite re-established, in fact better than in England, I think it unwise to leave the country without again visiting that rich region, and indeed going up still higher after the fine Napo Catagrammas, and the short-tail monkeys (*Onakary*), which I am sure Dr. J. E. Gray would like to have a series of; especially as an opportunity offers of going up in fifteen days, it taking four months in a sailing vessel.

“I may state here that *Megacephala Spixii* is most certainly distinct from *M. Martii*, since it has its own peculiar range, soil, and habits. I have not seen a single specimen of the former at Santarem, the only place where I have seen *M. Martii*, in soils and localities quite distinct from those of *M. Spixii*, and no intermediate variations of colour have occurred. A specimen of *M. spinosa*? went in the collection of June last; yesterday I found a third specimen, and a series of quite a different *Megacephalous* larva. *M. spinosa*? has its peculiar habits likewise; the three specimens were all taken about mid-day, running about dry sandy *campos*; at night, I have searched the place for it without seeing one. *M. curta* was very common a few days ago, close to the edge of the water, on sandy beaches: it hides in the daytime in semi-aquatic retreats under stones or sediments, I never saw it five yards from the moist edge of the water. About a month ago I saw undoubtedly an *Iresia* running over the trunk of a tree on a sloping bank in the forest, but missed it.”

“Santarem, March 30, 1853. — On the 12th instant I forwarded to you a collection and letters by a sailing vessel; I now avail myself of our steamer to write again and report progress, but most likely both letters will leave Parà by the same ship. Although my gains the last year and a half appear very small, I am not much discouraged, as my private collection is unusually fine, and two expensive voyages that I made in the time, will not occur again. I have previously stated the great difficulty in exploring out-of-the-way places, as the river Capari on the Tapajos, and that I should be reluctant to undertake such expensive and arduous voyages again. Forward me as often as you can a few numbers of the ‘*Zoologist*,’ especially for the sake of the reports of the Entomological Society contained therein; also all new Museum Catalogues of mammals, birds, reptiles, fishes and insects as they appear, and Chenu’s work, as being cheap, and easily replaced if lost. As a brother of the net, the death of Mr. J. F. Stephens was very sad intelligence; he did a great deal towards popularizing and facilitating Entomology in England. I should much like to have you here for three months; the novelty to me has, of course, worn off, but the real

fixed interest in the objects has constantly increased. I do not now feel startled to see, instead of a few *Pieris Rapæ*, *Gonepteryx Rhamni*, *Vanessa Urticæ*, *Polyommatus Alexis*, &c., crowds of large yellow and orange *Callidryas*, madly darting about the suburbs, with quantities of the green *Cethonia Dido*, *Agraulis Vanillæ*, strange silver-spangled *Argynnidæ*, with long narrow wings, numbers of delicate little *Terias*, where there is a carpeting of flowering shrubs; big *Phanæi*, especially *Ph. lancifer* and *Ph. Mimus*, and great heavy *Coprides*, lying smashed on the path-ways in early morning; bright green *Callichromas*, with red legs, smelling of musk more strongly than your nearly allied *Aromia moschata*, pestering one everywhere on showery days; besides another of the *Cerambycidæ*—*Chlorida festiva*—flying into one's face whilst writing by lamp-light. One entomological phenomenon, which struck me very much on my first arrival, I have now got so used to as not to notice it, except when I make an effort to do so; it is the wonderful incessant ringing of the *Grylli* and *Acridia* at night, in the suburbs of the towns, joined to the quacking, drumming, and hooting of the toads and tree-frogs: it fills the air with a resonance of life quite magical to a European. I speak now only of open grounds in the suburbs of towns; but where I should like to accompany you is through the over-arching shades of roads in the virgin forest. The insects of open grounds are all species very common throughout Tropical America; in the forests everything is different: and here we cannot make any comparison intelligible to an English entomologist. Of moths you see very few, at night none. Some things allied to *Polia* and *Acronycta* we see very rarely on trunks; the other *Noctuæ* are almost entirely of the genus *Erebus*, known by the long, cylindrical, terminal joint of the palpi: they lurk amidst the murkiest shades, and settle generally at the foot of tree-trunks, surrounded by entangled *sipés* at night. Some species frequent houses, but these are always different from those of the forests: many I have seen without being able to secure specimens of as yet: twice I have seen *Erebus Strix*, expanding nearly a foot in breadth, applied flat to the trunks of trees. *Sesiadæ* are the most abundant *Nocturnes*; perhaps I have taken eighty species. As to *Geometridæ*, they appear to be replaced by the diurnal family *Erycinidæ*, which fly out of bushes when beaten, just as the *Acidaliaæ*, *Emmelesiaæ*, &c. do in England. There are plenty of species of *Tortricidæ*, some pretty *Pyrallidæ*, even *Alucitidæ*, in the woods, which you, with Messrs. Stainton & Co., would make great things of, no doubt, if you were here, and not prevented from

attending to them on account of the greater interest of a series of twelve hundred species of Diurnes, and *new* species almost every day.

“ I am almost forgetting more important matters. Since the 10th of March, the Rio Nigro steamer has made its third monthly voyage, and brought news that another steamer would most certainly be put on the line from Barra to Nauta, in Peru, four months hence. I liked to see the show of energy and punctuality this voyage, and therefore think you may conclude that I shall revisit Ega, and go beyond. I expect to do wonders, besides, I have so very much more knowledge of the species: this is my chief reason for writing to you so soon. I have enough to do here until the steamer comes, besides waiting for all the entomological cheap books and papers you can send. Only think! — since writing on March 10th, I have taken sixty-five *new* species of Coleoptera, chiefly minute, indeed, but very interesting, such as six species of *Echiaster*, *Erichs.* (a genus of *Pædinidæ*), a duplicate of the new *Metopias* mentioned, besides several specimens of a third species, *quite new*. Besides these, six new longicorns, two new *Megacephalæ* (only one of each), one of which is undoubtedly *M. affinis*, *Dej.*, both very peculiar species of the metallic group; and several *new* genera and species of *Brachinidæ* from quite new ground.

“ I have now interested an influential head of the Indians; from him I have at last a clew to the *Lepidosiren*. He describes it exactly; the Indian name is *Tambaki-unboyia*, which means the *Tambaki* serpent—*Tambaki* being a very common eatable fish, feeding on fruits in the submerged *ygapós* which the *Lepidosiren* frequents, and has scales very similar in appearance to those of the *Lepidosiren*.

“H. W. BATES.”

General Natural-History Society. — It has struck me that by a little arrangement between local Natural-History Societies, the science might be much advanced, and facilities be offered for new Societies to be formed: I appeal therefore to all naturalists to assist in carrying out my views. For the first step, we must be indebted to your kindness: it is, to publish in the ‘*Zoologist*’ a list of all Natural-History Societies, with the names of the President and Secretary of each: a request from you in the ‘*Zoologist*’ would obtain this. This information being obtained, I would suggest that the papers read at one Society should be passed on until all the Societies had read them: this appears to me an excellent way of disseminating knowledge: it would also bind us more together, and give us an interest in each other. Natural History, or rather its friends, appear to be awaking from their torpor; and I think, by a slight effort, we might now place her in the proper rank. I shall be happy to attend to any communication I may receive.—*William Thompson; Weymouth, October 15, 1853.*

On preserving the Balance between the Animal and Vegetable Organisms in Sea Water. By ROBERT WARINGTON, Esq.*

IN the published notices of my experiments of 1849, to maintain the balance between the animal and vegetable organisms in a confined and limited portion of water, the fact was demonstrated, that, in consequence of the natural decay of the vegetation, its subsequent decomposition and the mucus-growth to which it gave rise, this balance could only be sustained for a very short period, but, if another member were introduced, which would feed upon the decaying vegetation and thus prevent the accumulation of these destructive products—a function most admirably performed by the various species of water-snail—such balance was capable of being continuously maintained without the slightest difficulty; and I may add, that the experimental proof of this has now been carried on, in a small tank in the heart of London, for the last four years and a half, without any change or disturbance of the water; the loss which takes place by evaporation being made up with rain or distilled water, so as to avoid any great increase of the mineral ingredients originally present. It follows then, as a natural deduction, from the successful demonstration of these premises, that the same balance should be capable of being established, under analogous circumstances, in sea water. And in a paper published in January, 1852†, I stated that I was, at that time, “attempting the same kind of arrangement with a confined portion of sea water, employing some of the green sea-weeds for the vegetable member of the circle, and the common periwinkle as the representative of the water-snail.”

The sea water with which the experiments I am about to detail were conducted, was obtained through the medium of one of the oyster-boats at the Billingsgate fish-market, and was taken from the middle of the English Channel.

My first object was to ascertain the kind of sea-weed best fitted, under ordinary circumstances, for keeping the water clear and sweet, and in a sufficiently oxygenated state to sustain animal life. And here opinions were at variance, for one naturalist friend whom I consulted, advised me to employ the Rhodosperms; another stated that

* Read at the Hull Meeting of the British Association. Printed in the ‘Annals and Magazine of Natural History’ for November, 1853, and communicated by the Author for publication in the ‘Zoologist.’

† ‘Gardeners’ Botanical Magazine and Garden Companion,’ Jan. 1852.

it was impossible to make the red weeds answer the purpose, as he had tried them, and strongly recommended the olive or brown-coloured Algæ; while, again, others thought that I should be more successful with those which had in theory first suggested themselves to my own mind, namely the Chlorosperms. After making numerous unsuccessful experiments with both the brown and the red varieties of Algæ, I was fully convinced that, under ordinary circumstances, the green weeds were the best adapted for the purpose.

This point having been practically ascertained, and some good pieces of the *Enteromorpha* and *Ulva latissima* in a healthy state, attached to nodules of flint or chalk, having been procured from the shore near Broadstairs, several living animal subjects were introduced together with the periwinkle. Everything progressed satisfactorily, and these all continued in a healthy and lively condition.

My first trials were conducted in one of the small tanks which had been used for fresh water; but as it was necessary, during the unsuccessful experiments with the brown and red sea-weeds, to agitate and aërate the water, which had been rendered foul from the quantity of mucus or gelatinous matter generated during the decay of their fronds, until the whole had become oxidized, and the water rendered clear and fitted for another experiment, it was, therefore, for greater convenience, removed into a shallow earthen pan and covered with a large glass shade to protect the surface of the water, as much as possible, from the dust and soot of the London atmosphere, and at the same time impede the evaporation. In this vessel then I had succeeded perfectly in keeping a large number of beautiful living specimens in a healthy condition up to the close of 1852. I therefore gave instructions for the making of a small tank as a more permanent reservoir, and one more adapted for carrying on my observations and investigations on the œconomy and habits of the inhabitants.

From the experience I had obtained in my experiments with the freshwater tank, I was induced to modify slightly the construction of this vessel; thus, at the back, or part towards the light, the framing was filled with slate in the same way as the ends and bottom; for I had found that the glass, originally employed, very soon became covered with a confervoid growth which had an unpleasing appearance to the eye, and in consequence of which I had been obliged to paint the glass on the exterior to prevent this growth from increasing to too great an extent. It was also an unnatural mode of illumination, as all the light should pass through the surface of the water. The front towards the room and the observer was constructed of plate

glass, the whole being set in a stout framework of zinc, and cemented with what is known under the name of Scott's cement, and which I have found to answer for the purpose most admirably. Within this tank were arranged several large pieces of rock-work, thrown into an arched form, and other fragments were cemented in places against the slate at the back and ends, and at parts along the water-line, so that the creatures could hide themselves at pleasure; a short beach of pebbles was also constructed in order that shallow water could be resorted to if desired. The whole tank was covered with a light glass shade to keep out the dust and retard evaporation.

With the sea water obtained in January, 1852, I have been working without cessation up to the present time, agitating and aërating when it became foul during the unsuccessful experiments on the sea-weeds, but since then it has been rarely ever disturbed; the loss which takes place from evaporation being made up, as before stated, with rain or distilled water.

For a considerable period, after commencing these experiments, I was much troubled to obtain living subjects in a healthy condition, but having alluded to this, and the success of my investigations, in a short notice appended to a paper published in the 'Annals' for October, 1852 (see also Zool. 3633), my friend, Mr. P. H. Gosse, who was then sojourning at Ilfracombe for his health, offered in the kindest manner possible to supply me with materials, and from that period he has always most heartily responded to my wants. It must not be imagined for a moment that the beautiful creatures I have thus received have been all preserved alive or always quite healthy. In experimental investigations this would be unreasonable to expect, as the very fact of experimenting implies a disturbance of the then state of things. Besides which, from want of a sufficient knowledge of Natural History, from want of forethought and experience and other causes, I have lost many very fine specimens; and as the detail of these losses may prevent the occurrence of the like annoyances to others, I shall venture to occupy your time for a short period with their history.

My greatest loss arose from too great an anxiety to transfer the collection I had preserved in a healthy condition to the end of December, 1852, into the new tank. As soon as it arrived from the maker's I lost no time in introducing my numerous family to their new abode, and dearly I paid for my precipitancy, for on the next morning I found many of my most beautiful specimens dead; thus I lost two fine *Holothurias* (*H. Pentactes*), a small freckled goby (*Gobius minutus*),

a beautiful little pipe-fish (*Syngnathus lumbriciformis*), and several others, and on opening the door of the case the cause of this mortality was at once evident,—an iridescent film of oily matter was floating on the surface of the water, arising from the paint with which the angular joints and edges of the small tank had been coloured not having become sufficiently hardened.

Another source of loss arises from the several creatures attacking and devouring each other, and it therefore becomes a point of great importance—and highly necessary to be carefully observed, where their preservation is an object—to ascertain what varieties may be safely associated in the same tank; as, for instance, I have found that the shrimps and prawns attack, and very soon devour, all the larger varieties of corallines and Polyyps, Sabellæ, Serpulæ, rock-borers, Cirrhipeds, some of the Annelids, many bivalve and univalve mollusks that are unprotected by an operculum, or have no power of closing their valves. The instances which have come under my own immediate observation have been the destruction of the *Pholas dactylus*, *Saxicava rugosa*, *Cypræa Europæa*, and several specimens of *Sabellæ*, *Serpulæ*, *Coryne sessilis*, and many others.

The common crab (*Cancer Mænas*) is likewise a most destructive agent; and the tribe of rock-fish, the blennies, gobies, &c. are also most voracious, devouring all the varieties of Cirrhipeds, corallines, Polyyps, Annelids, &c.; they will also attack the shrimps and prawns, and even seize upon the horns of the periwinkle, which they bite off. If the mollusks do not keep a very firm hold of the rock or tank sides, they are rapidly turned over by these fish on their backs and lie helplessly exposed to their attacks.* It is doubtless their seeking food of this kind which causes these little fish to be so generally found in the shallow rock-pools of the coast. In consequence of these ravenous propensities, I have been obliged to establish several small tanks and imitation rock-pools, so as to separate these various depredators from each other: thus in one I have varieties of *Actinia*,

* Since the reading of this paper at Hull I have received a blenny of larger size, being about 3½ inches in length, and although it has become so tame that it will allow itself to be touched by the hand and takes its food from the fingers, yet its destructive propensities are so great, that it very soon killed four small crabs; and to save three others, of rather a larger size, I have been obliged to remove the blenny to a rock-pool in association with his own species and a few *Actiniæ*. The only refuge the poor crabs had was to bury themselves in the sand, and whenever they attempted to move out of their refuge they were immediately pounced upon and only escaped by burrowing rapidly again.

shrimps, Nudibranchs, Holothurians, and some Annelids; in a second the rock-fish, as the blennies, gobies, Cottus, with crabs and Actiniæ; in a third corallines, Annelids, Polyps, rock-borers, Sabellæ, Serpulæ, Holothurians, and Actiniæ.

Another curious instance of loss I may detail which has quite recently occurred, and which may prove interesting; it was in a small rock-pool containing blennies, gobies, crabs, &c. I had procured two live oysters for the purpose of feeding my numerous small fry in these vivaria, and one of these having proved ample for the purpose of one meal, the other was placed on the sandy bottom; on the second day after this the oyster was observed to have opened the valves of his shell to a great extent, which were afterwards seen closed, but a small *Gobius niger*, inhabiting the pool, could nowhere be seen. The day after this the oyster was opened for the general feeding, when, lo! within the shell was found the unfortunate *Gobius*, quite dead. Whether this little gentleman had been attracted within the trap by curiosity or the ciliary motion of the oyster, it is impossible with certainty to say; but that he must have seized on some sensitive part of the oyster is more than probable, so as to have caused such a rapid closing of the valves of the shell as could entrap so active a burglar.

Another important point is the gravity of the sea water; this should be very carefully regulated, for it must be borne in mind that many of the marine creatures are supplied by a permeation of water through their tissues or over their delicate and beautiful organs. The specific gravity should not rise above 1026 at 60° Fahr., and a small hydrometer should be at short periods introduced to ascertain that this point is not exceeded, particularly during the hot months of summer. The reduction to this gravity can be readily effected by the addition of rain or distilled water. Many of the creatures will of themselves afford indications of this increase of density; some of the Actiniæ will remain closed and become coated with a white slimy covering within which they remain for a length of time, and if the specific gravity of the water be lowered this is very soon ruptured by their expansion, thrown off, and the tentacula become soon extended.

All putrescent matter or excess of food or rejecta of the Actiniæ should be carefully removed from the water, as the noxious gaseous compounds generated by the decay of such matters appear to diffuse themselves rapidly through the water, act as a virulent poison, and speedily destroy the vitality of the occupants. Thus many beautiful subjects were lost in a few hours from the introduction, into a small

glass jar, of a large Pecten shell, encrusted with corallines, which had become loaded with putrescent matter by partial submersion in a foul muddy bottom.

Great care should also be taken in moving the Actiniæ that the foot or sucking disk with which it attaches itself to the rocks, stones, or weed, be not injured, as, when this occurs, they rarely survive, but roll about without attaching themselves, and gradually waste away and die.

With these exceptions then, everything has gone on very satisfactorily, care being always taken not to overload the water with too large a proportion of animal life for the vegetation to balance, as, whenever this has been inadvertently attempted, the water has soon become foul, and the whole contents of the tank, both animal and vegetable, have rapidly suffered, and it has required some time before the water could be restored to its former healthy condition.

In one of the numbers of the 'Zoologist' of last year, I stated that besides the Ulvæ, Enteromorphæ and Cladophoræ, I had found the *Zostera marina* a very useful plant for oxygenating the sea water; but this observation has reference only to the case of a tank supplied with a ground where its roots will find a sufficiency of food for its growth, as in a clear shingle or sand it soon decays; and it should be associated with such animals as delight in a ground of this nature, as many of the Annelids, crabs, burrowing shrimps, &c. There are several interesting observations which have been made from time to time connected with this subject, which I hope to lay before the Natural-History world as soon as I can find leisure time for the purpose.

ROBERT WARINGTON.

Apothecaries' Hall, Sept. 10th, 1853.

Note on the Grasshopper Warbler.—In corroboration of Mr. Stevenson's note on the grasshopper warbler (Zool. 4072), I may mention that two nests with eggs were found here this summer, in swampy hollows in a small glen. Two or three years ago a nest with four eggs was taken in an orchard on the banks of the Wear, in the city of Durham; and a birds'-nesting boy showed me in his collection last year, nearly a dozen of these beautiful little eggs, which he had taken himself, but of which he did not know the name.—*H. B. Tristram; Castle Eden, Durham, November 1, 1853.*

Occurrence of the Roller (Coracias garrula) near the Land's End.—The roller has again made its appearance on our western shores; and the specimen now under notice was captured a few days since in the parish of St. Just, in Penarth, a few miles north of the Land's End. On dissection it proves to be a female, with the ovarium fully developed; and from the hard and compact state of the bones, it appears to be beyond a

bird of the year. The plumage is generally obscure, and presents the characters of a bird of the year; the brilliant hues of blue are confined to the quill-feathers and tail, and the rich brown on the dorsal feathers is only partially developed. This specimen, now in the possession of Mr. Vingoe, corresponds exactly with the example brought to me some years since, and reported at the time in the 'Zoologist.' — *Edward Hearle Rodd; Penzance, October 17, 1853.*

Note on the Hooded Crow, (Corvus Cornix).—As a friend of mine was walking on the sands near Cromer on the 24th ult., he observed a solitary hooded crow flying over from the sea, evidently fatigued with a long passage. He fired at it, and saw it immediately drop a small bird from its beak, which proved to be a chaffinch, with the skull fractured. Would not this seem to show that the crow had fallen in with a flock of chaffinches on the passage, and had secured one of his fellow-travellers for a meal on its arrival?—*Robert Birkbeck; Keswick, November 4, 1853.*

Note on the Woodcock, (Scolopax rusticola).—This favourite little "possessor of the long bill" has, in my opinion, made its appearance in this neighbourhood remarkably early, considering the season. A fine specimen was shot upon Blagdon, by Mr. Henville, on Friday the 14th instant: the "old people" say this portends a severe winter. Several others have been shot since. The appearances generally have not been observed here before the 24th instant; but I remember, several years ago, hearing of the occurrence of one so early as the 3rd of October. — *John Garland; Dorchester, October 31, 1853.*

Note on a White Variety of the Common Tern.—A tern, apparently a bird of this year, and an accidental variety of the common species, was shot at Lowestoft on the 12th of August, which was remarkable for having the entire plumage of a pure snow-white, except some minute horizontal ash-coloured lines between the nostrils and the eyes, a very slight smoke-coloured tint covering the whole remainder of the head from the eyes backwards, and a little tinge of gray on the quill-feathers of the wings. The colouring of the irides, of the beak, and the feet resembled that of ordinary immature specimens of the common tern.—*J. H. Gurney; Easton, Norfolk, October 21, 1853.*

Note on the occurrence of the Pectoral Sandpiper and Nutcracker near Yarmouth.—The above two rare birds have been recently obtained in the neighbourhood of Yarmouth, the first on the 30th of September, and the second about the 10th of October. I had the opportunity of examining the sandpiper in the flesh; it was a female, and apparently a bird of the year: it was not fat, but in very fair condition. The stomach contained some small seeds, and the remains of a few insects, but too mutilated to be recognizable with clearness.—*Id.*

Pike and Tench.—Mr. Slaney (Zool. 4020), alluding to the commonly received opinion that the tench, being the physician of fish, is respected as such, and therefore is not preyed upon by other species, relates, as something extraordinary, an instance of a pike having seized a tench crossways, which was too large to be swallowed, and swam about with it for a considerable time, carrying it between his jaws. This instance goes far to prove that the beautiful theory about the pike not feeding upon tench is a "vulgar error," as it most surely is; for I have, before now, myself seen a fine tench taken out of the stomach of a pike. Mr. Slaney, however, states that the instance he records is "the only one he ever met with in which the tench was attacked

by any other fish," &c., and that "all other kinds of fish, rats, young ducks, &c., have fallen a sacrifice to the all-devouring pike, *but not the tench.*" I heartily wish the latter part of this statement were true, and borne out by fact. Now I will relate what lately occurred to myself. In the autumn of 1848 I turned into a pit, which I believed to contain no fish of any kind, fifty small tench and forty or more crucian carp; seven tench and twenty-four crucians were also turned in at a subsequent period. One sunny day last August I was much surprised at seeing three or four very small pike basking in the shallow near the side of the pit; they were not so long as my finger, and must have been bred the foregoing spring. This convinced me that, no doubt, there were some larger pike in the water, the parents of these small fry; and I began to think it would fare but badly with my store tench and crucians. So I resolved to drag the pit, and accordingly did so on the 13th of October. We caught three pike, weighing respectively, I should guess, 3 lbs., 2 lbs., and 1½ lb., or thereabouts. They were not in good condition, and, from their length and frame, ought to have been considerably heavier. But what had become of the tench and the crucians? All that remained out of the fifty-seven tench and the sixty-four or more crucians, were one tench of 1½ lb. weight, and eight crucians of about 1 lb. each. I cannot have the smallest doubt that the pike had devoured the fish that were missing; and that these nine that remained only escaped because they were rather too large for pike of the size above-mentioned to swallow conveniently. I am quite aware that a pike of 3 lbs. will make no great difficulty of devouring an ordinary fish of a pound weight or more; but the crucian carp is so deep a fish, being nearly as broad as it is long, that one of less even than a pound would be a very awkward morsel for any but a large pike to swallow. The above is not a solitary instance of its kind: similar ones, and those even still more decisive of the point in question, have come under my notice several times. As to the opinions of keepers, I cannot always place implicit confidence in them. I remember once trolling for pike in a large pool or lake, which, among other fish, abounded in bream. The keeper, an intelligent man, insisted on it that pike never preyed upon bream. I was very sceptical; or, rather, I totally disbelieved the statement: so, to test the matter, I set to work and trolled with a small bream as a bait, and presently convinced him of his error by catching a pike with it. The fact is, when the pike is in the humour for his prey, nothing that he sees in motion comes amiss to him, be it fish, flesh or fowl, or even far less digestible articles, as, for example, ordinary pebble-stones of considerable size, which, in several instances, I have known taken out of a pike's stomach, (see Loudon's Mag. Nat. Hist. iii. 241). It may seem a strange thing to say, nevertheless it is a veritable fact, that pike, and, I may add, trout and perch too, will absolutely eat a larger fish than it is possible for them to swallow, — to swallow, that is, *all at once*; so that while the head of the prey is digesting in the stomach, the tail end remains projecting out of the mouth of the devourer; and it will sometimes happen that in this way the pike is choked, and falls a sacrifice to his own voracity. I was a good deal amused at the title I once heard given to the pike by a miller residing on the Wiltshire Avon, a beautifully clear stream, in some parts of which the pike have nearly exterminated the trout: — "We call it, Sir," he said (apologizing for the freedom of his speech), "we call it the water-devil." I have heard of a certain gentleman, a kind of *male Mrs. Malaprop* (so to say), who, in speaking of the voracity of the pike, is reported to have said that it was "by far the most *avaricious of all quadrupeds!*" Depend upon it — and let all the lovers of the delicious physican of fish bear it in mind — that the notion that the pike will not feed upon tench, is

just about as true as to say that we bipeds will not eat beef and pudding. — *W. T. Bree*; *Allesley Rectory, October 27, 1853.*

Postscript to the preceding Note.—Since the above was written, I have seen by the November number (*Zool.* 4100) that Mr. Slaney has experienced fresh instances of the pike feeding on tench; and that he is now fully convinced that the commonly received notion of the tench's immunity from the attacks of the pike is "totally unfounded." It appears also from Mr. Slaney's communication, as well as from repeated instances which have come under my own observation, that the pike is, as I may say, *doubly* destructive of tench as well as of other fish, not only devouring such as are of a size suitable to the capacity of his jaws and stomach, but also by seizing, mutilating, and finally destroying others which are too large to be so disposed of. — *Id.*; *November 4, 1853.*

Notes on the Oxfordshire Shells. By ALFRED MERLE NORMAN, Esq.

(Continued from page 3764).

It has been with much pleasure that I have read the numerous local lists of land and fresh-water shells that have appeared in the pages of the 'Zoologist,' since the publication of my notes on the species found near Oxford, (*Zool.* 3761). The season which is now so rapidly drawing to a close, has certainly been a very bad one for collecting most objects of Natural History; but there are exceptions to every rule, and "'tis an ill wind which blows no one any good." Thus, while entomologists have had to put by their nets in despair, as I, for one, have long since done; and even ornithologists have looked in vain for those sunny days which often tempt many a stranger to cross the seas; those who pay attention to our inland Conchology have had a harvest. Ducks, and certainly slugs and snails even more so, delight in a ducking; and after showers, the latter may be seen in great abundance crawling along the hedge-banks, up the smooth trunks of trees, over palings, &c. For the Limaces, moisture, to produce a flow of mucus, is absolutely necessary to existence, and they have been luxuriating in this rainy season in greater numbers than I have ever noticed before. A dry hot summer is also no friend to the Helices, which will then retire to some cool spot and close their mouths with an epiphragm, in order to avoid the heat, just in the same way as they do to avoid the cold in winter. Heat and drought are even more injurious to the inhabitants of small ponds and ditches; since when these dry up, the Mollusca perish in thousands.

Having for the last few months been staying in South Oxfordshire, I purpose giving a few remarks on the species found there, in order that I may render my Oxfordshire list of shells more complete.

The neighbourhood of Watlington, which is about sixteen miles to the South-east of Oxford, has but little water, and therefore I did not search much for the water-shells, and those few I found were contained in my previous catalogue. In land-shells, however, the locality would not be easily surpassed, since the magnificent beech-woods which crown the Chiltern Hills form a splendid preserve for shells.

The beech would seem to be an especial favourite with Mollusca, more so than any other tree; the smooth bark is what they delight in, and after showers the stems may be seen literally covered with many species, as the following notes will testify. The rotting leaves also afford food and shelter to many species.

With the exception of *Helix Pomatia* and *H. granulata*, the land-shells mentioned in the former list (Zool. 3761) are found also round Watlington; as well as the following twenty-three additional species, and two good varieties,—*Helix aspersa* var. *alba*, and *H. ericetorum* var. *obliterata*.

Arion flavus, *Forbes and Hanley*. This new species (?) is found, though but rarely, under and on moss &c. in the beech-woods.

„ *hortensis*. Rare, in the woods.

Limax maximus. The variety of this species which has the shield spotted with black, and the back marked with longitudinal black lines, is not uncommon on the hedge-banks of the Henley road, from half a mile to a mile from Watlington; I have also found it at Pyrton.

„ *arborum*, *Forbes & Hanley*. Very abundant in the beech-woods. It delights in crawling up and down the moist stems of the beeches to a considerable height. The remark made by Müller in his 'Historia Vermium' seems very applicable: he says it is "in fago vulgaris, vere et Novembre." It is very distinct from *L. maximus*, the sculpturing on the back in particular being totally different.

Vitrina pellucida. Very rare: a single specimen in Sherborne Wood.

Helix aspersa, var. *alba*. I took some half-dozen specimens of this pretty variety on a hedge-bank at the foot of Watlington Hill; other specimens found in company with them were remarkably pale, though marked in the usual way.

„ *hybrida*. A few specimens among brambles, near Watlington Church.

„ *lapicida*. Not uncommon in the woods.

„ *fulva*. Moist ground among moss, Pyrton.

Helix depilata. Rare, under stones lying on grass, Pyrton Common.

„ *ericetorum*, var. *obliterata*, Hartmann. Common along the Ickleton Way from Watlington to Ewelme, and is also to be found on Pyrton Common.

Zonites rotundatus. Common under timber lying on the ground, stones, &c., in the woods and elsewhere.

„ *cellarius*. Not common; among the under rotting leaves of *Iris foetidissima*, Pyrton.

„ *alliarius*. Frequent among decaying beech-leaves in Sherborne Wood.

„ *purus*. Not common; in similar situations to the last, in the Cuckoo-pen, Sherborne Down.

„ *nitidulus*. Very rare; two specimens at roots of grass on the Henley road.

„ *crystallinus*. Among rotting beech-leaves in the woods, and at roots of grass, Pyrton.

Bulimus Lackamensis. This species is to be found on the trunks of beeches in all the woods round the neighbourhood, in great numbers, after rain, and climbs up them frequently to the height of from 30 to 40 feet. I once took no less than three dozen from the trunk of a single tree.

„ *obscurus*. Common, though not so abundant as the last, with which it is found in company. The shells of the young of these two species are generally much encrusted with earth &c.

Achatina Acicula. Not common; at roots of junipers, on Swincombe Down.

Pupa Juniperi. Common on the trunks of beeches, in Sherborne Wood, especially at the outskirts of the western side.

Vertigo pygmæa. Frequent at roots of grass and junipers, on Swincombe Down.

Clausilia bidens. Abundant on the beech-trees. I only saw one specimen of the white variety, whereas in other parts of the country I have sometimes found the white in almost equal numbers to the brown.

Carychium minimum. To be found among the rotting beech-leaves in all the woods, and also at the roots of grass by wood-sides, &c.

Cyclostoma elegans. Not uncommon among leaves in the beech-woods.

I have thus met with seventy-six species, besides numerous varieties, in Oxfordshire; and to this list may be added eleven others, which I have not myself found, but which are enumerated in a catalogue of sixty-six shells, which the late Mr. Hugh Edwin Strickland,

whose melancholy death all who take an interest in Natural History have so recently had to deplore, published in Loudon's 'Magazine of Natural History' (viii. 494), as found by himself in the vicinity of Henley-on-Thames.

In conclusion, I would add that I shall be happy to assist, as far as lies in my power, any gentleman who may wish to exchange our marine for inland shells. I also have a few desiderata among the latter; and should feel extremely obliged to any one who could favour me with specimens of *Pisidium cinereum*, *Vertigo angustior*, *Clausilia Rolfii*, or *Amphipepla involuta*.

ALFRED MERLE NORMAN.

Clevedon, Somerset, October 10, 1853.

Note on the supposed late Appearance of Insects.—In the report of the Proceedings of the Society of British Entomologists for July last (Zool. 4007), Mr. Harding, the President, observed, in proof of the backwardness of the season, as shown by the late appearance of many kinds of insects, that "he took some fine specimens of *Semiophora gothica* at the end of May;" and as he evidently considered this a late period for the occurrence of this species, it may not be uninteresting to entomologists to know that I myself took at sugar, in Berewood, Dorsetshire, on the evening of Tuesday, the 19th of June last, six specimens of this same insect, in as beautiful condition as if they had just escaped from the chrysalis. Now, although many kinds of insects are accelerated or retarded in their appearance by the fineness or warmth of the season, or the contrary, yet this is by no means universally the case; although, no doubt, if we were thoroughly acquainted with the economy of all insects, we should readily perceive why this variation of seasons should influence some without affecting others. For instance, *Heliothis Dipsacea*, which occurs in some profusion on different parts of our heaths in Dorsetshire, appeared at precisely the same time as I had observed it in former seasons, and in about the same numbers as usual. I may here mention that I have always found this insect remarkably constant to about one time of appearance, never having seen it before the 12th of July, or after the end of the first week in August, although I have looked for it constantly, both before the former time, and after the latter. *Pamphila Actæon* also I found true to its time this season, even to a day, and in about the usual profusion, although, as the weather was very unfavourable during my two days' visit to its locality, I did not procure anything like the number of specimens that might have been obtained in fine bright weather, though what I did get (nine dozen) were in much finer condition than they would have been if the sun had shone continuously, and enabled them to exert their active and pugnacious propensities to the detriment of their plumage. *Anarta Myrtilli*, and several other heath species, such as *Ericetaria caliginosa*, &c., all kept to their usual times of appearance; while *Plusia Gamma*, generally so common on the heath-blossoms, was not only much later than usual, but when it did appear, was about the rarest insect on the heath at that time (the end of July). *Hipparchia Semele* and *Polyommatus Ægon* appeared at about the same time as usual, and in their ordinary numbers. *Triphæna pronuba*

and *Polia nebulosa*, generally numerous, and sometimes quite a nuisance at sugar, by the end of June, had not made their appearance by the 19th of July. As far as my own observations have extended, the more local the species the more constant seem to be their times of appearance; but it requires much more experience than I have had, both in looking for and awaiting species at their ordinary seasons, and in examining the peculiarities of their transformations, to be able to lay down with any degree of accuracy even the most general rules on this most interesting part of Entomology. In connexion with this subject, the present season has remarkably proved the truth of the old saying, that good plum seasons and plenty of wasps are generally concurrent, and *vice versâ*; for in some parts of Dorsetshire where the plums, in common with other like fruits, have almost failed, owing to late frosts and blight, there are scarcely any wasps at all, while in this neighbourhood, where every tree has been loaded with plums, the wasps are so numerous as to be a perfect nuisance, if the windows are left open at meal-times. — *Octavius Pickard-Cambridge; Hatch Beauchamp, Taunton, September 23, 1853.*

Lepidoptera taken near Tenterden. — Not having seen in the 'Zoologist' any list of *Lepidoptera* taken in the neighbourhood of Tenterden, the following may be acceptable. Where the contrary is not stated, all have been captured by myself, principally in one locality, — Knock Wood. I have included in the list none but the more uncommon species.

Thecla Betulæ, one, on oak, August; another seen but not taken.

Melitæa Athalia, heathy spots, June; not uncommon but very local.

Apatura Iris, two seen but neither captured.

Chærocampa Celerio, one specimen, (Zool. 3624).

Deiopeia pulchella, one, wasted, in a cobweb.

Zeuzera Æsculi, larvæ not uncommon, imago but seldom met with,

Platypteryx lacertula, two, by beating hazels, border of the wood, August.

„ *fulcula*, two on wing, July.

„ *unguicula*, one, beaten from oak, wasted, August.

Ptilodontis palpina, not uncommon, attracted by light at night.

Apatela leporina, not uncommon at sugar; I have taken perfect specimens in June, July, and August.

Acronycta auricoma, not rare at sugar.

Diphthera Orion, two, very perfect, at sugar, June, one wasted, July.

Cymatophora Oo, one, at sugar, July.

Tethea retusa, one, at sugar, near the town.

Cosmia pyralia, one, at sugar, August.

Xantholeuca croceago, one, at sugar, September.

Hadena lutulenta, one, at sugar, near the town.

Aplecta advena, two, at sugar, June.

„ *occulta*, one, at sugar, September.

Calocampa vetusta, one, at sugar, September.

Philopyra pyramidea, one, at sugar, near the church.

Toxocampa pastinum, one, by beating a hedge near the wood, July.

Pyrausta octomaculalis, one seen in a damp part of the wood.

Pyralis glaucinalis, one, beaten from a hedge near the mill-ponds.

Asopia flammealis, common, by beating oaks.

- Pionea stramentalis*, tolerably plentiful about Tenterden, in damp parts of woods, &c., July and August.
- Botys lancealis*, one, by beating, July.
- Madopa salicalis*, one, on wing, June.
- Polypogon derivalis*, not uncommon, by beating and on wing.
- Hypenodes albistrigalis*, ditto.
- Nola strigularis*, two, beaten from a hedge near the town.
- Geometra papilionaria*, one, very perfect, at sugar, July.
- Eurymene dolobraria*, one taken, another seen, at sugar, June.
- Ennomos lunaria*, one, taken on wing.
- Aventia flexularia*, one, beaten from a maple hedge near the town.
- Biston prodromaria*, one, taken by a friend.
- Eucosmia undularia*, two, taken on wing, June.
- Ephyra orbicularia*, two, by beating.
- Eupithecia pulchellaria*, one, by beating.
- Acidalia inornaria*, ditto.
- Halias quercana*, one, taken by a friend.
- Crambus pinetellus*, sparingly at sugar, also by beating.
- Lithocolletis Roboris*, one, beaten from a hedge near the wood.
- Pterophorus monodactylus*, one, by beating.
- S. C. Tress Beale*; *Wadham College, Oxford, October 22, 1853.*

Micro-Lepidoptera of the New Forest, Hampshire.

By THOMAS BOYD, Esq.

A VISIT of a few weeks during the past summer to Lyndhurst and the neighbourhood, has gratified, though far from satisfied a desire to work the *Micro-Lepidoptera* of the New Forest, which was raised in my mind by Mr. Douglas's paper in the 'Zoologist,' on the New Forest as an entomological locality: and I think the accompanying list of some of my best captures among the *Tineidæ*, will prove that it will amply repay any *Micro-Lepidopterist* who will work it.

I took *Crambus silvellus* rather freely, and as I still have some duplicates left, shall be happy to supply any one who may be in want of the species.

Should any one be induced to pay a visit to Lyndhurst at any future time, I shall be happy to give him any information in my power with regard to localities, &c.

Crambus dumetellus. Middle of July.

„ *silvellus*. On a swamp, July and August, apparently attached to a very wet kind of moss growing at the edge of the swamp; easily disturbed during the day, and flying for a short time at sunset.

Crambus selasellus. With the preceding, but more distributed, and flies later.

Eudorea Cratægella. August 1.

„ *concinella*. July 28 and August 30.

„ *delunella*. Middle of July, from palings, &c.

„ *pallida*. Middle of August, rather poor, from a swamp.

Ephestia semirufa. July 8.

Acrobasis consociella and *tumidella*. End of July and beginning of August, by treacling, &c.

Myelois epelydella.

Tinea Carpinetella. August 1.

„ *Knockiella*. July 23.

„ *semifulvella*. Middle of July.

Plutella sylvella. Beginning of September.

„ *Alpella*. Beginning of August, cocoons taken off oaks.

„ *nemorella*. July.

„ *scabrella*, end of August, beaten from various trees; near wild apple-trees.

Gelechia Walkeriella. July, on a small heath.

„ *atrella*. July, flying at dusk over heath.

„ *nigrovittella*. August 31.

„ *Gerronella*.

Argyresthia semitestacella. End of August, among beeches.

„ *glaucinella*. Middle of July, on a paling.

„ *Andereggiella*. End of August, rather poor, from wild apple-trees.

Coleophora discordella. August 2, on a heath.

Gracilaria Tringipennella. End of August.

„ *auroguttella*. Beginning of August.

„ *Phasianipennella*. Three specimens, August 31, September 3 and 6.

„ *elongella*. From alder, larvæ in September, imago in October.

Coriscium sulphurellum. End of August.

Elachista Rhamniella. Middle of August.

„ *pulchella*. July and August.

„ *Rhynchosporella*. July, on a heath, apparently attached to a species of cotton-grass; flies for a very short time at sunset, but is difficult to obtain by sweeping, as it falls down as soon as the grass is touched.

„ *biatomella*. July 8.

- Lithocolletis lautella. Bred from oak-leaves, mines the under side.
 „ Coryli. Mining the upper side of hazel-leaves.
 „ Nicellii. Mining the under side of hazel-leaves.
 „ Ulmifoliella.
 „ viminiella. Beaten out of a willow-hedge, end of August.
 „ Stettinensis. Mining the upper side of alder-leaves, the larvæ coming out on the under side.
 „ trifasciella. Larvæ end of August.

And several Nepticulæ, which are uncommon only because they have never been looked after, and the names of which are not accurately decided.

THOMAS BOYD.

17, Clapton Square, November, 1853.

Note on Cerura Vinula.—I have now a specimen of this moth, in the pupa state, which changed in August, 1852, so that this is the second winter of its pupation. It exhibits signs of life when handled. Though I have bred many of these moths, I have never before observed one remain two years in the chrysalis; probably this one will be developed next spring.—*John R. S. Clifford*; 21, *Queen's Row, Pimlico, November 1, 1853.*

Note on Hemerophila abruptaria.—This moth, in most entomological works, is marked as uncommon. It has been taken, however, in some plenty, both this season and the last, in the month of May, in a lane near Notting Hill. I have also taken two in Kensington Gardens, and have received a specimen this season from Shropshire, and another locality which I do not remember.—*Id.*

Mode of killing Neuroptera.—I have until lately experienced great difficulty in killing these, and especially the larger Libellulidæ. An easy and efficacious method recommended to me, is to drop a small quantity of camphorated spirit on the thorax, while the insect is confined in the net: this, if dropped just behind the head, at its junction with the thorax, produces death in a few seconds. An advantage of this method is, that both the camphor and the spirit are volatile, and will soon evaporate, leaving the specimen uninjured.—*Id.*

On the Scarcity of Hymenopterous Insects in certain Localities, particularly the Bombi, in 1853.—I have seldom witnessed so great a scarcity of the Bombi, since the years 1816 and 1839, as in the summer of 1853. In the spring I observed very few queens of the different species, which I attributed to the excessive rains and floods in November, December, and January last. After a very late spring, I observed a few of *Bombus lucorum* and *B. pratorum*; many of these seem to have perished in June and July. In the beginning of September I noticed one specimen of the male of *B. lucorum* (the most common), but have not seen one of *B. pratorum*: they seem to be nearly annihilated for the present. That most common species, *B. subterraneus*, has also become nearly extinct here, and of *B. hortorum* I have not seen one. The few nests of these species that I have found, have been on the edge of the steep banks of

the canal; and it is wonderful to see the instinct displayed by all the queen Bombi in choosing a place where the wet is drained off from their domicile. Wasps were also very scarce in the spring, no doubt from the same cause. Hive-bees also have suffered severely from the wetness of the past season, and, according to present appearances, they seem likely to be diminished one half in number throughout the country, few stocks having collected enough honey to keep them until next spring. In the summer of 1852, this neighbourhood had abundance of the different Bombi, particularly of *B. lucorum* and *B. lapidarius*. I watched about half-a-dozen of their nests, and am confirmed in my opinion that the males leave the nest but once, never to return, although the period of leaving depends a good deal on the progress of heat and cold in the season. In 1851, the males of three or four species appeared at the middle and end of June, or at latest about the 15th of July: in this last summer, they made their appearance full a month and even six weeks later, some not until the first week in September. *Bombus Derhamellus* is also very scarce, and this may be accounted for from their being so exposed in their habitations of moss, where they fall an easy prey to every marauder. I have hedgehogs near me, and I suspect that several nests both of *B. Derhamellus* and *B. muscorum* were plundered last summer by this animal.—*H. W. Newman; New House, Stroud, October 6, 1853.*

Capture of Aphanisticus pusillus in November.—It may be a fact interesting to many of your entomological readers, that so late in the season as November 1st, I made rather an abundant capture of *Aphanisticus pusillus*. I took it by sweeping long grass with moss at the roots, in a sunny nook formed by the trees in Moor Park, Farnham, Surrey. It seemed to inhabit just that particular spot, and no other. I should be glad to exchange specimens with any of your readers who may need this species.—*D. F. Jarman; Manor House, Hadley, Barnet, near London, November, 1853.*

Catalogue of Coleoptera found in the Neighbourhood of Dublin.

By A. R. HOGAN, Esq.

IMPERFECT though a list such as the following must necessarily be, I yet trust that it will be of use in assisting to determine the limits of distribution which exist among our native beetles.

Much of the information contained in this Catalogue has been communicated to me by A. H. Haliday, Esq., and Alfred Furlong, Esq., for whose kind assistance I have great pleasure in returning my best thanks. The names of the genera are those adopted by the late Mr. Stephens in his 'Manual of British Coleoptera.'

<i>Cicindela campestris</i> , L.	Killiney beach.	<i>Dromius linearis</i> , Ol.	Portmarnock, &c.
<i>Demetrius atricapillus</i> , L.	Killiney and Portmarnock.	„ <i>fasciatus</i> , F.	Killiney and Port- marnock.
<i>Dromius quadrimaculatus</i> , L.	Under the bark of trees, common.	„ <i>foveolus</i> , Gyl.	Portmarnock.
		„ <i>truncatellus</i> , L.	Ditto.

- Dromius meridionalis*, *Ste.* Cherrywood, Loughlinstown.
 „ *melanocephalus*, *Dj.* Portmarnock, &c.
 „ *agilis*, *F.* Not uncommon.
Clivina fossor, *L.* Abundant.
Dyschirius thoracicus, *Gyl.* Portmarnock and Portrane.
 „ *salinus*, *Schaum.* Portrane.
 „ *globosus*, *Hbst.* Common.
Carabus granulatus, *L.* Very abundant.
 „ *auratus*, *L.* This insect was taken some years since at Lough Bray by the Rev. E. Tardy and the late T. Coulter, Esq., but I have not heard of any recent instance of its capture.
 „ *glabratus*, *Pk.* Lough Bray.
 „ *nemoralis*, *Mlr.* Common.
 „ *catenulatus*, *Pz.* Local.
 „ *monilis*, *F.* Taken by the late J. Tardy, Esq.
 „ *clathratus*, *L.* Enniskerry.
Leistus spinilabris, *F.* Very local.
Helobia brevicollis, *Pk.* Everywhere.
Loricera pilicornis, *F.* Common.
Badister bipustulatus, *F.* Scarce, though generally distributed.
Chlænienus vestitus, *F.* Along the Dodder banks.
Anchomenus prasinus, *F.* Abundant.
 „ *oblongus*, *F.* Rare.
 „ *albipes*, *F.* Common.
Agonum marginatum, *L.* Dodder banks.
 „ *parumpunctatum*, *F.* Common.
 „ *micans*, *Nic.* Dodder banks.
 „ *piceum*, *L.* Local.
 „ *Bogemanni*, *Ste.* Of this rare species I have taken a single specimen at Baldoyle.
Olisthopus rotundatus, *Pk.* Sea-coast.
Synuchus vivalis, *Ill.* Portmarnock, on the sea-sands.
Sphodrus leucophthalmus, *L.* Dublin and Malahide.
Pristonychus terricola, *F.* Dublin, in cellars.
Calathus cisteloides, *Pz.* Common.
 „ *flavipes*, *Dft.* Portmarnock.
- Calathus melanocephalus*, *L.* Very abundant.
 „ *mollis*, *Mm.* Portmarnock, plentiful.
 (Amphigynus, *Hal.*) *piceus*, *Mm.* Freq.
Argutor erythropus, *Mm.* Local.
 „ *vernalis*, *Gyl.* Ditto.
Adelosia picea, *Ste.* Taken by the late Mr. Tardy.
Pogonius chalceus, *Mm.* Marshes at Baldoyle, Portrane, &c.
Pœcilus cupreus, *L.* Very common.
 „ *var. versicolor*, *Sturm.* Frequent.
Omaseus nigrita, *F.* Local.
 „ *melanarius*, *Ill.* Not uncommon
 „ *orinomum*, *Ste.* Military road.
Steropus madidus, *F.* Abundant.
Broscus cephalotes, *L.* Common along the sea-coast.
Platysma niger, *Ste.* Everywhere.
Abax striola, *F.* Generally distributed.
Amara similata, *Gyl.* Common.
 „ *vulgaris*, *Gyl.* Scarce.
 „ *communis*, *F.* Abundant.
 „ *trivialis*, *Gyl.* Local.
 „ *familiaris*, *Crz.* Portmarnock.
 „ *brunnea*, *Gyl.* Ditto.
 „ *bifrons*, *Gyl.* Ditto.
 „ *tibialis*, *Pk.* Not common.
 „ *nitida*, *Er.* Local.
 „ *acuminata*, *Pk.* Not uncommon.
Bradytus apricarius, *F.* Local.
 „ *fulvus*, *Deg.* Portmarnock.
 „ *consularis*, *Dj.* Ditto.
Cyrtotus piceus, *F.* Local.
Harpalus æneus, *F.* Portmarnock.
 „ *ruficornis*, *F.* Common.
 „ *tardus*, *Ill.* Portmarnock.
 „ *honestus*, *Dj.* Ditto.
 „ *limbatus*, *Sturm.* Common.
Ophonus puncticollis, *Pk.* Portmarnock.
 „ *pubescens*, *Pk.* Marine marshes at Baldoyle, &c.
Trechus aquaticus, *Ste.* Common.
 „ *rubens*, *F.* Very rare; Clontarf and Killiney.
 „ *fulvus*, *Mm.* Not unfrequent.
Cillenum laterale, *Lch.* Baldoyle, abndt.

- Tachys immunitus*, *Ste.* In river gravel.
 „ *obtusus*, *Dj.* Local.
Ocys rubens, *Ste.* Very rare; North Bull sands and Bray.
 „ *currens*, *Ste.* Dodder banks; very rare.
Notaphus ustulatus, *L.* Banks of the Liffey, at Celbridge.
Lophus assimilis, *Gyl.* Local.
Peryphus concinnus, *Sturm.* Mouth of the Dodder.
 „ *saxatilis*, *Gyl.* Dodder banks.
 „ *maritimus*, *Ste.* Killiney, but not common.
 „ *Bruxellensis*, *Wesm.* Local.
 „ *littoralis*, *Pz.* Not unfrequent.
 „ *tibialis*, *Dj.* Dodder banks.
 „ *viridi-æneus*, *Ste.* Plentiful.
 „ *decorus*, *Dj.* Dodder banks.
Tachypus celer, *L.* Everywhere.
 „ *bipunctatus*, *L.* Portmarnock.
 „ *pallidipennis*, *Ste.* Baldoyle.
 „ *ærosus*, *Er.* Dodder banks and Loughlinstown.
Philothus æneus, *Grm.* Local.
Notiophilus aquaticus, *L.* Common.
 „ *semipunctatus*, *Sturm.* Ditto.
 „ *palustris*, *Dft.* Ditto.
Elaphrus riparius, *L.* Very local.
- *Haliplus elevatus*, *Helw.* Canal, Dublin, and Loughlinstown.
 „ *fulvus*, *F.* Not uncommon.
 „ *ruficollis*, *Deg.* Canal, Dublin.
 „ *lineatocollis*, *Mm.* Ditto.
 „ *obliquus*, *F.* Ditto, taken by Miss M. Ball.
Noterus semipunctatus, *F.* Same locality.
Hyphydrus ovatus, *L.* Portmarnock, &c.
Hygrotus inæqualis, *F.* Not uncommon.
 „ *pictus*, *F.* Phoenix Park, Zoological Gardens, but rare.
Hydroporus palustris, *L.* Somewhat local.
 „ *planus*, *F.* Very abundant.
- Hydroporus reticulatus*, *F.* Canal, Dublin.
 „ *rivalis*, *Gyl.* Loughlinstown.
 „ *lepidus*, *Ol.* Local.
 „ *depressus*, *F.* Loughlinstown.
 „ *erythrocephalus*, *L.* Not uncommon.
 „ *nigrita*, *F.* Ditto.
 „ *pubescens*, *Gyl.* Ditto.
Laccophilus minutus, *L.* Local.
 „ *hyalinus*, *Deg.* Generally distributed.
Colymbetes fuscus, *L.* Common.
 „ *nebulosus*, *Ste.* Dundrum.
 „ *bipustulatus*, *L.* Exceedingly abundant.
 „ *chalconotus*, *Kug.* Local.
 „ *guttiger*, *Gyl.* A single specimen at Kingstown.
 „ *angustior*, *Gyl.* Fox-rock &c.
 „ *fuliginosus*, *F.* Common.
 „ *ater*, *F.* Local.
Dytiscus marginalis, *L.* Not common, though generally distributed through the county.
Acilius sulcatus, *L.* Howth and Portmarnock.
Gyrinus natator, *L.* Everywhere.
 „ *æneus*, *Ste.* Canal, Dublin.
Orectochilus villosus, *Mlr.* Loughlinstown.
Heterocerus femoralis, *Kies.* Baldoyle: the var. called *sabulosus* (Hal.) also occurs here.
Helophorus grandis, *Ill.* Local.
 „ *aquaticus*, *L.* Not uncommon.
 „ *granularis*, *L.* Frequent.
 „ *griseus*, *Hbst.* Local: a var. with a black head has been taken at Clontarf by Miss M. Ball.
Hydrobius fuscipes, *L.* Tolerably frequent.
 „ *globulus*, *Pk.* Scarce.
Laccobius minutus, *L.* Dundrum.
Limnebius mollis, *Ste.* River Dodder.
Ochthebius punctatus, *Ste.* Portmarnock.
Philhydrus melanocephalus, *L.* Local.

(To be continued).

A. R. HOGAN.

Charlton, Dundrum, near Dublin,
 November 3, 1853.

Notes on Ophiuridæ obtained from the Moray Firth, off Gamrie, Banffshire, and Pennan, Aberdeenshire. By the Rev. GEORGE HARRIS.

OPHIURA texturata. This species is very abundant, and individual examples, measuring considerably more than an inch across the disk, occur frequently. In almost every case the disk is prominently convex, and the convexity is preserved in even the dried specimen. Its form, though generally round, is by no means invariably so, but often assumes the subpentangular shape; and the triangular plates are sometimes seen to be separated by so many as three or four transverse scales.

Ophiura albida, is frequent along the coast, more particularly, I believe, to the west of this locality.

Comatula rosacea. I cannot affirm I have met with this species, but the Rev. George Gordon, of Birnie, informs me that fragments have been found, showing its existence, off Lossiemouth.

Ophiocoma Ballii. I have obtained but a few specimens of this very beautiful brittle star. The disk of the largest measures two-eighths of an inch in diameter, that of the smallest a tenth, and is pentangular. The only habitat indicated by Mr. Forbes (Brit. Star-fishes, 1841), is the Irish coast; but in addition to the above, the Rev. Mr. Gordon, of Birnie, writes me he has found several specimens of it in his neighbourhood.

Ophiocoma brachiata, seems to be very abundant. It is frequently brought up on the lines of our fishermen, though always in a very mutilated condition. The several specimens in my possession are not without the same imperfection, which however is owing to a different cause, the greater number of them having been taken from the stomach of the common haddock.

Ophiocoma granulata. I have obtained many examples of this species. It appears to congregate, and occurs in spots of limited extent. When the lines of the fishermen happen to be stretched across one of these spots, the overlying portion is occasionally found to be quite charged with them. Under "specific character" of this species, Mr. Forbes (Brit. Star-fishes, p. 50) describes the disk as "round." In the greater proportion of the specimens in my possession, the disks are either pentangular or subpentangular. The prevailing colour is dark brown, but many are also light brown, gray, and some yellow and orange, which last may be the same with that stated

by Mr. Forbes as being not uncommon in specimens obtained from the Irish Sea, (p. 52).

Ophiocoma bellis. Under "specific character" of this species, Mr. Forbes describes the disk as "subpentangular," and the same is repeated in his text. In three out of eight of the many examples that have come under my observation, the reverse is the case, the greater number being round, or as nearly so as may be imagined. I would also say that the sides are less tumid than one would infer is intended by his description, and all are more thickly set with plates than is shown in his figure. In size, the disks vary from three-fourths to one-tenth of an inch in diameter, and in the case of one the surface is strongly hirsute. I have "found them under stones at very low tides," but have also known them drawn from water of considerable depth along with *Thuiaria thuia*. A more intimate and extensive acquaintance with this species induces me to question whether the individual described and figured in the 'Zoologist' for 1850, under the name of *Ophiocoma parmularia*, be after all a distinct species, and not rather a *variety* of the present one? It certainly appears to differ from the description of Mr. Forbes in all the particulars so minutely stated by our late lamented and esteemed friend the Rev. James Smith, of Monquhitter. Yet, apart from the wedge-shaped scales at the insertion of each ray, the chief distinctions or disparities being the form, number of plates, and the arrangement or rather number of spinules, these variations cannot, I consider, be said to be greater than are frequently found to exist between identical individuals of other species, particularly where the comparison has been instituted on examples gathered from localities widely apart; and though the scales at the origin of the rays certainly present, to the eye as well as under a lens, a wedge-shaped appearance in their general outline, which is owing obviously in part to colour, or perhaps more properly to the want of it, it is possible that, were the specimen broken up and carefully dissected, it might be found to have little if anything more peculiar in it, than could be accounted for by the fact of its being more numerously covered with plates, while at the same time less thickly set with spinules than is usual. To my mind, by far the most important feature lies in these wedge-shaped scales, and were this authoritatively ascertained, I should have no hesitation in regard to a distinction of species; but more extended opportunities of examining these *genera* satisfy me that a wider range of variation falls to be admitted in the identification of species, than can reasonably be claimed in the classification of most other forms of animal life.

On comparing examples of *Ophiocoma rosula*, gathered on this coast, with others from a distance, and particularly with one from Ayrshire, which I owe to the kindness of Major Martin, of Ardrossan, I find differences nearly as great as those above referred to. For instance, one set as compared with another, are fuller and rounder; some are deeply pentangular and others circular; some are strongly spinous and others very slightly so; and in some, again, the triangular plates cover about half the disk, while in others of average size these plates are so small or obscured, that careful inspection is necessary in order to become satisfied of their existence. However the matter may prove eventually, I feel warranted in submitting these observations, and am ready to afford every facility in my power with a view to its determination.

Ophiocoma rosula. After the above reference to this species, I need only observe that here, as elsewhere, it is very abundant, and of great variety of colour, as brown, red, pink, purple, variegated, &c. Perhaps the majority of the specimens obtained here last season were more or less pentangular in the form of the disk, but in this respect there appears to be little uniformity. Three very small, measuring only one-sixteenth of an inch across the disk, I was willing to set down to the account of *Ophiocoma minuta*; but surrendering my reserve to the better judgment of a highly valued and accomplished friend, whose name I have already had occasion oftener than once to write in the course of these observations, I place them under the parental care of this our familiar rosy friend.

GEORGE HARRIS.

Gamrie, Banffshire, November, 1852.

Proceedings of the Entomological Society.

November 7, 1853.—J. O. WESTWOOD, Esq., Vice-president, in the chair.

The following donations were announced, and thanks ordered to be given to the donors:—The 'Zoologist' for November; by the Editor. The 'Literary Gazette' for October; by the Editor. The 'Athenæum' for October; by the Editor. The 'Journal of the Society of Arts' for October; by the Society. 'Revue et Magasin de Zoologie,' Nos. 7 and 8, 1853; by the Editor, M. Guérin-Ménéville. A lithographic portrait of the late Dr. W. A. Bromfield, framed and glazed; by his sister, Miss Bromfield. Lists of the British Tineidæ, for marking the desiderata to the Society's Collection; by E. C. Buxton, Esq. A box of South American Lepidoptera, in the finest condition, and containing several new species; by Thomas Jones Stevens, Esq., of Bogota, Corr. M.E.S. A box of British Lepidoptera, including a hermaphrodite

Smerinthus Populi; by the Rev. Joseph Greene. Six specimens of *Plutella Dalella*; by the Rev. J. Johnson.

Monsieur Henri Jekel, of Paris, was balloted for and elected an Ordinary Foreign Member of the Society.

Mr. Curtis exhibited a box of rare Coleoptera from Mozambique, received from Signor Bertoloni, of Bologna, including a specimen of *Goliathus Derbyanus*.

Mr. Edwin Shepherd exhibited a new British moth, *Noctua Sobrina*, *H.-Schæf.*, and an apparently new species of *Peronea*; both taken this season in Perthshire by Mr. Weaver.

Mr. S. Stevens exhibited another specimen of *Noctua Sobrina*, and a remarkable variety of *Trichius fasciatus*, in which the dark markings of the elytra were run together into a blotch; both taken by Mr. Weaver, in Scotland. He also exhibited a box of Diurnal Lepidoptera, in the finest condition, captured in Nicaragua, and forwarded in paper envelopes, the wings being closed over the body. In this state they were packed into a small space, and travelled free from injury, requiring only to be relaxed and set.

Mr. Shield sent for exhibition a specimen of *Depressaria subpropinquella*, bred from a larva found feeding on a thistle; and a new *Nepticula*, of which the larva makes a peculiar centrifugal mine in the leaves of *Rumex Acetosa*, and hitherto found only near Dublin. Mr. Stainton intends to describe the species under the name of *N. Acetosæ*.

Mr. F. Smith exhibited living specimens of a South American ant, *Odontomachus unispinosus*, imported with some Orchidaceous plants, and given to him by Mr. Stevens.

Mr. Douglas exhibited leaves of *Glechoma hederacea*, bearing tubular galls on the upper side, formed and tenanted by larvæ of *Cecidomyia bursaria*, *Bremi*. These insects he had been able to identify by means of the Monograph on *Cecidomyia*, just published by Herr Winnertz, in the 8th volume of the 'Linnea Entomologica.' Mr. D. also exhibited a living larva of a *Talæporia*? from a fence near Croydon; and leaves of sallow in which were the mines of Lepidopterous larvæ (*Nepticula*) and of Dipterous larvæ (*Phytomyza*), almost identical in appearance.

Mr. Boyd exhibited *Triphæna subsequa*, *Limacodes asellus*, *Macaria notata*, *Prodelia literalis*, and varieties of *Satyrus Janira* and *Argynnis Paphia*, all captured in the New Forest.

Mr. Curtis exhibited parasitic insects taken from *Malachius æneus*, *Epipone spinipes*, *Andræna Gwynana*, *Athalia lineolata*, *Bombus pratorum*, and an *Ammophila* from Africa.

Mr. John Clifford, of Pimlico, sent a sample of pearl barley, destroyed by insects, which were now identified as *Anobium paniceum* and *Ptinus ovatus*. The Chairman remarked that the former of these insects had several times been reported to the Society as injurious to farinaceous substances.

Mr. T. Desvignes exhibited specimens of a new Ichneumon, reared from larvæ of *Nonagria Typhæ* and *N. paludicola*; and read a description of the species under the name of *I. paludator*.

Mr. Baly communicated "The Characters of *Paralina*, a new Genus of Chrysomelidæ," of which the type is *Chrysomela Indica*, *Hope*.

Mr. Westwood exhibited his original sketch of a moth taken at Ballymena, in Ireland, by Mr. Templeton, and mentioned in Westwood and Humphreys' 'British

Moths,' (vol. ii. p. 67). Mr. Stephens had inserted the species in the Museum Catalogue under the name of *Dasydia torvaria*; but Mr. Westwood was now of opinion, from reference to Duponchel's figure and description, that it was *Cleogene Peletieraria*. Mr. Westwood also exhibited some larvæ in a bottle, which, from the locality of their capture on the coast, near Dublin, he thought might be those of *Diglossa mersa*.

Mr. Smith exhibited the same *Anthophorabia* he brought to the last meeting, still alive; also larvæ of *Anthophora retusa*, covered with larvæ of *Anthophorabia* and *Monodontomerus*, both apparently parasitical thereon: and he read a series of observations on the structure and œconomy of *Anthophorabia*. The chairman referred to the unprecedented circumstance of an insect without reticulated eyes possessing ocelli, as Mr. Smith was positive is the case in this instance; and Mr. Newman noticed, as most rare among insects, the fact reported of the male pairing consecutively with several females, and still surviving. Mr. Waterhouse, Mr. Curtis, and Mr. Hudson also made some remarks on the subject.

Mr. Wallace read the commencement of a paper "On the habits of the Butterflies of the Amazonian Valley," which will be resumed at the next meeting.—*J. W. D.*

Proceedings of the Society of British Entomologists.

October 4, 1853.—MR. HARDING, President, in the chair.

The President exhibited the following insects:—*Exæretia Allisella*, taken on the sand-hills near Sandwich, Kent, being a new locality, Mr. Allis having captured this insect in Cumberland; *Sphaleroptera ictericana*, with the pupa and case, the larva having fed on the flowers of the mouse-ear hawkweed, (*Hieracium Pilosella*); *Scaphila Perterana*, with pupa and case, the larva having fed on the flowers of the great white ox-eye (*Chrysanthemum leucanthemum*); *Depressaria Alstrœmeriana*, with the pupa and case, the larva having fed on the flowers of the common hemlock (*Conium maculatum*).

The President said a specimen of *Sphinx Convolvuli* was taken near his residence in Shoreditch; and that another was brought to him at Darenth Wood, having been picked up in the road: he also stated that he had taken a splendid pair of *Notodonta dictæoides* near Dartford, and *Hadena lutulenta* at Darenth Wood.

November 1, 1853.—MR. HARDING, President, in the chair.

The President read an extract from a letter received from Mr. Oxley, in Australia, in which the writer says,—"My man Jemmy had a large blue-bottle blow in his ear, and was nearly distracted for days, until I discovered the cause, and extracted seven large larvæ."

The President exhibited a beautiful variety of *Ephyra Porata*, and a singular variety of *Argynnis Euphrosyne*, taken in Hainault Forest; likewise a variety of *Callimorpha dominula*, the black marks on the inferior wings being obliterated and replaced by yellow ones. He also stated that he had taken some fine specimens of *Aporophila australis*, *Leucania crassicornis*, *Calocampa vetusta*, with several *Peroneæ*, and a *Gelochia* not named, near Deal, in October. The President also stated that a friend of

his had bred several specimens of *Spilosoma papyratia*, Ste., during the month of October.

Mr. Dalman exhibited some rare beetles, among which were *Helops pallidus* and *Micronyx tibiale*, taken on the Kentish coast by Mr. Harding.

Mr. Miller read the following paper on the habits of *Elachista Cerussella* : —

“The larvæ of this insect I found about the middle of the months of June and August, feeding on the inner substance of the leaves of a coarse kind of grass or sedge, the name of which is unknown to me, on which they spin a slight cocoon, and change to the pupæ. These pupæ appear alike in all respects, except in point of size and colour. I have not had an opportunity of observing, but suppose the light-coloured moth to be produced from the larger, and the dark-coloured one from the smaller pupæ. There is no perceptible difference in the larvæ, nor, except in size and colour, in the pupæ; therefore, taking this into consideration, together with the very great resemblance presented by the perfect insect under the microscope, I think I am justified in considering them one and the same species. I took both larvæ and pupæ at the same time, and bred them two days afterwards. The dark one, or male, is not generally known, and is only to be obtained by breeding the females. Mr. Harding informs me it is common in the fens.”

The specimens exhibited were bred. The *Ichneumon* infesting the larvæ was also exhibited.

The President announced the following donations for the cabinet: — From Mr. Edleston, a specimen of *Plusia bractea* and some others; from the Rev. J. Johnson, six specimens of *Plutella Dalella*.—*J. T. N.*

NOTICES OF NEW BOOKS.

‘*A History of British Crustacea.*’ By THOMAS BELL, F.R.S.,
Pres. L.S., &c. &c. Part IX., completing the work. London:
Van Voorst. October, 1853. Price 2s. 6d.

THE publication of this work has been a most tedious affair, — it has been spread over eight years: and we wish to enter our strong protest against publishers or authors commencing periodical publications of any kind, with the *self-imposed* terms of which they are not fully prepared to comply. Exceptions to the rule of punctuality may possibly occur: illness, death, or other unforeseen interruptions, cannot be guarded against; but in the present instance no such interruptions have occurred, and no kind of explanation is offered. This is a more serious subject than it may at first appear, because the want of punctuality in serials of any kind begets a distaste in the purchasers of such publications; and the proprietors of all periodical

literature are more or less injured by the shortcomings of any one of their number.

From these observations, imperatively called for but penned with great reluctance, we turn with pleasure to the work itself, which is admirably executed, and a long-desired addition to our Natural-History literature. This last part, containing the Introduction, is the most valuable of all, and we particularly commend to the close and studious attention of our readers the following most interesting passage on the metamorphosis of the Crustacea.

“One of the most marked characters by which this class was long considered as distinguished from that of insects, was the supposed absence of any such change of form, during the progress of development after exclusion from the egg, as is ordinarily understood by the term *metamorphosis*: and Dr. Leach, in his definition of the class, formally adopts this character, which has been repeatedly recognised by others.

“It was in the year 1823, that Mr. Vaughan Thompson, whose name is now identified with the discovery, following up an observation made by Slabber, a Dutch naturalist, as long ago as 1768, and published ten years afterwards, established the remarkable fact that those anomalous forms which constituted the genus *Zoea* of Bosc, are nothing more than the early or larva condition of the higher Crustacea. It will readily be imagined that no small excitement was produced in the scientific world by the announcement of a discovery which, followed up, as it afterwards was, with equal intelligence and perseverance, and with corresponding success, may claim for its author a place amongst the few observers who, from a single phenomenon, have been led to the establishment of generalisations and laws of the highest importance.

“Notwithstanding, however, the credit is due to Mr. Thompson of having carried out the suggestion to its full development, it was undoubtedly to the Dutch naturalist that he was indebted for the ascertained fact that the anomalous creatures on which Bosc afterwards founded his genus *Zoea* pass by metamorphosis into a different and a higher form.

“Before I proceed with the further history of this discovery, I think it right to show the grounds of Slabber's claim, which had been wholly overlooked as to its results, and which, in consequence of an error arising from deficient information, Mr. Thompson himself, in the first place, much depreciated, without, as far as I am aware, having afterwards taken any opportunity of correcting the misapprehension. It

was, then, in the year 1778, that Slabber published a small work, in which occurs a description with figures of a new crustacean animal (fig. *a*), to which the name of Zœa Taurus was afterwards given. Having taken at sea several specimens of this singular creature, he placed one of them (*a*) in sea water, which he constantly renewed, for the purpose of observation, and, 'on the third day, finding its movement become slower and its colour paler, he subjected it to the microscope, and found to his surprise that the anterior part of the animal had changed its form, and on the fourth day it had acquired the appearance represented in fig. *b*, so that, together with the other individuals he had taken, it seemed to have experienced a complete metamorphosis; under this new form the dorsal spine had disappeared, the front spine had become comparatively small, the antennæ were rendered conspicuous, the feet and eyes were apparently more developed, and the tail had changed from forked to spatulate, fringed by a row of thirteen short spines.' It would certainly seem that this plain and simple statement, supported as it was in many respects by Mr. Thompson's own subsequent observations, can scarcely justify the conclusion to which that gentleman is led, 'that Slabber lost his Zœa, in changing the sea water, and that the new form came from the added portion.' But the truth of Slabber's statement, and, consequently, the evidence of the correctness and originality of his discovery, are very strongly proved by the almost absolute identity of the second form of his animal with that of several species subsequently observed; and particularly of the ditch-prawn (*Palæmon varians*), as figured by Capt. Du Cane.

"It was, however, from this observation of Slabber that Mr. Thompson, in the year 1823, was induced to carry out the investigation. In the spring of the previous year, as he informs us, in the harbour of Cove, he first met with Zœas, and that in considerable abundance; and 'in the year following, at the same season, one of considerable size occurred, amongst a number of smaller ones, and, judging it full grown, he considered it a fit subject to keep for the purpose of witnessing the *metamorphosis observed by Slabber*,' &c. The metamorphosis was interrupted by the death of the animal when in the act of undergoing it; but it had advanced sufficiently to show that the animal belonged to the Brachyura, and the portion which was observed, contained all the five feet on one side, the anterior foot being furnished with a perfect claw; and it appears now more than probable that the form into which it was passing was that of Megalopa, to which further reference will be presently made.

“Here, then, was the first decided demonstration; but any doubt which might be supposed to appertain to an incomplete fact, was shortly removed by Mr. Thompson’s success in hatching the ova of the common crab (*Cancer Pagurus*), the product of which were true Zoeas.

“Subsequent observations made by Mr. Thompson confirmed his new views, and he established the truth of a metamorphic change in several genera; the results of his researches being given to the world in a subsequent portion of his “Zoological Researches,” in the ‘Entomological Magazine,’ in ‘Jameson’s Journal,’ and particularly in a paper read before the Royal Society in 1835, and published in the ‘Philosophical Transactions,’ in which details are given of the complete changes in the common shore crab (*Carcinus Menas*), which establish the further interesting and important fact, that while the animal appears under the aspect of a Zoea on its first exclusion from the egg, it undergoes a further change into a true Megalopa before its final assumption of the perfect form: showing that this supposed genus also, which was formed by Leach, is, like Zoea, only a phase of a higher type. Thus, in its progress from the egg to its final development, the brachyurous crustacean was proved to pass through two temporary conditions, which had previously been regarded as types, not of genera only, but of different families; and both strikingly dissimilar from the group to which, in its perfect state, it really belongs.

“The new doctrine was not received at once with implicit assent. Mr. Westwood, in a paper read before the Royal Society in June, 1835, not only contests the universality of the law, which Mr. Thompson had somewhat too hastily, perhaps, deduced from his facts, but concludes that that gentleman’s views are erroneous, and that ‘no exception occurs to the general law of development in the Crustacea—namely, that they undergo no change of form sufficiently marked to warrant the application to them of the term metamorphosis.’

“This hasty, and, as the result has proved, very premature condemnation, derived some *primâ facie* supports from the elaborate investigations of Rathke on the development of the embryo in the ova of the river cray-fish (*Astacus fluviatilis*), and the subsequent observations of Mr. Brightwell on that of the lobster, which latter, however, have since been only partially verified by Rathke, and are, indeed, modified in some particulars by Mr. R. Couch. To these I shall have occasion to refer more particularly hereafter; it is sufficient now to observe, that in both instances the animal was stated to be perfected by gradual development, and not by any sudden change of form.

These, if even the statements were fully borne out, have since been proved to be merely exceptional cases; and not only is Mr. Rathke's assumed general support of Mr. Westwood's objections completely removed, but that distinguished physiologist himself volunteers his strong testimony in favour of the opposite views in a subsequent paper, in which he says that he hastens the publication of these new researches respecting the development of several other forms of Crustacea, *one of which is the lobster*, 'in order, as soon as possible, to record a testimony to the correctness of Thompson's discovery, that even the Decapods, after they have already quitted the egg, undergo a very considerable metamorphosis;' and, in conclusion, he adds, 'from the notices which I have here briefly communicated respecting the development of some Decapods, it results that several of these animals, as first discovered and described by Thompson, undergo a very considerable and highly remarkable metamorphosis. . . . I, therefore, confess that I have done Thompson injustice in not putting faith in that discovery.' And he then states his intention, 'next spring, partially to subject his researches on the cray-fish to revision.' There is one apparent anomaly, however, on which Mr. Westwood dwells with some plausible show of reason, and on which it may be well to offer a few remarks.

"Amongst the specimens of Crustacea, preserved in spirits, which formed part of the collection of the late Rev. Lansdown Guilding, and which came into my possession after his death, was one of the abdomen of a female land crab (*Gecarcinus*), to which were attached numerous young, in their perfect form, and very similar, excepting in size, to the parent. Here, then, was a case in which, it may at once be granted, no *external* and independent metamorphosis, at least, had taken place; and on this, with the other instances above alluded to, Mr. Westwood founds his principal argument against the doctrine enunciated by Mr. Thompson. But may not this probably be an analogous phenomenon to that of the land salamanders amongst the Amphibia? And, as in that instance, where the animal has no opportunity of depositing her eggs in the water, where, in the more typical forms, the young undergo the transformations essential to the whole group, the changes take place in the oviduct; so may not the young of the land crab, whose habits require them to be speedily in a condition to leave the coast where they are hatched, formally undergo the metamorphosis within the egg? This being granted, it would be as reasonable to deny the phenomenon of transformation in the Amphibia generally, because the young of the salamander are brought

forth in the perfect state, as to deny its occurrence in the Crustacea, on the analogous exceptional case of the terrestrial *Gecarcinus*.

“ I do not consider it necessary to examine at any detail the ‘ six arguments ’ which Mr. Westwood adduces ‘ against the metamorphosis into crabs which the Zoeas are stated to undergo,’ since the facts, exactly as related by Mr. Thompson, have been so fully confirmed by subsequent observers. Indeed, I prefer referring to the whole of Mr. Westwood’s elaborate examination of the question, for the information of those who may have the curiosity to see how much may plausibly be urged against the truth of a theory, so irrefragably supported by facts. It is sufficient to say that Mr. Westwood does not attempt to bring forward a single investigation or observation of his own in support of his views, with the exception of that of the land crab, already mentioned.

“ But Mr. Westwood was not the only one who demurred to the correctness of Mr. Thompson’s conclusion. In the first volume of Milne-Edwards’s admirable ‘ History of Crustacea,’ this author says, ‘ Les Decapodes paraissent tous naître avec la série complète de leurs anneaux et leurs membres ; ’ and in a note occurs the following opinion on the earliest researches of Mr. Thompson : — ‘ Suivant M. Thompson, les Decapodes éprouveraient de véritable métamorphoses, car ce naturaliste regarde l’animal connu sous le nom de Zoé comme étant le jeune du crabe commun de nos côtes. Mais cette opinion n’est pas étayée d’observations assez précises pour entraîner la conviction.’

“ It is remarkable that this distinguished naturalist’s ultimate convictions were derived from his own observation ; and it is difficult to account for such a discrepancy when we consider the high character of the dissentient, and the means which were placed in his hands for determining the question ; for in consequence of the interest which it excited amongst the scientific men of France, Dr. Milne-Edwards was deputed, with another naturalist, to repair to the Isle de Rhé, for the express purpose of settling the disputed point, and he arrived, as we learn, at the conclusion above stated.

“ Subsequently to the researches above mentioned, the late Capt. Du Cane investigated the development of the shore crab (*Carcinus Mænas*), and of the ditch prawn (*Palæmon varians*), with complete success ; establishing in each of these forms the truth of Mr. Thompson’s position. Mr. H. Goodsir also examined, with similar results, the former species. But by far the most complete illustration of the subject, and the most extensive proofs of the general law, are afforded by the researches of my friend, Mr. Richard Q. Couch, of Penzance,

who, dissatisfied with the uncertainty and contradiction of former testimony, resolved to investigate the matter for himself; and this he effected with a degree of acumen and perseverance which characterize all his researches, and by which the truth of the doctrine is fully established, as regards the genera *Cancer*, *Zantho*, *Pilumnus*, *Carcinus*, *Portunus*, *Polybius*, *Maia*, *Galathea*, *Homarus*, and *Palinurus*,—a goodly number to have been investigated by one observer,—and of some of these he watched every change. These results were published in two Memoirs, read to the Cornwall Polytechnic Society in 1843; in which the author takes a clear and fair view of the whole subject, and comes to his decision with a host of evidence sufficient to set the substantive question entirely at rest. Unfortunately, the useful local publication in which these Memoirs appeared, is so much confined in its circulation, that it has probably fallen into the hands of but few naturalists.

“I have felt it desirable to give a more extended history of the discovery, as, with the exception of Mr. R. Couch’s first Memoir just referred to, no such digest has ever been placed at one view before the world. I now proceed to examine the actual results, and to endeavour to reduce the facts already known to some order.

“It will be inferred from the previous account, that there are considerable variations in the character of the metamorphosis of different families, and that in the case of *Astacus fluviatilis*, there appears at present to exist even an abrupt and isolated exception to the general law. As this is the only case at present in which such exception has been established, I refer my readers for further information on this subject, to the work of Mr. Rathke himself, which constitutes one of the most complete and elaborate monographs in existence, illustrated in the most beautiful and perfect manner; and to the full and satisfactory analysis of the work by Milne-Edwards, in the first volume of his ‘*History of the Crustacea*.’

“Eliminating, therefore, this exceptional case, it will be found that the fact of a metamorphosis has been demonstrated with more or less success in no less than seventeen genera of the brachyurous order of the Decapoda—in which order the phenomenon is most decided and obvious—belonging to the families *Leptopodiadæ*, *Maiadæ*, *Canceridæ*, *Portunidæ*, *Pinnotheridæ*, *Grapsidæ*, and *Gecarcinidæ*. In the Anomourous order, it has been shown in the genera *Pagurus*, *Porcellana*, and *Galathea*, and amongst the *Macroura* in *Homarus*, *Palinurus*, *Palæmon*, and *Crangon*.”—Introduction, p. xxxviii.

'*The Natural History of the Birds of Ireland, indigenous and migratory, containing Descriptions of the Habits, Migrations, Occurrence, and Economy, of the two hundred and sixty-one Species comprised in the Fauna.*' By JOHN J. WATTERS, Associate Member of the University Zoological Association. Dublin: John M'Glashan. London: W. S. Orr & Co. 1853. 300 pages, 12mo.; no illustrations. Price 5s.

WE believe that we shall be doing the author of this work the most acceptable service by quoting entire his explanatory Preface. We can only add that we rejoice in every attempt to make known the Natural-History riches of Ireland.

"The present 'Natural History of the Birds of Ireland' has been the result of many years' observation of their habits. Collecting and arranging that information, I have ventured, with considerable diffidence, to place it before the public. The late William Thompson, Esq., of Belfast, whose friendship I for many years enjoyed, on various occasions expressed a desire to see a cheap work on the subject published, regretting at the same time the unavoidable expense attending his own, which had prevented its circulation to the extent expected.

"For the purpose of making this book as popular and comprehensive as possible, many scientific technicalities have been left out, as tending to confuse the general reader without conferring any additional information, whilst such generic or specific names, essential to the subject, have in every instance their English signification attached. Intended to be within the comprehension of the *general reader*, it is hoped at the same time to be as available to *students*, and particularly to persons commencing or pursuing this branch of Natural History: for that purpose many details will be found through the work, recording the occurrence of the rarer visitants to our island, and in every instance specifying the habitat or country they are indigenous to. This arrangement might have been difficult were it not for the assistance afforded by the works of Temminck, Degland, and Schlegel, together with those of other distinguished naturalists, whose information is acknowledged in the text. Mr. Thompson's work has afforded me considerable facility in referring to notices of species which I had previously transmitted to him, which was fortunate, as in many cases I had no copy except what occurred in my correspondence with that gentleman, and which he has so amply acknowledged in his work.

“For the further information of the student the modern French scientific names have been added, together with a carefully revised and copious index to the systematic names in both languages; whilst in several instances notices have been introduced of the appearance of the same species in other countries, for the purpose of illustrating some peculiarity of habit not observable in our own.

“For the better economy of space and consequent saving of expense, I have omitted a description of the plumage of the birds, preferring to give a familiar description of their habits and migrations rather than to occupy the work with a quantity of matter not sufficiently attractive to the general reader.”

‘*The Annals and Magazine of Natural History.*’ No. 71, dated November, 1853. London: Taylor & Francis, Red Lion Court, Fleet Street. Price 2s. 6d.

THE papers in this number are as follows:—

‘On the Nucleus of the Characeæ.’ Translated by Mr. A. Henfrey from the original of Al. Braun.

‘On the Branchial Currents in the Bivalves.’ By William Clark, Esq.

‘On Preserving the Balance between the Animal and Vegetable Organisms in Sea Water.’ By Robert Warington, Esq.

‘On the Cornbrash of the Neighbourhood of Cirencester.’ By James Buckman, F.L.S., F.G.S., Professor of Geology, Royal Agricultural College.

‘On the Teeth of the Pneumonibranchiate Mollusca.’ By J. E. Gray, Ph.D., F.R.S., V.P.Z.S.

‘On the Mechanism of Aquatic Respiration, and on the Structure of the Organs of Breathing in Invertebrated Animals.’ By Thomas Williams, M.D. Lond.

Proceedings of Societies:—Zoological.

Miscellaneous:—*Spadix purpurea*; by W. P. Cocks. Note on the Parasitism of *Comandra umbellata*; by Asa Gray. Rare Irish Mollusca; by William White Walpole. *Natica sordida*; by the same.

With respect to these valuable papers we have scarcely any comments to make. That most interesting to zoologists has been kindly transmitted by the author, Mr. Warington, for publication in these pages, (see Zool. 4118). Mr. White Walpole’s brief notice of “Rare

Irish Mollusca" is contained in the more detailed and comprehensive paper by that acute and indefatigable naturalist in a prior number of the 'Zoologist,' (see Zool. 4101). This gentleman's note on *Natica sordida* states that specimens of that rare mollusk were obtained by him this summer off the Irish coast, by trawling in about 60 fathoms water: in company with this shell was *Fusus propinquus*. The same two mollusks have also been found in company off the coast of Wexford; and Dr. Melville has found them in close proximity off the Isles of Arran, in Galway Bay.

'*Shells and their Inhabitants. The Genera of Recent Mollusca arranged according to their Organization.*' By HENRY AND ARTHUR ADAMS. Part VII. London: Van Voorst. November, 1853. *Demy 8vo., with the plates plain, price 2s. 6d.; Royal 8vo., with the Animals coloured, price 5s.*

THIS part contains 32 pages of text and 4 plates, and comprises the under-mentioned genera:—*Volvaria, Lamarck*; *Dolium, Browne*; *Cadium, Link*; *Ringicula, Deshayes*; *Sycotypus, Browne*; *Velutina, Fleming*; *Lamellaria, Montagu*; *Cryptocella, Adams*; *Marsenina, Gray*; *Coriocella, Blainville*; *Natica, Adanson*; *Lunatia, Lamarck*; *Neverita, Risso*; *Ampullina, Lamarck*; *Ruma, Chemnitz*; *Mamma, Klein*; *Naticina, Gray*; *Catinus, Klein*; *Amaura, Moller*; *Cassis, Browne*; *Semicassis, Klein*; *Cassidea, Link*; *Levenia, Gray*; *Sconsia, Gray*; *Galeodea, Link*; *Morum, Bolten*; *Scala, Klein*; *Cirsotrema, Mörch*; and *Acus, Humphrey*.

The figures representing the shell and animal in their relative positions to each other are remarkably satisfactory, and do the artists, who are also the authors, infinite credit.

Anecdote of a Cow sucked by two Hedgehogs.—Having recently heard that my relative, Mr. T. F. Buxton, of Leytonstone, Essex, had met with an instance in which the old opinion on the above subject appeared to be verified, I wrote to him to request information respecting it; and I beg to forward his reply, together with a statement made by his servant, for insertion in the 'Zoologist.'

Extract of a Letter addressed to Mr. J. H. Gurney by Mr. T. F. Buxton, of Leytonstone, in Essex, dated November 9, 1853.—"One evening in the course of the summer I heard, several times repeated, a noise as of a blow on the iron palings of my

field, and sent my stable-boy with a lantern, to ascertain the cause. On his return he told me that he found a cow lying near the palings, and two hedgehogs sucking her. He made the cow get up, but the hedgehogs remained suspended to her till he knocked them off with a stick. He kicked them about in a vain attempt to kill them. I have no reason to doubt the boy's statement: he is an intelligent lad of sixteen, and I have never known him tell a falsehood. The movements of the lantern, which I observed from the house, entirely corresponded with his account."

Statement of Mr. Buxton's Servant, dated November 9, 1853. — "One evening in the month of July Mr. Buxton heard a noise in the field. Then I was sent to see what was the matter. I went half way through the field, and then I came to the old cow, which was laying on her left side and moaning, and two big hedgehogs sucking her milk. When they saw my light, then they bit her, and made her get up, then she began to kick at the fence, till I got a stick and knocked them off. I kicked them down the field some distance but did not kill them. They were about twenty minutes from the time Master told me till I got them off. I dare say they would have sucked her dry."

—*J. H. Gurney; Easton, Norfolk, November 11, 1853.*

List of Micro-Lepidoptera taken in the Vicinity of Dublin during the year 1853.—The Hill of Howth is the locality where the following captures were made, unless otherwise expressed:—

Tortrix icterana, July.

Peronea rufana, hedges by the side of the old road, September and October.

„ *favillaceana*, larvæ under beech-leaves in a fine web, plantations on the hill, July.

Spilonota roborana, larvæ on sweet briar (*Rosa rubiginosa*), May.

Sericoris cespitana, littorana, and lacunana, July.

Cnephasia musculana, larvæ on brambles, Enniskerry, September.

Phoxopteryx lundana, May.

Semasia spiniana, August.

Coccyx vacciniæ, May.

Catoptria hypericæ, Enniskerry, July.

Argyrolepis badiana, July.

Cochylis francillana, July.

Eudorea lineolea, larvæ under the yellow canker-moss on old blackthorns, June, (Zool. 3778).

Homœosoma nimbella, larvæ in the seeds of wild chamomile, August.

Tinea fuscipunctella, in the house, Dollymount.

Depressaria atomella, July and August.

„ *assimilella*, July.

„ *alstroemeriana*, gardens at Dollymount, August.

„ *subpropinquella*, larvæ under leaves of thistles, in a light web, June.

Gelechia fraternella, larvæ on *Stellaria uliginosa*, May, (Trans. Ent. Soc. n. s. vol. ii. p. 77, pl. 10, f. 3).

„ *næviferella*, July.

Röslerstammia granitella, July.

Argyresthia spiniella, in mixed underwood, August.

Coleophora Alcyonipennella, larvæ on *Centaurea nigra*, April and May, (Trans. Ent. Soc. n. s. vol. ii. pl. 11, f. 2).

„ discordella, larvæ on *Lotus corniculatus* in May, (Zool. 4026).

Gracilaria inconstans, larvæ on alders, June and October.

„ Tringipennella, larvæ mining the leaves of plantain, April and July.

„ auroguttella, April and July.

Nepticula margincolella (*Stainton*), n. sp., larvæ in elm-leaves, October.

„ Acetosæ (*Stainton*), n. sp., larvæ in the leaves of *Rumex Acetosella*, July, October, and November.

Lithocolletis trifasciella, October, November, and December.

—*Richard Shield*; 6, Fleet Street, Dublin, November 12, 1853.

Snakes with Two Heads.—A few days ago a collection of animals belonging to Mrs. Wombwell made a short stay in this town, and the proprietress circulated hand-bills, describing, among other novelties, “a group of *double-headed Snakes*,” a portion of one of which I inclose. Of course, the announcement of so extraordinary an anomaly aroused my curiosity, and I went to see this strange reptile, “with,” to use the words of the keeper in describing it, “a head at each extremity of the body, the scales running both ways towards the middle, where the vent is situated.” I endeavoured, but in vain, to obtain a close inspection. The reptiles were kept in a tin box, and when exhibited, the lid was opened, a quantity of old furs taken out, and one of them seized by the middle with a long pair of tongs, and thus held writhing over the heads of the spectators. The one I saw was just shedding its skin, and parts of the body from which it had separated were dark brown and moist-looking. Both extremities were thick and rounded, and from one I distinctly saw a tongue protruded several times: the other was much obscured by folds and fragments of old skin, which the keeper declared covered another head; but, from the manner in which the reptile was held up, and the respectful distance we were compelled to maintain, it was impossible to determine satisfactorily whether he spoke truth or not. My own conviction is, that the double head is, at most, *apparent*. If I am right, I think it very proper that such an attempt to impose on the credulity of the public should be exposed: if I am wrong, creatures so extraordinary should certainly not be suffered to remain inmates of a travelling menagerie. I may mention that the keeper related fearful instances of their deadly venom. A young rattlesnake, bitten by one of them, died in three minutes; a sparrow was swelled in a short time by the poison to the size of a pigeon!—*Jno. R. Hawley*; *Hall Gate, Doncaster, November 1, 1853.*

German Association for the Advancement of Science.

THE German Naturalists and Physicians held their thirtieth meeting this year at Tübingen, on the 18th ultimo. It was attended by about 580 members, including a moderate sprinkling of French and Russians, two Americans, and a few English.

The meeting at Tübingen was not so numerous as that last year at Wiesbaden. Tübingen, though offering considerable attractions, by its situation in one of the finest parts of Swabia, by its scientific institutions, and by its reputation as a University, is

not yet connected with the great European railway net; and people do not like traveling now in slow mail-coaches even for a day. Another cause was, that the President, Professor Hugo von Mohl, elected last year, did not do his duty. For reasons best known to himself, he did not appreciate the honour which the votes of nearly 1000 scientific men from all parts of the world had conferred upon him. Instead of endeavouring to further the object of the Society, he tried everything in his power to prevent the meeting from being held at all; and when he found that the patriotism of his townsmen did not allow them to go the same way with himself, he departed for Italy, leaving the whole business to be arranged by the Vice-President, Mr. Bruns, Professor of Medicine at Tübingen. Professor Bruns, much to his credit, took up the matter warmly, and so thoroughly succeeded in arousing the interest of the University and the towns of the neighbourhood, that the reception of the learned guests was of the most cordial nature. Tübingen itself had a very festive appearance. Outside the gates of the city triumphal arches, with streamers and flags floating upon them, had been erected, and within, nearly every house was decorated with garlands of oak-leaves and gay flowers; and whole spruce-trees had temporarily been planted before some of the buildings, and even in the dwellings of the humbler classes of inhabitants, attempts—aye, and some very successful ones—had been made to do something towards showing that the strangers were heartily welcome. It is unnecessary to develop the effect which such a reception produced upon the meeting; every one seemed to be happy, and at the first general dinner there was such a profusion of spirited speeches and toasts as are seldom heard on similar occasions. Preserving the scientific form, and moving only within the bounds of scientific terminology, several of the speakers told their audience some very amusing things of every-day life, and caused a great deal of laughter. Quenstedt, the geologist, and Veesenmeyer, the botanist, succeeded in rousing the merriment of the party to the highest pitch. On the 21st of September an excursion was made to Rottenburg, an ancient Roman town, and thence to the Niedernau, a modern watering-place. There were no less than 600 carriages, including cabs, omnibuses, and mail-coaches. In Rottenburg the naturalists were received by the Lord Mayor and Corporation. The principal street was most ingeniously ornamented; about 6000 hop-poles, with the graceful creeper around them, had been erected at suitable distances from each other, thus forming a complete avenue. The appearance they presented contrasted charmingly with the venerable old buildings, and the bright sun, the sweet smell of the hop, the flags and festoons, the music, the friendly faces of the inhabitants, the numerous huzzas, and the waving of handkerchiefs, formed altogether a scene of a very impressive kind. In Niedernau, where, after leaving Rottenburg and passing several villages, the carriages arrived, a good dinner was waiting, the President of the Society being aware that no one descended from Teutonic stock considers a festival complete without something substantial to eat. At dinner, the health of Uhland and Justinus Kerner was drunk. The presence of these two old poets, who have both endeared themselves by their patriotism to their countrymen, and have done so much towards making German literature what it is, called forth the greatest enthusiasm, which was the more real in a district which their writings have rendered classical ground, and where one cannot look at a ruin, or visit a town, that is not already associated in one's mind with some popular ballad or romance of these men. On the 23rd of September, an excursion was made to Reutlingen, formerly one of the free Rix-cities, but now a manufacturing town belonging to Württemberg. In the time of the last revolution, a great political

meeting was held here, which gave rise to the fearful struggle in Baden. On the day mentioned, it presented a very peaceable appearance. On passing the boundaries of the town, the naturalists were received by two heralds on horseback, in the costume of the middle ages, both holding banners in their hands. The one was dressed in the colours of Reutlingen: the other in those of Germany—black, red, and gold. Just outside the city gates there was a triumphal arch, and the cathedral and all the steeples of the churches were profusely decorated with flags and streamers. The weather was beautiful. In one of the public gardens the dinner table had been spread in the open air, where at least 1500 people sat down. During dinner a well-conducted band kept playing. A fine effect was produced by a chorus of singers, consisting of peasants, both men and women, of the neighbouring district; they were all dressed in their native costume, and, headed by a fine looking fellow of their party, who carried their banner, they marched around the table at which the naturalists were sitting. After dinner, most of the party paid a visit to the Achalm, the ruins of a castle mentioned in one of Uhland's ballads. The view from thence was charming. The vineyards surrounding the ruin, the town of Reutlingen, the rivulets, the distant chain of mountains, with its old feudal castles, formed a pleasing panorama, and amply repaid the exertions of those who, after taking in a hearty dinner, and letting the wine-bottle pass freely, had climbed the summit. In returning about eight o'clock in the evening to Tübingen, there was a firework on the top of the hill on which the castle is built. It produced almost a magical effect to see the old Gothic building illumined by the different coloured fires, and the numerous rockets, with their blue, red, and white nuclei, shooting up into the sky. In short, there was plenty of amusement during the whole time of the meeting. Balls, concerts, dinner-parties, alternated with each other; there was even once, so as to give a notion of German student-life, a representation of a "Kneipe," in which grave professors, throwing aside for a while all reserve, acted the part of students and freshmen.

The scientific part of the meeting was equally satisfactory. In the three general or public sittings none but subjects treated in a popular manner were this time admitted, and all papers that could in the least offend the ear of ladies had been strictly rejected,—a laudable restriction, probably adopted in consequence of the complaints made by the press that medical subjects not intended for any but medical men had been brought forward. One of the first speakers was Jaeger, of Stuttgart, who gave a brief account of the last year's labours of the Imperial L. C. Academy of Naturalists, detailing that, as the first German institution, it had assumed the protectorship over the Societies of German Physicians at Paris and New York, that it had asked for three prize essays, and that the King of Wirtemberg had shown his good will towards the Academy by presenting it with a sum of money, to be devoted to scientific exploring expeditions. Schultze, Bip., read an interesting paper 'On the Development of the Natural Sciences from the Middle of the Sixteenth Century until the Middle of the Nineteenth.' He assumed three periods:—1st, The period when knowledge was handed down by oral tradition; 2nd, When it was propagated by writing; and 3rd, When perpetuated by printing. The present time he looks upon as the commencement of a fourth period, when, by the intimate international intercourse and the power of steam, knowledge is rapidly diffused. Dove, of Berlin, gave a comprehensive account of the present state of meteorology, and a very clear explanation of the causes which determine the weather of Europe. Carnal spoke on the importance of salt, gold, and coal,—three monosyllables playing an important part in the affairs of the

world. He complained of the ignorance prevailing in England on the subject of German coal, and quoted a conversation he had with an Englishman of some scientific standing, who asked him whether there were any coal in Germany?—a question he answered by stating that not only had Germany enough coal for her own use, but could supply England and all the world, at the rate coal is now used, for 500 years to come. Fraas gave an account of the oldest inhabitants of the Swabian Alps. It appears that a few years ago fossil teeth were found which some at once declared to be those of man. This determination, however, was called into question, as no human teeth of the mammoth period had ever been found in any part of the globe. Again, these teeth were exhibited last year in Wiesbaden, by Jaeger, when they were generally admitted to be human teeth; one was even sent to Owen, who agreed with the Wiesbaden meeting in pronouncing them to belong to man. The discovery of several almost perfect skulls has set the matter finally at rest: there was a race of men living simultaneously with the mammoth and other huge antediluvian animals. Gumbel read a paper on Mosses, explaining their importance in the economy of Nature, their great use to man, with whom they appeared together upon the earth. Veesenmeyer gave a spirited sketch of the Kirguises, and with a power of language reminding one of Humboldt's 'Views of Nature,' he described their relation towards plants and animals.

The sectional meetings were well attended. In the section for Chemistry and Pharmacology there were Fehling, Schlossberger, Leube, Babo, Weidenbusch, Ammermuller, Fresenius, Weltzien, H. Rose, &c.; Fehling and Rose alternately presided. In the section for Mathematics, Physics, and Astronomy, we noticed Wolfers, Osann, Reusch, Dove, Holtzmann, Gugler, &c.; Dove and Osann presided. The section for Medicine and Surgery counted the largest number of members. We may mention Ritter, Virchow, Heyfelder, Erlenmeyer, Fraas, Vierodt, &c.; Virchow was elected President. The Botanical section counted amongst its members Martens, Veesenmeyer, De Bary, Steudel, Schnitzlein, Hochstetter, and elected Schultz, Seemann, and Gumbel Presidents. The section for Anatomy, Physiology, and Zoology was attended by Luschka, Ecker, Focke, Wutzer, and was presided over by Rapp. The section for Geology, Mineralogy, and Geography was represented by Carnal, Quenstedt, Strombeck, Glocker, Deșor, Gerlach, Stocker, &c., and elected Merian President.

The Imperial L. C. Academy of Naturalists, which may be looked upon as the nucleus of the Society, held two sittings under the Presidency of Professors Jaeger and Heyfelder. Dr. Nees von Esenbeck, the President, was unfortunately prevented by illness from attending. In a letter of his addressed to Jaeger he gave a favourable statement of the affairs of the Academy, showing that there were at present a greater number of first-rate scientific papers for publication in the 'Nova Acta' than at any former period. The topics of discussion referred chiefly to the affairs of the Academy, and have not yet been made public.

On the 24th of September the meetings were finally closed. Göttingen was chosen as the place of meeting for 1854, and Professors Listing and Baum were elected Presidents of the Society.—*From the 'Literary Gazette,' October 22, 1853.*

According to the 'Bonplandia,' three Englishmen were, on the 18th of August, elected Members of the Imperial L. C. Academy:—1. John Smith, Esq., who received the cognomen "Kunze." 2. Dr. Thomas Thomson, to whom the title "Hamilton" was given. And, 3. John Miers, Esq., on whom the name "Kunth" was conferred.

APPENDIX

TO

THE ZOOLOGIST

FOR 1853

ART. XXIX. — *Proposed Division of Neuroptera into two Classes.*

By EDWARD NEWMAN.

CHARACTERS are assigned to groups in Natural History, for the purpose of distinguishing them from other groups. To accomplish this end, characters should apply to all the component parts of the groups which they are intended to distinguish, and should *not* apply to the component parts of any cognate group which they are not intended to distinguish. It is, however, no proof that a group is unnatural, because the characters which naturalists have assigned to it are insufficient; for the uninstructed mind acknowledges Nature's grouping, without the aid of science: an infant will distinguish a bird or a fish, without knowing the characters which separate both from a mammal; and however the man of science may blunder in defining those characters, however unsatisfactory to himself and to others may be his definitions, still a bird and a fish will ever be recognized as things distinct and separate from each other and from mammals. Nothing is more certain than that Nature has distinguished such groups: nothing is more probable than that man should fail in defining them. In Entomology, we have hit on distinguishing characters for most of the classes; but that which is now universally known by the name Neuroptera, and, by a few entomologists, by my proposed name of Anisomorpha, has defied all attempts at definition, except such vague and negative definition as depends on variation or absence of character. Moreover, the mind does not recognize Neuroptera as one of Nature's divisions. All our systematists have felt this deficiency, this difficulty; but instead of carefully revising the entire group, and

endeavouring to re-arrange and harmonize its contents, they have cut off here and there a group which appeared to them peculiarly aberrant, thinking that they had thereby reduced the residue into a more homogeneous mass. Our most profound systematists have thus separated groups from the Neuroptera, and raised them to an equal rank with the heterogeneous residue, which they have left united. As instances I may mention De Geer, Fabricius, Dumeril, Kirby, MacLeay, Haldiday, Brullé, Laporte Count de Castelnau, &c., who, under the names of Elinguia, Odontata, Stegoptera, Trichoptera, Megaloptera, Thysanoptera, Isoptera, Raphioptera, Anisoptera, &c., have separated one or other of the integral portions of the class. To criticise the labours of the men whose names I have here enumerated, would be altogether out of place in one who is proud to rank himself as their disciple; but it cannot be overlooked that the concurrent testimony of these profound and original thinkers is against the integrity or homogeneity of Neuroptera, although each has sought a different remedy for an evil equally manifest to all.

My own idea, broached many years ago, is, that the character of variety in structure and metamorphosis, which all have assigned to the Neuroptera, and which, for want of a better, I must leave attached to the Anisomorpha, is not only insufficient but unphilosophical; and though still at a loss to find satisfactory characters for the imago, I think there is no doubt that the varied metamorphosis affords the means of dividing the group into two good and equal divisions. That these divisions should not be of the same extent as the other classes of Tetraptera, indeed, that they should be more intimately related, and should possess a great and structural resemblance in the perfect state, appears to me in no way to militate against the necessity for their separation, but simply to establish their central position among Tetraptera, a subject which it is not the object of the present paper to discuss; neither do I consider it needful to explain away the addition of an eighth division to this important group, although I am thus setting aside, at least to all appearance, the prevalence of the number seven. The following formula is that which I now beg to offer to the notice of entomologists, as desirable to adopt in this division of Entomology.

INSECTA TETRAPTERA.

Pupa amorphous	AMORPHA.
Wings normal, scaly	LEPIDOPTERA.
Fore wings normal, hind wings abnormal, club-shaped	DIPTERA.

Pupa necromorphous	NECROMORPHA.
Wings normal, naked	HYMENOPTERA.
Fore wings abnormal, coriaceous ; hind wings normal, folded.....	COLEOPTERA.
Pupa isomorphous	ISOMORPHA.
Mouth mordent, with transversely mov- ing jaws	ORTHOPTERA.
Mouth with its component parts setiform, fitted only for imbibing fluids	HEMIPTERA.
Pupa various	ANISOMORPHA.
Pupa isomorphous.....	NEUROPTERA.
Pupa necromorphous	STEGOPTERA.

The following additional characters of the two new classes are offered in further elucidation of their distinguishing differences ; and it may be observed that they are subject to occasional exceptional modifications.

NEUROPTERA, *Newm.*, non *Linn.*

Larva hexapoda ; *agilis* ; mordens ; Ephemeris, Agrionibus, Libellulis, Perlis, aquatica, rapax, entomophaga ; Termitibus, Psocis, Thripibus, terrestris vel arborea, plerumquè phytophaga.

Pupa *propemodùm isomorpha* ; hexapoda ; *agilis* ; *natat, currit, vorat.*

Imago *larvam plus minusve simulans* ; alis 4 amplis, membraneis, *nudis*, paribus ; Ephemeris, Agrionibus *erectis* ; Libellulis *porrectis* ; mandibulis corneis, plerumquè validis, mordentibus.

STEGOPTERA, *Newm.*, non *Dum.*

Larva hexapoda ; *segnis* ; mordens ; Phryganeis, Corydalibus, aquatica, ? phytophaga ; Myrmeleonibus, Hemerobiis terrestris vel arborea, rapax, entomophaga.

Pupa *necromorpha* ; *pelliculo ligata* ; *sine ore, sine motu* ; *neque natat, nec currit* ; *folliculo serico diù quiescit.*

Imago *larvam nullo modo simulans* ; alis 4 amplis, membraneis, plerumquè hirsutis, paribus, *neque erectis, nec porrectis*, sed *convolutis aut decumbentibus*, corpus tegentibus, instar tecti ; mandibulis plerumquè corneis, plerumquè mordentibus.

A few additional observations may serve still further to illustrate the differences between the two classes. In the first place, the metamorphosis is decidedly different : the pupa in the Neuroptera is uniformly locomotive and feeding, in the Stegoptera uniformly quiescent

and incapable of feeding: the much-discussed exception in the instance of *Raphidia ophiopsis* is apparent, and not real; in this insect there is no cocoon, and the pupa inhabits exactly the same situations as the larva, namely, excavated passages in the decayed bark of trees; it moves after a fashion, but only in the same way that the pupa of a *Hepialus* or an *Ægeria* may be said to move; and in each of the three instances the character, as regards the tribe, is exceptional, and not distinctive. The pupa in the Neuroptera, on the contrary, is uniformly active and voracious, although not uniformly isomorphous; the squat toad-like pupa of the *Libellulina* being very unlike the elegant imago. Natural classification is tripod, and metamorphosis, alary structure and cibarian structure are the three legs on which it stands: to neglect metamorphosis, therefore, where so decidedly marked as in the present instance, were to undermine the entire edifice, and to endanger the stability of the building. The flight, again, in the typical Neuroptera is pre-eminently strong and long-continued, gradually failing in aberrant orders, and perhaps becoming totally extinct among the most aberrant of all, the *Thripsina*: in the *Stegoptera* the flight is generally of short duration, heavy, fluttering and laboured, and the more strongly marked the characters of the class, the more feeble are the powers of flight. Again, as to food: the conspicuous and numerically preponderating *Libellulina* in the Neuroptera are predaceous and voracious in an eminent degree; whereas the equally well marked and equally numerous *Phryganeina*, in the *Stegoptera*, not only are not predaceous, but are not known to take any food: and when we find the *Stegoptera* exhibiting a predaceous and raptorial structure, as in *Raphidiina* and *Mantispina*, such characters are associated with the assumption of other Neuropterous characters, as the nude, hyaline, glittering, and strongly reticulated character of the wings, and the nudity of the pupa. These considerations lead to the belief that the Neuroptera and *Stegoptera* are distinct but proximate classes. In addition to these observations, it seems desirable to explain that these classes, although bearing old names, are nevertheless totally new. I feel an absolutely insuperable objection to giving new names where old ones can by any ingenuity be made to answer the purpose; and although I take on myself the responsibility of the new combinations of groups, and of the present application of the names, I trust that entomologists will feel no difficulty in the mental connexion of the word Neuroptera with the dragon-flies, heretofore and still the type of the class, nor of the word *Stegoptera*, or "roof-winged," with the ant-lions and lace-wings, for which Dumeril originally intended it.

I now proceed to a more detailed account of the contents of the new classes : the divisions are so perfectly natural, that naturalists are already agreed on them, with a single exception ; and they may be briefly expressed by the following formula.

Divisions of NEUROPTERA.

- Larva and pupa aquatic, carnivorous : —
 - Wings when at rest erect, meeting vertically over the back : —
 - dissimilar, fore-wings large, hind wings small : tarsi 5-jointed EPHEMERINA, *Newm.*
 - alike : tarsi 3-jointed AGRIONINA, *Newm.*
 - Wings when at rest porrected horizontally:
 - tarsi 3-jointed LIBELLULINA, *Newm.*
 - Wings lying flat on the back : tarsi 3-jointed PERLINA, *Newm.*
- Larva and pupa terrestrial or arboreal, omnivorous or phytophagous : —
 - Wings lying flat on the back, alike, reticulated : tarsi 4-jointed TERMETINA, *Newm.*
 - Wings deflected over the abdomen, dissimilar ; fore wings large, hind wings small : tarsi 3-jointed PSOCINA, *Newm.*
 - Wings lying flat on the back, alike, fringed, without veins : tarsi 2-jointed... THIRIPSINA, *Newm.*

Divisions of STEGOPTERA.

(Tarsi uniformly 5-jointed).

- Larva subcortical or arboreal, supposed to be phytophagous : —
 - Mouth prolonged into a beak PANORPINA, *Newm.*
 - Mouth of ordinary form : —
 - Fore-legs simple RAPHIDIINA, *Newm.*
 - Fore-legs raptorial MANTISPINA, *Newm.*
 - Larva aquatic, supposed to be phytophagous : —
 - living in a case PHRYGANEINA, *Newm.*
 - naked, natatory CORYDALINA, *MacL.*
 - Larva terrestrial, insectivorous : —
 - digging pitfalls for its prey MYRMELEONINA, *M'L.*
 - living on leaves and feeding on Aphides HEMEROBIINA, *MacL.*

Characters of EPHEMERINA.

Larva aquatic, breathes by means of external gills, which also serve as organs of natatory locomotion: it has long filiform multiarticulate antennæ, corneous but small and feeble mandibles, long and strong legs, and three long filiform multiarticulate caudal setæ: it frequents the bottom of ponds, and especially of running streams, is fond of secreting itself under stones, and appears to feed on the decomposing organic matter which mingles so largely in the sediment of all waters.

Pupa similar to the larva in its forms, habits, and food; the rudiments of the wings are however very perceptible at the posterior angles of the wing-bearing segments: it attains its perfect state by a double ecdysis; after the first, the insect retains the soft silky pellicle which invests a great number of insects, and which, in all other cases, is shed with the pupa-case; but, although remaining in this pellicle, it assumes its final form, and (*mira-bile dictu!*) acquires the power of flight: after a feeble flight the insect settles, and in the course of a few hours divests itself of the pellicle, and has then accomplished all its transformations.

Imago with very short 3-jointed antennæ, the terminal joint longest, and a mere seta: 3 ocelli: the mouth is so soft and fleshy as to become amorphous after death, and its component parts totally obliterated: Latreille and Savigny, our greatest cibarian entomologists, examined the mouth of these insects, and the former left descriptions, the latter figures, of its parts; but these do not correspond, and I confess to my own entire inability to verify their observations: the life of these insects being proverbially short, and spent almost entirely either at rest or on the wing, we may conclude that the imago does not feed, and hence, probably, the apparently imperfect development of the cibarian organs: the prothorax is atrophied: the wings are much reticulated with veins, and very unequal in size, the fore wings being ample, the hind small, and sometimes totally wanting; they are held perfectly erect, meeting over the back when the insect is at rest, like those of a butterfly: the flight is in the evening, and in company, like that of some gnats, rising and falling, and is remarkable for its extreme elegance: the wings appear to be moved only in rising, the insect floating downwards by its own weight, with motionless and semi-expanded wings: the legs are simple and slender, the fore-legs longer and protracted in the

males : the abdomen terminates in long caudal multiarticulate setæ.

The following formula, founded on the researches of Dr. Leach, exhibits the characters by which these insects may be again readily subdivided.

Wings 4 : —

Caudal setæ 2 BAETIDÆ, *Newman*.

Caudal setæ 3 EPHEMERIDÆ, *Newman*.

Wings 2 : —

Caudal setæ 3 CŒNIDÆ, *Newman*.

Caudal setæ 2 CLOEONIDÆ, *Newman*.

Characters of AGRIONINA.

Larva aquatic, breathing by means of an internal abdominal apparatus, which, like the internal gills of fishes, or the external gills of the Ephemerina, appears to possess the power of abstracting oxygen from water, which is subsequently expelled through the anal aperture with a jerk which propels the insect forward, and seems to constitute its only natatory movement, although it crawls on mud, stones, and the stems of aquatic plants: it has moderately long, filiform, 7-jointed antennæ, corneous mandibles, and a remarkable jointed and porrectile labium, with which it seizes the small aquatic animals which constitute its food: its body is long and linear, with six legs of moderate length, and three long flattened caudal appendages : it is carnivorous, and excessively voracious.

Pupa in figure, habits, and food *resembles the larva*, but possesses rudimentary wings.

Imago with short slender antennæ, usually but not constantly 7-jointed: *transverse hammer-shaped exerted head : round widely separated lateral eyes : complete manducatory mouth : atrophied prothorax : cylindrical abdomen : four wings minutely reticulated and all alike, their shortest diameter near the base, their longest diameter at three fourths of the distance from the base to the apex, the increase being uniform throughout, they are held above the body of the insect when at rest, meeting each other back to back : legs simple and of uniform length, tarsi 3-jointed : they walk slowly and awkwardly, fly feebly and heavily in the sunshine, and continue but a short time on the wing : feed entirely on living insects : the tarsi are 3-jointed.*

The Agrionina may be divided according to the subjoined formula.

Those in which the continuity of the costal margin of the wing is interrupted or broken near the base, and the costal cells between this break and the base have scarcely any transverse veins, AGRIONIDÆ, *Newm.*
non *Leach.*

Those in which the continuity of the costal margin of the wing is interrupted or broken at more than a third of the distance from the base towards the tip, and the costal cells between this break and the base have very numerous and regular transverse veins, CALEPTERYCIDÆ, *Newm.*

Characters of LIBELLULINA.

Larva aquatic, breathing by means of an internal abdominal apparatus, which appears to possess the power of abstracting oxygen from water, which is subsequently expelled through the anal aperture with a jerk; it has rather short filiform antennæ, corneous mandibles, and a jointed porrected labium; its body is rather robust, and gradually attenuated towards the caudal extremity, which is furnished with three flattened appendages: it is carnivorous and excessively voracious.

Pupa *in figure very unlike the larva, short, obese, and somewhat toad-like*, its wing-cases large and conspicuous, the abdomen turned up at the extremity, and furnished with short conical appendages: habits entirely aquatic, carnivorous, voracious.

Imago with very short and slender antennæ, transverse, *subglobose*, exserted head generally occupied exclusively with the enormous approximate eyes, and powerful, fully developed mouth, 3 ocelli, atrophied prothorax, elongate variously formed abdomen; 4 reticulated wings, nearly alike but not quite so, the *shortest diameter of the fore, and the longest diameter of the hind wings is near the base; all of them are porrected separately and horizontally when at rest*, and never meet back to back above the abdomen; their *flight is powerful, rapid, and enduring*, their lives are spent almost entirely on the wing, hawking for insects, especially over pools and in damp woods; they are excessively voracious and predatory, seizing their prey on the wing, and settling for the purpose of devouring it: their tarsi are 3-jointed.

The following formula for dividing the Libellulina into groups, is proposed as provisional only; but being founded on the acute observations of Leach, Van der Linden, Charpentier, Selys de Longchamps, Rambur and Brullé, it may be considered as expressing the present state of our knowledge of these neglected but remarkably conspicuous and beautiful insects: they inhabit every part of the globe, and the number of species appears to be enormously large.

Labipalpi biarticulate: ocelli in a triangle:—

Anal angle of hind wings rounded in

both sexes LIBELLULIDÆ, *Newm.*
non *Leach.*

Anal angle of hind wings acute in ♂,

rounded in ♀ CORDULIADÆ, *Newm.*

Labipalpi triarticulate: ocelli in a line:—

Eyes contiguous ÆSCHNIDÆ, *Newm.*

Eyes separate GOMPHIDÆ, *Newm.*

Obs.— It will be observed that this and the preceding group are new, having hitherto been united: but they seem to me distinctly separated, neither am I aware of any species or so-called genera occupying debateable ground between them.

Characters of PERLINA.

Larva aquatic, breathing by external tufted branchiæ attached to the leg-bearing segments, with long filiform multiarticulate antennæ, strong corneous mordent mandibles, depressed body, broad flattened head, and two long multiarticulate caudal setæ: frequents the bottom of clear running streams, secreting itself under stones, and feeding indiscriminately on all minute aquatic animals.

Pupa closely resembling the larva in form, habits and food, the only conspicuous difference that obtains is the prolongation of the posterior angles of the wing-bearing segments into processes, evidently containing the future wings of the imago.

Imago with long filiform multiarticulate antennæ, corneous masticatory mandibles, broad flat head, distant hemispherical eyes, equally developed leg-bearing segments, 4 membranous recumbent but not deflected wings, nearly alike, the hind wings largest and having the greatest diameter at the base, where they are

longitudinally folded: flight in the evening, laborious, almost invariably descending; feeds on insects.

Obs.—Almost every entomologist of eminence, and amongst them Geoffroy, Reaumur, Fabricius, Olivier, Latreille and MacLeay, have regarded this group as possessing the case-bearing larva and quiescent cocooned pupa of the Stegoptera; but my conclusions are drawn from long and pains-taking observations on the insects themselves, and are confirmed by the subsequent researches of the accurate Pictet: I cannot therefore doubt of their correctness.

The following formula expresses what we know of the subdivision of this group.

- Imago breathing by external branchiæ as well as tracheæ PTERONARCIDÆ, *Newm.*
- Imago breathing by tracheæ only:—
- and has 2 caudal setæ PERLIDÆ, *Newm.*, non *Leach.*
- and has no caudal setæ..... NEMOURIDÆ, *Newm.*

Characters of TERMITINA.

Larva and pupa terrestrial, active, hexapod, furnished with powerful mandibles: social, constructive, voracious, omnivorous.

Imago with moderately long moniliform antennæ, depressed head received in the prothorax, hemispherical small distant lateral eyes, strong corneous mandibles, fully developed and transverse prothorax, 4 long membranous wings of equal size and form, which when at rest are decumbent but not deflected, the hind pair not folded, abdomen with two minute caudal papillæ: flies slowly and laboriously, and rids itself of its wings before founding a new colony; some authors assert that the wings are articulated to the thoracic segments, and fall off spontaneously at the articulation; Mr. Davis asserts that he saw the insect *bite off* its own wings: tarsi 3- or 4-jointed.

Obs. 1. — These are the white ants, universally known by their extraordinary constructive instincts.

Obs. 2. *Relating to the present confusion of the states of larva and pupa.* — In social necromorphous insects, the Formicina for instance, we have commonly four kinds of imagines or adults, these are perfect males and females, and imperfect males and females; in these latter, the progress of development appears to have been arrested at a given point by a certain law of Nature, which seeks, in these instances, the

well-being and preservation of the species, through the labours of the great mass of individuals, and consequently requires labourers devoted solely to the task: the two kinds of apterous individuals which perform the labours of an ants' nest, are clearly neither more nor less than, the smaller, imperfect males, the larger, imperfect females. Among social isomorphous insects, in which the general figure and character is preserved from the egg to the imago, and is little more than a gradually progressive development in size, accompanied by a slight modification in form after every ecdysis, we have strong reasons for believing that these four kinds of individuals differ even from the egg, thus giving us four kinds of larvæ, four kinds of pupæ, and four of imagines. Such being the *rationale* of the composition of a colony of white ants, such being a summary of what, by analogy, we are to look for in inspecting its individuals, there is no just cause for surprise, if when, by analogy, we may calculate on finding twelve kinds of individuals, we do actually discover six or eight; neither is it at all astonishing, that with these six or eight kinds of individuals we should be unable to pronounce immediately and with certainty on the states of each; that is, to say that such an individual is the larva of a perfect female, and such another the pupa of an imperfect male. Latreille tells us that he found individuals having what he supposed the rudiments of wings attached to the wing-bearing segments, and that he therefore thought himself at liberty to conclude that these were pupæ, and subsequent authors have regarded this matter as settled; but we cannot consider this a sufficient conclusion: in all probability the great majority, as in the Hymenopterous ants, never attain wings at all, and the pupæ of such apterous imagines consequently possess no rudiments of wings; hence it follows that Latreille had only discovered one of the forms of pupa, without settling which. The individuals called by the illustrious author "neuters," and which Smeathman graphically described as "soldiers," and Fabricius as "pupæ," and which appear to be as scarcely one in a hundred to the smaller individuals which perform the labours of the community, are probably imagines, both male and female, arrested like the working apterous Hymenopterous ants, while still imperfectly developed. We are in want of more entomological observations, and also more philosophical deductions, before these matters can be finally settled.

The Termitina appear to be capable of division into two minor groups, by the length of their wings and the joints of their tarsi, according to the following formula.

Wings greatly longer than the body: fore-legs
 simple: tarsi 4-jointed TERMITIDÆ, *Newm.*
non *Leach.*

Wings no longer than the body: fore-legs di-
 lated: tarsi 3-jointed EMBIIDÆ, *Newm.*

Characters of PSOCINA.

Larva generally arboreal, with long setaceous multiarticulate anten-
 næ, exserted head, hemispherical and widely distant eyes, corne-
 ous mandibles, narrow but distinct leg-bearing segments, obese
 ovate abdomen, with two caudal papillæ: found on the bark
 and leaves of trees, among dried plants in herbaria, on preserved
 specimens of insects, among old papers, &c., and feeds on these
 various substances.

Pupa resembling the larva in figure, habits, and food, but with
 rudimentary wings at the posterior angles of the wing-bearing
 segments.

Imago with the antennæ, mouth, and general figure of the larva and
 pupa, but a narrower prothorax and 4 wings, whereof the ante-
 rior pair are ample and variously veined, the hind wings are
 smaller, with fewer veins, and slightly folded longitudinally, the
 wings are recumbent and deflected, having something of that
 roof-like character which distinguishes the Stegoptera: the fe-
 male lays her eggs on the leaves and bark of trees, and com-
 monly spins a slight web over them by way of protection; they
 run with great celerity, fly rarely and awkwardly, and appear to
 feed on the same substances as the larva and pupa.

The whole of this group is at present comprised
 in the family PSOCIDÆ, *Leach.*

Characters of THRIPSINA.

Larva hexapod, fusiform, and slightly depressed, with inserted head,
 lateral and simple eyes, and an equal development of the leg-
 bearing segments: feeds on bark, leaves and flowers of plants.

Pupa resembling the larva in figure, habits, and food, it differs in
 its slower movements, in the less equal development of the leg-
 bearing segments, in having its antennæ bent back on the sides
 of its head, and in having its wings distinctly visible, attached
 in a rudimentary form to their respective segments.

Imago of the same general figure, habits, and food as the preceding

states : the head is oblong, the eyes oval, lateral, distant, and placed very forward in the head ; the ocelli are three, and placed between the eyes ; the antennæ are moderately long, moniliform, and have six or seven very distinct joints : the head, which is lengthened in front, is bent back towards the prosternum, and is produced into somewhat of an obtuse rostrum ; all the parts of the mouth are present, the mandibles being corneous, lengthened, acute, very slender, incurved at the apex, broad and somewhat swollen at the base ; the palpi exhibit no peculiarities, and there is not the least trace of the part I have called "galea," and which is so conspicuous, various, and important in the Coleoptera and Orthoptera : the prothorax is largely developed, receiving the head ; the meso- and metathorax are soldered together : the wings are four, membranous, almost veinless, exactly alike, and fringed with long silky hairs ; the legs are moderately long and simple, the profemora sometimes incrassated, the tarsi 2-jointed, rather swollen and without claws. These insects are minute, and infest in countless thousands the blossoms of Dahlias, Fuchsias, and other cultivated plants, often entirely destroying their beauty : one species is particularly injurious to wheat in some seasons, but its ravages fortunately are not common. They are so abundant throughout the summer, that it is almost impossible to shake a flower of any kind over a sheet of white paper, without procuring them : they rarely fly, and their flight is laborious and of brief duration.

Obs. 1. — Mr. Haliday, whose invaluable and highly philosophical papers on Entomology, published in the 'Entomological Magazine,' stamp him as one of the first, if not the very first of living entomologists, regards the Linnean genus Thrips as a group of insects equivalent in its distinctness to Coleoptera, Lepidoptera, Diptera, &c., and assigns it the name of Thysanoptera : yet Mr. Walker, although no one is so thoroughly acquainted with Mr. Haliday's views, has associated these insects with the Homopterous Hemiptera. To differ from two authors so justly celebrated, would almost be tantamount to declaring myself in error, were it not that their views are so dissimilar ; this circumstance may serve as an apology for differing from either, and therefore equally so for differing from both. It may at the same time be allowable to state, that although the observations of Haliday threw the first light, and a flood of light it was, on the structure and classification of these minute creatures, yet his materials were so limited, and

so very much restricted geographically, that we are compelled to consider the study of the Thripsina as still in its infancy.

The following formula, copied from the fourth part of Mr. Walker's 'List of the Homopterous Insects in the British Museum,' exhibits the views entertained by Mr. Haliday of a systematic arrangement of these insects.

Terebra fœminis

nulla :	Fam. 1. TUBULIFERA.
ocelli	
tres, anticus distans.....	Gen. 1. IDOLOTHRIPS.
tres, æquidistantes (aut obsoleti) ...	„ 2. PHLÆOTHRIPS.
quadri-valvis acuta :	Fam. 2. TEREBRANTIA.
incurva	Tr. 1. STENOPTERA.
antennæ apice	
capillacæ	Gen. 3. HELIOTHRIPS.
stylatæ : abdomen	
tomentosum	„ 4. SERICOTHRIPS.
subnudum.....	„ 5. THRIPS.
antennæ apicula	
connata	Sub-gen. 1. APTINOTHRIPS.
discreta; prothorax apice	
valde angustatus	„ 3. CHIOTHRIPS.
parum attenuatus :	
abdomen dorso	
efoveolatum	„ 2. LIMOTHRIPS.
seriatim foveolatum	
apicula pro ratione	
articuli 6ti	
brevis	„ 4. THRIPS.
elongata	„ 5. BELOTHRIPS.
recurva :	Tr. 2. COLEOPTRATA.
antennæ	
articulis 9 discretis	Gen. 6. MELANTHRIPS.
articulis 5 citra apiculam	„ 7. ÆOLOTHRIPS.
alæ completæ	Sub-gen. 1. COLEOTHRIPS.
alarum rudimenta tantum	„ 2. ÆLEOTHRIPS.

Obs. 2.—I beg to offer the following reasons for placing the Thripsina in the class Neuroptera : —

First. — Those naturalists who either extend their systems to the whole of animated nature, or confine them to the typical group,

the vertebrated animals, invariably seek to include all animals, however aberrant, in one or other of the primary divisions: we occasionally see much ingenuity exhibited in settling the question to which division an animal belongs; for instance, Ornithorhynchus, Lepidosiren, Pterodactylus, Deinotherium, Ichthyosaurus, have all afforded scope for argumentative writing in this way: entomologists would unhesitatingly have ranked these as primary groups of vertebrated animals, equivalent to mammals, birds, reptiles and fishes; but it seems to me that the general zoologists are right in considering to which established group such abnormal forms can be referred, rather than in creating new groups purposely to receive them. Applying the same reasoning to insects, I think we ought to inquire to what established entomological group an aberrant species or genus belongs, rather than to create a new group purposely for its reception. Assuming then that Thrips is referrible to an established group, we have next to consider to what group it is referrible.

Secondly.—The metamorphosis of Thrips is totally different from that of Lepidoptera, Diptera, Hymenoptera, Coleoptera, and Stegoptera; it agrees tolerably well with that of Orthoptera and Hemiptera, and is positively identical with what we know of that of the Perlina, Psocina, and Termetina among the Neuroptera.

Thirdly.—The structure of the mouth absolutely forbids its association with the Hemiptera or Orthoptera, but differs no more from that of Neuroptera, than those of the divisions of Neuroptera do among themselves: for instance, than the Perlina do from the Agrionina, the Psocina from the Perlina, the Ephemera from all the rest: the mandibles, considered so anomalous, are almost exactly similar to those of *Corydalis cornuta* in the Stegoptera, which no one has ever attempted to separate from its congeners.

Fourthly.—The perfect similarity of the fore and hind wings in Thrips is characteristic of Neuroptera, and especially of the Agrionina and Termetina, and is totally at variance with what obtains in all other classes.

On these grounds I have no hesitation in expressing my decided conviction that the Thripsina form an integral part and a primary section of the Neuroptera.

Characters of PANORPINA.

Larva unknown.

Pupa necromorphous: a single individual (of *Panorpa*) has been figured by Stein in Weigmann's 'Archives.'

Imago with long, setaceous, many-jointed antennæ; lateral, distant, hemispherical eyes; and the head produced into a long, deflexed beak, bearing the mouth at the extremity, as in the *Curculionina*.

This group may be divided in accordance with the following formula.

Ocelli 3, placed in a triangle between the eyes, PANORPIDÆ, *Newm.*

Ocelli 0:—

Wings porrected when at rest, greatly dissimilar, fore-wings ample, much reticulated, hind-wings lengthened to four times the length of the body, and perfectly linear NEMOPTERIDÆ, *Newm.*

Wings when at rest deflexed, ample, reticulated, similar MEROPESIDÆ, *Newm.*

Wings rudimentary only BOREIDÆ, *Steph.*

Obs. 1.—The *Panorpidæ* are divided into two genera, *Panorpa* and *Bittacus*; they are closely allied, but the latter is distinguishable at once by its greatly lengthened legs and wings.

Obs. 2.—The family *Meropesidæ*, founded on the genus *Merope*, is nearly allied to the *Boreidæ*, with which it would readily associate but for its ample and normal wings. It is a native of North America, and has the *Stegopterous* character of roof-like wings, which in the *Panorpidæ* and *Nemopteridæ* is not perceptible.

Characters of RAPHIDIINA.

Larva elongate, slow, much resembling in figure that of many *Coleoptera*, but having the meso- and metathorax more restricted: the mandibles are corneous and acutely toothed; the antennæ are very short and 3-jointed, and, together with the strong curved legs, exhibit many analogies with those of certain *Coleoptera*: it burrows in the dead bark of trees, never leaving the gallery which it excavates; hence it may be inferred that it feeds on the dead bark, but entomologists have concluded, from the structure of the mandibles, that it is carnivorous: if so, it is the only instance on record of a carnivorous larva forming galleries.

Pupa necromorphous: the antennæ reflected and immovable, but the legs distinct from the body, and said to be used in walking; having only seen it in spirits, I cannot confirm this: wings rudimental, but very apparent, folded over the hind legs, an arrangement which seems altogether opposed to the alleged power of walking: it changes in the galleries formed by the larvæ, and is not enveloped in a cocoon.

Imago with an ovate head narrowed behind, and long narrow prothorax, articulated loosely so as to admit of an easy snake-like motion of the head and neck, whence the specific name of *ophiopsis*: eyes hemispherical, lateral, very distant: antennæ filiform, many-jointed; mandibles strong, corneous, curved, and sharply toothed: meso- and metathorax short, transverse, much broader than the prothorax: abdomen soft, terminating, in the females, in a falciform ovipositor: legs simple, almost precisely resembling those of pseudo-tetramerous Coleoptera, the basal joint being long, the second very much shorter, the third deeply cleft and produced into two large lobes, the fourth very short and placed in the cleft, and the fifth moderately long and of ordinary form: not uncommon in dry woods, and supposed to feed on insects.

I am only acquainted with one genus, *Raphidia*, forming the family *RAPHIDIADÆ*, *Newm.*,
RAPHIDIIDÆ, *Leach.*

Characters of MANTISPINA.

Larva and pupa unknown.

Imago with short many-jointed antennæ, slightly thickened towards the tip; corneous acute curved mandibles; broad transverse head; distant hemispherical eyes, occupying nearly the whole of each lateral surface; long, narrowed, and often transversely furrowed prothorax; elongate raptorial fore-legs; broad transverse mesothorax; narrow transverse metathorax; large and conspicuous propodeon; simple middle and hind legs; soft, moderately long, slightly incrassated abdomen, unprovided with any processes at its extremity: wings alike, roof-like, transparent, glittering, beautifully reticulated, no portion of them folded.

These insects may at present be included in the single family,
MANTISPIDÆ, *Newm.*

Obs. — It remains a matter for future consideration, whether the Raphidiina and Mantispina should be united: to me there appear many points of resemblance between them, but others of decided difference; indeed, the more attentively the anatomy of Raphidia is studied, the more closely will it be found to approach the Coleoptera; while Mantispa, especially in its raptorial fore-legs, exhibits a like approach to the Mantina among the Orthoptera: this different tendency induces me to continue them separate.

Characters of MYRMELEONTINA.*

Larva short, obese, inactive, with a flat head and oval body; the antennæ are short and setiform; the mandibles long, toothed, and slightly curved, perfectly adapted to seizing their living insect prey; along the sides of the body are fasciculi of stiff bristles, amounting to a regular fringe in one of the families (Ascalaphidæ). These larvæ, under the familiar name of “ant-lions,” or some equivalent for that term, have been celebrated in all ages for their instinctive habit of excavating pitfalls, in the shape of an inverted cone, at the bottom of which they lie concealed all but the mandibles, awaiting the arrival of their prey, which having once fallen over the side of the excavation, cannot maintain a footing on the light sand of which its sides are composed, but gradually descends (the sand giving way beneath its feet) to the very bottom, where it is seized by the rapacious larva lying in wait to receive it; its juices are sucked out, and the empty skin is thrown to a considerable distance by the muscular exertion of the ant-lion. The larva of Ascalaphus is not generally supposed to make an excavation, but it lies in wait amid sand or light earth, in the same manner as that of Myrmeleon: some few of the Myrmeleontes are also aberrant in this respect.

Pupa strictly necromorphous, bearing no resemblance to the larva, than which it is remarkably smaller, and the head and tail are bent towards each other, so as nearly to meet; in some of the species it is contained in a spherical cocoon of silk interspersed with grains of sand; in this it changes to the imago, and the head escaping first from the shell of the pupa, gnaws with its

* *Myrmecoleon*, and not *Myrmeleon*, ought certainly to have been the name of the genus; but I cannot agree with Burmeister in thinking we are at liberty to alter it: such a liberty would re-open questions long since supposed to be decided.

newly acquired mandibles a hole through the wall of the cocoon, through which the imago passes, leaving the shell of the pupa still projecting from the aperture: it is a common belief that the pupa gnaws this opening, but this is not the case, the pupa having no command whatever over its cibarian apparatus.

Imago without the slightest resemblance to the larva, and scarcely any to the pupa; its head is transverse, and its antennæ generally incrassated outwardly, although in some Myrmeleontes almost filiform; its mandibles are corneous, curved, and mordent; its body long, slender, and cylindrical; and its wings of uniform size and shape, and finely reticulated.

The contents of this group seem to be capable of subdivision in accordance with the following formula.

Antennæ abruptly capitate:—

of nearly the same length as the wings,

Eyes divided ASCALAPHIDÆ, *Newm.*

Eyes undivided HAPLOGLENIIDÆ, *Newm.*

of nearly the same length as the head, STILBOPTERICIDÆ, *Newm.*

Antennæ gradually clavate, short, MYRMELEONTIDÆ, *Newm.*

Obs. 1.—The Ascalaphidæ are divided by M. Rambur into the genera Ascalaphus, Theleproctophylla, Puer, Bubo, Ulula, and Colobopterus: after a careful examination of the characters employed by this learned entomologist, I feel considerable hesitation in adopting them as indicative of more than specific differences. I may perhaps be pardoned for objecting also to names previously used in a sister science.

Obs. 2.—The Haplogleniidæ are divided by the same entomologist into the genera Byas, Haploglenius, and Azesia, the latter comprising but a single species, the Azesia Napoleo of Lefebvre, described and figured in Guérin's 'Magasin de Zool.' Ann. 1842, Ins. p. 92; but this very striking insect, truly the emperor of its tribe, had been previously described by myself, under the name of Stilbopteryx marginatus (see Ent. Mag. v. 399, under date of 1838), and the name had for three years been employed in all our collections: I have regarded it as forming a distinct group.

Obs. 3.—The Myrmeleontidæ are divided by Rambur into four genera, Palpares, Acanthoclisus, Myrmeleon, and Megistopus, and the genus Myrmeleon is again subdivided into fourteen sections.

Characters of HEMEROBIINA.

Larva long, flattened, with a rather flat head; short setiform antennæ; long, curved, large and distinct leg-bearing segments: it comes from a very peculiar egg, deposited by the parent on the leaves of trees, to which it is attached by a long foot-stalk: it feeds on Aphides, vast numbers of which it consumes, and hence has obtained the name of Aphis-lion.

Pupa strictly necromorphous, bearing some resemblance to the larva; the head and tail are bent towards each other, thus forming a sort of semicircle; it is inclosed in a nearly spherical silken cocoon, in which it remains motionless throughout the winter.

Imago bearing no resemblance to the larva, and very little to the pupa: it has a small transverse head, with distant hemispherical eyes, remarkable in the genus *Chrysopa* for their excessive golden brilliancy; moderately long, filiform, multiarticulate antennæ; acute, corneous, mordent mandibles; four ample, similar, beautifully reticulated wings; distinct prothorax; soft cylindrical body; and moderately long simple legs: they fly languidly and heavily; and when irritated or crushed, many of the species emit a most offensive odour.

The Hemerobiina may be divided into four principal groups, as expressed in the following formula.

Ocelli 3:—

Wings long in proportion to their breadth, very much resembling the ant-lions' OSMYLIDÆ, *Newm.*

Ocelli 0:—

Antennæ setaceous, labrum emarginate CHRYSOPIDÆ, *Newm.*

Antennæ moniliform, labrum entire..... HEMEROBIIDÆ, *Newm.*,
non *Leach.*

In this division must also be placed a small and very singular insect, the *Hemerobius parvulus* of Vill. Ent. Linn., which is also the *Phryganea alba* of Fab. Ent. Syst., the *Malacomyza lactea* of Wesm. Bull. Acad., and the *Coniopteryx Tineiformis* of Haliday, in Curt. Brit. Ent. The larva is short and obese, very much like that of the ant-lion; it is apparently entomophagous, and when full-fed spins a spherical and perfectly white cocoon, which is generally attached to the bark of a tree: the pupa is perfectly quiescent, and, like the larva, short and obese: the imago has multiarticulate filiform antennæ, large lateral eyes, entire labrum, horny acute mandibles, a bifid lacinia to the maxillæ, long slender 5-jointed maxipalpi, a truncate labium, elon-

gated approximate 3-jointed labipalpi, atrophied prothorax, four nearly equally-sized wings, the lower pair smallest, their nervures following the formula of *Panorpa* rather than of *Hemerobius*, and covered with a white powder: the legs simple, of moderate size, and the tarsi 5-jointed, with the penultimate joint bilobed. There are several specific names in addition to those mentioned above, as *Aphidiformis*, *Psociiformis*, &c., but whether or not they represent species, I am quite unable to say. For this little group I propose the name of

CONIOPTERYCIDÆ, *Newm.*

Obs. 1.—The genus *Psychopsis*, at present consisting of the single species, *Psychopsis mimica*, a most lovely insect from New Holland, which has every appearance of the clear-winged *Pieridæ* among butterflies, must for the present be placed with the *Hemerobiidæ*.

Obs. 2.—Other forms of *Hemerobiina* remain to be characterized: it is possible that *Aleyrodes* may find its affinities with *Coniopteryx* rather than with *Aphis*.

Characters of CORYDALINA.

Larva hexapod, active, aquatic, with short slender antennæ, corneous toothed mordent mandibles, soft fleshy body, and a series of remarkable articulated false legs, a pair of which is attached, as in the larvæ of the *Lepidoptera* and the *Tenthredinina*, to each segment of the abdomen; these are evidently natatory organs, and although all authors seem to agree that they are also respiratory organs, like the external branchiæ of the *Ephemerina*, this must not be taken for granted; the appendages in the two groups are totally different; in the *Corydalina* being slender, cylindrical, quinque-articulate antennæform organs, without any external indication of respiratory functions; although aquatic, this larva is able to live out of water, remaining unchanged for a long time in its earthy cell, without any indication of that shrivelling which so quickly attends the respiratory apparatus of the *Ephemerina*, causing speedy death: that these organs are connected with respiration is quite possible, but the premises from which this inference has been drawn are insufficient: there is a single hairy caudal process.

Pupa strictly necromorphous, perfectly quiescent, but capable of some motion when touched or irritated, it changes in a spherical earthen cell, formed with care by the larva in the banks of streams; the head and tail are bent, probably like those of the two preceding groups, to accommodate the insect to the restricted limits of the cell.

Imago having scarcely any similarity to either larva or pupa, with transverse head, deeply received into the well-developed prothorax; the wings are nearly alike, recumbent, and deflected, numerous veined, but not finely reticulated, the hind-wings are longitudinally folded.

These insects appear further divisible in accordance with the following formula.

Ocelli 3:—

Body clothed with hair..... ITHONESIDÆ, *Newm.*

Body naked:—

Antennæ simple CORYDALIDÆ, *Newm.*

Antennæ pectinated CHAULIODESIDÆ, *Newm.*

Ocelli 0 SIALIDÆ, *Leach.*

Obs. 1.—The Ithonesidæ appear to be a numerous group, confined to New Holland. Ithone is the only genus described, but there are many species, and these very dissimilar, and likely to be generically subdivided when we become better acquainted with the entomological productions of the wonderful country in which they are found.

Obs. 2.—In this division must also be placed, at least provisionally, the curious Spanish insect, *Dilar Nevadensis* of Rambur, which has much the appearance of a Hemerobius, but the male has pectinated antennæ, and the female a very long exerted ovipositor: the antennæ of the male are rather longer than the body, and have twenty-six articulations, each of which is furnished with a single long branch at its extremity, these gradually increase in length from the base to the tenth articulation, and from this decrease to the tip. The mouth has not been examined, and the economy is entirely unknown. Not being able to associate this insect with any other division of the Corydalina, I propose to institute the division *DILARIDÆ, Newm.*

Characters of PHRYGANEINA.*

Larva aquatic, much resembling in figure that of the Lepidopterous genus *Psyche*; the head is small, without antennæ, and having corneous mordent mandibles; the leg-bearing segments are of equal development, and have a coriaceous skin; the legs are short; the abdominal segments are covered with a soft skin, and are inclosed in a case constructed of extraneous materials, after the manner of the genus *Psyche* and other *sackträger*s

* I think the name of the genus should have been *Phryganodes*, i. e., consisting of fragments of twigs, or like a little bundle of dry twigs, and the group would in that case have been *Phryganodeina*: the termination I have given I am aware is unclassical.

among the Lepidoptera: in this case they reside at the bottom of running streams; they feed principally on decaying leaves and other vegetable substances which fall into the water, but also, as proved by Pictet, on other aquatic larvæ: they are supposed to breathe by means of external abdominal filaments, which, in some of the species, are separate and very conspicuous, in others they are grouped in bundles, but their office is rather assumed than proved.

Pupa necromorphous: when arrived at its full growth, the larva spins, by means of an oval spinneret like that of the silk-worm, an open net across both ends of the case, and this allows the pupa, which possesses the same (supposed respiratory) filaments as the larva, to breathe by separating oxygen from the water which passes freely through the case; the posterior extremity is firmly attached to some stick, stone, or other substance, at the bottom of the stream: in figure the pupa closely resembles the imago, all its limbs being discernible: when the time arrives for its assuming the imago state, the mandibles are first liberated from their investing membrane, and with these it gnaws an opening in the net-work at the anterior extremity of the case, and its specific gravity being less than that of water, it soon emerges altogether from the case, and rising to the surface there floats, until propelled by the casualties of winds or currents to the shore, when, by means of its liberated fore-legs, it crawls up a twig, a blade of grass, a stone, or other convenient object, and there completes its metamorphosis.

Imago with small exserted head; very long, filiform, multiarticulate antennæ; distinct, lateral, hemispherical eyes; three epicranial ocelli; the palpi long, porrected, and conspicuous; the other cibarian organs mere rudiments; the prothorax atrophied; the wings dissimilar, almost revolute, of nearly equal size, the hind wings folded longitudinally; the legs long, the tibiæ spurred; the body and wings covered with hair, and the entire figure and habit resembling the *Tineina* amongst Lepidoptera: the flight is generally slow, in the evening, and for a short distance; the life short; the food none.

This group is the only one amongst the Stegoptera which has been thoroughly worked: the task has been admirably executed by M. Pictet, of Geneva. The following formula, although based on characters of the larva and pupa, is confirmed and supported by those of the imago.

Larva residing in a movable case, which is carried on its body as a snail carries its shell : —

Case opening in a circle : —

Thoracic segments rounded : —

Supposed organs of respiration
single, filamentous PHRYGANEIDÆ, *Newm.*

Supposed organs of respiration in
bundles : —

Hind legs long..... MYSTACIDIDÆ, *Newm.*

Hind legs short SERICOSTOMIDÆ, *Steph.*

Thoracic segments with the front angles pointed

TRICHOSTOMIDÆ, *Newm.*

Case opening with a slit..... HYDROPTILIDÆ, *Steph.*

Larva residing in a fixed case : —

Pupa in a double envelope..... RHYACOPHILIDÆ, *Steph.*

Pupa inclosed in a single envelope HYDROPSYCHIDÆ, *Steph.*

From this analytical view of the contents of the two proposed classes, it results : —

1. That there is no difficulty in defining the limits of each, and no genera occupy debateable ground between them.

2. That there is no discrepancy in the numerical contents ; that is, that their divisions and subdivisions, as families, genera, and species, nearly correspond.

3. That in the distinctive characters laid down, that of metamorphosis is employed as imperative in all other instances in the science of Entomology, and therefore, that its employment as imperative in the present instance, is no innovation, nor any deviation from an accepted law of the science.

4. That the divisions flow naturally into each other as now arranged, whereas in all arrangements where the fourteen minor groups are treated as parts of a single major group, and arranged in accordance with structure only, there are perpetual violations of Nature : groups are approximated that have only a single character in common, and others dis severed that are all but identical.

Under such circumstances, I cannot entertain a doubt that the classes Neuroptera and Stegoptera will hereafter be received as essential component parts of all systems of Entomology.

EDWARD NEWMAN.

