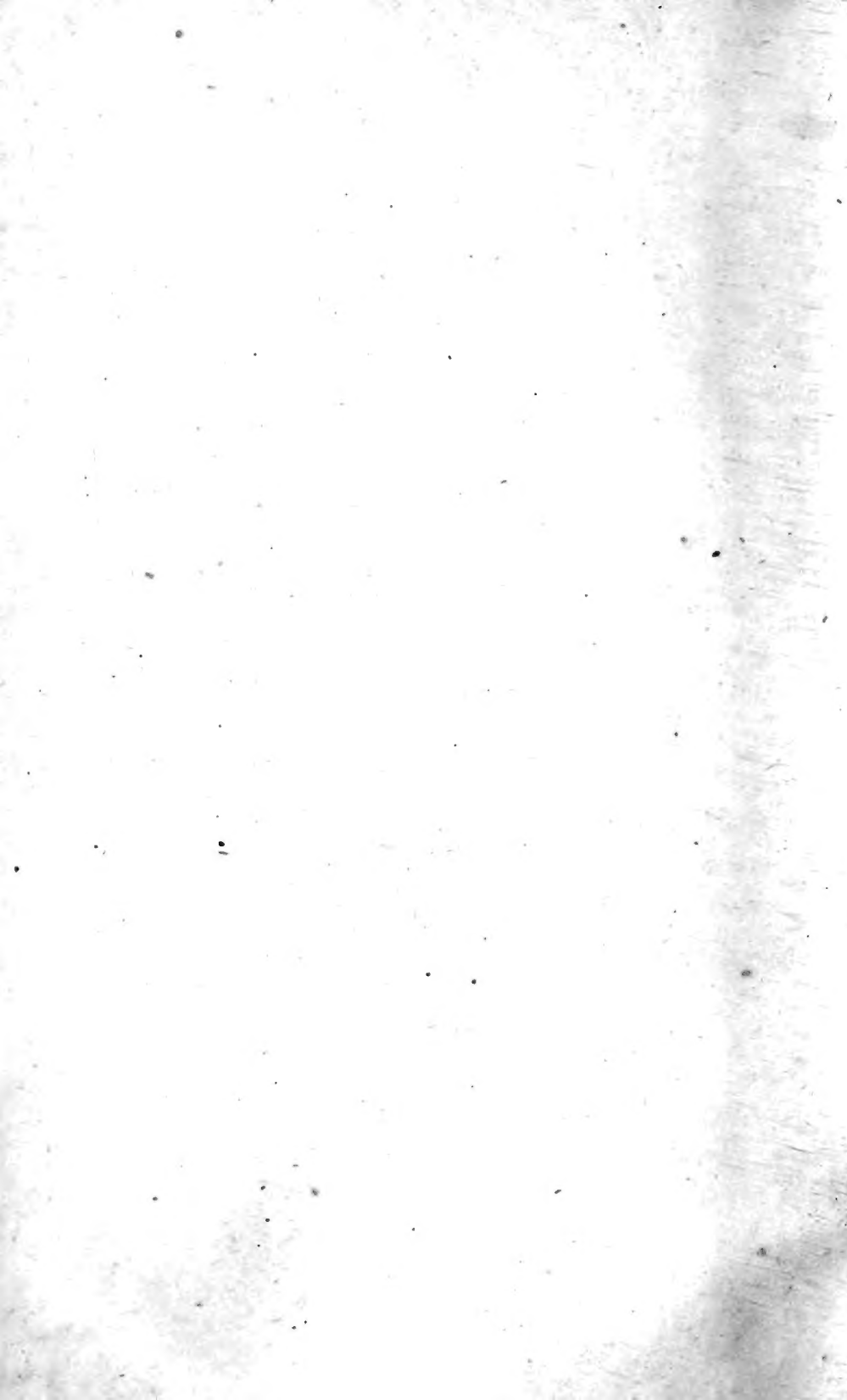


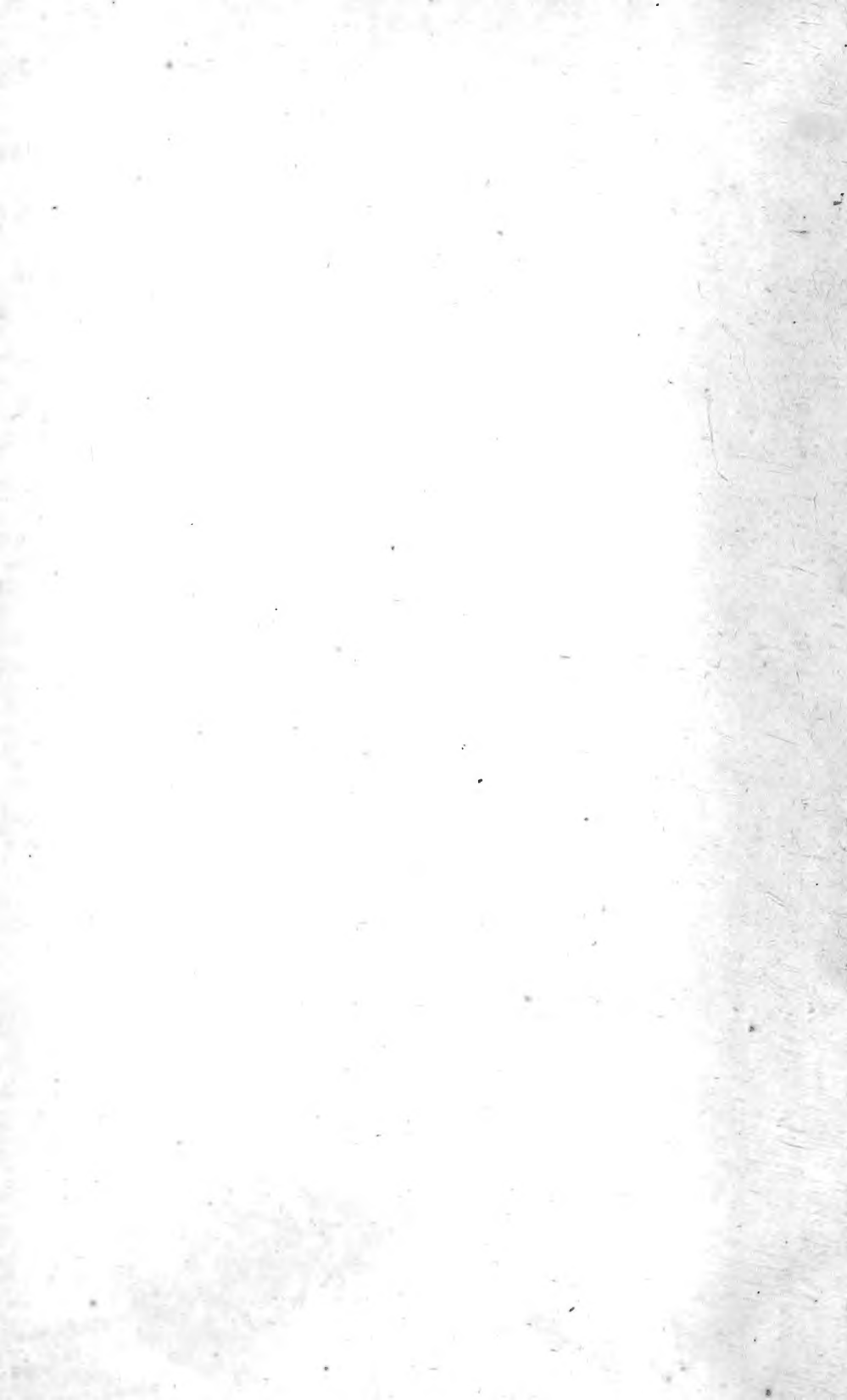
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EDWARD NEWMAN, F.L.S., MEMB. IMP. L.-C. ACAD.

VOLUME THE TWENTIETH.



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JOHN VAN VOORST, PATERNOSTER ROW.

M.DCCC.LXII.

Great God of Nature! 'Tis thy voice
That bids th' obedient world rejoice!
'Tis in the depths of ocean heard,
And in the forest—where the bird
Joins with her mate the song to raise,
And celebrate their Maker's praise.
The opening buds their offerings pour,
Their fragrance swells the teeming store
Of incense, caught from hill and dale,
And wafted on the spicy gale.
And there's the music of the breeze
That's answer'd by the murmur'ing trees.
Afar the placid, lowing herd
Advancing to the well-known word;
While, unseen, the cuckoo near
Pours his note upon the ear.
Soar upward to the glowing sky
Gay lark, with untaught melody;
And in thy early flight thou 'lt meet
Near to earth—with burden sweet,
The grateful bee—and higher still
The giddy moth—but pause not till
Heaven's gate thou find'st in fields of air,
And sing thy morning anthem there.
Amidst this joyous sound of gladness
Shall man retain one tone of sadness?
Shall he, for whom all things were given,
Refuse his offering to heaven?
Shall he alone discordant be
Amidst creation's harmony!
Ah no! chase discontent away:
It suits not with this blithesome day:
By evil fears is evil brought—
Then for the morrow take no thought—
Blithe as the birds aloft in air,
Be now thy heart devoid of care:
This passing globe their only tie,
They sing their little song and die:
But thou shalt seek thy Maker's shrine—
A glad eternity is thine.

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P R E F A C E .

To WRITE a preface *after* a volume is considered the right thing. There is no other course open. But a preface may have a multitude of phases,—the apologetic, the vainglorious, the mock modest, the trifling, the profound, the philosophical, the argumentative, the deprecatory, the retrospective, the historical, and so forth: still, to the best of my knowledge, I have never read a prospective preface, a preface that ignores the past and looks only to the future. Such a preface is simply impossible; the future itself is built upon the past, and so must be a preface: nevertheless I incline to make an experiment,—to project the shadows of the past into the future.

How numerous are the zoological problems still unsolved! How well worthy are they of solution! How many active minds desire their solution! How many of us would have declared the existence of a feathered reptile impossible! And granting that the history of a feathered reptile has been printed on the lithographic stone of Solenhofen, a question *adhuc sub judice*, where in our system shall we place such a monster? What a subject for the systematist. How can we cut this gordian knot. Shall we deny the existence of such a creature? Shall we assert that all the pterodactyles were birds? Shall we say “let bygones be bygones,” and maintain that extinct animals form no part of our systems; just as those who fear lest some future Darwin should deduce their descent from a gorilla, assert that man is not an animal, that he forms no part of the animal kingdom? Shall we hold with the author of *Omphalos* that fossil bones were created with and of the rocks? What a fertile subject for conjecture is here! what a field for enquiry!

In Ornithology how many problems yet await solution! What was the dodo? “A dove,” replies the comparative anatomist, and with great subtlety has he argued his point, with a profound knowledge has

he argued his point; so good a case has he established that every chamber student believes the dodo to have been a gigantic dove, and that when the poet rapturously exclaims

“ Oh that I had pinions fleet as those that bear
The dove exulting through the realms of air ”*

he was wishing himself a dodo—pious aspiration!—and was in spirit forestalling the discovery that our philosophers claim as their own.

Again, the familiar cuckoo; her history is very incomplete. Some say the cuckoo feeds her own young one; some say she haunts the neighbourhood of that young one simply as a guardian, or rather as a kind of umpire to see fair play between the cuckoo squab and its unwearying step-mother. And how does the cuckoo get her egg into the nest of the hedgesparrow? Does she lay it after the approved manner of birds, decently in the nest, and hide it with lichens and cover it with feathers? Or does she first deposit her treasure on some mossy bed, and then transferring it to her throat, or her beak, or her foot, so aptly fashioned for such a purpose, carry it about while she seeks a home suitable for the board, lodging and education of the juvenile cuckoo it is destined to produce? And does she “suck birds’ eggs,” whether “to make her voice clear” or for any other occult purpose? And do the hairs of the hairy caterpillars she devours, “stick in her stomach and cover it with a coating of plush?” All these statements have been made: why not inquire into their truth or falsehood?

The change of plumage in many birds, first intelligibly described by the really illustrious Waterton, that true friend of the feathered tribes, is a subject of the highest possible interest. The naturalist of Walton Hall treats of it especially in the drake, but I believe it is of very general occurrence, a great number of species, especially their males, assuming a nuptial dress of peculiar beauty, and losing it again as soon as the breeding season has past. “About the 24th of May,” says Mr. Waterton, “the breast and back of the drake exhibit the first appearance of a change of colour. In a few days after this the curled feathers above the tail drop out, and gray feathers begin to appear amongst the lovely green plumage which surrounds the eyes. Every succeeding day now brings marks of rapid change. By the 23rd of June scarcely one single green feather is to be seen on the head and neck of the bird. By the 6th of July every feather of the former brilliant

* C. H. Townsend’s ‘Jerusalem.’

plumage has made its disappearance, and the male has received a garb like that of the female, though of a somewhat darker tint. In the early part of August this new plumage begins to change gradually; and by the 10th of October the drake will appear again in all his rich magnificence of dress, than which scarcely anything throughout the whole wild field of nature can be seen more lovely or better arranged to charm the eye of man.*

Mr. Waterton speaks of this change of colour as a "double annual moulting," but I have grave doubts whether each change is a moulting, in the common acceptation of the term; and in years long bygone I have made many attempts to invite the attention of naturalists to this most interesting question. In March and April the drake has the distinguishing plumage of his sex; in June, July and August he wears the plumage of the duck; in October, November and December he is again arrayed in his own beautiful livery. Now the questions to be solved are these. *First*. Are the feathers worn in March and April actually different feathers from those worn in June and July? *Secondly*. Are the feathers worn in June and July actually different feathers from those worn in October? If so, then is Mr. Waterton right in calling it a "double annual moulting." But another suggestion has been made, and is partially supported by some observations of my own, namely, that the individual feathers, still remaining *in situ*, undergo a change in colour. This inquiry is by no means to be confined to the drake: gulls, plovers, linnets, and very many other birds, undergo a double change somewhat similar, but the change in different species is not synchronous; thus in several species the brilliant or nuptial plumage is assumed in spring; in others, of which the drake is the familiar example, late in the autumn. I must acknowledge the service done to Science by the entomologist, in preserving a series of varieties, although not with the intention of using them for educational purposes: would that the ornithologist would do the same! would that he would condescend to show us those progressive changes in colour which have their meaning and their teaching. Let him affix to each specimen the date when it was killed: he might also indicate his own opinion as to age or sex, as "? male," "? bird of the year," "? adult." The date would be an incontrovertible fact, and therefore always of the highest value. The owner's opinion of the sex and age would often be valuable; in the instance of a Doubleday, a Gould, a Hewitson, a Bond and a few

* Waterton's 'Essays on Natural History,' 1st series, p. 201

others it would be particularly acceptable. How few are there at this moment who can distinguish the sexes of the nightingale, the robin, the wren, the moorhen, or twenty other most familiar birds! Is not this knowledge worth acquiring?

There is yet another subject, the facts of which are familiar and indisputable, and the digest of facts and theories thereon have been rarely attempted by our ornithologists,* while our entomologists, who possess perfect means, attempt no explanation or investigation whatever. I allude to the local appearance, disappearance or apparent extinction of particular species.

In this island the bustard, the crane and the stork have become extinct almost without a thought, without a lament; while the kite, formerly existing round London in great abundance, and valued as a scavenger, has taken himself to the hills and is unknown near the towns. But it is to entomologists I would especially appeal. Is it not worth their while to inquire why *Limenitis Sybilla* has deserted Coombe Wood; why *Vanessa C-album* is extinct at Birch Wood; why *Polyommatus Hippothöe* has disappeared from the fens; and what has become of *Lycæna Acis* in Herefordshire, and *Leucophasia Sinapis* at Darenth? Again, why do *Lycæna bætica* and *Pieris Daplidice* occasionally visit our Kent and Sussex coasts, but never remain to breed? Where has *Noctua subrosea* secreted itself? Some of these questions are answered without difficulty, such as that about the stork; but how shall we account for the disappearance of *Lycæna Acis*, which at Leominster in 1832 was certainly the most common of all the blues, and which has never been persecuted. I am not aware that a single specimen has been seen in that locality for thirty years. Its food-plant cannot have failed; its pupæ cannot have been drowned, as water never rests on the hill sides where the insect once abounded; no fens have been drained; no common land enclosed; no alteration has taken place in the temperature.

Let us still pursue Entomology and investigate the connection between cuckoo-bees and their hosts; wondrous associations, and for what purpose? Where is the *cui bono* of this friendly compact? Is the number of bees diminished, their increase checked, and why should it be checked? Is the increase of bees too rapid, and is the cuckoo

* I cannot forbear alluding to the laborious exertions of the late Mr. Strickland in the dodo book to which I have already alluded; and also to those of the late Mr. Wolley and Mr. Newton into the history of the northern penguin as instances.

larva fed by its foster-parent, and with the same food? The same questions may be applied to *Chrysis* and *Odynerus*, *Ripiphorus* and *Vespa*, *Sitaris* and *Anthophora*. Some little, but, alas! very little, light has been thrown on the economy of *Stylops*, and still less on that of *Melœ*, the food and growth of which in its active hexapodal state is yet unknown to us.

What a vast field of conjecture is opened up by the discovery of isomyious pairs! What is the teaching of this phenomenon? How is it that beings beginning life with such exceeding difference, should approach so nearly in their ultimate state, that they are scarcely to be distinguished from each other? The familiar instance of the two *Acronyctas*, *Psi* and *tridens*, first called my attention to this. It is now made manifest by a hundred examples; the most recent are those of *Lophyrus rufus* and *L. similis*, worked out by Vollenhoven, and *Eupithecia fraxinata* and *E. innotata*, discovered by Mr. Crewe. Whither does this discovery tend, and in what does it differ from Mr. Darwin's dimorphism? Are the isomyious pairs really distinct, and are the dimorphous pairs really identical as species? We know it is asserted that a cowslip may produce a primrose, and that primrose a cowslip, and so on throughout countless generations. In like manner *Volucella plumata* may produce *Volucella bombylans*, and *Volucella bombylans*, *Volucella plumata*; and so on through endless alterations. *Colias Edusa* produces *Colias Helice*, and *Colias Helice* produces *Colias Edusa*. Then among the Aphides we have alternations of generations with great regularity, of which Mr. Walker would furnish much more information than any other entomologist. Even the common gooseberry grub of the spring becomes the currant grub of the autumn; it eats other food and until lately has borne another name. How wonderful are these things! How worthy of our investigation!

The question of uniting or keeping separate the *Phryganidæ* and *Lepidoptera* is still unsettled. The presence of scales or hairs is perfectly valueless as distinctive, or *Mormonia* must be a *Lepidopteron* and *Psyche* a *Phryganea*: the more this subject is investigated the more difficult does it become to draw any definite line of demarcation. There is no lepidopterous or phryganidous character that possesses the important attribute of constancy; and no one, as I have lately shown, has yet attempted to fix the systematic position of *Acentria* by actual investigation and comparison of all its characters. The immense, the insuperable difficulty of separating these groups leads me to the

conclusion that they are inseparable. So again with the *Perlidæ*. I can find no difference of importance between these and the *Achetidæ*, either in their mouth, their wings or their metamorphosis; and therefore I am quite disposed to annex the former to the latter.

Again let me invite attention to life-histories of our common insects, those concerning which there is no question of specific identity involved. Let me entreat my contributors to describe the larvæ of our *Satyridæ* and *Lycænidæ* from nature; it is discreditable for us to copy copies of descriptions, and continue to apply them to insects the names of which have been repeatedly changed. Great praise is due to Mr. Stainton for his life-histories of *Micro-Lepidoptera*, but why stop here? Why deny to Macroes that careful and minute attention which we are always gratified to find accorded to the *Microcs*? Let no one listen to the cuckoo-cry that isolated histories are useless: they are the pith and marrow of Entomology, the nerves and sinews of the science. How puerile the idea that a man is never to publish until he is omniscient, until he has exhausted the secrets of Nature! Who may expect to attain this perfection? The very best informed amongst us are but learners, and those who are the most modest and the least pretending are the most likely to evolve the truth.

I trust the contributors to the 'Zoologist' will enter on these and other kindred subjects too numerous even to mention, and in that truth-seeking spirit which for twenty years has characterised its pages. Let every question be discussed with kind and gentlemanly feeling, and let every beginner bear in mind that here at least he will be protected from that overbearing and dictatorial contradiction, that insolent depreciation of rising merit which has disgusted so many with a science which they had previously believed guaranteed them from such unmannerly attacks, but whether in the pages of the 'Zoologist' or the meetings of a society, let every votary of our science be assured that he who flippantly depreciates, dogmatises or contradicts is sure to be in the wrong. Time has already shown the truth of these remarks.

EDWARD NEWMAN.

9, Devonshire Street, Bishopgate,
November 12, 1862.

THE ZOOLOGIST

FOR 1862.

The Song of Birds. By Colonel H. W. NEWMAN.

THIS subject is treated of in Dr. Bechstein's work on cage birds, and I wish to mention to the ornithological readers of the 'Zoologist' a few observations made during my experience.

Mr. Broderip is of opinion that love and rivalry are the main causes of their song, but in reply to this our beautiful songster the thrush sings a few days in October, and, in mild weather, often in the third week of November, and frequently most of December; but in these months the thrush is perched a great deal higher from the ground, and consequently not so well heard as in the breeding season in the spring, when he is nearer his nest. I have never heard the wild thrush sing in September, but in late summers frequently a week in the first part of August: in 1859 the summer was so early and hot that the thrushes near me ceased singing on the 24th of July, a week earlier than usual.

Dr. Bechstein is of opinion that there are two species of the nightingale, one which sings by day and another which sings by night. I do not fall into this theory in England, as I have noticed that where one or two pairs of these birds have frequented a particular copse, hill or hedgerow, I have always found them both by day and night close to the very spot at both periods. These birds are very constant to their locality, and Dr. Bechstein may have mistaken this by the difference of their song, as they never sing nearly so loud by day as at their usual time near midnight. I never heard a nightingale sing by day in its full splendour of song: when singing he is perched generally within twenty feet from the ground.

Mr. Macgillivray gives a most interesting account of the formation of throats of singing birds.

The Hon. Mr. Daines Barrington gives a scale of the comparative merits of singing birds, but not in my ear a just one, as he places the

thrush at No. 10, after the whole of the finches, the linnet, blackcap, titlark, skylark and woodlark. I have added another scale of my own. Mr. Daines Barrington must have had a peculiar ear for music, although I hear he was a good amateur musician. My selection contains ten of the best singing birds in England, leaving out the minor songsters in the scale.

THE COMPARATIVE MERITS OF TEN ENGLISH SONG BIRDS.
(The nearest to perfection is represented by 20).

	Mellowness of tone.	Sprightliness.	Plainiveness.	Variety of Notes.	Degrees of Compass and Execution.
1. Nightingale	15	12	20	16	20
2. Song Thrush	8	9	10	11	12
3. Blackbird	6	2	10	6	10
4. Skylark	4	12	3	10	10
5. Blackcap	10	14	2	8	9
6. Woodlark	16	2	7	6	9
7. Titlark	7	6	1	5	7
8. Robin	4	10	11	8	10
9. Fauvette or Pettichaps	5	7	4	6	8
10. Missel Thrush or Storm Cock	4	6	3	4	6

Nightingale (*Sylvia lusciniæ*). The nightingale among birds is, to make a comparison, "*Luna inter minora Sidera*," and no wonder that poets and lovers of birds have written so often on this matchless songster.

"Sweet bird, thou sing'st away the early hours
Of winters past. * * *
What soul can be so sick which by thy song,
Attired in sweetness, sweetly is not driven
Quite to forget earth's turmoils, spites and wrongs,
And lift a reverend eye and thought to heaven?
Sweet artless songster, thou my mind dost raise
To airs of spheres, yea, and to angel's lays."

DRUMMOND.

The nightingale is remarkable for the curious circuit it makes in the migration to this island, being confined to certain counties in England and Wales. It seems that mild temperature has nothing to do with it in one sense, as one was never heard singing in Cornwall and very seldom in Devonshire, and only a solitary instance in that part of Devon bordering on Somerset. They seem to be more numerous in Hampshire, Kent, and all the counties near the metropolis, than elsewhere. The line of demarcation taken by the nightingale has been

the wonder of many naturalists, and much has been written on the subject; my own opinion is that some peculiar insects, the main object of its food and search, must be the cause, and not the climate of the circumscribed district, which it inhabits during the five months of its sojourn in England. Experiments have been tried, in Scotland, to alter their range of flight by placing the eggs of these birds in the nest of the robin. The young nightingales have been hatched and flown from these nests, but have never returned to Scotland, nor have they been heard to sing there, nor in the counties of Northumberland, Durham or Lancashire, and little proof even in Yorkshire. The greatest puzzle to me is why they are not plentiful near Exeter, as one would think, from the mildness of the climate of Devon and the dryness of some of its air, the same food would be found as in the adjoining counties of Somerset and Dorset.

Song Thrush (*Turdus musicus*). Dr. Bechstein says that in Germany, where he lived, the thrush is a migrating bird, but it is not so in England, as it is to be seen in our gardens in the most severe winters, and, as I mentioned before, sings in a mild winter in December and January. In a trip I took to Ostend a bird followed the steamer for several hours after leaving Ramsgate, and about little more than half way across it became so tired that it settled on the rigging of the vessel, within four yards of the deck. I examined it and found it was a thrush. On coming near the Flemish shore it immediately took wing towards Ostend. This happened in the month of July. A single bird is often known to take a flight of this sort, as observed by seafaring men. Dr. Bechstein says "The melody of birds, like the fragrance of flowers cannot be [properly] described; it must be listened to, and that by one whose senses are properly attuned to outward harmony by an indwelling and abiding love of the beautiful and the pure in Nature: to him the soaring lark will seem indeed to pour forth at 'heaven's gate' a morning hymn of praise, and the nightingale to chant, amid the leafy woodlands, a vesper song of thankfulness; the full chorus of feathered minstrelsy will be to him like an angel choir, scattering melody on all around, which sinks in the soul like summer rain into the earth, gladdening and refreshing it;" and, as Broderip expresses it also, "The melody of birds finds its way to the heart of every one." I place our beautiful indigenous song thrush next to the nightingale. The thrush has at least eleven varieties of note, some of them very sweet and plaintive, and possesses great execution. I never could reckon more than fifteen or sixteen varieties of note in the unrivalled song of the nightingale. I need say but little of either of these

songsters, as they have been the theme of poets and the admirers of sweet sounds in the rural districts for centuries, and they may be said really to have a "local habitation and a name," for they are both most constant to locality near their resting place. The nightingale, although his stay is so short, and his song still shorter, may always be found within fifty to sixty yards of the same spot in the month of May, in some favourite pollard oak or thick low underwood or hedge.

Blackbird (*Turdus merula*). The beautiful plaintive song of this bird places him third on my list of our singing birds. It seldom commences its song before February, unless January be nearly the extreme of mildness. It has about six varieties of note, and has "the soft melody of sounds, the sweeter for simplicity." The blackbird is most brilliant in song in showery weather in May, mixed with hot gleams of sunshine.

Skylark (*Alauda arvensis*). The skylark, as Wordsworth says,

"Leaves to the nightingale her shady wood,"

and becomes a "pilgrim of the sky." The lark is underrated in its song by many, being unheard in half its beautiful song from the height to which it soars. It mounts to

. . . . "The last point of vision and beyond,
A daring warbler."

"True to the kindred points of heaven and home."

The descent to its nest is unique and picturesque. Its compass is about 12, and it possesses great variety of note.

Blackcap (*Sylvia atricapilla*). This magnificent garden warbler enlivens our shrubberies for two or three months, but his fidgetty and volatile character render his visits so short and transient, that unless his nest is very near he is off in a minute or two, or even less, to range elsewhere. On a moonlight night I have heard this bird sing as early as twelve to one o'clock at Midsummer. It has been compared to the nightingale, but it is far inferior: the "minor" and plaintive notes of the nightingale are quite wanting in the blackcap. It is called the "monk" on the Continent. It is very properly rated as the first of the garden warblers.

Woodlark (*Alauda arborea*). This bird is almost unequalled in mellowness of tone, and is superior to the skylark in richness and clearness of its song. In consequence of its being a favourite it has become a scarce bird in Gloucestershire, for the birdcatchers there take them in the greatest numbers. The compass of voice of the wood-

lark is small, and his variety of notes few, but the clearness is perfect and mellifluous.

Titlark (*Anthus pratensis*). A pretty little lively bird, which may be seen and heard in almost every parish in England, in May, June and part of July. Sprightly and lively to a degree, with no great compass of voice, the paucity of these birds seen in confinement pretty well shows how far they are favourites, and they are nearly as constant to the locality of their breeding place as the skylark. The titlark has a pleasing variety of song, between the skylark and woodlark, but inferior to both.

Robin (*Sylvia rubecula*). This bird is an exception to all the singing birds, for, unless the weather is very severe or very temperate, it sings almost every week in the year. Although a rather monotonous song it is a mixture of the serious and sublime. The robin is admired by many as a first-rate singing bird.

Fauvette or Pettichaps (*Sylvia* —— ?). This little bird, often mistaken for the blackcap, visits our gardens and delights us with its song. It is nearly of the same fidgety nature as its migrating congener, but not so loud. It is a deadly devourer of currants and raspberries, the latter particularly. If these birds want their throats moistened in the month of June they do not keep them long dry, for they are most mischievously active; few grudge them their robbing, except the market gardeners.

Missel Thrush or Storm Cock (*Turdus viscivorus*). This, the largest singing bird in England, is a great favourite with me. It has often been mistaken, even by persons who have resided in the country all their lives, for the blackbird, but it is of course very different and very inferior; one or two notes of the missel thrush are like those of the blackbird. It sings in the most tempestuous weather, and I heard one last year during a perfect hurricane, in the month of January, perched on a tree about thirty feet from the ground. It had its face to the wind, and seemed to enjoy the tempest. Its pretty wild chant, although wanting in variety and compass, has something very grand in it, both during a storm and during a lull after a storm. It is very fond of a high Italian poplar or an elm for its song. When surprised by seeing an enemy it utters a coarse scream. I hope this was the sound my old neighbour, Mr. Knapp, in his 'Journal of a Naturalist' mistook for the song, which he designated a "coarse sound." I certainly am one of those who reckon the missel thrush a really eccentric and pleasing bird, as he sings when no other bird attempts it, but then it generally happens that the bird is not so often heard as many others,

unless very tall trees abound near our habitations; he never condescends to be very near the ground during his wild chant, which can be heard at a great distance.

The restless little goldfinch, the sprightly linnet, the chaffinch, with his tune going prettily down a full octave, the wren and hedgesparrow, are all inferior singers, and scarcely deserve a place in the category of first-rate singing birds, although the first-named of these is often kept in confinement more for his beautiful plumage and docility than his song, like the piping bullfinch. The bullfinch is a nice bird in a room, but its note is so weak that in a shrubbery one must be very near to hear it at all.

I have omitted to mention another bird, which some of our English poets designate a singing bird; I mean the cuckoo: at all events the cuckoo is a most pleasing harbinger in April of generally the first lovely vernal days. If we are to reckon the cuckoo really a singing bird, then my old friend the missel thrush must yield the palm to the cuckoo, the delight of the schoolboy, as the largest singing bird in England. The cuckoo is also at times a flying songster.

“The same when in my schoolboy days
 I listened to that cry
 Which made me look a thousand ways,
 In bush and tree and sky.
 * * * * *
 O blithe new comer! I have heard,
 I hear thee and rejoice.
 O cuckoo! shall I call thee bird,
 Or but a wandering voice?”

I hope my ornithological readers will not be offended by my lesser notice of the other minor songsters of the grove, the wren, reedsparrow, redpole, hedge accentor, siskin, the pretty meek and innocent wood wren and the tomtit, each of which have their short notes and wild spring calls. All these minor songsters add to the brilliancy of the feathered choir on a fine early spring morning, and causes those who really delight in the country to feel what Addison describes as the height of vernal enjoyment, scarcely capable of being expressed, but at the same time enthusiastically felt by the lovers of Nature.

H. W. NEWMAN.

Hillside, Cheltenham,
 November 8, 1861.

Recollections of the Swans and Geese of Hudson's Bay.

By GEORGE BARNSTON, Esq., of the Hon. Hudson's Bay Company.*

THE birds comprising the two genera *Cygnus* and *Anser* are, with slight exception, the largest of the Palmipedes, or web-footed fowls, found in North America; and, being generally difficult of approach, and at the same time highly prized as an article of food, any account of their migrations and habits becomes interesting. Of the many who may have enjoyed the relish of a well-seasoned wild goose at the sumptuous banquet, few are aware of the distance the bird may have travelled, or of the many perils, by flood and field, through which it may have passed.

On the coast of Hudson's Bay their manners may be studied to great advantage. There they repose after a long and fatiguing flight; there they enjoy a perfect surfeit on the juicy roots of the swamps, and the tender sprouting herbage of the boundless downs; and there, assembled in a mass along the sea-girt shore, they follow the never-varying course of the points and headlands that stand out revealed as the line of march of all their ancestors who have gone before them.

The swan, except in a few particular localities, is a scarce rather than a plentiful bird on the shores of Hudson's Bay. Of somewhat ponderous flight, swans are seen at the same time as the other migratory tribes, winging their way to the secluded recesses of the north, resting themselves throughout the interior, and losing units of their number here and there by the Indian's gun. In the scarcity of their favourite food, the tubers of the *Sagittaria sagittifolia*, they have recourse to the roots of other plants, and the tender under-ground runners of grasses in the higher latitudes. They sometimes breed in the interior before arriving at the coast. I had two eggs brought to me from the borders of a lake near Norway House, latitude nearly 55° N.; but it was impossible for me to say whether these were of the *Cygnus americanus* or *C. Buccinator*; the probability rests with the former.

Towards Eastmain James's Fort, in James's Bay, a considerable number of swans hatch. A few are killed by the natives there, who watch the game as it passes up and down narrow rivers communicating with the sea, and flowing from lakes of some magnitude scattered over the interior. In the winter months all the northern regions

* Read before the Montreal Natural History Society, and reprinted from the 'Canadian Naturalist' for October, 1861.

are deserted by the swans, and from November to April large flocks are to be seen on the expanses of the large rivers of the Oregon territory and California, between the Cascades Range and the Pacific, where the climate is particularly mild, and their favourite food abounds in the lakes and placid waters. Collected sometimes in great numbers, their silvery strings embellish the landscape, and form part of the life and majesty of the scene. These societies break up as they advance upon their long spring journey to the north. They are then dispersed in small bands and but few together, each of a pair at last separating and betaking to the cares of the season of incubation. In the most secluded and unfrequented districts, where there is ample water range, they rear their young.

Superior to the swans as an article of food, the geese of every species are tenfold in number, and they form the favourite dish of the Indians of Hudson's Bay. When the long and dreary winter has fully expended itself, and the willow grouse (*Tetrao Saliceti*) have taken their departure for more northern regions, there is frequently a period of dread starvation to many of the natives, who are generally at that time moving from their wintering grounds to the trading posts. The first note, therefore, of the large gray or Canada goose (*Anser canadensis*) is listened to with a rapture known only to those who have endured great privations and gnawing hunger. The melancholy visages brighten, and the tents are filled with hope, to which joy soon succeeds, as the happy father, or hopeful son and brother, returning successful from the hunt, throws down with satisfaction and pride the grateful load.

The *Anser canadensis* here alluded to is the largest of our geese, and is almost always first seen in the Hudson's Bay Company's territories. It may be only a single straggler which has lost its mate, or at most five or six together. These are the advanced guard of the serried legions of other water-fowl which nature and instinct send forth every spring from the south, to occupy, during the productive summer, the land of the north, and to partake of the plentiful and luscious repasts that Providence has, during their absence, been storing up for them, in a hidden yet nascent state.

The Canada gray goose, as if aware of the general favour in which it is held, spreads itself very diffusively over the whole continent. Its disposition has less of wildness in it than that of the snow goose. We come upon it hatching in quiet recesses and corners, surrounded by reedy waters, where "rushes and grasses do most abound." It is at home over the whole wooded portion of the country, equally so in

the extensive marshes of the sea-coast, and on the mossy barrens of the Chipewyan and Esquimaux lands. During the winter, like other species, it takes refuge in the more temperate portions of the country, courting always open water. I have seen a flock in the strong open current of the St. Lawrence, above Lachine, near Montreal, in the month of January or February; but such an occurrence is rare. In this latitude—say 45° west of the Rocky Mountains, but especially on the coast of the Pacific—they are plentiful during the whole winter, in mild seasons. Before Oregon was settled by the Americans the Hudson's Bay Company's post of Fort Vancouver used to be supplied by Indian hunters with gray geese, large and small, as well as with occasional swans and white geese; and this at times so liberally that a day's rations twice a week could be furnished to an establishment of thirty to forty men. Some of these geese had been killed by the bow and arrow. This game formed our best rations, but it was seldom in such condition as it is to be had in the north after it has enjoyed a week or two on the feeding-grounds. I have no doubt that the great mass of the gray geese pass their winter to the south of the Platte waters, in the swamps of Florida and the Lower Mississippi, and on the waters of the western side of the continent, towards their outlets into the Pacific. Now that the rifle and fusee have been introduced so plentifully into California and Oregon, it is to be feared that the numbers of the larger wild fowl will decrease rapidly. The bow and arrow formerly thinned them considerably; now, with an increasing population, the gun will have more fatal effect.

The lesser gray goose (*Anser Hutchinsii*) arrives, in subarctic regions, later than the other, and about the same time as the snow goose (*A. hyperboreus*). They are shot occasionally in the interior when they alight, and in considerable numbers at Albany, and elsewhere along the coast of James's and Hudson's Bays. Unlike the large gray goose, it can scarcely be said that they incubate in a scattered and detached manner over the whole extent of the wooded country; they rather proceed in large and united bands, keeping a lofty flight, and making few stoppages until they reach the coast. On arrival there, about the beginning of May, they immediately commence feeding in the salt-marshes, on the soft white rooted grasses, continuing to do so for a fortnight or three weeks, and at last becoming quite plump, and capital subjects for the table. When fully in good plight, they take their departure for more arctic regions, at nearly the same time as the snow geese, not to appear again until they return with their young broods in the month of September. These

smaller gray geese are killed in fewer numbers than the larger species on their passage to Hudson's Bay, which may be accounted for by their higher and more continuous flight; but if once they settle upon their feeding-grounds the tables turn upon them, and the slaughter committed in their ranks is wonderful, and would sate the greatest Nimrod that ever waded swamp.

The Brent goose (*A. Brenta*), the calliwappemaw of the coast Crees, is but little looked after or cared for in Hudson's Bay, being a small species, keeping out to sea on the shoals and towards lowest water-mark, and affording a dish not in high estimation. Their arrival in the north is later than most of the waders and Palmipedes.

The snow goose, although it plays a less conspicuous part in the interior of the country, where it seldom alights except along the margins of the larger lakes and streams, becomes, from its consolidated numbers, the first and greatest object of sport after the flocks alight in James's Bay. The havoc spread throughout their ranks increases as the season advances, and their crowds thicken, and even the Indian becomes fatigued with the trade of killing. In the fall of the year, when the flocks of young "wewais," or "wavies" as they are called, are numerous and on the wing between the low-tide mark and the marshes, or are following the line of coast southerly, it is no uncommon occurrence for a good shot, between sunrise and sunset, to send to his lodge above a hundred head of game. In such cases the hunter is stationed in what is called a stand,—a space from four to five feet square, enclosed by willow-twigs and long grass-stalks,—from which he fires, with forms of geese or "decoys" set up a short distance in his front. The geese fly towards these, when he gives out their peculiar call, and frequently he has his wife or son, or grown-up daughter, to load the discharged gun for him, while he fires with the loaded.

These wavies, or white geese, form the staple article of food as rations to the men in James's Bay, and are the latest in leaving the coast for southern climes, an event which takes place towards the end of the month of September, although some weak broods and wounded birds linger behind until the first or second week in October. They are deliberate and judicious in their preparation for their great flight southwards, and make their arrangements in a very business-like manner. Leaving off feeding in the swamps for a day or more, they keep out with the retreating ebb tide, retiring, unwillingly as it were, by steps at its flow, continually occupied in adjusting their feathers, smoothing and dressing themselves with their fatty oil, as athletes

might for the ring or race. After this necessary preparation the flocks are ready to take advantage of the first north or north-west wind that blows, and, when that sets in, in less than twenty-four hours the coast that had been covered patch-like by their whitened squadrons, and wildly resonant with their petulant and incessant calls, is silent as the grave—a deserted, barren and frozen shore.

The friendly intercourse that exists between these geese and the blue wavies (*A. cærulescens*) has induced some to suppose that they were merely varieties, which is a mistake. The young white wavies arrive from the north with their parents without mixture of other geese, and they have nearly the same white garb as the old birds, but with their heads of a dirty reddish tinge, exactly as if they had been rubbed by the hair-dresser with the red rust of iron; and the bill, as is always the case with the young of the feathered race, is tender, soft and compressible. On the other hand, the *A. cærulescens* comes down upon the east main coast also in perfectly distinct flocks, the young of a more diffused blue colour, as well as being of smaller size. The full-grown blue wavy is besides somewhat larger than the white, and has its flesh most decidedly of a much fairer hue. In the spring James's Bay is frequently crossed by both species as far north as Capes James and Henrietta Marie, and occasionally two or three of the blue may be observed in a large flock of the white on the Albany or west shore. White again are seen mixed up to a certain extent with the full flocks of blue on the Eastmain. This is not singular, their cry being almost the same and their habits similar, and they are, it must be allowed, closely allied species.

According to Indian report, a great breeding-ground for the blue wavy is the country lying in the interior of the north-east point of Labrador, Cape Dudley Digges. Extensive swamps and impassable bogs prevail there; and the geese incubate on the more solid and the driest tufts dispersed over the morass, safe from the approach of man, or any other than a winged enemy. Neither fox nor wolverine can penetrate to them, nor pass over the deceitful quick bogs to disturb their quiet.

The whitefronted goose (*A. Gambelii*), called by some the laughing goose, is seldom seen in the southern part of Hudson's Bay. At York Factory they are less rare, but at Churchill frequent enough. I am disposed to believe that this goose is more an inhabitant of Central and Western America during the winter months than of the eastern board. Proceeding northwards, therefore, in the end of April and early part of May it comes upon the coast of Hudson's Bay towards

York Factory, and is scarcely seen in James's Bay. I have not been able to ascertain whether any detachments are met with on the Atlantic coast of Labrador. Do they not feed on the productions of dry downs and barren and rocky country, in preference to the swamp grasses and Algæ? On the Lower Columbia, and in Oregon or the Willamette Valley, they abound with other geese, sometimes in nearly equal proportions, and the snow goose still delighting to keep the sea coast, while the *A. Gambelii* and the gray geese take to the rivers and lakes of the interior. These are seldom frozen to the southward of latitude 45° , and very severe weather only requires from this kind of game in that quarter a slight removal of one or two degrees to the southward.

Of all the geese I have enumerated the blue wavy (*A. cærulescens*) appears to be the least known in the settled and civilized portions of North America. In May it frequents only James's Bay and the Eastmain of Labrador, and it is probably the case that its hatching-ground is on the north-west extremity of that peninsula, and the opposite and scarcely-known coast of Hudson's Straits. In the autumn their bands, increased six or sevenfold by the young, return by the same route, but where they winter is the query. I have not seen them on the Columbia nor on the north-west coast. Do they adopt the sea-board on a lower latitude? Are they to be found in winter retreat in Southern California and Mexico?

It is very difficult to form anything like an accurate idea of the numbers of the various species of geese that have just been passed under review. Of the quantity shot at particular points where they become an article of provision we may arrive at a wide but still a better estimate. Seventeen to twenty thousand geese are sometimes killed by the Albany Indians in the autumn or fall of the year, and ten thousand or more in the spring, making a total for these coast Crees alone of at least 30,000; not speaking so certainly of other natives, I would place the Moose Indians as killing, at all seasons, 10,000; Rupert's River natives, 8,000; Eastmain and to the north, including Esquimaux, 6,000; the Severn coast I cannot compute as yielding less than 10,000; the York Factory and Churchill Indians, with Esquimaux beyond, must dispose of 10,000; making a total of geese killed on the coast of 74,000.

As many geese must die wounded, and others are got hold of by the foxes and wolverines, we may safely allow the total loss to the flocks while running the fiery gauntlet as equivalent to 80,000. I was at one time inclined to believe that two-thirds of this number was, or might

be, the proportion for the autumn hunt, but it is probably nearer three-fourths, and we have thus 60,000, in round numbers, brought down from the newly-fledged flocks, as they pass southernward along the bay. I have lately been informed by an old and experienced hunter that he believes that for every goose that is killed above twenty must leave the bay without scath, as although there is sometimes destruction dire among some lots that approach the gun, and that feed in quarters frequented by hunters, yet innumerable families of them alight on remote and quiet feeding-ground, remain there unmolested, and take wing when the cold sets in, with their numbers intact. I must allow the correctness of this remark, and the deduction to be drawn from it is that 1,200,000 geese leave their breeding-grounds by the Hudson's Bay line of march for the genial south. Of the numbers to the westward along the arctic coast that wend their way to their winter quarters straight across the continent, we can form but a very vague opinion, but computing it at two-thirds or more of the quantity supposed to leave the eastern part of the arctic coast, we cannot have less than two millions of geese composing the numerous battalions which pass over the continent between the Atlantic and the Rocky Mountains, borne aloft generally like the scud, and as swiftly hastened on by the force of the boreal blast.

I ought to observe that the Brent geese (*Anser Brenta*) are not included in the above estimate. They are pretty numerous on the Atlantic coast, but are quite neglected by the Indians in general of Hudson's Bay.

Two small species of south-west habitat, the *Dendrocygna autumnalis* and *D. fulva*, never come north, so far as I know. I have never seen the first, but have shot one out of a pair of the latter on the banks of the Columbia, above Okanagan. This, I daresay, is usually its limit to the north, and I believe it has never been seen to the eastward of the great stony ridge. Neither of these elegant little geese ever visit Hudson's Bay.

*The Nest and Eggs of the Bohemian Waxwing.**

THE first intimation I received from Mr. Wolley that the discovery was accomplished was contained in a letter written by him on his

* Extracted from a paper in the 'Ibis' for January, 1861, intituled "Particulars of Mr. J. Wolley's Discovery of the Breeding of the Waxwing (*Ampelis garrulus*), Linn.), by Alfred Newton, M.A., F.L.S.," and kindly communicated by the author.

way up the Baltic, and dated the 2nd of September, 1856. He says, "Let me tell you now, whilst I think of it, that I have some reason for believing that the waxwing makes its nest in good-sized fir-trees in the month of June. I give you this hint in case I should not live to give you more certain information; but you remember that I am not to return home without a waxwing's nest in my hand."*

His next letter is dated "Muoniovora, Sept. 14, 1856," and after describing his own doings and those of the friends I had made the preceding year, telling me of the expected scarcity of food, and giving the general results of the nesting season, goes on to say:—

"I have still to tell you of Ludwig's expedition with Piko Heiki to Sordio, on the Kittila River. It was early in June, and he had to wade over Pallas-tunturi up to his middle in snow. Arrived at Sordio, he found the lads there all at home, deep in dirt and laziness. He soon extracted from them the information that a pair of birds had been seen about, which they took to be 'Tuka rastas;' and Ludwig himself had seen such a bird, and this bird's egg was entered in my list. * * * Ludwig immediately started off into the forest, and sure enough he saw a bird which he thought was 'Sidensvans;' but he was not quite sure, for the end of its tail looked white in the sun instead of yellow, as in your picture;† but the next day, or in the evening, it was cloudy, and Ludwig saw the yellow; and now he had no longer any doubt. He said he would give all the lads day-money, and they must all search, even if it were for a week, till they found the nest. They sought all that night and the next day till about mid-day, [when] a lad called out that he had found the nest; and there it was, with two eggs, about nine feet high, on the branch of a spruce. * * * After five days Ludwig snared the old bird—a beautiful cock; and you may fancy with what pleasure I took it in my hand, and saw that there were no doubts remaining. Indeed, I had before been pretty confident about it: Ludwig had written that I might be quite satisfied that it was the right bird. Martin Pekka had the picture with him at Sodankyla, and as soon as he came back Ludwig compared the bird with it, and made certainty doubly sure. The other

* The division of the paragraphs indicates the omission of portions of the original: I thought it better to leave the paragraphs somewhat unconnected than to supply the thread of the narrative by any additions of my own.—*E. N.*

† This picture was one of several coloured sketches of different birds sent to Mr. Wolley by Mr. Hewitson and myself, to assist him in making known his wants to the natives.

picture went to Gellivara. * * * I do not expect waxwings in that quarter. You can fancy how eagerly I waited for Ludwig to produce the eggs. With a trembling hand he brought them out: but first the nest, beautifully preserved; it is made principally of black 'tree-hair' (lichen), with dried spruce twigs outside, partially lined with a little sheep's grass and one or two feathers,—a large deep nest. The eggs—beautiful!—magnificent!!—just the character of the American bird. An indescribable glow of colour about them! Ludwig had made for them such a box, that even if a horse trod upon it it would not break. * * * The next incident was the arrival of Niku, with a couple of young birds scarcely able to fly, which he had caught, as he said, out of a brood of five, by Pallas-tunturi. One of these Ludwig had stuffed, and a rare little beauty it is; the other was much knocked about, and Ludwig made nothing of it. Then a little girl, just ten days ago, brought three eggs from the other side of Nälima (about twenty-five miles from here), which she said were taken on a certain day in July, and were 'Kukhainen.' They were undoubted waxwing, but are very badly blown by her, as they were just hatching. At mid-summer Sordio Michel brought in a small batch of 'Sidensvans,' with the birds (four in number) to each nest. So now I have a series, though but a very short one, of this *rara avis in terris*—this forerunner of famine, and of infinite value when one thinks of the uncertainty of getting it again."

In all, Mr. Wolley obtained twenty-nine eggs of the waxwing in 1856. Later on in the autumn an intelligent Lapp informed him that he remembered having seen a bird some twenty years before, and once or twice since had seen or heard another, but that was perhaps ten years previously. On the other hand, in 1856, he had seen them some half-dozen times, and found a nest, from which, however, the young ones flew. This nest he subsequently brought very carefully, with the branch on which it was built, to Mr. Wolley, by whom it was sent the following year, by the hands of Dr. Edwin Nylander, to the museum of the University of Helsingfors. The Lapp added that in the spring he had observed of the birds that "they flew up in the air, and came and sat in the same spot whence they had flown—he thought in play; but perhaps they were catching insects," as Mr. Wolley himself suggested.

In 1857 it seems that the waxwing was still more rarely distributed in Lapland than it had been the preceding year. Mr. Wolley was of course exceedingly desirous of taking a nest with his own hands, and

for this purpose devoted to the search much of his time before crossing the district hitherto unexplored by him between the Muonio valley and the head-waters of the Tana. In this object he was only partially successful. He writes, "For myself I could not, in spite of every exertion, get a living waxwing within range of my pair of eyes. I took a nest which had been deserted a day or two before, and from which something had thrown the eggs, one after another, upon the ground as fast as they were laid; of course, broken to bits. It was close to the house of Sardo. In vain I wandered through the woods, and scarcely shut my eyes at night. Many people were on the look-out; but, after the nest of three eggs I told you of from Jerisjärvi, the only arrival has been a perfect nest of five eggs found by Piko Heiki, whom I desired to give up everything else, and work all the mountain-district for waxwing." The nest thus taken by Mr. Wolley, and which I intend to retain in my possession, as being the only one taken by him, bears date "16th June, 1857." It was built in a spruce, and agrees in most respects with those previously seen and described by him. The eight eggs just mentioned were the only ones obtained by him that year."

The summer of 1858, when Mr. Wolley was with me in Iceland, was "a great year for waxwings." Not far from a hundred and fifty nests were found by persons in his employment in Lapland, and some of them close to Muoniovara. It seems, as nearly as I have been able to ascertain, that no less than six hundred and sixty-six eggs were collected; and more than twenty more were obtained by Herr Keitel of Berlin, who happened, without I believe any expectation of the luck that was in store for him, to be that year on the Muonio River. A detailed account of Herr Keitel's success appeared some months after in the 'Naumannia,'* from the pen of its editor, and the specimens of the eggs figured in that magazine were obtained through him. It is unnecessary for me to go into details respecting the magnificent series of eggs which Mr. Wolley was thus enabled to add to his cabinet. The nests were built mostly in spruce and Scotch-fir trees (*Pinus abies* and *P. sylvestris*)—chiefly, I think, the former. The usual complement of eggs is certainly five; but six not uncommonly, and seven and four occasionally, were found. The second week of June seems to be the general time for the birds to have eggs; but

* 'Naumannia,' 1858, p. 498, pl. 1, figs. 5—8.

there are some which must have been laid in the last days of May, and others (perhaps second broods) a month later.*

This same year (1858) saw an Englishman, however, accomplish what Mr. Wolley only partially succeeded in doing. The interesting account of an independent discovery of the breeding of the waxwing, with which the kindness of Mr. H. E. Dresser has furnished me, will, I am sure, be read with pleasure, and I leave that gentleman to narrate his exploit in his own language:—

“In 1858 I was a short time in Uleaborg, while on my way from Stockholm *viâ* Tornea to St. Petersburg, and having a little time on my hands I spent it in company with Mr. John Granberg, of Uleaborg, collecting in the neighbourhood of the town. We intended to pass a day or two amongst the small islands near the harbour, and determined to visit one called Sandön, about four Swedish (twenty-seven English) miles from Uleaborg.

“We (that is, Granberg, a student by name Heikel, and myself) left the town on the evening of the 3rd of July, in a little boat, and sailed to Warjakka, an island outside the harbour, where we provisioned for our trip. We then started for Sandön; but, there being but little wind, did not arrive off the island until about two o'clock in the morning. We grounded at some distance outside, and all three stripped for a swim, to find some deeper water; but, not being able to get the boat much nearer, we made her fast and carried our traps on shore, getting almost devoured by mosquitoes in so doing. We had heard that there was a rough log-hut somewhere on the island, built by the Karlö peasants, who come annually to take away the marsh-grass, and accordingly set off in search of it. We were crossing a small open place when we started a bird, which Granberg, who was on first, said was a waxwing (*Ampelis garrulus*), and having my gun loaded with dust-shot, I followed it up and succeeded in shooting it. It proved to be an adult female, and had evidently been incubating. We searched all the bushes and trees near, in hopes of finding a nest, but without any success; and as the mosquitoes were very troublesome, we determined to find the hut, take a nap, and continue the search afterwards. We soon did find it, and after smoking out the mosquitoes and stopping up the smoke-hole, turned in on some marsh-grass, and did not awake until pretty late in the day. After

* The American species would seem sometimes to breed much later in the season. Dr. Brewer told me at Boston, August 31st, 1857, that on the preceding day he had seen a cedar-bird's nest, with eggs still unhatched.

breakfast we separated to explore the island; and Heikel and myself, meeting soon after on the opposite side, went on in company, but had no success, only finding a few small birds. * * *

“We had quite given up all hope of finding the waxwing’s nest, when, as I was crossing a little barren to join Heikel, I saw, in a small pine tree close to where he was standing, a nest with several young ones in it sitting bolt upright, just as grebes sit. Going nearer, I instantly knew them to be waxwings. We threw off our game-bags, and, while he stood below, I climbed up to the nest, which was in the fork between the main stem and the first branch, and not above nine or ten feet from the ground. The moment I touched it, the young ones (five in number) flew out. I jumped down, made a cut at the largest with my cap, and secured him; but Heikel did not get one. Directly the young one which I had caught began to cry out, several waxwings flew from the neighbouring thicket, all however keeping out of gunshot except two, which came close round me, and both of which I shot. I then sat down and imitated, as well as I could, the call of the old birds. I was soon rewarded for my trouble by a young one coming out of a blueberry bush close by and calling lustily. Heikel and I gave chase and secured him. Granberg, who had heard my two shots, then coming up, we commenced a diligent search for the other three young ones, but had to give it up as hopeless, owing to the thickness of the under-scrub. I then climbed up again and took the nest away carefully, so as to preserve the shape, and to my great delight found one egg in it. We hunted for several hours in the higher part of the island for another nest; but, although we saw about nine old birds, we did not succeed in finding another nest. We did not shoot any more, hoping to find nests there at some future period.

“We returned to Uleaborg the same evening, when I skinned my birds. We ought to have made an equal division of the spoil, but neither Granberg nor Heikel would hear of any division; consequently I have still two old birds and two young ones, besides the nest and egg, in my possession. I regret to say I did not look to see what the young birds had been fed upon; but when I took the nest I found one or two of last year’s dried cranberries in it.”

In 1859 the waxwing bred, but in no great numbers, in the Muonioniska and Kittila districts. Though much sought for, not more than forty-six eggs were obtained by Mr. Wolley’s collectors.

During the past summer it seems to have been rather more numerous.

I am told of fifty-two eggs having been collected for me by the agents of my late friend, whom I keep in my own employment, but these specimens have not hitherto arrived. Early in the present year, Mons. C. F. Dubois described and figured the egg of the waxwing in the 'Revue et Magasin de Zoologie,'* but without stating whether his example had been obtained from Mr. Wolley, or derived through another source. M. Dubois states that its egg "ressemble beaucoup à celui du *Coccothraustes vulgaris* et du *Lanius ruficeps*; il peut facilement être confondu avec les œufs de ces derniers." In this latter assertion I do not agree with him. Out of the several hundred specimens which form the series I possess, there is not one, I think, which could be taken for that of either the hawfinch or woodchat shrike, though I freely admit there is a likeness to the eggs of both. †

Occurrence of the Peregrine Falcon in Cambridgeshire.—I have just seen a male peregrine falcon, in its second year's plumage, which fell to the gun of Mr. J. Johnson, of Wicken Hall, Cambridgeshire, at which place it was shot on Monday, November 11th, 1861. The markings upon its breast are particularly bright for an immature bird, calling to one's mind, at first sight, that of the hobby: the ash-gray of the adult is becoming distinctly visible upon the back and tail. The visits of the peregrine falcon to this county are at very uncertain periods, and always limited to not more than two or three in the same year. Upon reference to my note-book I find it is seven years since the last capture, so that with us this bird must be considered a rare visitant.—*S. P. Saville; Dover House, Cambridge.*

Capture of the Merlin in Cambridgeshire.—Like the peregrine falcon, with us the merlin cannot but be termed a rare bird. I am indebted to Mr. T. Wells, of Foulbourn, for the present of a pretty little male merlin, which that gentleman shot at Foulbourn, in this county, on the 7th of November, 1861. This little fellow was, and had been, paying his respects to a number of larks,^u t which it was hawking when shot. It is a bird of the year.—*Id.*

Note on the Merlin.—Two pairs of the merlin, and no more than two, usually appear each spring to breed on our moors. What is remarkable, each successive year sees the several pairs occupying the same limited district of the moor for their several

* 'Revue et Magasin de Zoologie,' Février, 1860, p. 64, pl. 2, fig. 4 (miscalled on plate "*Bombycilla cærulea*").

† Since the above was in type I have seen No. 1, for 1860, of the 'Bulletin de la Société Impériale des Naturalistes de Moscou,' which contains an interesting notice by Prof. Alex. v. Nordmann of the Birds of Finland, as observed by his son Arthur. It is therein mentioned (page 21) that the Helsingfors Museum contains five nests, with eggs, of the waxwing, and that "*Studiosus Malmgren*" had brought its young from Kajana.

nests, and that although each of the four birds of the preceding year has been shot or otherwise destroyed. What is almost as remarkable, the spring of the present year saw no merlin on our moors at all. Both the breeding-places were quite tenantless.—*J. C. Atkinson ; Danby, Grosmont, York, December 12, 1861.*

Shorteared Owl and Roughlegged Buzzard near Bishop Stortford.—I beg to forward a note of two birds found on the estate of Mr. J. A. Houblon, and killed by one of the keepers, G. Lambert :—November 12th, a shorteared owl, in the stubble ; November 18th, a roughlegged buzzard, which had been seen at times for a fortnight, but managed to escape the vigilance of the keepers until Monday last, when it was shot in Hatfield Forest : it measured 4 feet 4 inches from tip to tip, and 18 inches from beak to tail.—*T. Brunton ; Hallingbury Place, November 21, 1861.*

Note on the Food of the Kestrel.—My notice was drawn, a few minutes since, to Mr. Saxby's "Notes on the Food of Birds" (Zool. 7809), and in reference to the food of the kestrel I would willingly place on record a fact or two which have recently come to my knowledge, and which are inconsistent with all my former observations. I had held, on the presumption afforded by these observations, that the kestrel does not attack game, unless indeed a very "weak and infirm" and "unprotected" chick should present an utterly overpowering temptation. Stating my opinion, last spring, to a bird-loving and observing gentleman, he told me I was mistaken, for that such and such facts—the death of nearly-grown young partridges and the like, occurring within his own knowledge—were clearly against me. Later in the year I was talking to the "watcher" about his experience in hawk-slaughter this year, and I added my doubts as to the expediency of killing kestrels. "But, sir," he said, "they kill a vast of game." "Oh, no! surely not much: they are not strong enough or big enough." "Well, sir, I don't know how that may be; but I shot t' cock bird iv a nest i' t' crag, and he had t' fore-quarters iv a fine young moor bird in his claws; and what's more, I brought it home with me."—*J. C. Atkinson ; Danby, Grosmont, York.*

Scops Eared Owl (Strix Scops) in Norfolk.—On the 27th of November an adult male of this pretty little owl was picked up dead near the lighthouse at Cromer, against which it had apparently flown with great force, attracted by the glare of the lamps. The head exhibited no marks of injury, and the plumage was perfect, but the flesh on the breast and the point of one wing showed symptoms of having sustained a severe blow. The stomach contained a mass of fur, about the size of a walnut, amongst which was discernible an almost perfect skeleton of a mouse, together with the heads and forceps of several earwigs, and three stout caterpillars nearly an inch in length. This rare species has previously occurred in this county in three or four authentic instances, but not of late years. The present specimen is now in the collection of J. H. Gurney, Esq., M.P., of Catton Hall.—*H. Stevenson ; Norwich, December 7, 1861.*

Parrot Crossbill at Cheltenham.—This bird, the occurrence of which I noticed three years since in the pages of the 'Naturalist,' has again made its appearance in the neighbourhood of Cheltenham. Nathaniel Skelton, bird-preserver of that place, writes me word that he has taken three examples this autumn.—*W. V. Guise ; Elmore Court, December 2, 1861.*

Sand Martins' Nests in the Walls of an Old Priory.—A circumstance which I remember in connexion with Godstow is the fact that a colony of sand martins had—and probably still have—their nests in holes of the wall of the Old Priory, many of them entering from within the building, which of course is roofless. This is the only

instance in which I have seen them frequenting a building. House martins, on the other hand, I have more than once found breeding at a distance from any human habitation, *e. g.*, on the chalk cliffs of the coast at Ramsgate and in a large stone quarry on the moor between Kirkby-in-Cleveland and Bilsdale.—*J. Dalton; Church Broughton.*

White Variety of the Blackheaded Bunting.—This unique albino was shot on Burwell Fen, in this county (Cambridgeshire), on the 3rd of October, 1861. It has passed from the hands of the man who shot it to those of Mr. F. Barlow, of Cambridge, in whose museum it forms a decided ornament. Its entire plumage is of an uniform white, with the slight exception of a few minute dashes of black, almost imperceptible unless closely inspected. The second quill in the tail is of the ordinary colour. Eyes light hazel; upper and lower mandibles light flesh-colour; tarsi, feet and toes whitish flesh-colour. I think I am not erring when I state that it is at least a decidedly rare occurrence to come across a variety in any form of the blackheaded species.—*S. P. Saville; Dover House, Cambridge.*

Occurrence of Shore Larks, Little Auks, Gray Phalarope, &c., in Norfolk.—During the last ten days three specimens of the shore lark have been killed on different parts of the coast, whilst hitherto only three other examples are known to have visited this county—one at Sherringham, in 1830; one at Yarmouth, in 1850; and one at Holkham, in 1855. Of these recent specimens the first was killed at Yarmouth, on the 7th of this month; the second at Sherringham, on the 9th; and the 3rd near Yarmouth, on the 12th. All three proved on dissection to be males, and are apparently adult birds in a state of change between the summer and winter plumage. The bands of black and yellow on the throat are very bright, more especially in the one from Sherringham, which has also a richer vinous tint on the wings, but in each the band on the crown of the head is but slightly traceable. As usual after such sudden and violent storms as have recently prevailed, many specimens of that irregular and probably most unwilling visitant to our shores, the little auk, have occurred in various parts of the county, in some instances driven far inland by the force of the gales. On Monday, the 12th, after the high wind of the previous night, one was shot near Yarmouth, one at Hevingham, another at Scotton, and a fourth in the river at Eaton, about a mile from this city, and upwards of twenty miles from the sea. I have since heard of one or two others which appeared about a fortnight previous, and this morning (Nov. 20th) I received two more from Salthouse, a village on the coast, probably killed yesterday, and was shown a third picked up near Norwich. All these birds exhibit more or less distinct traces of the black band on the throat peculiar to their summer plumage. A fine gray phalarope, in part change to winter plumage, was also sent me from Salthouse on the 9th, and an equally good specimen was killed in this county about the 17th. During the last two or three weeks an unusual number of great spotted woodpeckers have been killed in various parts of the county, and for the most part near the coast. One birdstuffer in Norwich has had six or seven, all young, from different localities; another man has had four, two old and two young birds. There can be but little doubt that these are migratory specimens from the north, though more numerous at the present time than in most seasons.—*H. Stevenson.*

Cuckoo's Egg in Reed Warbler's Nest.—The mention of cuckoos' eggs having been found in reed warblers' nests (Zool. 7818), reminds me that, in the spring of 1854, I saw two nests of the latter bird by the side of the river Isis above Godstow, each of which contained a cuckoo's egg in addition to its own. These nests were suspended in a large bed of nettles, and were within ten yards of each other. Both the cuckoo's

eggs being unusually light-coloured, and exactly resembling each other, I conclude that they were laid by one bird. The stalks of the nettles were so slight as to render the manner in which the cuckoo's eggs had been placed in the nests a curious subject of speculation. It would appear, however, that the process is not attended with much difficulty, for had the parent birds in question preferred the nests of the sedge warbler they would have found abundance of them in the same locality, and these nests being placed on or close above the ground would have been easily accessible. I may mention that the reed warbler was very plentiful in the gardens of Worcester College, Oxford, where numerous nests were to be seen every year. These were built in various situations, but always resembled each other. I have seen them in the thorn hedge which divides the canal from the gardens, and lilac, *Seringa*, *arbor-vitæ*, box and laurel bushes were also selected.—*James Dalton ; Church Broughton.*

Gathering of Magpies.—I see in the 'Zoologist' for December (Zool. 7817) one of your correspondents writes respecting magpies, he having seen a flock of twenty, and asks, "Is this a common occurrence?" I should say of very rare occurrence indeed, at least in this neighbourhood, although a few years ago, one fine sunny afternoon in October, I saw fifteen on the wing together: they rose in a very scattered manner from a stubble field on Throckley Fell, which is about four miles from this place. This is the greatest number I ever saw together: they assembled on the tops of two trees near at hand.—*Thomas Thompson ; Wintaton, December 7, 1861.*

Gathering of Magpies.—Mrs. Battersby expresses surprise (Zool. 7817) at having seen an extraordinary gathering of magpies, some twenty or more, about 5 P. M., on the 29th of October, and asks whether such gathering is a common occurrence? I believe it is the usual habit of the magpie to congregate in flocks previously to their going to roost. I speak particularly of what I see take place in this parish, where I have repeatedly observed these birds to congregate about dusk in much greater numbers than flocks of twenty, previously to their coming into the woods to roost, on which occasions they are frequently and readily shot by persons who secrete themselves for that purpose under the trees the birds are about to occupy. I have often heard my late old woodman quote a saying of his father, who in his day was a woodman also, that "it was time to leave off work when the magpies come into the wood," *i. e.*, about dusk, which, as regards the hour of day, would very well correspond with Mrs. Battersby's 5 P. M., on the 29th of October. I well recollect to have once observed a really very extraordinary gathering of magpies, not for the purpose of going to roost, for it was in the morning before 11 o'clock. They occupied a considerable space in a high hedge and the trees therein, parallel to the turnpike road on which I was riding, and not more than fifty or sixty yards from it. Any attempt to count the birds would have been quite hopeless, but I speak well within compass when I say there must have been many hundreds. They kept hopping about and fluttering in the hedge, chattering in a very restless manner. What they might be about besides I cannot pretend to say. One might have thought it was the general assembly of all the magpies throughout the country convened on some special and important business. I speak of what I witnessed more than fifty years ago, but the fact is as vividly impressed on my memory as if it had happened only yesterday, and I can still point out the exact spot where it took place. I never saw the like before or since.—*W. T. Bree ; Allesley Rectory, December 11, 1861.*

Great Spotted Woodpecker and Little Gull on the Norfolk Coast.—Since I sent off my notice about Norfolk rarities I have heard of more arrivals on the coast of great

spotted woodpeckers. These occurred about the same time as those I have named—three at Wells, six at Lynn, and three at Wisbeach. A little gull (immature) was also shot at Lynn last week, and a Temminck's stint near Yarmouth.—*H. Stevenson ; Norwich.*

Great Spotted Woodpecker, Little Auk and Crossbills in the Isle of Wight.—A fine male specimen of the spotted woodpecker was shot on Headon Hill, on the 8th of October: this is the second specimen that has been shot at Freshwater: the bird is only an occasional visitor with us. Two specimens of the little auk were also shot at Freshwater Bay, one by myself, the other by Mr. T. Murrow, of the Royal Albion Hotel. Several flocks of crossbills have been seen here within the last week, but I have not been fortunate enough to obtain a specimen yet.—*H. Rogers ; Isle of Wight.*

Greater Spotted Woodpecker in Cambridgeshire.—This species has been unusually numerous this autumn, more particularly birds of the year. I should be glad to learn if this has been the case in any other neighbourhood.—*S. P. Saville ; Dover House, Cambridge.*

Note on the possible Existence of a huge Bird allied to the Moa.—The following extract from the 'Nelson Examiner,' of June 12, 1861, will afford ground for much speculation on the possible existence of one of those gigantic birds of the southern hemisphere which all authorities have agreed in supposing to be extinct:—"About three weeks ago, while Mr. Brunner, chief surveyor of the province, and Mr. Maling, of the Survey Department, accompanied by a native, were engaged in surveying on the ranges between the Riwaka and Takaka valleys, they observed, one morning, on going to their work, the footprints of what appeared to be a large bird, whose tracks they followed for a short distance, but lost them at length among rocks and scrub. The size of the footprints, which were well defined wherever the ground was soft, was fourteen inches in length, with a spread of eleven inches at the points of the three toes. The footprints were about thirty inches apart. On examining the bones of the foot of a moa in the Museum, we find the toe to measure, without integuments, eight inches and a half, and these evidently form part of a skeleton of a very large bird: the length of the impression of the toe of the bird in question was ten inches. The native who was in company with Messrs. Brunner and Maling was utterly at a loss to conjecture what bird could have made such a footprint, as he had never seen anything of the kind before. On a subsequent morning similar marks were again seen, and, as a proof that they had been made during the night, it was observed that some of them covered the footprints of those the party made the preceding evening. The size of these footprints, and the great stride of the supposed bird, has led to a belief that a solitary moa may yet be in existence. The district is full of limestone caves of the same character as those in which such a quantity of moa bones were found, about two years ago, in the neighbouring district of Aorere. We believe it is the intention of the Government to take steps to ascertain the character of this gigantic bird, whether moa or not, which keeps watch in these solitudes." A tale has found some currency that huge apes have been seen in the interior of Australia, but this seems very apocryphal.—*Edward Newman.*

The Goosander and Spotted Rail in Leicestershire.—As ornithological events are unusual in Leicestershire, it may be worth while to record the goosander and the spotted rail, both of which were shot in this neighbourhood. The former, a very fine female, I shot as it was passing over my head by itself, near this place (Kibworth), on November 18th, during a hard frost. The spotted rail was killed a short distance

from here, by my friend the Rev. A. Matthews, on the 9th of November.—*A. H. Hildebrand; Kibworth, Market Harborough.*

Note on the Goosander.—On Friday, the 6th of December, I walked along our "Beck" for some distance, for the chance of meeting with a duck or two. At a point not far distant from Viscount Downe's "shooting-box," Danby Lodge, I came quietly upon the bank of the river at a point at which I could command a sight of the water in both directions, at the same instant that I became visible myself to any occupant of the surface. As it happened, immediately below the small bush on the bank, which was immediately below me, was a "dun diver" who did not see me before I saw her. On catching sight of me, already as still as if a statue and not a man, she swam out into the stream quite deliberately, and moved on and on, down with the current, watching me as she went. Fearful she would dive if I moved hand or foot, I remained perfectly motionless until, at last, about fifteen to eighteen or twenty yards from me, she took wing; and then I shot her. On taking her from the water a good deal of coagulated blood issued from the throat, but nothing else. About an hour after, on removing her from my pocket, I felt some large substance in the gullet, and on extracting it it proved to be a trout of from 7 to 8 inches in length, which had been swallowed tail first,—at least it came up head first, and the last inch and half of the tail and body had a bend in it,—and which I believe had been taken the very instant previous to my appearance on the bank.—*J. C. Atkinson.*

Little Auk [at $\frac{1}{2}$ *Sudbury.*—A little auk was brought to me this morning alive, having been picked up yesterday, in an exhausted state, about a mile from this town; probably it had been driven so far inland by the late severe storms. The bird has died in the course of the day, for want no doubt of its proper maine food, but is in good plumage for preserving.—*S. King; Sudbury, November 18, 1861.*

Occurrence of the Iceland Gull and Rednecked Grebe at Plymouth.—On the 27th of November, when walking through Plymouth after dark, my attention was attracted to some boys swinging about something, which, on nearer inspection, proved to be a gull, and which I immediately recognised to be an immature specimen of the Iceland or lesser whitewinged gull (*Larus leucopterus*). I, of course, at once secured it, and it is now in the hands of the birdstuffer. In October last a specimen of the red-necked grebe (*Podiceps rubricollis*) was obtained in the neighbourhood of Plymouth: of late years this species has become very rare.—*John Gatcombe; Wyndham Place, Plymouth, December 16, 1861.*

Chit-chat, chiefly Ornithological, from the Isle of Man.—The mole, the toad, the viper and the snake are unknown here, thanks to a pop visit from St. Patrick. Weasels are common, and hedgehogs abound now throughout the island, though quite a recent introduction, and, in spite of an increasing persecution waged against them by the natives, under the strange idea that poor piggie is "veminous!" The noble peregrine still breeds on Manghold Head, and even nearer home (I know one of his nurseries full well), as he did centuries ago, when a cast of hawks "from Ramsey Bay, in the Isle of Man," was reckoned no mean gift; witness Sir Walter in 'The Betrothed.' The raven, too, is far from scarce, and pert "mag" is everywhere. The song thrush and blackbird are abundant indeed, but the former almost entirely deserts us in winter, in company with the skylark; the blackbird remains lingering wistfully over the last of his darling blackberries, and consequently, in a severe winter like the last, endures such hunger-pains as force him, in spite of his innate misanthropy, to have recourse to the crumbs strewn for poor robin on our window-

sills, whither his coming is presently made known throughout the house by the noisy strokes of his beak against the woodwork,—aye, and against the glass itself,—if his presence and his wants are inadvertently overlooked too long. Rock-pigeons haunt many of the caves around our coast; and the sweet “cushat” is “at home” wherever she can find trees enough to shelter her. The grouse has but recently become extinct on our hills, where the plover and the curlew still find some security in their comparative insignificance. The heron, here miscalled the crane, is a regular visitor. The little jack snipe is not nearly so common as is its larger brother. Woodcocks abound in a hard winter: they know full well how short and slight our frosts are, and never fail to remember “something” so much “to their advantage,” the cunning long-bills! about the shortest day of last year it was no uncommon thing for a single gun to bag from six to ten couple. But decidedly the most prominent members of the ornithological *beau monde* here are the cuckoo and corn-crake, companions in arrival (they announced themselves respectively May 4th and 5th this year), they are mates both in song and in silence: “in song,” I repeat, for songsters they both are right pleasant to my ear: how merrily their calls ring over our treeless hill-sides here all day, and all night too, where the “no real night” of the almanacs is a patent reality! The cuckoo may perhaps snatch a couple of hours’ “snooze,” but let the midnight hours be only calm and mild, and the corn-crake never closes an eye in sleep: the cuckoo loiters longest with us, haunting the sand-hills of the north far into the autumn months.—*Hugh A. Stowell; Christ Church, Manghold, Isle of Man, December 12, 1861.*

The Heart surviving the Body, and the Body surviving the Heart.—Dr. Harley, in his introductory address at University College, made some observations on these extraordinary subjects which seem to have excited general interest. Having been applied to by a naturalist to explain more fully and more publicly his views, Dr. Harley has supplied the following particulars, from which it appears that both the phenomena are brought about through the agency of poisons:—“The two poisons to which I alluded in my address at University College, which enable the physiologist to produce the wonderful sight of a dead body with a living heart, as well as of a dead heart in a living body, are curiously enough the preparations of savages in the opposite hemispheres of our globe, and are employed by them for similar purposes, namely, the making of poisoned arrows and other weapons. One of the poisons, woorara, is prepared and employed by the natives of Guiana, and is so powerful that it requires but a very small quantity to penetrate a wound in order to produce a fatal result. At one time, indeed, it was said to be destructive not only to animal but even to vegetable life, and that if a poisoned arrow chanced to penetrate the bark of a tree the tree soon drooped and died. Although this is a gross exaggeration of its poisonous properties, it is nevertheless true that it requires but a very small quantity of woorara to take away the life of an animal. I have myself seen a dog killed in the short space of sixty seconds, with somewhat less than a grain of the poison introduced into a vein. Woorara possesses some properties entirely distinct from any poisonous agent, if we except conia, the preparation of which is known to civilized man; for, notwithstanding its virulence, the physiologist has it in his power to administer it so as to paralyse the motor nerves, and render the limbs flaccid as in death without destroying the intelligence of the animal. Its action on the heart I have already

alluded to, and I think that I cannot better explain the latter than by citing the following experiment:—A healthy and full-grown frog was pricked with the point of a poisoned arrow, and in the course of a few minutes its limbs gradually became paralysed. The paralysis soon extended itself over the body, the animal ceased to breathe, and in the course of a few minutes more was dead. On examining the heart about an hour afterwards, that organ however, and that organ alone, was found still alive. Death could not be said here to have usurped its power, for the heart slowly and regularly pulsated as in life. On the following day the heart still continued to beat, although the tissues surrounding it were already assuming the appearance of death. Forty-eight hours after the animal had been poisoned its heart still continued to act regularly, and even seventy-two hours after death the action of the ventricle and auricles, though feeble, was yet distinct. On the fourth day (ninety-six hours after death) part of the heart had died, the left auricle alone continued to pulsate; but now not only was the frog dead, but its lower limbs were already shrunk and withered. I now made an attempt at resuscitation, and exactly a hundred hours after the animal died I put it into a moist warm atmosphere, and there retained it till the temperature of its body was slightly raised. This treatment had the effect of restoring the irritability of the heart, and on touching the ventricle with the point of my pen it resumed its pulsations, and during several minutes the contractions, first of the auricles and then of the ventricle, continued rhythmically; even the pulsations in the large vessels attached to the heart became distinctly visible, and continued with regularity for upwards of a quarter of an hour. Here, then, the origin of my remark, that we can have a living heart in a dead body. I may here mention, however, that the woorara used in the above case was half a century old. It appears, therefore, that this poison retains its tonic properties for a great length of time. For some of the specimens of woorara now in my possession I am indebted to the kindness of the celebrated traveller and naturalist Charles Waterton, Esq., of Walton Hall, who brought them with him from South America in 1812, and, although they are consequently half a century old, they still exert their poisonous effects in a remarkable manner. In a MS. article by Sir R. Schomburgk, kindly lent to me by the author, I find several facts related in corroboration of this point. I ought to add, however, that the poison does lose some of its active properties by prolonged exposure to the air. Now, as regards the substance with which we can produce the strange sight of a dead heart in a living body, it is the Upas antiar, a poison prepared by the natives of Borneo, for the same purposes as woorara; but curiously enough the physiological actions of these two poisons on the animal body are the reverse of each other; for the primary effect of the antiar is to paralyse, and consequently totally to suspend, the rhythmical movements of the heart. The effect of the antiar is best seen on a cold-blooded animal, such as the frog. With a small piece of the poison introduced by a wound in the cuticle, it is very easy to exhibit the striking spectacle of a living animal leaping about with a perfectly dead heart; so that the story of a dead heart is not merely a stage fiction, but a scientific reality.”—*Field Newspaper*.

The Sea Serpent.—Thursday, December 10. Off Madeira, on board R.M.S. “Thames.” Made acquaintance with a Captain Christmas, of the Danish Navy, a proprietor in Santa Cruz, and holding some office about the Danish Court. He told me he once saw a sea serpent between Iceland and the Faroe Islands. He was lying in a gale of wind, in a frigate of which he had the command, when an immense shoal of porpoises rushed by the ship, as if pursued, and lo and behold a creature with a

neck moving like that of a swan, about the thickness of a man's waist, with a head like a horse, raised itself slowly and gracefully from the deep, and seeing the ship it immediately disappeared again, head foremost, like a duck diving. He saw it only for a few seconds; the part above water seemed about eighteen feet in length. He is a singularly intelligent man, and by no means one to allow his imagination to run away with him.—*Stephen Cave, M.P. for Shoreham; 35, Wilton Place, April 29, 1861; in a letter to Mr. Gosse.*

The Sea Serpent.—On a Sunday afternoon, in the middle of August, above a hundred persons, at that time in and about the hotel, were called on to observe an extraordinary appearance in the sea, at no great distance from the shore. Large shoals of small fish were rushing landwards in great commotion, leaping from the water, crowding on each other, and showing all the common symptoms of flight from the pursuit of some wicked enemy. I had already more than once remarked this appearance from the rocks, but in a minor degree; and on these occasions I could always distinguish the shark, whose ravages among the “manhaidens” was the cause of such alarm. But the particular case in question was far different from those. The pursuer of the fugitive shoals soon became visible; and that it was a huge marine monster, stretching to a length quite beyond the dimensions of an ordinary fish, was evident to all the observers. No one, in short, had any doubt as to its being the sea serpent, or one of the species to which the animal or animals so frequently before seen belonged. The distance at which this one was, for ten minutes or a quarter of an hour, visible, made it impossible to give a description of its apparent dimensions so accurate as to carry conviction to the sceptical. For us who witnessed it, it was enough to be convinced that the thing was a reality. But one of the spectators, Dr. Amos Binney, a gentleman of scientific attainments, drew up a minute account of it, which is deposited in the archives of one of the Philosophical Societies of Boston. I was and am quite satisfied that on this occasion I had a partial and indistinct but positive view of this celebrated nondescript; but had the least doubt rested on my mind it would have been entirely removed by the event of the day following the one just recorded. On that day, a little before noon, my wife was sitting, as was her wont, reading on the upper piazza of the hotel. She was alone. The gentlemen, including myself and my son, were, as usual, absent at Boston, and the ladies were scattered about in various directions. She was startled by a cry from the house of “The sea-serpent! the sea-serpent!” But this had been so frequent, by the way of joke, since the event of the preceding day, and was so like “The wolf! the wolf!” of the fable that it did not attract her particular attention for a moment or two, until she observed two women belonging to the family of the hotel keeper running along the piazza towards the corner nearest the sea, with wonder in their eyes, and the cry of “The serpent! the serpent! he is turning, he is turning!” spontaneously bursting from their lips. Then my wife did fix her looks in the direction they ran; and sure enough she saw, apparently quite close beyond the line formed by the rising ground above the rocks, a huge serpent, gliding gracefully through the waves, having evidently performed the action of turning round. In an instant it was in a straight line, moving rapidly on; and after coasting for a couple of minutes the north-west front of the hotel, and (as accurately as the astonished observer could calculate) looking as it stretched at full length about the length of the piazza,—that is to say, about ninety feet,—it sank quietly beneath the surface, and was seen no more. The person who was thus so lucky as to get this unobstructed view is one so little liable to be led

astray by any imaginary impulse that I may reckon on her statement with entirely as much confidence as if my own eyes had demonstrated its truth.—Grattan's 'Civilized America,' p. 39.

Ommastrephes todarus, Delle Chiaje. — The violent gales of wind which prevailed about the middle of last month (November) may very possibly, amongst other waifs and strays, have thrown ashore many denizens of the deep, whose presence might have been worthy of record, had there been 'any one to "make a note of it when found." The squid whose technical name stands at the head of this notice was found, by a fisherman, thrown ashore at Stifkey, on the Norfolk coast, and, being strange to the finders, was carried about the country and exhibited as a "queer fish." I made a careful sketch of the animal, the occurrence of which may be worthy of notice, as it does not appear to be a common form of cephalopod. Being pressed for time, I requested a servant to measure it, forgetting to instruct him to make a separate measurement of the body and arms. The entire length was 2 feet 4 inches, of which I should judge that the body, from the beak to the tail, could not have been less than 18 inches.—*W. V. Guise; Elmore Court, December 2, 1861.*

Additions to Forbes' 'Malacologia Monensis.'—Two small species of fresh-water shells which abound here may be worth recording in the pages of the 'Zoologist;' the one, *Ancylus fluviatilis*, Müll., solely on account of its being an addition to the list drawn up by the lamented Edward Forbes of the Mollusca of this his native isle, a synopsis of which will be found in Dr. Gray's edition of Turton (pp. 30 *et seq.*). It must surely have been omitted by mistake, since its absence from our clear stony rivulets would be more remarkable than is its presence. The other species, *Pisidium obtusale*, Pfeiff., is noteworthy not merely as a novelty to the Manx Fauna,—no species of the genus being included in Forbes' list,—but also as a scarce or at least local species in the South of England, and which, so far as I am aware, has not yet been detected in any locality so far north. *Clausilia bidens*, Müll., also omitted by Forbes, occurs on beeches at Ballaglass Glen in this parish.—*Hugh A. Stowell; Christ Church, Manghold, Isle of Man, December 12, 1861.*

Note on the Supposed British Specimen of Argynnis Aphrodite.—The proverb says "better late than never," so I am now going to point out an error into which you have inadvertently fallen so long ago as the date of your excellent 'Natural History of all the British Butterflies,' which I can truly say is worth ten times the money it costs; and I feel the more bound to do so, inasmuch as I have been the innocent cause of misleading you. Under the head of *Argynnis Aphrodite* (p. 18), after stating that it was described as British by me in Mag. Nat. Hist., you go on to say, "I had an opportunity of examining the very specimen described by Mr. Bree," &c., and that "the mode of setting and the pin were identical" with other specimens in your possession, taken by the late Edward Doubleday in North Carolina. Now this is altogether erroneous; for I beg to assure you that you never have seen the specimen described by me, and that the mode of setting and the pin are not foreign. The real fact is this. When the specimen came into my (*i. e.* my son's) possession, being ignorant of the names of foreign butterflies, and wishing to know the name of the one in question,

with a view to record the capture in Mag. Nat. Hist., I resolved to apply to you for assistance, but I did not like to run the risk of sending Mr. Walhouse's example on a journey, so I procured an avowedly foreign, and that a very miserable but unquestionably identical, specimen for that purpose, and this foreign specimen was the one you saw and not Mr. Walhouse's, the one described by me. I am a great stickler for exact truth in all matters relating to Natural History, and should your most useful article ever be reprinted I hope you will correct the mistake or at least omit the erroneous statement. I will not quarrel with you for excluding *A. Aphrodite* from the British list. The recorded capture of a single specimen of a North American insect in England is scarcely sufficient to establish its claim as British; and as to the fact of its having been taken in Ufton Wood, that is a point which does not rest on my shoulders, but solely on the authority of the Messrs. Walhouse.—*W. T. Bree; Allesley Rectory, December 12, 1861.*

[From this it would certainly appear that the actual specimen of *A. Aphrodite* submitted to me to name, and figured in the 'Magazine of Natural History,' was not taken in Great Britain at all, but was an "undoubtedly foreign one." I think this ought to have been specified at the time, because I now presume that no competent authority has pronounced on Mr. Walhouse's specimen, and consequently it falls to the ground as a specimen of *A. Aphrodite* at all. The 'History of Butterflies' has been reprinted with several valuable additions and corrections by Messrs. Doubleday and Bond.—*Edward Newman.*]

Occurrence of Glæa erythrocephala near Newark.—I captured a very fine example of *Cerastis erythrocephala* at sugar, on the 28th of October, in company with *S. satelitia*. Although I visited the same locality several previous and subsequent evenings I was not successful in meeting with more.—*W. P. Hatfield; Newark, December 21, 1861.*

Note on Pionea forficalis.—The larvæ of this common garden pest answer, if I mistake not, a query of Professor Westwood's, which appeared in the 'Entomologist's Weekly Intelligencer' (vol. i. p. 104), and ran as follows:—"Now that green peas are coming in, it will be useful to examine the pods of any which have a suspicious appearance, as they enclose the larva of a lepidopterous insect, which gnaws the pea inside. If any of your subscribers should be so fortunate (?) as to find this larva I should be very much obliged to them for a specimen, as well as for the name of the perfect insect." To this question there appeared no reply at the time, and probably most who read it concluded at once that it referred to an *Endopisa*. However, two years ago last spring my peas had the good fortune (?) to yield a large supply of these interesting creatures: from them I bred a host of *Pionea forficalis*, but having unfortunately forgotten the Professor's duplicate request I can now only supply the latter half of it.—*Hugh A. Stowell; Christ Church, Manghold, Isle of Man, December 12, 1861.*

Anthribus albinus and other Coleoptera at Folkstone.—I was fortunate enough to obtain a specimen of *Anthribus albinus* during my stay at Folkstone this year. It was found on some rotten stumps of trees in a field near Sugar-loaf Hill. The habits of this insect seem peculiar, and its extreme sensitiveness to touch is remarkable. From its strong resemblance to the colour of decayed wood it is difficult to find, and would be passed over by any but entomological eyes. The season just closed was certainly not favourable to insect life, and species common at Folkstone in former years were with difficulty to be met with. Among other more abundant species I obtained the

following:—*Pterostichus ruficollis*, *Stenolophus luridus*, *Ocyopus pedator*, *Aphodius porcus*, *Apion subulatum*, *A. vorax*, *A. Waltoni*, *A. flavimanum*, *A. difforme*, *Plinthus caliginosus*, *Orchestes pratensis*, *Psaridius picicornis*, *Rhinoncus subfasciatus*, *Cæliodes guttula*, *Chrysomela Banksii*, *C. varians* and *C. Graminis*.—*Horace Francis*; 38, *Bedford Place*, November 21, 1861.

Note on Hylurgus piniperda.—When on a visit in the neighbourhood of Swaffham, Norfolk, in the month of October last, I was informed that about two years ago great injury had been done to some young plantations of Scotch fir by the ravages of a small insect which mined the tender shoots of the plants. Upon examination evidence was not wanting that the mischief was still in progress, as here and there it was observable that the terminal shoots were bent downwards and looked sickly, or were altogether brown and withered. Upon examination a small round hole was perceptible, which being followed up showed the interior of the shoot entirely mined, and all the soft parts of the wood eaten away. At the end of the gallery thus formed the little excavators were for the most part found, which proved to be *Hylurgus piniperda*, *Linn.* Curtis gives an admirable figure of this insect, with a short account of its mode of working, accompanied by illustrations.—*W. V. Guise*; *Elmore Court*, December 2, 1861.

Capture of Euthia plicata of Gyllenhal in Britain.—During the month of September last we found in our garden, beneath a decaying bone, a beetle of small size, which we at once saw was new to our Coleopterological experience. Mr. F. Smith has kindly compared it with specimens of the *Euthia plicata* of Gyllenhal in the Continental collection at the British Museum, and both he and we are satisfied that it is identical with that species.—*D. & H. M. Moses*; *Stockwell*.

Capture of Stenolophus derelictus of Dawson on Wimbledon Common.—In August we had the good fortune to capture a specimen of this insect on Wimbledon Common, most probably on the same spot on which Messrs. Solomon found a specimen recorded in a previous number of the 'Zoologist'.—*Id.*

Capture of Helophorus intermedius of Mulsant near Dover.—We met with this species, a late addition to the British Fauna, by the side of a pond in the vicinity of Dover, during a short visit to that town.—*Id.*

Prolegs identical with Thoracic or True Legs.—In my description of the larva of *Cidaria dotata* (*Zool.* 7822) the term "prolegs" means the "six thoracic legs." I was under the impression that "prolegs" and "posterior legs" were well understood terms for the six anterior and four anal legs of the larvæ of the *Geometrina*.—*Percy C. Wormald*, 10, *Priory Road, Kilburn*, November 30, 1861.

[This is doubtless the proper application of the term, although the late lamented Mr. Kirby applied it to the claspers, and has been followed by Mr. Westwood in this unfortunate error. The term had better be discontinued, since it can never be used without an explanation.—*E. N.*]

Hymenoptera and Diptera desired.—I am now rearranging the British Hymenoptera and Diptera in the cabinets of the Entomological Club, with a view to rendering them more useful to my Thursday evening visitors; and I shall feel sincerely obliged to gentlemen who will contribute specimens of these unfashionable and much neglected insects: almost every entomologist takes them, but leaves them without any attempt at arrangement: the species of *Sirex*, *Cimbex*, *Allantus*, *Tabanus*, *Stratiomys* and *Anthrax* will be particularly acceptable.—*Edward Newman*; 9, *Devonshire Street, Bishopsgate, London, N.E.*

Life-Histories of Sawflies, Translated from the Dutch of M. Snellen Van Vollenhoven. By J. W. MAY, Esq.

(Continued from p. 7724.)

NEMATUS VALLATOR, *V. Voll.*

Larva and imago both undescribed.

Nematus niger, nitidus, antennis crassioribus, pedibus rufo-flavis, tibiis posterioribus dimidiato albis nigrisque.

The insect which I am now about to describe belongs undoubtedly to the genus *Nematus*, although possessing two peculiarities in the direction of the genus *Cladius*; thus the antennæ, especially in the male, are vertically incrassated, and the terminations of the joints form somewhat hook-shaped projections, as shown at fig. 5; on the other hand, the second recurrent nervure is not exactly received by the second submarginal cell, but, in the male, by the nervure between the second and third submarginal. *Nematus vallator* is, however, far more remarkable by its habits and economy than on account of any structural peculiarities, its habits being so singular that I have found nothing similar in the history of any other insect.

In the garden at the back of my house stands an Italian poplar which has been planted about ten years, and on one occasion, in the month of May, looking among the foliage in search of any insects which might be little known or entirely unknown to me, I was surprised to perceive some little white projecting points round the holes which had been eaten in the centre of some of the leaves; these projections appeared erected on the surface of the leaf. I could not at that moment detect any animal to which I could attribute this structure; but my curiosity was aroused, and I resolved to watch the tree in question. It was not long before I discovered the origin of the white plantation. I found in some of the holes in the leaves a number of little saw-fly larvæ with the palisades surrounding the holes; I placed these larvæ in a glass. The following day I found new erections on fresh leaves which I had put into the glass, and on taking another look at my poplar, in the evening, I saw two larvæ at work making this singular fortification.

When the palisade larva, if I may so call it, has selected a leaf which it intends to feed upon, it turns round so soon as it has got on to the leaf-stalk, and then, with its body on the leaf, and its head and two or three anterior segments on the leaf-stalk, it makes a sort of

chevaux de frise, consisting of ten or twelve little posts formed of dried secretion: beginning at the stalk, it emits a little of the secretion from the mouth, and raises its head to a certain height, whereupon the fluid immediately dries (see fig. 1, *f*). Under the microscope the palisades appear as if formed of dried bubbles or little bladders, and are highly iridescent, as I have endeavoured to represent in fig. 2. When the larva has covered the leaf-stalk, it turns round again, creeps further on to the leaf, and raises a whole row of similar little posts, placed quite close to each other, so that it is entirely surrounded by them (fig. 1, *c*). In the open space inside this rampart, it bites a hole in the leaf and begins to feed, as shown in fig. 1 *a*. When the hole becomes very large, the larva erects its fortification on both sides of the leaf. I have observed that in feeding it consumes its palisades, and I have once seen a larva first eat up its old defences, and immediately erect new ones enclosing a larger area.

With regard to the object of this singular operation, it can only, I think, be as a means of defence against the attack of apterous Hymenoptera, such as ants, or parasites of the genus *Pezomachus*. I have never seen any other insect on a leaf which was occupied by a larva of *Nematus vallator*.

This larva is in no wise remarkable either for form or colour. Like other *Nemati*, it has twenty legs, of which the anterior six are longer than the rest and provided with claws. The fourth and eleventh segments are apodal. The head round, but depressed anteriorly, pale green, with two brownish green stripes running obliquely across the vertex; trophi pale brown; the eyes seated in round black spots. The general colour of the body is pale green, clothed, as it were, with brownish granules, more particularly on the sides above the legs and round the spiracles. The legs are green, somewhat darker at the joints. The caterpillar appears never to stretch itself at full length, but is usually in the position shown at fig. 3. I have also never seen it elevate the abdomen in the air, as is continually done by some others of the genus, for example *N. septentrionalis*. The larva attains a length of 6 lines.

This species remains in the larval state about four weeks. Those larvæ which I had placed in glasses, for the purpose of rearing, hid themselves in the earth on the 26th and 27th of June. I had, however, already missed other larvæ from the tree, and these I must regard as full-grown; so that all the eggs were not laid in one week. On the 29th of June I observed another individual spin up in the folds of a withered leaf, from which it appears that they do not all

bury themselves in the ground for the purpose of passing the pupa state. The cocoon was pale yellow. The first imago appeared, with me, on the 5th of the following July, the rest following shortly afterwards. In the works on Hymenoptera to which I had access I was unable to find any description applicable to my insect; I was thus obliged to describe it as a new species, and the singular method of defence adopted by the larva readily supplied me with a specific name. This species is most nearly allied to *Nematus crassicornis*, *Hart.*, described by Hartig, at page 204, of his *Blatt und Holzwespen*, which insect also has broad, or, rather, deep antennæ, similar to those of *N. vallator*. The ground colour of this last is black, shining; head and thorax punctate, and thickly clothed with short brown hairs. The antennæ are vertically incrassated from the third joint, more especially in the male, and the terminations of the joints on the under side project like the teeth of a saw, as shown, although not sufficiently marked, at fig. 5. The antennæ are black; in those of the male insect a red tinge is observable on the outside. The compound eyes are rather large, spherical, black. Tegulæ white or reddish white. Legs yellowish red; femora darker; tarsi paler; the posterior legs have the tibiæ red for one-eighth of their length, counting from the base,—then half white and the remainder black; the posterior tarsi are pale gray. My imagos were somewhat longer than 3 lines (7 mm.), expanding to 6 lines (14 mm.)

The saw of the female is represented at fig. 6.

I have not as yet been able to learn anything respecting the eggs or manner of ovipositing. I have also failed in rearing any parasites from this species.

Note.—Since the above was written in the original, I have received a letter from the author, in which he says, “This larva has since been found on other poplars in Leyden, and also at Utrecht; with me it has appeared annually in considerable numbers.” He also informs me that the eggs of *Nematus vallator* are found inserted into the under side of the midrib of a leaf, two, three and four together; and that on the 20th of July, 1861, he found some larvæ just hatched, and at the same time he observed the marks left by the eggs.—*J. W. M.*

Notes on the Sea Anemones of the Mersey and Dee.—[Addressed by Dr. Cuthbert Collingwood to P. H. Gosse, Esq., and communicated by the latter.]

Plumose Anemone (*Actinoloba Dianthus*). The locality chosen by your correspondent is a strange one, “Liverpool, under the pontoons of the landing-stage.” It is possible it may have been found there, but no one would think of going there to look for it; but higher up the river, on the Dingle Rocks, they occur in abundance,—

nearly all pure white,—just under the ledges of the rocks at low-water mark. On the other side of the river, at the slip or pier to which the railway ferry-steamer plies, they are numerous, but here they are not only white, but often of a fine deep buff colour: this, moreover, is one of the dirtiest parts of the river, and they are seen sticking to the side of the slip, at and above low-water mark. The white variety is also rarely taken at New Brighton. In the Dee, however, both white and buff varieties of great size are met with on Hilbre Island, the only rocky part of the Dee Estuary,—not the “Mersey Estuary,” as at p. 23 (Act. Brit.), and again at p. 104.

Sagartia miniata. Tolerably abundant at Hilbre Island, where it fringes the under ledges of the rocks, just above low-water mark, in hanging festoons.

Sagartia Troglodytes. This is one of our most common species. I doubt if any are found at Birkenhead now; but lower down the river, at Egremont,—at the mouth of the river, off New Brighton,—and between the estuaries of the Mersey and Dee, at Leasowe,—they are numerous. I have never calculated how many of the α to χ varieties we possess, but they are not few, θ (*Aurora*) perhaps being the most frequently met with. The same may be said of the west side of Hilbre Island.

Sagartia viduata. This, next to *Actinia Mesembryanthemum*, is our rarest anemone, but may generally be found at Hilbre Island,—not, however, in the Mersey.

Actinia Mesembryanthemum. I consider it as not a little remarkable that this anemone should be so rare with us—perhaps more so than if it were altogether absent. Mr. Price once took one somewhere on our shore, and in 1854 several were taken at Hilbre; but, although a shore-hunter of some years' standing now, I have never found it, nor am I aware of any being found since I came to Liverpool. You remark (Act. Brit. p. 181), on the authority of Mr. E. L. Williams, that the Mersey estuary is the only place on our coast in which he has not taken this species, which he attributes to the foulness of the water. Now in this I cannot agree. If it were merely the foulness of the water, why should we find *Actinoloba Dianthus* in profusion, both opposite the landing-stage and higher up the river? Moreover, those delicate and beautiful animals, the nudibranchiate Mollusca, are in great numbers and variety all along the shore, and one would certainly imagine that foul water sufficient to offend the “Mes.” would altogether extinguish them. You go on to say, “In the neighbouring estuary of the Dee the former (Mes.) is common, as usual.” This, however, is a mistake. As I observed before, the estuary of the Dee offers but small space for such animals to flourish, and although the little rocky island of Hilbre is amazingly rich for its size (see ‘Annals,’ Sept. 1860), nevertheless the “Mes.” is not among its riches, its occurrence there being a rarity. In fact, points of geographical distribution, such as this, cannot be referred to any single condition, such as the foulness of the water, but are among the most obscure questions in Natural History, like the range of the nightingale in England. Why, too, should we have in the Mersey a *Dorid*, *Doris proxima* (and also in the Dee), which seems to occur nowhere else? and why should *Doris aspera*, its close ally, be absent here? Why should a little rock-pool at Hilbre Island be the only known habitat in the wide world for *Antiopa hyalina*? not once taken by chance, but three times at intervals of three or four years?

Tealia crassicornis. This, which, before the appearance of your book, we always called “coriacea,” is our abundant sea-anemone. New Brighton in the Mersey, and Hilbre Island, in the Dee, are the two great colonies of it, and here it attains a size and colouring which are truly magnificent. One cannot walk upon the rocks without

stepping upon them, when out flies a jet of water to the distance of several feet. When considering the abundance of this species I am the more struck by the absence of *Mesembryanthemum*, unless indeed that law which seems to obtain in some kingdoms of Nature should hold here, *viz.* that the stronger of two nearly allied species should prevail over the other, until it became dominant and absolutely excluded it.

The only other anemone we possess is *Sagartia sphyrodeta*, of which I have nothing to advance, save that it inhabits Hilbre Island in numbers which place it for frequency between *S. miniata* and *S. viduata*.

But anemones are not our strong point; indeed in species we are poor, possessing only seven out of seventy-five British species, or one-eleventh, while of *Nudibranchiata* we have twenty-eight out of one hundred, or more than one-fourth.—*C. C.*

Proceedings of Societies.

ENTOMOLOGICAL SOCIETY.

November 4, 1861.—J. W. DOUGLAS, Esq., President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—‘*Proceedings of the Royal Society*,’ Vol. xi.; presented by the Society. ‘*The Zoologist*’ for November; by the Editor. ‘*Notice of Blackwall’s Spiders of Great Britain and Ireland*’; ‘*On the recent Geologico-Archæological Researches in Denmark*’; by John Lubbock, Esq., F.R.S.; by the Author. ‘*Journal of the Proceedings of the Linnean Society*,’ Vol. xi. No. 21; by the Society. ‘*The Journal of the Society of Arts*’ for October; by the Society. ‘*The Athenæum*’ for September and October; by the Editor. ‘*The Entomologist’s Weekly Intelligencer*,’ Vol. x.; by H. T. Stainton, Esq. ‘*Catalogue Méthodique des Lépidoptères d’Europe pouvant être employé comme Etiquettes pour le Classement des Collections*’; by M. Deyrolle.

Election of a Member.

Signor Antonio de Lacerda, of Bahia, Brazil, was elected a Member of the Society.

Exhibitions.

Mr. Kirby exhibited a large number of North American *Lepidoptera*, and remarked on the close resemblance between many of the species and those found in Europe.

Mr. M^r Lachlan exhibited a female variety of *Colias Edusa*, destitute of the usual orange spots in the dark border of the wings.

Mr. Stevens exhibited a box of insects collected in Japan by Mr. Fortune, and observed it was the first collection from that country he had had the pleasure of exhibiting; it contained fine examples of the rare and singular *Damaster Blaptoides*, and numerous other interesting *Coleoptera*, as well as two apparently new species of *Papilio*.

Mr. Reading exhibited specimens of *Leucania putrescens* taken at Torquay by Mr. King, and some rare Lepidoptera from South Devon, including *Diasemia literalis*, *Heliothis peltigera*, &c.

Mr. Reading also exhibited varieties of *Pontia Napi*, *Colias Edusa* (*var. Helice*), and a singular variety of *Arcitia villica*, having the anterior wings entirely dark brown, the posterior pair being of the usual colour.

Dr. Knaggs exhibited a case of remarkable form, from Australia, believed to be that of a species of *Psyche*.

Mr. Miller exhibited some living larvæ of a species of *Incurvaria* found feeding on fallen leaves.

Mr. Adam White exhibited some insects, of various orders, collected by F. M. Rayner, Esq., Surgeon of H.M.S. 'Herald,' during its voyage of exploration in the South Seas. He especially noticed some from Aneiteum, New Hebrides, such as that interesting Longicorn, *Psalidocoptus scaber*. He showed other Longicorns from these islands, and the *Pyrrha Wollastoni*, from Lord Howe's Island, close to the genus *Deucalion* of Wollaston; *Elytruri*; Phasnidæ, such as *Eurycantha australis*, with its strange thickened hind femora and somewhat mole-cricket aspect, suggested ideas of analogy, now, since W. Sharpe Macleay had ceased to write, unfortunately little heeded by naturalists. Mr. White considered these ideas, if developed by their illustrious author in a republication of his works with annotations, as likely to prevent the dangerous theories of Lamarck and his pupil, Charles Darwin, from ever affecting, except in a sanatory way, "our little systems," which "have their day and cease to be." He said a few words on his good friend Mr. Rayner's admirable collections of Crustacea, and expressed a hope that the Government would grant a sufficient sum to publish the valuable 'Natural History of the Voyage of H.M.S. Herald,' begun by John McGillivray, and carried on so successfully by Messrs. Rayner and Dr. Macdonald.

Mr. White also exhibited a beautiful *Bombyx*, allied to the *Bombyx Certhia*, *Fabr.*, figured by Petiver. This new species was brought from India, by General Sir John Hearsey, K.C.B., and for which he proposed the name of *Brahmæa Hearseyi*. It is smaller than the *Brahmæa Wallichii*, *Gray* (*Bombyx spectabilis*, *Hope*), and has three or four irregular undulating white lines in the apex of the fore wing, instead of three longitudinal lines of angled white Vs: he pointed out the black band behind this space being curved outwardly, instead of angled and irregular as in *B. Wallichii*.

Mr. White also exhibited a fine species of *Phryganidæ*, also brought from Northern India by Sir John Hearsay, with yellowish brown upper wings richly and thickly spotted and blotched with black; the lower wings black, with purple tinge, and a broad yellow band before the tip, widest on the fore part. He named it *Holostomis McLachlani*, in compliment to a gentleman who had done, and would yet, if he lived, do much to advance our knowledge of Trichoptera, and neuropterous insects in general.

Mr. White also exhibited the male and female of a beautiful *Lycæna* from New Zealand. It was allied to *L. Sallustius*, *Fabr.* (the *L. Edna* of Doubleday). The male of this lovely *Lycæna* is suffused with purple-violet, and has a row of red spots on both wings, and black marks and spots; the under side is quiet brown and gray. The female is larger, and has only a line of purple behind the tip of fore wings and parallel with its margin, and a macular line of violet on lower wings. Mr. White proposed for it the name *Lycæna Boldenarum*, after Helen and Frances Mary Bolden,

the former for eighteen years his devoted wife, the latter for the last three years the wife of T. Corbet de Lacy, Esq., of Dunedin, in New Zealand. The last three exhibitions are of insects to be figured and described in the 'Proceedings of the Zoological Society.'

Mr. Waterhouse exhibited three species of Curculionidæ from Australia, and laid descriptions of them before the Meeting. The first he supposed to be the *Strongylorhinus ochraceus* of Schönherr; and the remaining two he regarded as members of a new genus, very closely allied to *Strongylorhinus*, but differing chiefly in having the rostrum curved, in the antennæ having the seventh joint of the funiculus confounded with the club-joints, in the second joint being short, and lastly, in the total absence of claw-joints to the tarsi. To this genus the name *Atelicus* was applied. The two species received the names *A. inæqualis* and *A. ferrugineus*.

A. inæqualis is described as being $5\frac{1}{2}$ lines in length, oblong, and of a pitchy black colour, but densely clothed with scales, partly of an ochraceous colour, and partly dark brown, giving a variegated appearance to the upper parts of the body. Thorax with the sides but gently rounded, the fore part constricted, the surface uneven and punctured; elytra striato-punctate, the alternate interstices unequally raised, and having four tubercles in a transverse line towards the apex. It is from Tasmania.

The second species, *A. ferrugineus*, is from Adelaide. Its length is $2\frac{3}{4}$ lines. In size and form it nearly resembles the small European insect known as *Lixus rufitarsis* of Schönherr: in colour it is of a somewhat deeper red than the *Apion frumentarium*: the head, rostrum, sides and under parts of the thorax clothed with yellow scales; a small spot at the humeral angle of the elytra, and a ring at the apex of each elytron are also formed by yellow scales: head and thorax with scattered punctures; elytra striato-punctate, and with the interstices flat.

Mr. Janson exhibited specimens of the following Coleoptera, brought by him before the Society on previous occasions under the names of *Homalota subterranea* and *Haploglossa rufipennis*, and made the following observations respecting them:—

"*Homalota subterranea*, Muls. This appears to coincide, as Mr. Waterhouse states, with an insect in the European Collection at the British Museum furnished by Dr. Kraatz, under the appellation of *Homalota scapularis*, Sahlberg. I had, however, prior to bringing the subject under the notice of the Society, carefully compared my specimen with the descriptions both of Sahlberg and Kraatz, and found disparities which precluded me from referring it to that species: thus, Sahlberg (*Insecta Fennica*, 372, 50) described his *Aleochara scapularis* as being 'barely one line long,' and as having the 'abdomen shining, scarcely punctulate,' and the characters attributed by Kraatz (*Naturgesch. d. Ins. Deutschl. ii.* 291, 100) are not in accordance with those presented by my example; finally, my specimen appeared to me to coincide well with both Mulsant's and Kraatz's descriptions of *H. subterranea*, and furthermore its occurrence in a nest of *Formica flava* led me unhesitatingly to refer it to that species: if, however, an insect received at the British Museum from Dr. Kraatz as the *Homalota subterranea* of Mulsant is really the species described by that author, it is not only specifically distinct from the insect to which I had applied that name, but pertains to a different section of the genus.

"*Haploglossa rufipennis* is not the species so designated by Kraatz, as I have convinced myself by a comparison with examples sent by him to the British Museum, but is perfectly distinct from an insect which I regard as the true *H. pulla* of Gyllenhal, being less coarsely punctate, having the antennæ conspicuously stouter, their articula-

tions otherwise proportionate, &c., &c. The following synonymy of the two species will probably prove correct:—

“1. *Haploglossa pulla*, *Gyll.*

Aleochara pulla, *Gyll. Ins. Suec.* iv. 495, 56—57 (1827). *Fairm. et Laboulb.* 3
Faune Ent. Franç. Coleopt. i. 451, 27 (1856)—but *not* of Kraatz or Waterhouse.

“2. *Haploglossa nidicola*, *Fairmaire.*

Aleochara nidicola, *Fairm. et Laboulb. Faune Ent. Franç. Coleopt.* i. 451, 28 (1856).

Haploglossa rufipennis, *Janson, Proc. Ent. Soc., Feb. 6, 1860, Zool.* 6357 (1860)—*nec* Kraatz.

Haploglossa pulla, *Kraatz, Naturgesch. d. Ins. Deutschl.* ii. 80, 2 (1856).
Waterhouse, Cat. Brit. Col.—but *not* of Gyllenhal.

“The first is said by Gyllenhal to inhabit Fungi: the only indigenous specimen which I have seen, the one now exhibited, was given me by Mr. H. S. Gorham, who captured it in the Isle of Wight, he thinks, in an ant’s nest beneath a stone, and who, I believe, has other examples.

“The second, M. Fairmaire informs us (*l. c.*), he found abundantly in the nests of the sand martin at St. Valery-s.-Somme, and I have myself met with it crawling upon and at the base of sand banks inhabited by these birds, and have watched the beetles ascend the almost perpendicular walls of sand and enter the burrows in which nests were situate. Mr. May found it copiously in flowers, and I have several times taken it in those of the ragwort (*Senecio Jacobæa*).”

Mr. Tegetmeier called the attention of the meeting to a theory propounded by Principal Leitch to account for the development of a fertile queen-bee from an egg which would, under ordinary circumstances, have produced a sterile worker.

It is well known that bees deprived of their queen select several workers’ eggs or very young larvæ for the purpose of rearing queens. The cells in which these eggs are situated are lengthened out and the end turned downwards. The larva undergoes its development in this perpendicular cell, which is capable of being entirely surrounded by the worker bees. It was found by experiment that the position of the cell was not of importance, as a fertile queen was developed with equal certainty when the cell was placed horizontally or even inverted, as when it remained in the natural pendent position. It was suggested that the more perfect development of the fertile larva was due to increased temperature, and that the object of the isolation of the cell was to allow its being entirely surrounded by a cluster of bees, whose rapid and increased respiration was productive of the warmth necessary to accomplish the growth of a queen.

In remarking on this theory, Mr. Tegetmeier stated that the idea of the development of a queen being dependent on the use of a food known as “royal jelly” appeared destitute of any foundation in fact, and that the theory which attributed the change to increased temperature produced by the clustering bees appeared supported by the fact that in rearing queens artificially several queen cells were usually situated closely together, and also that the production of fertile workers, which occasionally took place under these circumstances, might be regarded as dependent on the adjacent cells being subjected to a somewhat increased temperature by the clustering of the bees around the royal cells. He further stated that it had been ascertained by the use of delicate thermometers that a higher temperature existed in

the neighbourhood of the queens than was found in any other part of the brood-comb.

Mr. M'Lachlan exhibited a fine series of Phryganidæ pertaining to the genus *Stenophylax* of Kolenati, and read descriptions of all the known British species, amongst which were two not hitherto recorded as natives of this country.

Mr. Adam White called attention to the injury caused to ginger root brought to this country from Cochin and Calicut by the larva of a small coleopterous insect, believed to be *Lasioderma testaceum*, *Steph.*; and to the damage done to macaroni by the rice weevil (*Sitophilus Oryzæ*). The depreciation of the crop of ginger root in value is computed at £3000 or £4000 annually; and a large consignment of macaroni from Genoa, which cost 5*d.* per lb., would, in its now damaged state, be gladly disposed of by its unfortunate owner for 1½*d.* per lb.

Mr. Desvignes communicated descriptions of two new species of Ichneumonidæ, pertaining to the genus *Ephialtes*.

Part 10, completing the fifth volume of the new series of the Society's 'Transactions' was on the table.

December 2, 1861.—J. W. DOUGLAS, Esq., President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—'Notice of some North-American Species of *Pieris*,' by Samuel Scudder, from the Proceedings of the Boston Society of Natural History, September, 1861; presented by the Author. 'The Journal of the Society of Arts' for November; by the Society. 'The Zoologist' for December; by the Editor. 'Stettiner Entomologische Zeitung,' 1861, Nos. 10—12; by the Entomological Society of Stettin.

Election of Subscribers.

James Fenn, Esq., of Clyde Villa, Lee; Charles Fenn, Esq., Clyde Villa, Lee; and Frank O. Ruspini, Esq., 85, Oakley Street, Chelsea, were balloted for and elected Subscribers to the Society.

Exhibitions.

Mr. Stevens exhibited a box of splendid Lepidoptera, sent by Mr. Wallace from Mysol, near New Guinea: the species were very similar to those previously sent home by Mr. Wallace from New Guinea and other adjoining islands. Mr. Stevens announced that Mr. Wallace was now at Batavia, and would probably return to England in the spring of next year.

Mr. Barnaud exhibited an extensive series of Coleoptera from Smyrna.

Mr. Machin exhibited specimens of a *Gelechia*, and also of a *Tinea*, which he was unable to refer to any known British species; and an example of *Æthia emortualis*, *W. V.*, taken near Loughton, in Essex: this species has been erroneously recorded as a native of Britain by Haworth and subsequent authors; but the only authentic indigenous example known, with the exception of the one now exhibited, was captured by the Rev. H. Birks, of Henley-on-Thames.

Mr. D'Urban exhibited a large collection of South African Lepidoptera, including several new species of the genus *Acræa*, &c.

Mr. Adam White exhibited drawings, by Mr. Robinson, of a species of *Mantispa*, bred in some numbers from a nest of *Polybia scutellaris*, *Saussure* (*Myrapetra* *scutel-*

laris, *White*), a wasp said to collect honey; this fine nest was brought from Monte Video: of the economy of the *Mantispa* nothing is yet known.

Mr. White called attention to a remarkable beetle of the family Buprestidæ in the collection of Mr. Jeakes: it is near *Anthraxia*, having the epistome projecting and developed into two marked horns—a character quite novel in this family of Coleoptera. Length about $2\frac{1}{2}$ lines. For the reception of this insect, which is from Santarem, Mr. White proposed to found a new genus, and dedicate it to the gentleman in whose collection it is contained.

Mr. S. Stevens exhibited a specimen of *Adelops Wollastoni*, *Janson*, found by Mr. John Stevens, under dead leaves in a market garden at Hammersmith.

Professor Westwood observed that Hammersmith appeared to be a far richer entomological locality than the neighbourhood of Oxford; since his removal from the former to the latter place he had captured very few insects.

Mr. Waterhouse exhibited a specimen of *Ishnoglossa corticina*, a species hitherto unrecorded as British, which he had detected in the collection of the late Mr. Heysham, of Carlisle.

Mr. Waterhouse also communicated some notes on the British species of the genus *Gyrophæna*, including two species not yet indicated as indigenous, *viz.* *G. lævipennis*, *Krautz*, and *G. maura*, *Erich.*: he stated that both these species appear to be not uncommon in this country, and Mr. Janson observed that he also had recently recognised them in his own indigenous collection.

Dr. Wallace read a letter from Captain W. T. Russell, of Monk's Sleigh, Bildeston, Suffolk, in which the writer stated, with reference to the specimens of *Papilio Podalirius* in a collection in Suffolk, said to have been captured at Sevenoaks, as mentioned by Dr. Wallace at the October meeting of this Society, that the said specimens were certainly taken at Sevenoaks by him (Captain Russell), but in the immediate vicinity of the residence of a lady who had a day or two previously set at liberty a number of specimens of this butterfly, which she had bred from pupæ imported from the Continent; there could of course be no doubt that those captured by him were part of the imported brood. Captain Russell also detailed with much minuteness the circumstances attending the capture of several specimens of *Callimorpha Hera* and one of *Eulepia grammica* on a precipitous bank near Wrexham, North Wales, on the 27th of July, 1859: one of the examples of *C. Hera* is now contained in the indigenous collection at the British Museum.

Mr. F. Walker communicated descriptions of Exotic Lepidoptera contained in the collections of W. W. Saunders and A. Fry, Esqrs.

The Secretary called attention to a specimen copy of the first part of Mr. Trimen's new work on the Rhopalocera of Southern Africa, which was on the table, to which he should be happy to receive the names of subscribers.

The Secretary also read some descriptions of South-African Lepidoptera by Mr. R. Trimen, including species pertaining to the families Satyridæ, Lycænidæ and Hesperidæ.

The President announced that the Council had, in compliance with the almost unanimous wish of the Members of the Society, resolved to alter the hour of meeting from eight to seven o'clock; and that in future the chair of the monthly meetings would be taken at the latter hour.—*E. S.*

NOTICES OF NEW BOOKS.

'*The Romance of Natural History.*' By PHILIP HENRY GOSSE, F.R.S. Second Series. London: James Nisbet & Co., 21, Berners Street. 1861. 390 pp. letterpress: nine plates.

IT is very curious to observe what particular articles of faith individual naturalists adopt. The British Museum believes in meteoric stones, but rejects sea serpents; the 'Zoologist,' on the contrary, believes in sea serpents and thinks every meteoric stone a hoax; one man pooh-poohs the cow-sucking propensities of the hedgehog, but cherishes, as the apple of his eye, a belief that a toad can exist without any inconvenience for some ten thousand years in a block of granite; many a man has witnessed showers of fish, but thinks the showers of frogs altogether apocryphal; all sailor naturalists believe in mermaids, but all landsmen naturalists consider these tales the merest rubbish. It would be most interesting to study the phrenological development of each believer; to inquire why one man should believe in ghosts, another in meteoric iron: why he should call it lunar iron I can easily conceive, for, on the principle that love tinges every object with its own rosy hue, so the mind, impregnated with lunar influence, will impart a lunar character of every object on which it reflects. But why should a man believe in lunar iron and reject a mermaid? or believe in a mermaid and reject a sea serpent? or believe in a sea serpent and reject the immortality of toads? or believe in the immortality of toads and "pooh-pooh" the abundantly proven fact that vipers swallow and disgorge their interesting progeny at pleasure? Some bump of general credulity must be common to all such believers, but surely there should be a peculiar development of brain for each particular belief: a man must needs have a "capacious vaulted cranium" to invest a seal with the gigantic proportions of a sea serpent. Mr. Gosse is the only naturalist who believes in everything; he seems specially retained by the marvellous, and pleads its cause wherever he finds the least scrap of legendary lore that he can convert into a brief. He makes out a triumphant case for the showers of fishes (chap. 2); he leaves the traducers of mermaids as destitute of a leg to stand on as the mermaids themselves (chap. 3); he shows that toads can endure hunger, thirst and suffocation for a few thousand years with perfect impunity (chap. 4); and what is still more strange, when accidentally exhumed, they exactly resemble their fellows of the present generation of toads: thus giving a severe, but we trust unintentional, blow to

Darwinianism. He revives and establishes the torpidity theory of swallows (chap. 5); defends the crested and wattled snake that crows like a cock (chap. 6); and adduces incontrovertible evidence that vipers swallow their little ones (chap. 7). Such a work may well be yclept the 'Romance of Natural History.' It bears about the same relation to the every-day natural history of our fields, as the Iliad of Homer to the despatches of the Duke of Wellington.

One result, however, is inevitable to those who read the 'Romance': it is impossible to rise from the perusal without finding that the author has supplied abundant food for thought. Nothing is more easy than to avow a disbelief in whatever we cannot see, or feel, or do not possess; but it is most illogical to found a disbelief on the absence of such evidence. A parity of reasoning would rob us of history with its multitude of facts, and especially of those natural phenomena which have left no trace behind them, such, for instance, as comets, eclipses and earthquakes long, long, past, and of which we can obtain no information, except from the accounts written by actual eyewitnesses: in all instances the character of such witnesses must be our main guide in the reception or rejection of their evidence: thus if six men describe a mermaid, six men describe a sea serpent, and six men a chariot wheel they have dredged from the bottom of the Red Sea, we have no right to reject the first and second events, and accept the third, on the ground that it is rendered probable by a knowledge that Pharaoh and his host were overwhelmed by the waters at the very spot where the chariot wheel was found. The only question that need be answered is this—Is the narrator worthy of credence? And should the result be affirmative I hesitate not to say that I would as readily believe in the sea serpent as in the chariot wheel. Never will I admit the right of the scientific to dictate to the unscientific what they shall see and what they shall believe; the measuring mind of the mere technical naturalist, like the locomotive engine, must keep to the direct line of rail,—it is upset by the slightest deviation to the right hand or the left. Not so the observer of Nature out of doors; to him the land, and sea, and air, are welcome to reveal all their wonders; he can gaze on a sea serpent or a mermaid without exclaiming, "Avaunt! stand aside because you have no place in my museum." I do not claim unhesitating belief for all that is marvellous, but I do ask the truthlover to sift evidence for his own satisfaction: the very attribute of marvellous is often conferred by ignorance alone.

It cannot, however, escape the notice of the cautious that many of the "marvellous" discoveries, especially in the instance of toads, are

made by men who consider beer the natural produce of their narratives. This was the case in the celebrated Chesterfield quarries, as recorded in the 'Zoologist' by Mr. Plant; when that gentleman refused to advance a single pint, the tales of toads absolutely ceased, although he offered no less than two pounds sterling for a toad *in situ*. The frequent occurrence of cavities in nodules of flint, and the figure of those cavities, often suggest the idea that they have been occupied by an animal; and the heedless avidity of wondermongers has often induced a doughty quarry man who has cracked a hollow nodule of flint, to squeeze a toad into what he would feign have us believe its legitimate domicile; so true it is that demand creates supply. Then, again, as to meteoric iron: that there is a substance so called no one will dispute, and that this substance realises a price little inferior to gold is patent to every one; but exactly according to the fluctuation in credulity does the value of meteoric iron fluctuate also. Of late years the depreciation has caused an "awful sacrifice on the article," to use the language of dealers, the evidence of the extramundane nature of meteoric iron having been thoroughly examined and found very faulty. Both sides of every question should be patiently heard, and any object that will not bear the test of inquiry must be abandoned by the truth-seeker, whether it be a sea serpent, a toad, or a thunderbolt.

After thus generalizing on the romantic in Natural History, we turn to the 'Romance' itself, and at once pronounce it the most amusing, though the least original, of all Mr. Gosse's labours. To myself it is peculiarly pleasing to observe how extensively the 'Zoologist' has been quoted, and how admirably the quotations read. The value of this Journal as a repertory of Natural-History facts has long been known, but it is to such volumes as those lately published by Mr. Atkinson and Mr. Gosse that I am indebted for showing how greatly the cause of Natural History has been served by the accumulation and preservation of narratives which would otherwise have been lost to the historian of our Science.

I feel considerable difficulty in selecting from an acknowledged compilation passages which will be new to my readers, but those I have selected, if not possessed of the engaging quality of novelty, cannot fail to be found interesting. It only remains for me to say that it is impossible to place in the hands of the young, the imaginative and the adventurous, a work more likely to lead them on to discoveries for which Science may hereafter acknowledge how greatly it is indebted to them.

Extinction of Didunculus strigirostris and Nestor productus.—

“Species are dying out in our own day. I have already cited the interesting case of the moho, that fine Gallinule of New Zealand, of which a specimen—probably the last of his race—was obtained by Mr. Walter Mantell, and that of the káureke, the badger-like quadruped of the same islands, which was formerly domesticated by the Maoris, but which now cannot be found.

“The Samoa Isles, in the Pacific, recently possessed a large and handsome kind of pigeon, of richly coloured plumage, which the natives call Manu-mea, but to which modern naturalists have given the name of *Didunculus strigirostris*. It was, both by structure and habit, essentially a ground pigeon, but not so exclusively but that it fed, and roosted too, according to Lieutenant Walpole, among the branches of tall trees. Mr. T. Peale, the naturalist of the U. S. Exploring Expedition, who first described it, informs us that, according to the tradition of the natives, it once abounded; but some years ago these persons, like more civilized folks, had a strong desire to make pets of cats, and found, by means of whale-ships, opportunities of procuring a supply; but the consequence of the introduction of ‘pussy’—for under this familiar old-country title were the exotic tabbies introduced—was the rapid diminution of the manu-mea. Pussy did not fancy yams and taro,—the vegetable diet on which the natives regaled,—and took to the woods and mountains to search for something better. There she met with the feeble-winged *Didunculus* scratching the soft earth for seeds, and with a purr and a mew soon scraped acquaintancē with the stranger. Pussy declared she loved him well, and so she did—too well, in fact; she felt ‘as if she could eat him up’—and did. The news soon spread among the tabbies that there were sweet birds in the woods, and the result is the almost total disappearance of poor manu-mea. Like the dodo, it has ceased to be, but at the hand of a more ignominious foe. The Samoan may truly say to his former pet, ‘*Cecidisti, O manu-mea, non manu meâ, sed ungue felino.*’ So rare had the bird become, that during the stay of the Expedition only three specimens could be procured, and of these, two were lost by shipwreck. I do not know whether another has been met with since. Probably they are all gone; for that was twenty years ago.

“When Norfolk Island—that tiny spot on the Southern Ocean, since so stained with human crime and misery—was first discovered, its tall and teeming forests were tenanted by a remarkable parrot with a very long and slender hooked beak, which lived upon the honey.

of flowers. It was named *Nestor productus*. When Mr. Gould visited Australia, in his researches into the Ornithology of those antipodeal regions, he found the Nestor parrot absolutely limited to Philip Island, a tiny satellite of Norfolk Island, whose whole circumference is not more than five miles in extent. The war of extermination had been so successful in the larger island that, with the exception of a few specimens preserved in cages, not one was believed to survive. Since then its last retreat has been harried, and Mr. J. H. Gurney has published in the 'Zoologist' (Zool. 4298) the dirge of the last of the Nestors."—P. 79.

This subject of the gradual but certain extinction of species, one after another, is not only of great interest, but is of far wider extent than naturalists generally suppose; the genera *Notornis*, *Nestor*, *Strigops*, *Apteryx*, *Casuaris* and many others are as certainly following in the wake of *Deinornis*, *Palapteryx* and *Didus*, as these have followed the pre-historic inhabitants of this earth's surface.

Spontaneous production of Fish.—"It is a curious fact that the pools, reservoirs and tanks in India and Ceylon are well provided with fish of various species, though the water twice every year is perfectly evaporated, and the mud at the bottom becomes converted into dust, or takes the condition of baked clay, gaping with wide and deep clefts, in which not the slightest sign of moisture can be detected. This is the case with temporary hollows in the soil, which have no connexion with running streams or permanent waters, from which they might be supposed to receive a fresh stock of fish. Two modes of accounting for this strange phenomenon have obtained currency. The one is that received by those Europeans who are content with any solution of a difficulty without too closely testing it; viz. that the fishes fall with the rain from the air. The actual occurrence of such showers rests, as we have just seen, on good evidence; but admitting the fact, it must be a rare phenomenon, whereas the presence of fish in new-made pools is universal. Again, if the rains brought them in such abundance as to stock all the pools, an equal number would fall on the dry ground, which is not pretended to be the case. The other accepted solution is that which has received the sanction of Mr. Yarrell, who observes, 'The impregnated ova of the fish of one rainy season are left unhatched in the mud through the dry season, and from their low state of organization as ova, the vitality is preserved till the occurrence and contact of the rain, and the oxygen, of the next wet season, when vivification takes place from their joint influence. This may be fully allowed,

yet it does not meet the exigencies of the case. Sir Emerson Tennant and others have shown that it is not young fishes, just escaped from the egg, which appear in the newly-formed pools, but full-grown fishes, fit for the market; a fact well known to the Cingalese fishermen, who resort to the hollows as soon as the monsoon has brought rain; and they invariably take, in these pools, which a day or two before were as dry as dust, plenty of fishes fully grown, a foot or eighteen inches long or longer. Neither of these hypotheses, then, will account for the fact; and we must admit that the fishes of these regions have the instinct to burrow down into the solid mud at the bottom, on the approach of the dry season, and the power of retaining life, doubtless in a torpid condition, until the return of the periodic rains, as Theophrastus long ago observed."—P. 118.

And I may add that this is abundantly proved by the now thoroughly ascertained habits of that "odd fish" the *Lepidosiren*.

EDWARD NEWMAN.

'*The Entomologist's Annual*' for 1862. London: John Van Voorst, Paternoster Row. 160 pp., demy 12mo; 1 coloured plate. Price 2s. 6d.

After the publication, in the expiring 'Intelligencer,' of Mr. Stainton's views on the subject of periodicals, I scarcely expected to have had the pleasure of once again beholding an 'Entomologist's Annual;' but here it is, and although the cover is as bilious-coloured as usual, I most heartily congratulate the editor in having wholly excluded that bilious writing which has so often served to set entomologists together by the ears. The volume before us contains the following papers:—

A Comparative List of the Fossil Insects of England and Bavaria. By Dr. Hagen.

Index to the new Coleoptera enumerated in the 'Entomologist's Annuals,' 1856,—1861. By W. F. Kirby.

Notes on British Trichoptera, with Descriptions of new Species, &c. By Robert M'Lachlan.

Notes on *Eupithecia* Larvæ. By the Rev. H. Harpur Crewe, M.A.
A Chapter on *Zygæna Minos*. By the Editor.

New British Species of Lepidoptera in 1861. By the Editor.

Rare British Species of Lepidoptera captured in 1861.

Observations on British and Continental Tineina.

Answers to Enigmas : Enigmas still unanswered : New Enigmas for solution.

Natural History of the Tineina.

Notes on Hymenoptera observed during the past Season ; Some Observations on Hymenopterous Parasites, and a Monograph of the Family Chrysididæ. By Frederick Smith.

On Hemiptera, commonly called Bugs. By John Scott.

New Works on Entomology.

Mr. M'Lachlan's paper is one of great interest, and does infinite credit to its author : it is written throughout with the greatest care, and introduces one species apparently new to Science, the

PHILOPOTAMUS SCOTICUS of M'Lachlan.

Female. Antennæ brown, annulated with yellowish ; head clothed with golden yellow hairs ; eyes black ; thorax and abdomen black ; legs pale ochreous, tibiæ fuscous, spurs fuscous beneath ; anterior wings rich yellow, with numerous more or less confluent, irregularly formed, fuscous streaks and blotches ; the first apical cell does not reach the anastomosis ; posterior wings purplish fuscous, costa and inner margin narrowly edged with yellow ; pterostigma and a spot at the margin in each apical cell also yellow. A single specimen is in the British Museum, taken at Rannoch, in Perthshire, by the late Mr. Foxcroft.

Mr. Crewe's descriptions of the larvæ of Eupitheciæ are already known to my readers, and I believe greatly valued by them : the describing of larvæ is a new feature in our science, or rather one that had almost become obliterated.

Mr. Stainton's chapter on *Zygæna Minos* is both useful and interesting, but he does not seem sufficiently at home with the German language, always to convey in English the exact meaning of the authors he translates. The following passages relating to the larvæ are very valuable :—

Larvæ of Zygæna Minos, var. Heringi of Zeller, described by Professor Hering. "The larva of the ordinary *Zygæna Minos*, which we find here almost exclusively on *Pimpinella Saxifraga*, ever occurs later with us than about the middle of May. The larva of the above-mentioned variety or species, which flies in the perfect state in August, when *Z. Minos* is long past, I had for several years sought in vain. I find them only on *Thymus Serpyllum*, on sandy places in fir woods, never in our fortification trenches,

where *Z. Minos* is, in many years, quite common. This year I found a larva on the 21st of June, which died for want of care. But I made the following description:—The larva is dark citron-yellow; at the end of each ring are two black spots, which consequently form a double row of spots, between which are numerous white hairs, placed on extremely fine blackish warts. Along the legs is placed, in the middle of each segment, a small black spiracle, over and under which are white hairs, as on the back.”—P. 60.

Observations on the Larva of Zygæna Minos, by C. F. Freyer.—“When I gave my figure of *Zygæna Minos*, on plate 86, I had always found the larvæ yellow and no other colour. However, on the 25th of May, 1843, I chanced by accident to find, in a meadow near a wood, a number of the white larvæ of *Zygæna Minos*, which is very like Hübner’s figure, and, at the very same place, amongst them some yellow larvæ. They ate very properly only *Pimpinella*, but they also bit other plants, such as thyme, &c. Of these larvæ, which when I found them were just full-grown, I collected considerably more than a hundred, amongst them from seventeen to twenty of the yellow ones, which were also rather larger. I immediately separated them, and kept the white larvæ and the yellow larvæ in separate cages. But unfortunately many, indeed most, of the larvæ were infested with *Ichneumon*s or *Gordii*, so that in proportion to my stock of larvæ I obtained only a few perfect insects, which showed no further differences except the above mentioned characters. Only I may remark this, and I consider it of some importance, that the yellow larvæ almost all produced females, whereas the white larvæ furnished mostly males and very few females. Is the difference of colour a sexual character? I may further observe that the yellow larvæ had a dark dorsal stripe, whereason the white or bluish white larvæ no dorsal stripe was perceptible. The cocoons of the yellow larvæ were silvery gray, some few cocoons were, however, pale yellow. The cocoons of the white larvæ were also much flatter, and not so vaulted as those of the yellow larvæ. * * * If we reflect on the difference in the colour and markings of the larvæ, it is of course very probable that if the differences do not indicate the sexes, two species may have been confounded, although it will be difficult to find out any good points of distinction in the perfect insects.”—P. 59.

Mr. Stainton, with admirable fairness, leaves every writer to speak for himself, and leaves it a moot question whether in Ireland or on the Continent two species of *Zygæna* are confounded under the name of *Minos*.

Mr. Smith's paper on Hymenoptera possesses all the excellencies of that accomplished entomologist; the instances of parasitism which Mr. Smith has established from actual observation are extremely interesting, especially to an entomologist who thirty years ago associated these parasites under the name of cuckoo-bees.*

Epeolus variegatus,	parasitic on	Colletes	Daviesana
Nomada varia,	„	Halictus	rubicundus
„ furva	„	„	Morio
„ Solidaginis,	„	„	abdominalis
„ Jacobeæ,	„	Andrena	fulvicrus
„ ruficornis,	„	„	nigro-ænea
„ lateralis,	„	„	longipes
„ baccata,	„	„	argentata
„ ochrostoma,	„	„	labialis
„ borealis,	„	„	Clarkella
„ armata,	„	„	Hattorfiana
„ germanica,	„	„	fulvescens
„ sexfasciata,	„	Eucera	longicornis
Cœlioxys quadridentata,	„	Megachile	argentata
„ Vectis,	„	„	maritima
„ simplex,	„	„	Willughbiella
„ umbrina,	„	Saropoda	bimaculata
Stelis aterrima,	„	Osmia	aurulenta
„ phœoptera,	„	„	fulviventris
„ octomaculata,	„	„	leucomelana
Genus Melecta,	„	Genus	Anthophora
Apathus rupestris,	„	Bombus	lapidarius
„ campestris,	„	„	Hortorum
„ Barbatellus,	„	„	Pratorum
„ vestalis,	„	„	terrestris

* "Apathites, cuckoo-bees. Larva hatched from an egg deposited by its parent in the nests of all the preceding Apina at the time when their own eggs are laid; when it hatches, being stronger and larger than the rightful possessor of the cell, it consumes the food provided for its companion, and starves it to death; and in those instances in which fresh supplies of food are daily provided it continues to receive and appropriate them as its own. Pupa changes in the same situation, in a silken cocoon spun by the larva. Imago has no apparatus either on the body or legs for collecting honey; in other respects it resembles in structure each of the orders of Apina before described; it enters their nest with perfect familiarity, and seems to be quite unsuspected of intrusion; it collects no pollen or honey, never builds a nest of any kind or takes any care of its young, but spends its time among flowers, or hovering about sand-banks in which other bees have fixed their habitations. Apathus, Cœlioxys, Melecta, Stelis, Epeolus, Nomada, Hylæus?"—*Ent. Mag.* ii. 404.

It is not a little remarkable that out of the seven genera of bees *supposed* by myself to be parasitic in 1834, Mr. Smith should have *proved* six to be parasitic before 1862; his labours seem to have wonderfully established the conclusions I had drawn many years ago: the seventh genus, *Hylæus*, since called *Prosopis*, Mr. Smith considers to have been proved non-parasitic both by Mr. Thwaites and Mr. Sidney Saunders, and I most cheerfully bow to authorities so deservedly esteemed. I always entertained a doubt on the subject, and expressed that doubt by a note of interrogation.

In Mr. Stainton's *New British Species of Lepidoptera* he makes no mention of my *Ephyra decoraria*, supposed by Mr. Doubleday to be a *Nemoria*. Whence this reticence I cannot imagine. I am glad to see Mr. Stainton quoting with approbation Mr. Doubleday's "truly philosophic note,"—"Whether the Irish *Zygæna* is anything more than a local variety of *Minos* time may perhaps prove." The spirit of this "truly philosophic note" might be advantageously extended to the whole of those minute *Lepidoptera* to which Mr. Stainton has paid such undivided attention.

On the whole the 'Entomologist's Annual' for 1862 is superior to either of its predecessors; and I shall regret to read any announcement of its discontinuance, on the ground recently advanced, in the now defunct 'Intelligencer,' against periodical literature in matters of Science.

EDWARD NEWMAN.

'*The Natural History of the Tineina.*' Vol. VI., containing *Depressaria*, Part I. By H. T. STAINTON, assisted by Professor ZELLER and J. W. DOUGLAS. London: John Van Voorst, Paternoster Row. 280 pp. letter-press; eight coloured plates.

This volume not merely equals, it exceeds, those which have preceded it in the careful accuracy of its letter-press and the extreme beauty and fidelity of its plates. There is an exquisite delicacy of drawing in the representations both of the perfect insects and larvæ, and the difference exhibited between the larvæ of closely allied species will do more than any descriptions of the perfect insects to prove them really distinct.

Of some of Mr. Stainton's labours I am unable to see the merit, and therefore, in truthfulness, have abstained from all praise; but in his 'Natural History of the *Tineina*' he is erecting a monument which

will be the admiration of all entomologists, whether of the present or future generations, whose approbation is worthy of being earned.

EDWARD NEWMAN.

'Tabular View of the Primary Divisions of the Animal Kingdom: intended to serve as an Outline of an Elementary Course of Recent Zoology (Cainozoology), or the Natural History of Existing Animals.' By ROBERT E. GRANT, M.D. London: Walton and Maberly. 1861.

The Professor of Comparative Anatomy and Zoology in University College, London, in sending a copy of this little work to the editor of the 'Zoologist,' seems to challenge that fair and conscientious criticism which it is the custom of the said editor to mete out with impartial pen to all who invite it. Taking this view of the subject I cannot in courtesy decline the task of reading and publicly noticing this very faint outline of an elementary course of lectures delivered in University College by a Professor of thirty-four years standing, Dr. Grant having received his appointment in 1827.

In perusing these pages the first thing that attracts my notice is their inflated style; the second the substitution of new names, with Grant as the authority, for old names with Cuvier, &c., as the authority; the third is the apparent inattention to, I scarcely presume to say ignorance of, the discoveries and improvements of the last quarter of a century; and the fourth is the apparently crude and unsatisfactory manner in which groups are either associated or divided. I proceed to give illustrations.

First, of the inflated style. "With one fell swoop of the wand of truth, you have now scattered to the winds the pestilential vapours accumulated by species-mongers over every step of this ever-varying, ever-charming part of Nature's works; and your next movement will dispel the remaining clouds of mystical supernatural typical intrusions which still hang on the horizon of the sublime prospect, now opening to the view, of the natural animalization of the orbs of space by the same simple laws which govern the physical and chemical phenomena with such wondrous harmony throughout the rest of the material universe." This rhodomontade is addressed to Mr. Darwin, and doubtless has some occult reference to that great naturalist's work on the 'Origin of Species,' but its meaning is entirely obscured by the multiplicity of inappropriate words.

Secondly, of the substitution of new for old names. In the bats the words Pteropodida, *Grant*, Noctilionida, *Grant*, Vespertilionida, *Grant*, Phyllostomida, *Grant*, Rhinolophida, *Grant*, are employed for groups long since characterised and familiarly known under prior names: the Marsupialia or Marsupiata, described by numberless authors under these names, are now the Dimetroa, *Grant*. Lepidosiren constitutes the order Nematopteri, *Grant*. Similar instances occur in almost every page, and, what seems greatly to be regretted, the new names are rarely so appropriate, and never so pronounceable, as the old, and are therefore most unlikely ever to be adopted.

Thirdly, of inattention to modern discoveries and improvements. The Carnivora follow instead of precede the less perfectly formed Insectivora, and the rodents take precedence of the pachyderms. In birds no reference whatever is made to physiological characters.

Fourthly, of the unsatisfactory way in which groups are associated or divided. The genera Psophia and Gypogeranus, the raptorial Gypogeranus! form the new order Alectorides; the genera Grus and Chionis, the pigeon-like Chionis! are combined in order Grallatores; Columba stands as the type of Gallinæ; yet these are described as "large, heavy;" the woodpeckers stand at the head of the order Zygodactyli, characterised as "coarse or hard vegetable-feeders;" but it is inexpressibly painful to point out the innumerable errors or oversights of this kind. It would seem that the Professor, satisfied with the laurels earned in early life, is now standing still while a crowd of competitors are passing him in the race. He appears complacently to have placed his chair and to have said "thus far and no farther," and to have believed that the advancing waves of human research will never venture to overtake him. This is a fatal mistake; let no man who presumes to teach, think that he is too old to learn.

EDWARD NEWMAN.

Birth of Polar Bears in the Zoological Gardens.

By E. W. H. HOLDSWORTH, Esq., F.L.S., &c.

THE reproduction of polar bears in captivity, amid scenes and under circumstances so different from those to which these truly northern animals are accustomed, is perhaps of sufficient importance and general interest to deserve a notice in the 'Zoologist,' especially as the case to which I am about to refer is the *first* which has ever been recorded. I will begin by saying something about the ursine

parents. The ages of the two adult polar bears in the Zoological Gardens are not certainly known, but both animals have been for many years inhabitants of their present limited enclosure. The female—the smaller of the two—is an old friend of mine, of nearly sixteen years' standing. The male is a good deal larger, and is a fine representative of the species; it was captured in Barrow's Straits by some adventurous whalers in 1850, and was brought to England, secured, it is said, in a cask. The process of incarceration must have been a difficult one, and the capture of such an animal, grown up, as it had, amid the wild regions of the icy north, may be recorded as no mean triumph of man over the brute creation. On this animal's introduction to its present domicile, it evinced the most praiseworthy desire for freedom, and climbed about the strong iron railings of its enclosure with a skill and perseverance such as only an apprenticeship on icebergs could have enabled it to exhibit. Its efforts to escape were unceasing; so that extra precautions were necessary to secure the animal in its den, and it was only when an open iron roofing had been fitted, besides the incurved spikes already terminating the top of the high railings, that the imprisoned bear could be induced to submit to its fate. The difficulties usually attending the first meeting of two savage animals in a confined space were not wanting when this male bear was introduced into the den already occupied by his future companion.

After being accustomed for a few days to look at one another through an iron grating they were both allowed the free run of the enclosure, and then ensued a most animated and snarling discussion about *Might versus Right*—physical force against priority of occupation. Fortunately the dispute did not terminate in blows. Each animal soon took up its position in an opposite corner; and if one attempted to move a growl from the other cautioned it to be quiet; it was evidently "Touch me if you dare" on both sides. After a time the two bears would advance towards one another, snarl, and then retire to their corners, the stranger always moving backward, and presenting a firm front to his supposed enemy; the female, confident in her right of place, would turn and walk away in her usual manner, contenting herself with sidelong glances at her companion. At last, however, peace was declared (except at dinner-time), and, companions in misfortune, they now appeared as happy together as if they had never quarrelled. The retrograde movements of the male bear, originating in suspicion, have, however, been confirmed into a habit; and, without any reference to the position of his mate, after pacing

the length of his den, he very commonly backs the whole distance to his original corner.

During the last few years hopes have existed of young polar bears being added to the list of novelties in the Gardens, but they were not realized until the 5th of November, 1861. On that day the keepers observed a renewal of the old family quarrel, and it was soon ascertained that two young bears had been added to what I may call the polar circle. Unfortunately, both little ones were dead, probably killed by the mother, as one of them was much injured. These young animals are each about thirteen inches long, and would have stood nearly seven inches high,—miniature polar bears, well proportioned and covered with a coat of fine white silky hair, except on the ears, which are quite naked. The little things look like large white tailless rats. They are now stuffed, and will soon take up their quarters on the shelves of the British Museum.

In February, 1860, at an evening meeting of the Zoological Society, Mr. Bartlett called attention to the size of some young hybrid black and brown bears which had been produced in the Gardens on the last day of the previous year. When born they were only as large as rats, and their eyes did not open until they were about five weeks old, when the young animals had attained the size of a common rabbit. It has now been shown that the polar bear agrees with its congeners in producing its young of a disproportionately small size.

It is well known that bears bring forth during the period of hybernation, and, at that time, are for a long interval without food. No attempt at hybernating has hitherto been observed among the bears in the Regent's Park; yet, as winter approaches, some of these animals show failing appetites, and, if any young ones are produced, the mother ceases for a time to feed. The polar bear ate nothing for a week after her cubs were born. This curious fact shows us that the absence of a desire for food is not wholly dependent on hybernation, but is especially marked under those circumstances which make other quadrupeds most ravenous. The period of gestation is seven months, and union continues about two hours.

The two polar bears in the Gardens daily consume from sixteen to eighteen pounds of fish between them, and, under ordinary circumstances, winter sees no diminution in their appetites. Both animals always appear very unwilling to enter the water, and rarely venture in further than they can help; possibly they have learnt the advantage of dry clothes, and, moreover, that little is to be gained by a wetting except at dinner time.

I may add that on the 27th of December, 1861, three little rat-like brown bears were born in the Gardens, and are still alive and doing well, the paternal honours in this case belonging to the well-known gigantic animal sent a few years ago from Norway.

E. W. H. HOLDSWORTH.

January 8, 1862.

Weasel fascinating Small Birds.—Returning from church one Sunday morning, my attention was drawn to a clump of six or seven small trees planted on the village green. Five sparrows were fluttering about, near to the ground, and uttering loud cries of alarm. I drew cautiously nearer to the place, and saw a weasel in the middle of the clump. He was facing the birds, who seemed to flutter helplessly around him. He suddenly made a spring and snatched a bird, and at the same instant I threw a stone at him, which alarmed him, and he made off into an adjoining farm-yard, retaining his prey in his mouth. I had often heard of the power of fascination possessed by some animals, but never saw anything approaching to it before.—*J. Ranson ; York.*

Cream-coloured Mole.—I have in my possession at present a beautiful cream-coloured mole, which was killed, in August last, in a hay-field near this village. A similar one was also caught in October on the farm adjoining; it, however, made its escape, after being a few hours in captivity.—*Thomas Thompson ; Winlaton, December 7, 1861.*

[I have met with numerous instances of cream-coloured moles, but never with one perfectly white.—*E. Newman.*]

In re Leporines.—It is difficult to visit Leadenhall Market, or any other market where living animals are exposed for sale, or any dealer in living animals, or any spot where living animals are exhibited, though not sold,—as in our Zoological Gardens,—without seeing, in considerable abundance, an animal called a leporine; and without hearing, should any inquiry be made, that the said leporines are hybrids between the rabbit and the hare. Again, it is difficult to open the 'Field' newspaper—which, by the way, is an admirable repertory of sporting and field lore—without lighting on a discussion as to the value, origin and characters of the leporines in question. Now the mind of the true naturalist has not only an inquiring, but almost a doubting turn, and this I fancy more wholesome than too eager a credulity, than such a swallow, for instance, as would gulp a meteoric stone, or such a stomach as could digest the wondrous but circumstantial narrative thereanent, when swallowed. Now this sceptical spirit or doubting turn of mind has largely fallen to my own share; and I do not take on trust that these leporines are hybrids between rabbits and hares, for two reasons; the *first* and *primâ facie* reason is that they resemble rabbits and not hares; and the *second*, that they are extremely fertile, which is very rarely, perhaps never, the case with hybrids between distinct species of either quadrupeds or birds; instance the mule as a hybrid between horse and ass, and the mule hybrid between canary and goldfinch. Seeing then that appearances and probabilities are equally against the assumption that leporines are hybrids, half-hare, half-rabbit, I may mention another character they possess that is purely a rabbit character. The female or doe makes a cozy nest of hay, and lines it with fleck torn from her own belly: in this nest she brings forth; and her young ones are born

perfectly naked and perfectly blind. I need scarcely mention, except for the edification of the few non-naturalists who may peruse these lines, that the female hare makes no nest; that she tears no fleck from her body; and that her young are brought into the world with an abundant covering of hair, and possessed of eyes remarkable for wide-openness, brilliancy and beauty. Before the little world of naturalists will believe in the hybridity of these leporines a number of very difficult questions must be answered clearly and definitely:—

1st. Who raised the first litter of leporines?

2nd. Where were they raised?

3rd. Was the male or female parent the hare?

4th. By what management did the breeder achieve so unnatural a combination?

5th. What was the period of gestation in the first instance; and what is it now, when the leporines breed freely among themselves?

6th. How does the breeder account for the disappearance of all hare characters, except some slight approach in size and colour, which all naturalists agree in regarding as totally unimportant?

Until these questions are satisfactorily answered I shall continue to regard leporines as a breed of tame rabbits, differing no more from the common wild rabbit than do the lop-eared, the silver sprigs, &c., &c.—*Edward Newman.*

Ornithological Notes from Edinburgh.—On the 13th of last month a bird-catcher showed me several hawfinches, bramblings and crossbills, which had been caught by his boys near Morningside, about two days previously: one of the hawfinches, a very fine male, having died soon after its capture, I took it away as a specimen, and on examining the stomach found that it contained nothing but a few fragments of barley and a little coarse sand. On the 15th, the same man brought me four curlew sandpipers and three dunlins, all of which he killed at a single shot on the Fife coast: he said that they were in company, with many others, feeding upon the sand, close to the water's edge. On the 19th of the present month a friend of mine picked up the remains of a little auk upon the sands at Portobello: it was a female, and had apparently been dead for at least a week; the stomach was quite empty. A few days ago I observed nine snow buntings feeding among the bushes which cover the face of the steep rocks upon the south side of the Calton Hill: the ground being frozen at the time the poor birds were probably led by hunger, rather than by choice, to seek their food in this unusual situation.—*Henry L. Saxby; 54, Gilmore Place, Edinburgh, December 28, 1861.*

Occurrence of the Golden Eagle near Driffield.—Early in this month I received a fine adult golden eagle in the flesh, from Skerne, near Driffield, shot by J. Kemp, gamekeeper to A. Bannister, Esq., of Hull. The bird in question is a male, and measures from beak to end of tail 2 feet 9 inches, to the end of toes 2 feet 6 inches, spread of wings 6 feet 7 inches; weight 8 lbs. 5 oz. I have also had lately brought me, to be preserved, stormy petrels, little auks and the gray phalarope.—*Alfred Roberts; King Street, Scarborough, December 27, 1861.*

Occurrence of the Merlin near Alton.—Last week a female merlin was shot at Chawton, about a mile from here. I have never known the merlin shot in this neighbourhood before.—*Philip Crowley; Alton, January 7, 1862.*

Occurrence of the Great Gray Shrike at Jevington, Sussex.—A beautiful male specimen of the great gray shrike (*Lanius excubitor*) was shot, on the 19th of November last, at Jevington, four miles from Eastbourne, by Mr. W. B. Read, farmer, of that place, and is now in my possession. Mr. Read informs me that he several times since saw another about the same spot, but has been unable to succeed in shooting it. On dissection I found the head of a small mouse in the stomach, and which I have preserved in alcohol.—*John Dutton; South Street, Eastbourne, December 18, 1861.*

Query about the Robin.—It is the general opinion in the North Riding of Yorkshire that the young birds kill off the old ones. For two years I have endeavoured to ascertain the truth of this opinion, but without success; for, though the young ones are common in June and July in the gardens and hedge-rows, yet the old birds are very rare indeed. In August and September the well-known breast is common enough. I should feel obliged by information as to whether this opinion prevails in any other county, and if so, whether there are any grounds for it.—*J. Ranson; York.*

Large Flocks of Magpies.—In reply to your correspondent's query (Zool. 7817) I beg to state that previous to the year 1859 large flocks of magpies were frequently observed in the neighbourhood of Stockmoor, near Huddersfield, when the weather was severe; sometimes they numbered thirty, or even forty, in a flock. But since that time the gamekeepers have nearly exterminated the species in that neighbourhood, and where formerly you could see scores you cannot see one now.—*B. Gibson; Wakefield, December 27, 1861.*

Occurrence of the Crossbill near Eye.—On the 18th of October last my brother shot a very fine male example of the crossbill (*Loxia curvirostra*): it was feeding in a fir plantation close to our house, eating either the seeds of the fir or insects contained in the cones; as he skinned it before I had an opportunity of examining it, I am unable to say on which. According to Macgillivray, they sometimes visit this country in large flocks.—*R. Tyrer, jun.; Eye, Suffolk, November 8, 1861.*

Food of the Wren.—In a paper on the habits and food of the wren by Mr. Brockholes, published in the 'Transactions of the Literary and Philosophical Society of Liverpool,' this gentleman states that *snails* constitute a large portion of the food of this little bird during the winter,—that it often carries them to a particular spot, where it detaches the animal by breaking the shell, or by other means, and then eats it; and that the broken shells are often noticed lying in considerable numbers together, by persons who are ignorant of the cause of their destruction. I cannot conceive how Mr. Brockholes can have fallen into this error: a moment's consideration must convince any one that a wren could not by any possibility break the shell of a snail, and if it could detach the animal in any other way it could not swallow it. I thought every one who has paid the least attention to birds was aware that it is the song thrush which feeds upon snails, and this bird almost always carries them to a particular stone to break the shells. The wren feeds entirely upon small insects and worms, and in winter frequents ditches and brooks for the sake of the small red worms so abundant in the mud: the stomach of one killed a day or two since contained nothing whatever but these worms. Mr. Brockholes also states that wrens roost in such numbers in a single hole in a haystack that a dozen may be taken out at once in the hand: if this is the case at Liverpool wrens must be far more numerous there than they are at Epping.—*Henry Doubleday; Epping, January 4, 1862.*

Variety of Partridges.—It may be interesting to some of the numerous readers of

the 'Zoologist' to learn that the variety of partridge, of which I sent you an account last year (Zool. 7544), has not disappeared from the parish of Shebbear. A covey of twelve birds, of the same description, with a single female of the ordinary plumage, appeared during the present season of 1861-2, in the same locality, not more than half a mile from the spot where the birds were killed in the previous year,—in fact, I may say that they occupied the same ground. Four of these have come into my possession; four still remain; another and the old hen were also accounted for; of the remainder I have learned nothing, but doubtless they have fallen victims to some sportsman's gun. All those brought to me were in a slight state of moult, but show exactly the same peculiar markings which characterized the birds previously recorded, with the following exception,—the existence in two of them of some few white feathers on the breast. This, I think, will go far to show that *variety*, and not *hybridity*, must be the light in which these singular birds should be regarded,—more especially so, indeed when the existence of an ordinary old hen in the covey, as above stated, is taken into consideration. The white feathers are certainly few in number,—not more than two in one specimen and ten in another. The other bird killed, which did not reach me, appears to have had a greater number of these feathers, as they particularly attracted the attention of the man who bagged it, and who would have brought the specimen to me if his dog had not injured it. I am told that the birds still remaining keep to themselves and do not associate with other partridges occupying the same ground. The farmer on whose estate they are, informed me that during the snow in November they were seen running about in his yard. Beyond recording the above, I can add nothing to what I wrote last year respecting this variety. I have failed in obtaining any correct information respecting the importation of foreign birds—or, more probably, eggs—by a gentleman, who some years since lived about ten miles distant. More than one person has mentioned the fact to me, and I think it very probable that such was the case; however, whether, if true, this has anything to do with the present birds the readers of the 'Zoologist' can form as correct an opinion as myself.—*W. S. Hore; Penrose Villas, Barnstaple, January 7, 1862.*

Examination of a Specimen of Sabine's Snipe.—Mr. Vingoe and myself have been engaged this evening in examining minutely a specimen of snipe, in every respect as to colour, arrangement of markings, and dimensions answering the description of Sabine's snipe (*Scolopax Sabini*). There is an entire absence of the longitudinal stripes on the back, with the uniform brown-freckled plumage from the chin to the vent; the facial mask from the corner of the mouth to the eyes, and so all round under the throat, is dull black; a black stripe, half an inch wide, runs from the top of the head to the nape of the neck, with a few rusty brown spots sparingly distributed; the under surface of the quill, secondary and tertial feathers blackish gray, as are also the lateral under scapularies; the whole of the upper plumage marbled with deep black and rust, uniform throughout; the tail with alternate black and rusty bars. With all these exterior characters in perfect accordance with the various figures of Yarrell, Selby and others, I have, I confess, felt very little hesitation hitherto in not believing that the species is distinct, and not, as it has been suggested, and in fact strongly set forth by some modern naturalist, a permanent variety of the *Scolopax Gallinago*; but I confess that I am at present at fault by the great character of the number of tail-feathers wanting in the present example. In counting the feathers with great care three times there was no doubt as to the result—*viz.* fourteen, and not twelve. This number favours its alliance to the common snipe, which has fourteen also. This bird was

killed near Carnanton, the residence of Humphrey Wilyams, Esq., the same locality from whence the spotted eagle (No. 2) was lately obtained. The specimen is now preserved for Mr. Brydges Wilyams, and in case it should be desired to have submitted the specimen for the inspection of any of the scientific societies in London, I will apply to him to allow it to be sent, and I have no doubt it will be granted. I mention this in case my notice of this curious bird should excite a strong interest in the further investigation of its character. — *Edward Hearle Rodd; Penzance, January 3, 1862.*

Occurrence of the Egyptian Goose at Alton.—A fine specimen of the Egyptian goose was shot on Oakhanger Pond, near Alton, on the 16th of December last.—*Philip Crowley; Alton, January 8, 1862.*

[I always feel an inclination to consider the Egyptian geese killed in this country as escapes: this beautiful bird is a great favourite on ornamental waters.—*Edward Newman.*]

A clever Duck.—An intimate friend of mine here, himself a man of Science, relates to me the following curious fact, which occurred before his own eyes a few days ago. He keeps a pair of ducks in his yard: one day he remarked the drake dodging about in one corner, and presently saw that he had “cornered-up” (to use a Yankeeism) a little half-grown mouse. The drake cleverly cut off its retreat on every side, the angle of the wall much assisting him; at last he made a dash and seized mousey in his broad beak. Here he held his prey for some moments, as if not knowing what to do with it. Then, all on a sudden, as if struck with a bright thought, he marched straight to the water, at some distance, and plunging his beak beneath the surface, kept the mouse submerged till it ceased to struggle. He then withdrew it, and with some slight difficulty managed to gobble it up. The carnivorous appetite is curious, the skill displayed in capture still more so, but the ingenious resource of drowning the active mouse, in order to eat him securely and comfortably, most curious of all. My friend (I may mention his name, Mr. Henry Curtis, known by repute to every rose-lover, almost to every botanist) is so sober, grave and upright a man that I have the most absolute confidence in the truth of what he told me.—*P. H. Gosse; Torquay, January 4, 1862.*

Occurrence of the Little Auk Inland.—I wish to add the following to the cases of the occurrence of the little auk inland which I find in the ‘Zoologist’ of this month. I received a letter, from which the following is an extract, from my friend and neighbour, William Butler, Esq., of Lee Court, Empshott, two miles from hence:—“Lee Court, November 19, 1861. My dear Sir,—I have this day forwarded to you a bird which one of my labourers picked up near his cottage: it ran, but made no attempt to fly.” The bird soon died, and had refused all food. It has been stuffed, and is now in the Museum of the Alton Institution.—*Thomas Bell; January 7, 1862.*

Variety of the Common Gull.—At Balta Sound, last December, I shot a common gull (*Larus canus*) of such small size that its whole length (fourteen inches and a half) did not exceed that of the wing of an ordinary specimen, when measured from carpal joint to tip. It was an adult male in full plumage, but the bill, legs and feet presented a very unusual appearance, being strongly tinged with yellowish brown.—*Henry L. Saxby; 54, Gilmore Place, Edinburgh.*

Plumules in the Wings of the Genus Pieris.—At a late meeting of the Manchester Literary and Philosophical Society Mr. John Watson read a paper "On certain Scales of some Diurnal Lepidoptera," in which he recommends a new and careful study of this subject. In some genera peculiar scales, called plumules, have long been known; but examination with the binocular microscope shows that they are not flat, like ordinary scales, but cylindrical and hollow. They have been found only in certain genera (named in the paper) at present, and on the males alone; they possess generic resemblances and specific differences, each species displaying its own distinguishing variety. One of great beauty and novelty, found only on two African butterflies, *Pieris Agathina* and *P. Chloris*, was described, and some very fine drawings of it, by Mr. Joseph Sidebotham, were exhibited, and also other figures by him of about one hundred species never figured before. The names and habitats of the insects were given, and the author pointed out the value of these scales for the assistance of the scientific entomologist in arranging genera and species. He then entered into the question as to their probable use as air-vessels in the economy of the insects possessing them. The chairman remarked that the scales of the Lepidoptera may prove as valuable in determining species as the scales of fishes. Mr. Sidebotham alluded to the value of the binocular microscope in defining the cylindrical form of the plumules, and described the mode of finding them *in situ* by breaking the wing. Mr. Watson stated that some of Mr. Sidebotham's excellent drawings were taken under the eighth objective, magnifying 750 diameters. Mr. Watson further said that he had examined the wings of 400 specimens of the Papilionidæ, but had not discovered any plumules in that family. He also alluded to several so-called species from South America, of which no males have yet been found, others of which no females have yet been discovered, and suggested the possibility of some of these being male and female of the same species, to ascertain which careful examination of the scales might be useful. Mr. Watson exhibited a number of mounted specimens of the plumules, and four cases of the Lepidoptera, from whose wings the ninety-eight drawings figured by Mr. Sidebotham were taken. They were principally *Pieris*, *Anthocharis*, *Enterpe* and *Eronia*. Amongst the former were some new and unnamed species from Celebes, with rare specimens from Venezuela, Quito, East and West Indies, Africa and other parts of the world.—'Quarterly Journal of Microscopical Sciences' for January, p. 69.

[It is interesting to see this, the oldest of all entomological inquiries, again revived; a similar attempt was made in 1828, when the plumules of fifty-four species of male Pierides were figured, and the objects themselves examined at a meeting of the Entomological Club. The idea that these plumules had ever been considered "flat" is new to me.—Edward Newman].

Viscid Lines in a Spider's Web.—As I have, although very casually, alluded in this paper to the large garden spiders, I may, perhaps, be allowed to mention a fact connected with them which came under my notice about the same time. It is well known that in all geometric spider webs the concentric lines, with the exception of those in the very centre, are most beautifully dotted with a viscid substance, to aid in the capture of insects. Mr. Blackwall has, I believe, computed that there are more than 100,000 of these gummy drops in a web which is made in about half an hour; it has always, therefore, been a puzzle in my own mind how this part of the process was effected, and as I had been unable to find any one who could give me a satisfactory explanation, I thought I would carefully watch a spider during the operation, when, with only a pocket lens, I could distinctly see that the viscid lines, as first drawn from

the abdomen were not dotted. On a careful examination with a microscope, which I took into the garden, the thread appeared only slightly thicker than an ungunmed line, but after a very short time undulations appeared, and subsequently, at the most regular distances, the viscid matter formed into alternating large and small globules. The whole process is such a beautiful illustration of molecular attraction, which Mr. Rainey has been so patiently and profoundly working out with regard to the highest organic structures, that I thought this simple example might interest some of our members. The cold weather has, of course, driven away this spider till next autumn at least, but the same result can easily be obtained artificially.—*Richard Beck, in 'Journal of Microscopical Science.'*

Mangold Wurzel Crops injured by a Species of Anthomyia.—With a view to ascertain the origin of the evil, I paid frequent visits to a mangold field, in order to discover the fly which was the parent of the leaf-mining larvæ whose existence within the cuticles an intelligent farmer had first pointed out to me. I searched hundreds of leaves, in order to obtain possession of some pupæ, but in vain. I brought home several leaves containing full-grown larvæ, which I anticipated would soon become pupæ, and placed them in water, in hopes of thus being able to secure a pupa or two; but I found the larvæ always dropped out of the leaves. Failing in this, I determined to watch the insects in the field, and my suspicions were soon fixed upon a two-winged fly with reddish brown eyes, which was very abundant on the mangold leaves, and seemed evidently to have some object in view beyond the mere ordinary and incidental one of settling upon them. I observed, on the under surface of the leaves, a number of small white cylindrical ova, in clusters varying from two to six or eight together. On holding these up to the light I could clearly see from the track, which extended from the ruptured ova between the cuticles to the larvæ in another part of the leaf, that these were the undoubted ova of the damaging insect; but it still remained to prove that the suspected fly was the parent of the ova. I therefore made a microscopical examination of the eggs which had been deposited on the leaves; these, under a power of 250 diameters, presented a beautiful reticulated structure. I then dissected a number of the flies, whose abdomens were evidently distended with ova, with a view to compare the eggs in the ovary with those I had already examined. I found them in every stage of development, and discovered some of the exact shape and size, though of softer consistency than the eggs on the leaves, and presenting the same network structure, characteristic of those which had been naturally excluded. About this time I was made acquainted with Mr. Curtis's description of the male *Anthomyia Betæ*, which exactly agreed with specimens I had taken myself, and as I afterwards discovered a couple of flies *in coitu* I could no longer have any doubt on the subject. It appears singular that this is the first instance on record of the mangolds suffering to any extent from the depredations of these larvæ, the direct cause of the injury last year being the large proportion of female flies compared with the number of the males, being on an average as twelve to one: from the fact of the males only being hitherto recognised, there can be little doubt that in former years this sex predominated, hence the immunity of the plants from injury up to this time; but, as to the cause, whether atmospheric or otherwise, of the large proportion of females during the last year, this is a question which perhaps can never be solved. The female fly continues to deposit ova quite late in the season; I found this to be the case as late as the first week in November. I cannot think that the larvæ change to pupæ *in situ*; I never could detect a single pupa in the leaf, and my observations, so far as they go, tend rather to

show that the maggots drop out from between the two cuticles, and undergo their metamorphosis in the ground; at any rate, I could occasionally discover, by scraping away the soil at the root of the mangolds, here and there a larva; indeed, if the late broods do not remain as pupæ under the ground, how are they able to survive the winter, and by what means is the continuation of the species to be carried on? The larva, at the time of the rupture of the ovum, is about a line long; it is armed with two strong hook-shaped mandibles; it grows fast, and reaches the size of about the third of an inch in length, feeding upon the green parenchyma of the leaf.

ANTHOMYIA BETÆ, *Curtis.*

Female. — The ground-colour of thorax light brown, marked with five or six darker longitudinal lines, with four or five bristles similarly disposed; abdomen rather variable in colour, generally light brown or ashy gray, with a distinct or indistinct darker line down the middle, occasionally with irregular dusky patches, which sometimes become so confluent as to give the abdomen a uniform dusky colour; shape of abdomen oval, narrow at the extremity; head semi-orbicular; eyes reddish brown, remote, destitute of hairs; antennæ velvet-black, drooping, arista bare; face satiny white, with black bristles, having a broad bright chestnut band down the centre; ocelli three, situated on a satiny subtriangular spot on the crown; wings the size of the body, tinged with tawny at the base; alulæ of moderate size; legs black, tawny at the base, long; proboscis dark, with tawny tinge; whole length nearly three lines.

The female is readily distinguished from the male; the more general obvious differences being the shape of the abdomen, which is oval in the female, but linear in the male; the remoteness of the eyes, those of the male being nearly contiguous; and the less bristly character of the female. Two important practical questions will naturally suggest themselves to the agriculturist; 1st. Is this insect likely to abound again in such numbers as to affect the mangold wurzel crops this year? 2ndly. If it does so abound, what remedial measures can the agriculturist adopt? To both these queries it is perhaps impossible to give a satisfactory answer. It has been seen that the injury done to the plants last year is owing, in a great measure, to the large proportion of female flies, a fact which depends on phenomena, of the nature of which we are wholly ignorant. A frost of some weeks duration is generally considered to be the means of destroying many noxious insects, and no doubt this is true to some extent, but it will be remembered that the winter of 1860 was tolerably severe, and yet these *Anthomyiæ* abounded in the following spring. With regard to the second problem, the only possible direct mode of lessening the evil is, as it appears to me, to examine the leaves when the mangolds are young, and when, in consequence, they are most likely to be injured, and to crush between the finger and thumb the little groups of ova, which can readily be detected by the naked eye, of course this would demand a good deal of valuable time, and perhaps for this very reason, may be deemed altogether impracticable. There can be no doubt that many of our smaller birds are of great use to us in helping to diminish the extent of the injury, and since the first appearance of the larvæ of this destructive insect is contemporary with the time when birds are very busy seeking food for their young, perhaps the farmer's best policy is to abstain from an indiscriminate slaughter of the feathered tribes, and to leave with them the chance of being of considerable benefit to him.—*Journal of Microscopical Science, January,* p. 40.

Life-Histories of Sawflies, Translated from the Dutch of M. Snellen Van Vollenhoven. By J. W. MAY, Esq.

(Continued from p. 7857.)

LOPHYRUS PINI, L.

Linn. Syst. Nat. ii. 922, 14. *Fabr. Syst. Piez.* 22, 7. *Panz. Faun. Germ.* H. 87, Tab. 17, et H. 119, Tab. 5. *Schæff. Icon.* Tab. 67, f. 13. *Hartig, Blatt-und Holzwespen*, p. 141 and following. *Lepel. de St. Fargeau, Mongr. Tenthr.* p. 54. *Ratzeburg, Forstins*, Th. iii. 85. *Snellen van Voll. Schad. Ins.* bl. 52 and following.*

Lophyrus ♂ niger, abdominis segmento primo albo-maculato, pedum genubus, tibiis tarsisque pallide rufo-flavis; ♀ sordide flavus, maculis tribus dorsalibus thoracis et macula magna irregulari in abdominis dorso nigricantibus.

The destructive animal which we are about to treat of has been long known, as much, probably, from the great numbers in which it generally occurs as on account of the injury it occasions, and we find it mentioned in the works of the founder of the system. Since his time so much has been written about it that it becomes a matter of some difficulty to keep within the bounds of a periodical, and at the same time not to omit notice of matters deserving to be recorded.

I will begin by my own observations. On the 10th of July, 1845, I received from Dr. M. C. Verloren six larvæ of *Lophyrus Pini*, which he had found near Zeist or Driebergen. These larvæ fed, whilst in my possession, on the leaves of the common pine (*Pinus sylvestris*). They pupised among the withered leaves, at the end of July. The first appearance of a perfect insect from the cocoon was on the 5th of August; this was a female; the others remained over the winter, and did not appear until the month of June in the following year. I have since had the larvæ more than once, and have succeeded in rearing them, some males among the number, but I have kept no record of the dates. The following appears from my notes of the metamorphoses of the larvæ. The larva attains a length of one Paris inch and three lines, or 35 mm. The whole body is yellowish green. Head ochre-brown. with darker mandibles, and two round black spots, in which are the eyes. Obliquely below these are the little feelers, which are also

* To these may be added, J. O. Westwood in 'Gardener's Chronicle' for 1852.

darker than the ground colour. All my larvæ had a triangular spot on the crown of the head, blackish to quite black, and always darker than the ground colour; some individuals had, in addition, two small spots on each side of the head, as represented in the above-quoted work of Dr. Hartig, pl. iv. fig. 1, c. I have not observed a head marked as represented at fig. 16 of the same plate.

In some individuals the yellowish green colour of the body passes into greenish yellow; I have seen some of our Netherland species of this tint. The greater number of those which I reared had three darker stripes on the back and sides; that on the back was always conspicuous, while those on the sides were faint. I have represented a rather dark individual at fig. 1.

Each segment of the body of the larva is divided into six folds, the first, third and sixth having little dark sharp hairs; these are not distributed in the manner represented by Hartig (pl. iii. fig. 25) in the work above referred to, namely only one row of hairs on each fold, but, as I have endeavoured to show at my fig. 2, growing irregularly all over the fold. At the side, almost in the first fold, is found the elliptical spiracle. Close below and behind are two little cushions or elevations of the integument, also covered with similar pointed hairs. The neck is of the same colour as the under side of the abdomen, namely a dirty greenish yellow. The thoracic legs are black, with dull yellow rings; the sixteen abdominal prolegs are of the same colour as the belly; above each are two black transverse marks, the second being almost twice the length of the first; these form a row on each side of the body, called by Hartig "die schwarze Semicolon Reihe." None of my larvæ showed any traces of the spots on the first segment mentioned by this author. The last segment is of the same colour as the ventral surface, but entirely covered with spinous hairs and having two oblique green stripes. The author above referred to also mentions some varieties of these larvæ, among others one entirely pale yellow, the head pale brown and without any markings, not having even the two stripes above each proleg. I have not observed any examples of this variety.*

* The following has been communicated to the translator by the author since the above was published in the original. "I have since received from Gelderland the yellow variety almost without marks above the legs. I reared this larva on leaves of the Weymouth pine. The imago appeared on the 27th of May, showing no difference from the ordinary insect. In July, 1858, I also had some larvæ, which were taken at Wassenaar, and which deviated greatly from the usual type. The head was yellowish green, with two blackish spots at the sides surrounding the eyes, and another

Immediately after each moult the heads of my larvæ were yellowish white and the thoracic legs pale green; this colouring remained but a very short time. Not long after the moult the former became brown, and the latter assumed the usual darker tint.

My first larvæ were full-grown by the end of July. They then spun cylindrical cocoons among the withered leaves lying at the bottom of the glass vessel in which I kept them. These cocoons were from 4 to 5 lines or 10 to 12 mm. in length; they were rounded at either end. They may be known by the strength and pergamentaceous nature of their walls; the colour is, however, very variable, for those individuals which spin in and under the moss at the foot of the pine trees generally form brown, sometimes even dark brown, cocoons, while those which spin up in the angles of the twigs usually make silky ashy gray, white or yellowish white cocoons. (See fig. 3).

In the case of a very nearly allied species, *Lophyrus similis*, I once observed that all those which had spun up on the twigs were attacked by parasitical wasps, while those cocoons which had been formed at the foot of the tree produced perfect sawflies. I cannot possibly say whether this was merely a chance observation or whether it was in any wise an illustration of a rule, but I can confidently assert that no such rule or, if one may say so, law of disease is observable in the case of *Lophyrus Pini*. Hartig remarks that the spring brood, which appears in July, spins up among the branches, whilst the remainder hide in the moss; but, as in the case of those I observed, out of one and the same brood one individual became an imago after being one month in the pupa state, whilst the others remained over for eleven months, I find some difficulty in accepting his statement without further observation. Those cocoons which have been opened by the sawfly itself may be known by their having a little lid, as it were, cut out as if by a sharp instrument, as shown at fig. 3, whilst those cocoons which have produced parasitic wasps have a small oval or round hole at the side, and on the other hand those which have been infested by parasitic Diptera have an irregular opening at one end.

Inside of this pergamentaceous cocoon the larva passes sooner or

spot on the clypeus; there was also a black circle immediately round the eyes. Abdomen dull green, greenish yellow underneath; a very irregular black stripe extended over the back. On a level with the stigmata was a row of eleven black spots; similar marks were observable above the anterior legs; over the prolegs was a pitchy black spot preceded by a black dot; the terminal segment was smooth, without wrinkles. From these larvæ were reared one male and three female imagos."

later into a pupa, in which the external divisions of the body are clearly indicated. This pupa is at first of a light cheese-colour, but gradually assumes the tint exhibited by the little animal on its escaping from prison. Fig. 4 represents a female pupa. After having emerged from the pupa state by casting a very thin enveloping skin, the perfect insect, in order to effect its escape, gnaws the round lid out of the cocoon, of which we have just spoken.

From the greater number of those cocoons which have remained hid in the moss during the winter the imagos are developed, some in June and some in the first half of July, so that their time of appearance coincides with that of those imagos of which the larvæ have fed in the spring of the year, and which have only passed about a fortnight in the pupa state. From those same cocoons, namely those which have remained over the winter, some sawflies make their appearance in April, or even, if the season be favourable, in March. When about to deposit their eggs they make with their saw an incision in the side of a fully developed fir leaf, extending the whole length of the leaf, and lay their eggs in the opening, beginning at the base and proceeding towards the tip. The number of eggs varies from two to twenty, or, according to Müller, (*Asterraupenfrass*, 2 Auflage, Aschaffenburg 1824.), even to thirty. Each egg is separately covered by a fluid ejected from the ovipositor. The egg is so placed that its longer diameter is parallel with the midrib; the egg itself is elliptical or cylindrical, with rounded ends; the colour is yellow; length not exceeding 1 mm. By degrees, as the germ is developed within the egg, the latter swells up and the shorter diameter becomes equal to the longer. In consequence of this the sides of the leaf also swell up. After an interval of a fortnight or three weeks the young larvæ are born. During the first period of their existence the larvæ live together in companies of from fifty to eighty, mostly keeping very close together and consuming the leaves at the sides only. They afterwards gradually disperse and eat up the midrib right down to the sheath.

The larvæ hatched in May consume last year's fir leaves during May and June, spin up in the beginning of July, principally among the leaves of young shoots, and generally appear as imagos in about a fortnight. These again lay eggs, the larvæ from which during August and September live on the last year's leaves as well as on the new year's, descend in the middle of September, and spin up in dark-coloured cocoons among the moss and *débris* at or near the roots of the trees. From these cocoons the imago makes its appearance in the following spring. Sometimes, however, these cocoons remain

twenty-one months instead of nine before the perfect insect comes forth.

The time of appearance of these sawflies is thus somewhat irregular, and individuals of this species will sometimes produce but one brood, and at other times two broods, in the same year. However, the rule is generally only one generation in the year, the several stages being as follows. Two or three weeks suffice for the egg state, two months for the larva out of the cocoon, nearly nine months for the larva in the cocoon, only a few days for the pupa state, and but a very few days for the perfect insect before the laying of the eggs takes place. In the usual course April and June are the months in which the insect is to be met with on the wing.

The male of this common sawfly is 3 to $3\frac{1}{2}$ Paris lines (from 7 to nearly 9 mm.) long, and expands 7 to $7\frac{1}{2}$ lines (between 16 and 18 mm.). The joints of the antennæ are beautifully pectinated on both sides, from one end to the other, the teeth on the outside being much longer than those on the inside; the colour is black or brown-black. Head black, punctulate, with dark gray pubescence; three ruby ocelli arranged in an acute triangle; the appendage to the upper lip and the extremities of the palpi rufo-testaceous. Thorax black, strongly punctulate, pubescent; tegulæ brown. Wings pale smoke-colour; nervures and stigma dirty yellow. There are two whitish spots on either side of the first joint of the abdomen; they are situated on that part of the joint in question forming the dorsum, and which reaches down in a point to the under side of the abdomen. For the rest the abdomen is finely punctulate and black, with the exception of the anal extremity, which is reddish. The legs are black from the base to half way the femur, the remainder being pale rufo-testaceous, only the extremities of the tibiæ somewhat darker and inclining to brown.

Klug mentions a variety, from the neighbourhood of Berlin, having the under side of the abdomen pale brown, with some black stripes, and a similar variety is observed by Hartig in the Harts, near Neustadt-Everswalde.

The colouring of the female is entirely different; she is at the same time a little longer and much broader, her length reaching to $4\frac{1}{2}$ lines, or something more than 1 centimetre, and having an expansion of nearly 9 lines or 19 mm. The general colour of the body, with the exception of the head, is a dirty more or less brownish but shining yellow; the head, on the other hand, is decidedly brown, in some individuals even passing over to a black-brown; beneath the eyes and the parts of the mouth the colour is paler, being dirty yellow. The

antennæ have 18, 19 or 20 joints, the basal joints being bright yellow, the others dirty yellow or brownish; they are distinctly serrated on the under side, but are not provided with the beautiful pectination of the male. On the thorax are three large black or dark purple spots, the first covering nearly the whole of the surface of the anterior division of the mesothorax; the two others, which are situated at the sides of the thoracic surface, are elliptical and curved, having their convex sides towards each other. Between these last are two smaller spots. In dark-coloured individuals the black colouring is more diffused, in some instances covering the whole of the middle of the thorax. The scutellum is yellow, the posterior margin being generally black, which sometimes extends beyond the middle. In Germany, where this species is more generally met with than with us, individuals have been found having the entire scutellum black. The breast is almost always wholly yellow, but a few examples have been observed with a black spot on the breast. The upper surface of the metathorax is almost always entirely black, and very rarely having yellow spots on the sides. The abdomen varies much in colour, in the extent of the black marking, which forms a shining spot in the centre. The first segment is yellow, with or without a very small central triangular spot; the second is either yellow, with a similar little triangular spot, or black with yellow margins; the four following are almost always black in the centre and yellow at the sides, the yellow being divided from the black by diverging notched lines. The seventh segment has generally a small triangular mark in the centre; the remaining segments are yellow, which colour is also that of the under side of the abdomen and of the legs, with the exception of some small spots on the coxæ and femora. It only remains to add that the extremities of the tibiæ and of the joints of the tarsi are darker than the ground colour, and that the wings are hyaline, but reddish towards the apex. (See fig. 6). Hartig records as a distinguishing characteristic of this species that the extremities of the under wings are blackish; I do not find this to be the rule with specimens taken in this country; on the contrary, it seldom occurs here.

Both Klug and Hartig have given themselves the trouble of describing all the varieties in coloration which they have observed in the female of this species, to the number of fourteen or fifteen. We shall, however, not follow them in this.

The saw of the female consists, as in the other tree-wasps, of two equal parts, which, when applied to each other, are pointed and more or less curved. They have nine oblique rows of teeth, and on the

upper surface are furnished with eight horizontally projecting serratures. The ovipositor, which opens only at the extremity, is transversely ribbed, and has some little knobs on the under side.

This sawfly occupies a conspicuous place among injurious insects. It is the only one of this family which, although not gregarious, has proved singularly destructive. In our country it has made itself known by its ravages, more especially at Driebergen, Zeist, Epe, Apeldoorn, Eibergen, Groesbeck, Barneveld, Brummen, Voorst, Gorssel, Vorden, Laren, Lochem and Ruurlo. It is not possible to estimate with any exactitude the amount of injury caused by this insect in any given year, as our foresters and keepers have so little knowledge of Entomology, or, rather, see so little difference in the various species of vermin, as they call them, that no reliance can be placed on their observations in these matters. There has been some talk of a commission *ad hoc*; but this, like so many projects of a kindred nature, has been laid aside. The injury is indeed felt, but little noticed, and the means of preventing such devastations are, it appears, left to chance, or are expected to come by inspiration.

There is one fact which may tend to make the attack of this insect less injurious than it otherwise would be; that is, that the larvæ much prefer sickly to healthy and well-developed trees, or, what comes to the same thing, the female lays her eggs by preference on diseased pine trees. Whenever they have occurred in such numbers that both sickly and healthy trees have been alike attacked it has been remarked that the southern and western sides of the forest were the first to be eaten bare, and had thus undoubtedly harboured the greatest number of larvæ.

In Germany the devastations of this insect have been known for the last seventy years.

In 1781 they appeared in such great numbers in Pomerania that an average of three hundred cocoons were found on each square Rhineland rood. In the following year they spread themselves into Mark-Brandenburg. There they remained in moderate numbers till 1818, but in 1819 and 1820 they suddenly spread over the greater part of Franconia and Saxony, causing immense injury. In 1834 their numbers again increased to an incredible extent in the neighbourhood of the Elbe. This is not the place to recount the means that have been taken to restrain their ravages, sometimes with and oftentimes without any good result. We refer the reader who may wish to know what has been done in the matter to the special works on the subject, and particularly to Ratzeburg, 'Die Forst Insekten oder Abbildung und

Beschreibung der in den Wäldern Preussens und der Nachbarstaaten als schädlich oder nützlich bekannt gewordenen Insekten,' Berlin, 1839.

It remains, in order to complete the history of our larva, to notice its insect enemies, and more especially its parasites. Of these we have ourselves only observed among the Hymenoptera, *Tryphon aulicus* and *T. variabilis*, *Campoplex argentatus* and *Eulophus Lophyrorum*, whilst among the Diptera we are only able to name *Tachina bimaculata* as having appeared from the cocoons of our insect. Hartig gives in addition to these, *Cryptus leucosticticus*, *C. flavilabris*, *Phrygadeuon Pteronorum*, *P. pugnax*, *Mesochorus Laricis*, *Campoplex relectus*, *Tryphon Lophyrorum*, *T. Tenthredinum*, *T. hæmorrhœicus*, *T. calcator*, *Exenterus marginatorius*, *E. oriolus*, *E. adpersus*, *Metopius scobriculatus*, and *Torymus obsoletus*; and of Diptera, besides those mentioned, *Tachina gilva* and *Musca stabulans*.

We pass by in silence the notices by Müller in the work above referred to, as the determination appears to us to be too uncertain; but Ratzeburg, in his *Wirths-System*, mentions, in addition to the Hymenoptera above named, *Campoplex carbonarius*, *Cryptus incertus*, *C. leucomerus*, *C. nuberculatus*, *C. punctatus*, *Hemiteles areator*, *H. crassiceps*, *Mesochorus areolaris*, *M. scutellatus*, *Ophion merdarius*, *Pezomachus cursitans*, *Pimpla rufata*, *Tryphon impressus*, *T. leucosticticus*, *T. lucidulus*, *T. Rennenkampffii*, *T. scutulatus*, *T. triangulatorius*, *Pteromalus lugens* and *P. subfumatus*. Of all these *Phrygadeuon Pteronorum* is the most frequent parasite. Some of the above Ichneumons are parasites on parasites.

Coccus of the Rose.—When hunting on a north wall for large garden spiders I could not but notice a *Coccus* in great abundance on the older stems of a rose bush, both the male and female insects being visible to the naked eye. For many reasons I for some time believed this to be a species entirely different from that on the orange. The external appearance of all the shields was very different, and when these were turned over the females were so much larger at the head as to be quite different in shape, and of a much darker colour. The eggs, also of a darker colour, were laid in a more or less circular position, and most of the males contained a fly entirely different from that I had previously described. But these were the only differences, and ultimately, after a very careful examination, I traced both males and females, the former more especially, through exactly the same metamorphoses as I have described in my former paper. The small fly I have alluded to as being present in some of the male shields, and, as I found afterwards, in those of the female also, is a species of ichneumon, but its presence alters the external character of the *Coccus* very little, a slight

enlargement in the males only being visible. Beneath the shields there are, however, considerable differences; in the female Coccus the mere fact of a fly being developed is sufficient to indicate an unnatural state, and whereas the male Coccus, when in its pupa state, undergoes considerable changes in its form, the smooth, hard shell in which the ichneumon-fly is developed is invariably uniform. This shell is left behind when the imago escapes, in the male Coccus one or other extremity being removed, but in the female a clean round hole is made through both shell and shield. From examination of some skins of Aphides, from which the ichneumon flies have escaped, I believe that in making the hole this portion of the shield is not destroyed, but a piece is cut out which has very much the appearance of the cover of a "man-hole" to a boiler. The external features of the ichneumon are also of a much higher class than those of the Coccus. The head is perfect in all its parts; there are four wings; the eyes are compound; the extremity of each leg is provided with a beautiful trumpet-shaped sucker, and the ovipositor is capable of being protruded or otherwise. To sum up these few and very short remarks, I venture to repeat the two facts which I consider of most interest,—*first*, that the male of this Coccus may, under some circumstances, be detected in our own gardens; *second*, that the same species may differ very considerably, more especially on the exterior of the shield, according to the climate, its position, or the nature of its food.—*Richard Beck, in 'Quarterly Journal of Microscopical Science.'*

Notes on the Entomology of the Isle of Man.

By the Rev. HUGH A. STOWELL, M.A.

THE Isle of Man has certainly hitherto had scant measure of justice done to its Natural History. Edward Forbes catalogued its Mollusca, and he and others have contributed a paper or two on its Flora; but with these two exceptions, and a few scattered references in the works of Yarrell, the page is still blank. Turning to the 'Zoologist,' that storehouse of local Natural-History lore, we find that four brief notices, not occupying more than half a page collectively,—two of them ornithological, by Captain Hadfield, a third recording a large flight of *Vanessa Urticæ* on Christmas Eve, and the fourth noting the occurrence of a dark variety of *Hydroporus 12-pustulatus*, by the Rev. Hamlet Clark,—are the sole contributions towards its Fauna which the eighteen volumes of our familiar friend contain. Stephens' 'Manual' just recognises its existence by noting it as a locality for *Carabus granulatus* and the *ruficeps* var. of *Harpalus fulvipes*, both of which still abound here. Mr. Stainton could glean no item of intelligence about its Lepidopterous productions for *his* 'Manual.' No wonder then that he bestows this piece of advice upon a correspondent, "The island has been very little worked entomologically, but if you keep

your eyes open you may do something towards it yourself.”—(Ent. W. Int. i. 50). How far “S. R. M.,” the individual therein immediately addressed, may have profited by the editorial counsel I know not, for since my coming hither it has not been my good fortune to see net entomological plied other than my own. Of nets piscatorial of course there are *quantum sufficit* and a few over, at least so complain one’s olfactory nerves now and then. Yet surely the island is not without a peculiar interest, arising from its central position between England, Wales, Scotland and Ireland; and as a *terra incognita* in the heart of the British seas, easily accessible and of late years much visited, it is rather surprising that it should have been quite overlooked by such indefatigable explorers as Dr. Power, Mr. Wollaston and Mr. Clark. I include Mr. Clark because I am sure that he can only have paid it a flying visit if he found nothing more remarkable than the occurrence of *Hydroporus 12-pustulatus* to record concerning its Coleoptera.

It is only of this immediate neighbourhood that I can speak with any confidence; for be it remembered the Isle of Man—“*the Island*,” as we pretentiously style it—is rather larger than Lundy, the Wollaston-explored, and the Scilly Isles of Holiman note. Nevertheless in soil, geological formation and local features this district will represent at least half the island, with a consequent probability of no great variation in the insect fauna of that half. The sandy level of the North, with its “currags” or bog-lands, from which the sea has retired at a very recent date geologically speaking,—the old red sandstone of the Western Coast,—and the limestone district in the South,—each of these has probably its own special denizens which will find no record here. Let me then, as briefly as may be, glance at the peculiar features of this locality. The soil is light, gravelly and generally shallow, resting upon schistose rocks, which rise rapidly from the cliffs of the coast to a height of 1000—1200 feet, over which towers the summit of Nortto Barrule, 1900 feet. Of level land there is none. Cultivation reaches an average height of 850 feet; beyond this all the land is unenclosed moor. Glens and ravines varying much in depth and extent plough up table land and hillside in all directions, the beds of as many pretty rivulets, and, where not cloven abruptly through the rock, their lower slopes are rendered swampy by the constant exudation of the water which has fallen on the higher land and been repelled by the underlying rock. Insignificant brooks and shallow puddles on the moors, where the surface has been peeled for fuel, are our only waters, saving always the sublime presence ever with us of the great deep.

Of trees we can boast very few; the ash alone seems indigenous here; the plantations, chiefly of larch and Scotch fir, which clothe the glen sides here and there are all of recent date. The rank herbage and glowing masses of honied flowers that overrun the sunny banks and wood-glades of the mainland, especially in the South, are wanting here. The primrose in spring, the foxglove in summer, the heather in autumn, and the bonnie golden gorse all the year round, are the only flowers sufficiently massed to make much of a show. Hedges are supplanted by banks, of which more elsewhere. It is evident then that the Hydradephaga, Xylophagi, and those families of Coleoptera which especially affect the society of "lush floral beauties," the Longicornes for example, will be poorly represented in such a district, and the same local conditions are of course even more unfavourable to Lepidopterous life than to Coleopterous.

The Macro-Lepidoptera hitherto observed here amount to no more than 146 species, thus distributed:—

Diurni	12	Noctuæ	53
Nocturni (<i>Guen.</i>)	15	Deltoides (<i>Latr.</i>)	2
Geometræ	42	Pyalides	9
Pseudo-Bombyces (<i>Guen.</i>)	2	Crambites	11

Many common and widely distributed species appear to be entirely absent. For this and other reasons, at which I have already hinted, a complete catalogue of our Entomological Fauna would be very interesting were it attainable. In the absence of this, owing to the want of more complete observation, we must be content with enumerating the few species that are in any degree noteworthy, distinguishing those that occur in some plenty with an asterisk, and adding a note where it may seem desirable.

Diurni. Satyrus Semele.*

Nocturni. Macroglossa Stellatarum, Acherontia Atropos, Sætina irrorella, Nudaria mundana,* Arctia fuliginosa,* Bombyx Rubi.*

Geometræ. Boarmia cinctaria, Pseudoterpna cytisaria,* Fidonia atomaria,* Gnophos obscurata,* Larentia cæsiata, L. salicata, Emmeslesia albulata,* Eupithecia subfulvata (*Haw.*), E. nanata, E. satyrata, E. absinthiata,* E. pumilata,* Thera firmata, Cidaria miata, C. populata, Eubolia mensuraria,* E. palumbaria,* Anaitis plagiata.*

Noctuæ. Leucania canigera,* Hydræcia nictitans, H. micacea,* Axylia putris, Luperina testacea,* Mamestra furva, Miana literosa,* Agrotis valligera, A. nigricans, A. corticea,* A. porphyrea,* Noctua

brunnea, *N. bella* (*Bork.*), *Rubi* (*View.*), *N. neglecta*, *Xanthia* *Silago*, *X. Cerago*, *Polia* *Chi*, *Epunda* *nigra*, *Hadena* *Chenopodii*, *Xylina* *petrificata*, *Heliothis* *marginata*, *Anarta* *Myrtilli*, *Plusia* *pulchrina*, *Stilbia* *anomala*.*

Deltoides. *Hyphenodes* *costæstrigalis*.

Pyralites. *Pyrausta* *purpuralis*, *Botys* *fuscalis*,* *Scopula* *etialis*,* *S. ferrugalis*.

Crambites. *Crambus* *margaritellus*, *C. perlellus*, *C. Warringtonellus*, *C. geniculeus*,* *Aphomja* *sociella*.*

Bombyx Rubi. Of thirty-six larvæ of this species collected on the Cliffs on the 26th of September it may be worth noting that eleven were feeding on *Lotus corniculatus*, eight on *Calluna vulgaris*, five on *Trifolium pratense*, four on *Erica cinerea*, four on *Rubus cæsius*, three on *Viola canina*, and two on *Thymus Serpyllum*. In confinement, however, they all appear to prefer bramble leaves to any other food. The painful irritation of the skin caused by handling them did not entirely subside till the fifteenth day. The only other larva from which I have experienced the same unpleasant infliction in any marked degree is that of *Liparis chrysoorrhœa*.

Boarmia cinctaria. This species must be double-brooded here. Three young larvæ taken in June, 1859, fed up fast upon *Aira canescens*, and appeared in the perfect state in the middle of August. The larvæ of *B. repandata*, which abound here, feed upon various species of *Rumex*. "Larva living on trees."—(Staint. Man. ii. 25).

Gnophos obscurata. A form of this insect intermediate between the true *obscurata* and the var. *pullata* is not uncommon at the foot of the cliffs, south of Cornah Harbour. It flies madly over the huge fallen masses of rock in the hot sunshine, and as soon as the sky is overcast disappears and lies so close that it is almost impossible to put it up. Hence its capture is by no means easy.

Eupithecia pumilata. This pretty little insect is by no means scarce. But on what plant does the larva feed? *Clematis* and *Convolvulus* are both absent from our flora hereabouts; so, too, is the common *Anthriscus sylvestris*, upon which Mr. Crewe reared it. The only Umbellifer growing in any plenty here is the usually rare *Carum verticillatum*, and upon this I cannot find it.

Anaitis plagiata. In the warm cozy Kentish woods, where I first met with this graceful species in plenty, *Hypericum perforatum* and *H. hirsutum* were the sole representatives of its favourite order. Here on our wild storm-beaten cliffs, where it is equally abundant, they are

replaced by *H. pulchrum* and *H. humifusum*. In both localities it occurs in company with its Coleopterous messmate *Chrysomela fucata* (Hyperici).

Miana literosa. This may be added to the list of occasional day-fliers.

Heliothis marginata. A single larva taken May 29, 1859, upon *Geranium molle*, in the middle of a clover field, and fed up on that plant. No Ononis, I am pretty sure, within four miles. Not met with either as larva or imago since. Can this be in any way connected with the "in-seed-importation" doctrine?

Stilbia anomala. This curious insect has only occurred to me at light. The same remark will also apply to *Aphomia sociella*.

Pyrausta purpuralis. An example of this species came to light about midnight, July 22. I had supposed the genus to be exclusively day-fliers.

I may remark, before taking leave of the Lepidoptera, that the Noctuæ here do not seem to understand sugar. It attracts literally nothing but a few *Depressaria* and hosts of earwigs. Flowers, on the other hand, especially those of the "cushag" (*Anglice* ragwort), the potent attractions of which are fully appreciated by the practical entomologists of the Lancashire coast, yield a tolerable harvest, though it chiefly consists of the commonest ground-feeding species.

Of the Coleoptera of the Island I can fortunately report better things. The number of species I have met with (406) is considerable, if the fact be taken into account that, with but half a dozen exceptions, they have all occurred within two miles of the house from which I write; and amongst them will be found several very local species and a few of great rarity.

Of the 406 species the thirteen great clans claim respectively the following proportions:—

<i>Geodephaga</i>	71	<i>Heteromera</i>	5
<i>Hydradephaga</i>	8	<i>Rhynchophora</i>	77
<i>Brachelytra</i>	94	<i>Xylophagi</i>	0
<i>Necrophaga</i>	58	<i>Longicornes</i>	0
<i>Lamellicornes</i>	18	<i>Eupoda</i>	33
<i>Sternoxi</i>	11	<i>Pseudotrimeria</i>	18
<i>Malacodermi</i>	13		

It will be observed how remarkably their distribution bears out my previous remarks on the local conditions under which they exist.

The following list will be found rather more select in quality than that of our Lepidoptera, but at the same time more full in quantity, an enlargement which it is hoped will not be blamed by those who remember, how little, comparatively speaking, is known of the distribution, haunts, habits, &c., of British Coleoptera. The terms "by raking" and "in moss, &c.," will be found explained elsewhere.

Dromius fasciatus. Abundant, by raking; also sweeping heather. February—November.

Lebia cyanocephala. One example by raking. Head black, with a slight violet tinge. Thorax pale orange-red. Elytra brassy violet. Legs dark pitchy, except the base of the femora, which are red. March 26, 1861. Is not this very far North for the occurrence of this species?

Clivina collaris. Rare; under stones in moist places. April, September.

Nebria Gyllenhalii. Occasional; under stones, 800 feet and upwards. March—June.

Carabus arvensis. Local and scarce. On Craig-na-mult, 900—1000 feet, in heaps of stones. May. One specimen, black, with a very slight brassy reflection in certain lights.

Carabus nitens. Very local. Swampy ground near the top of Snaefell, 1900—2000 feet. May, June.

Anchomenus micans. Occasional. Wet meadows. March—June.

Pterostichus minor. Locally abundant; in moss, &c. February—April.

Amara bifrons. Rare; under stones. April.

A. consularis. Occasional; under stones and rubbish. March—June.

A. aulica. Frequent; under stones. March—June.

Agabus fontinalis. One example only. May.

Myrmedonia limbata. Rare; in nests of *Formica fusca*. May.

Eucephalus complicans. Occasional; in moss, &c., and sweeping meadows. March—September.

Quedius maurorufus. Occasional; in moss, &c. March, April.

Lathrobium terminatum. Frequent; in moss, &c. February—April.

Cryptobium fracticorne. Frequent; in moss, &c. February—April.

Evesthetus scaber, *E. læviusculus*, *E. ruficapillus*. In moss, &c. February—April, and more sparingly in autumn. I am indebted to

the kindness of Dr. Power and my friend Mr. Reading for the determination of these species. *E. læviusculus* has not, I believe, been taken anywhere else in Great Britain since its first discovery at Holyhead, by Mr. Wollaston.

Olophrum piceum. Frequent; in moss, &c. March, April, September.

Philorinum humile. Frequent; on *Ulex*. April—June.

Omalium Salicis. Occasional; on blossoms of cherry trees. May.

Pseudopsis sulcatus. One specimen in garden rubbish. September.

Monotoma longicollis. In garden rubbish, with *M. picipes*, but far scarcer. September, October.

Cytilus varius. Occasional; in moss, &c., and sweeping meadows. March—June.

Simplocaria semistriata. Rare; under stones on grassy banks. May—July.

Scydmænus scutellaris. Rare; in moss, &c. April.

S. hirticollis. Frequent, but local; in moss, &c. March, April.

HUGH A. STOWELL.

(To be continued).

Proceedings of Societies.

NORTHERN ENTOMOLOGICAL SOCIETY.

December 21, 1861.—The meeting took place at the residence of James Linton, Esq., 6, Trafford Mount, Old Trafford, Manchester. C. S. GREGSON, Esq., President, in the chair.

Elections.

The President called attention to the advisability of electing his successor at the present meeting, rather than to elect him at the next meeting, when, whoever the duty fell upon, he could scarcely be expected to be in a position to deliver an address at a moment's notice.

The question was discussed, put and carried without a dissentient.

Nicholas Cooke, Esq., was elected President, and G. H. Wilkinson, Esq., was re-elected Secretary.

The Rev. Joseph Greene, Cubley Rectory, Derbyshire, was elected a Member.

Photography applicable to Entomology.

Mr. Greening introduced the subject of photography as applicable to entomological purposes, illustrating his remarks by exhibiting a photograph of a variety of *Abraxas grossulariata* from the President's collection, executed by Helsby & Co., Church Street, Liverpool.

Mr. Sidebotham explained how, by the use of coloured glass before the lens, the colour of the insect might be neutralized, as in the case of yellow a light blue glass would give green, which colour enabled the photographer to work successfully.

The President explained how, with a half-plate lens, he had succeeded in obtaining the natural size negative of the insect before the meeting. After sundry attempts which all produced reduced figures of the insect, he determined to try what a much greater elongation of the camera would do, and immediately made a long box without ends, fixing the lens end of the camera in one end of it, and drawing the back part out; he got a full-sized figure without further trouble.

Mr. Sidebotham called the attention of the meeting to a series of carefully executed diagrams on the table of the plumules and scales of Pieridæ, made by himself to illustrate a paper by his friend Mr. Watson, and observed that in no case had they found any plumules upon female specimens.

An interesting conversation ensued, in which Mr. Sidebotham gave much valuable information.

The President distributed a number of copies of his "Coleoptera of the District around Liverpool. Section I. Geodephaga. 1861."

Exhibitions.

Mr. Miller exhibited two boxes of Lepidoptera, containing many interesting species, including two fine *Acidalia obsoletaria*, and some fine varieties, including *Hepialus*, var. *carnus*, *Steph.*, and a fine variety of *Cymatophora flavicornis*.

Mr. Chappell exhibited a box of Lepidoptera, in which was the pupa-case of *Chortobius Davus*, two fine varieties of *Polyommatus Phlæas*, and a fine pair of *N. Bondii*, a black variety of *Hybernia leucophearia*, and a perfect hermaphrodite *H. progemmaria* having the male wing and female antennæ on the same side and *vice versâ*. He also exhibited a box of rare Coleoptera, including *A. Ericeti*, *Ptenidium lævigatum*, and a *Pterostichus* variety?

The Rev. H. A. Stowell sent a box of Coleoptera for distribution at the meeting, containing *Dromius fasciatus*, *Omius sulcifrons*, *Mantura Chrysanthemii*, &c.

Mr. Greening exhibited a box, in which were a series of *E. virgaureata*, bred from the seed-heads of *Lychnis dioica*, and a new species allied to *Eupithecia absinthiata*, but perfectly distinct. Mr. Johnson also sent this species to be identified.

Mr. Kenderdine exhibited a box, in which was *Eupithecia denotata*, also *E. virgaureata*, &c., from Exeter.

Mr. Linton exhibited a box of Lepidoptera, as a sample of the specimens he had received from Mr. Rogers, Freshwater, Isle of Wight; they were generally fine and well set: *Agrotis lunigera* and *A. obelisca*, very fine; *Aporophila australis*, small; *Heliophobus hispida*, light; *Epunda viminalis*, darker than southern specimens usually are. He also exhibited a fine series of *C. pinguinella*, taken by himself in Regent's Park. He also distributed a number of *Sesia Cynipiformis*, &c., amongst the members.

Mr. Mawson, of Cokermonth, sent a box, in which, amongst other species, all fine, were *Lobophora viretata*, from Keswick, *Oporabia filigrammaria*, *Agrotis Ripæ*, *Xylina petrificata* (dark), *Coremia ferrugata*, *Notodonta Carmelita* (very large and well marked), and a variety of *Cidaria silaceata*, with the band uninterrupted.

Mr. Hodgkinson exhibited a box, in which were *Acronycta Alni*, *Leucania*

putrescens, and a recent specimen of *Lycæna Acis*, from Ipswich, taken amongst *L. Ægon*, in 1861, and a box in which were fine series of *Stigmonota lunulana*, *C. pupillana*, *Asycbna terminella* and *Elachista trapeziella*, from Mr. Wilkinson, of Scarborough.

Mr. Pugh, of Preston, exhibited a pair of *Dicranura bicuspis*, fine and beautiful, from his own cabinet.

Mr. Sidebotham exhibited a box, in which was a magnificent variety of *Chelonia villica*, having dark suffused wings, which was much admired, the President calling attention to one almost like it exhibited by Mr. Reading, of Plymouth, three or four years ago.

Mr. Sidebotham also exhibited a box containing foreign specimens of *Dianthæcia compta* and *D. conspersa*, and opposite to them British specimens, one of which (received from Mr. H. J. Harding, of Deal), having the white band continued through the wing, presented the exact appearance of the foreign *D. compta*.

Mr. Hodgkinson distributed *Noctua neglecta*, *Phoxopteryx unca*, &c., amongst the members who wanted them. He then exhibited *Schænobius mucronellus*, recently captured in the North of England.

Mr. Sayer, of London, sent to the President, for his opinion as to their specific difference, a series of an *Elachista* he had bred from *Poa aquatica*, mining differently to *E. Poæ*. The President said he should prefer seeing the mine before giving an opinion, as the perfect insect is very like *E. Poæ*.

Mr. Thomas, of Sheffield, sent a *Eupithecia* to be named at the meeting: it proved to be a variety of *E. subumbrata*.

The President read the following:—

Description of a Coleophora new to Science.

COLEOPHORA IDÆELLA, Gregson.

“The whole insect silvery gray in the male, and grayish ochreous in the female. Wings very narrow; expanse 4 to 5 lines. Closely allied to *C. viminetella* and *C. vitisella*, but differs from them in its case, which is when young cylindrical; afterwards the mouth is ringed, as in the case of *C. vitisella*; then a small raised lump on the shoulder; then a decided triangular hump, giving the case much the shape of a *Notodonta* larva.

“I first observed this case on leaves of *Vaccinium Vitis-Idæa* received from Scotland: it was then young and dead, and I have ever since kept my eyes open for it when in localities where its food-plant grows; but we are indebted to one of our members for first finding it in Lancashire, and first breeding it. The untiring patience of Mr. Hague here meets its reward, he having now bred it several times. I may say we spent many cold hours at the Brushes together in April hunting for it before it put in an appearance there, and now that it is found it seems very scarce. Its case is nearly allied to that of *Coleophora viminetella*, and the insect should be located between that species and *C. vitisella*.”

The President also read the following:—

Notes on Variety Breeding.

“After years of constant study of the habits and food of insects, I determined to ascertain if a change of food would give a change of colouring and marking to species liable to sport, and during the last ten years I have been quietly pursuing my

experiments, unknown to and unassisted by any one, and the results of my experience go to prove most unquestionably that many species may be cultivated into varieties, some of them hitherto not often thought liable to vary; for instance, *Pygæra Bucephala* fed upon sycamore is much finer and much darker than when fed upon any other food I know, though it is well known this species never is found on that tree in its natural state. Again, *Xylophasia polyodon* fed upon heather is always a dark insect, sometimes perfectly black; *Hadena adusta* fed upon heath is also much darker than when fed upon any other plant; *Acronycta Menyanthidis* fed on shallow, on the contrary, often produces Curtis's variety, *A. Salicis*, whilst fed on heath it produces the light specimens of our mosses. Again, *Cidaria populata* fed on *Vaccinium Myrtillus*, is always light, whilst when fed upon *V. Vitis-Idæa* it is always darker, sometimes dark brown without any markings; *Hybernia defoliaria* fed upon birch gives beautifully marked specimens, whilst those fed on elm are but poor dull coloured forms, almost without markings; *Eupithecia venosata* fed upon inflated catchfly is almost white, whilst those fed on the shore catchfly are much larger and almost lead-colour; *Noctua festiva* fed upon thorn is a rich red insect, well marked,—fed upon grasses it is light yellowish, and though it attains its full size, yet it is rarely well marked; and *N. triangulum* fed on thorn is perhaps one of the richest coloured *Noctuæ* we have,—dark, and its markings well defined, whilst fed on low plants it is a light insect. *Eupithecia assimilata* fed on wild hop is finer than when fed on black currant. *Abraxas Grossulariata* fed upon red currant produces a light brood, fed upon blackthorn they are darker; but fed upon bullace, or wild plum, they are darker still, and the white is sometimes turned into yellow. But what will perhaps interest you most to know, and undoubtedly what I know best and have oftenest tried and succeeded in, is that *Chelonia Caja* fed upon *Petasites vulgaris*, or upon the common coltsfoot, will produce darker specimens than when fed upon any other plant I know, and the chances are that when fed upon this food one or more will prove extraordinarily dark, but there is a singularity in the fact that the dark specimens so bred rarely expand their wings: the same remarks apply to the dark specimens of the 'pepper moth,' though we know that one Bolton breeder did succeed one year in getting a considerable number of dark ones out perfect; he never stated on what he fed them, but I expect it was on coltsfoot.

"In bringing this paper before the meeting, I wish it to be understood that I have succeeded in breeding varieties as stated, but not that these are the only species I have practised upon or succeeded with. A sight of my varieties will best show that, but having derived great pleasure from my successful experiments I wish others to follow them up, and so share with me the pleasure."

Mr. Gregson illustrated the foregoing paper by a box containing specimens of varieties of the following species, all recently added to his collection:—*Ephyra orbicularia*, *Celæna Haworthii*, *Tæniocampa gothica*, *Acronycta Menyanthidis*, *Orthosia suspecta*, *Noctua triangulum*, *N. festiva*, *Cidaria immanata*, *Abraxas Grossulariata*, *Liparis auriflua*, *Chelonia Caja*, *Hybernia defoliaria*, &c.

An interesting discussion on the paper ensued.

A vote of thanks to the retiring President brought the meeting to a close.—
G. H. W.

Proceedings of Societies.

ENTOMOLOGICAL SOCIETY.

January 6, 1862.—J. W. DOUGLAS, Esq., President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—‘Nouveaux Mémoires de la Société Impériale des Naturalistes de Moscou,’ Tome xiii. Liv. II.: ‘Bulletin de la Société Impériale des Naturalistes de Moscou,’ 1860, Nos. 2, 3 and 4; presented by the Society. ‘Exotic Butterflies,’ Part 41; by W. W. Saunders, Esq. ‘Sitzungsberichte der Königl. Bayer. Akademie der Wissenschaften zu München,’ 1861, I. Heft IV.; by the Academy. ‘The Zoologist’ for January, 1862; by the Editor. ‘The Journal of the Society of Arts’ for December; by the Editor. ‘The Athenæum’ for November and December; by the Editor. ‘Bibliotheca Historico-Naturalis Physico-Chemica et Mathematica,’ Vol. ix.; by the Editor, Ernst A. Zuchold. ‘The Entomologist’s Annual’ for 1862; by the Editor, H. T. Stainton, Esq.

Election of a Subscriber.

W. S. M. D’Urban, Esq., of Newport House, near Exeter, was balloted for, and elected a Subscriber to the Society.

Exhibitions.

Mr. Smith exhibited a mutilated specimen of *Myrmedonia Haworthi*, captured by Mr. Bouchard, near Sutton, Surrey; and a singular nest of a bee of the genus *Anthidium*, brought from the Cape of Good Hope by Mr. D’Urban: this nest was formed of the fibres from the stems of plants, and might be mistaken for a spider’s nest, from its external appearance; in the interior Mr. S. found the parasite of the bee, a species of *Leucospis*, believed to be *L. ornata*.

Mr. Smith also exhibited spines of a species of *Acacia*, also brought from the Cape of Good Hope by Mr. D’Urban; the interior of these formidable spines, being hollow, is frequently found occupied by the nest of a bee of the genus *Hylæus*. Mr. Smith believed this genus of bees constructs no cells of any kind; the pupæ is merely enclosed in a very slight web; and on opening these spines, the eggs, larvæ, and perfect bees were found mixed indiscriminately together.

Mr. Waterhouse stated that he had recently detected, in the collection of Dr. Power, specimens of *Gyrophæna pulchella*, a species not hitherto recorded as a native of Britain.

Mr. Bond exhibited a sample of compressed peat, cut in thin slices, which had lately been introduced in Germany as a substitute for cork for lining entomological boxes and drawers; the total absence of holes and hard veins, which are occasionally found even in the best cork, make it well adapted for the above purpose, especially when fine pins are employed, whilst the cost is said to be less than that of cork.

Dr. Knaggs exhibited some cases of species of *Psychidæ*, containing living pupæ, which he had lately received from Mr. James Carrighan, of Ararat, Victoria.

Professor Westwood observed that the Australian species of *Psychidæ* had, at the request of W. W. Saunders, Esq., been observed with great care by Mr. Stephenson, and the specimens collected by that gentleman having been placed in his (Professor Westwood's) hands, he had illustrated them in a memoir published in the 'Proceedings of the Zoological Society:' the largest of these species had been described by Mr. Saunders himself in the 'Transactions of the Entomological Society,' Vol. v. (1847) p. 43, under the name of *Oiketicus elongatus*, which he (Professor W.) had changed to *Oiketicus Saundersii*, in order to keep up uniformity in the specific nomenclature of the genus. It forms a tough leathery case, several inches long, to the outside of which long twigs are attached longitudinally. One case, exhibited by Dr. Knaggs, had not been described by Professor Westwood, although known to him, in consequence of the moth not having been reared: the case of this species is a leathery oval one, with sharp longitudinal ribs of the same material, without any extraneous materials fastened on the outside.

Mr. Dunning exhibited an admirably-executed photograph of a dark variety of *Abraxas grossulariata*, and read an extract from the 'Proceedings of the Northern Entomological Society' of December last, which referred to the production of it: Mr. Dunning thought that Photography might be found useful in obtaining accurate delineations of many entomological objects.

Professor Westwood observed that a work had been published at Paris, several years since, by the authorities of the *Jardin des Plantes*, in which Photography had been tried in different branches of Zoology, but the representations of insects had proved failures, owing to the want of accurate definition in the extended limbs, antennæ, &c., which seemed to render the act useless to Entomology, except in flat surfaces, such as the wings of *Neuroptera*, &c., of which the veins were capable of being very clearly represented.

On the Breeding of Varieties in Lepidoptera.

Mr. Dunning also read, from the 'Proceedings of the Northern Entomological Society,' a paper by Mr. C. S. Gregson, "On the Breeding of Varieties in *Lepidoptera*," in which the author detailed the result of his experiments on various species, with the view of showing that by supplying the larva with a food-plant differing from the known natural food of the species, variation from the usual coloration would be obtained in the imago.

Dr. Wallace had often noticed that on chalky soils oak-leaves were of a very pale green tint; on limestone soils, as in Wales, foliage generally had a dark leaden hue. On mosses dark tints were prevalent, as also at Killarney and Rannoch. He attributed this to the chemical difference in the soils, aided by solar and atmospheric influence. Brighton insects were notoriously pale, and inclined to fade on the setting-board; Scottish insects remarkable for their richness of colour; Welsh insects for their leaden hues. Since the juice of different plants possessed different chemical elements, he attributed to this, as also to the power possessed by the larva of assimilating these different elements, much of the variation in depth of colour in the instances cited by Mr. Gregson: he therefore referred the tone of colour in an insect's wing to the chemical elements assimilated through the medium of the plant from the soil.

Professor Westwood trusted that, if Mr. Gregson's article should only be privately

circulated, the Entomological Society would obtain permission to publish it in their 'Transactions.*' He considered Mr. Gregson's remarks as important, with reference to the question of modification of species dependent on the food of the larva, which he had so often insisted upon, with reference to many so-called species of Micro-Lepidoptera. The question as to the proper term to be applied to variations in the colour of flowers was at the present moment under discussion, all variation from the normal colour being considered by some writers as monsters, and in that view Professor Westwood fully concurred, considering that every species possessed a normal condition, which it had retained ever since the period of its creation, and that every modification of size, colour or markings was monstrous.

Mr. Lubbock would like to see the experiments of Mr. Gregson continued for many successive generations of the insects; he felt convinced that important and interesting results would be arrived at by so doing, and hoped that Mr. Gregson would persevere in his experiments.

Bees and the Art of Queen Making.

Mr. Smith read the following communication:—"At the November Meeting of this Society, Mr. Tegetmeier called the attention of the members to a theory lately propounded by Principal Leitch, in an article published in the August number of 'Good Words,' entitled 'Bees and the Art of Queen Making.' I beg to lay before the Society the opinion of a correspondent, Mr. Woodbury, of Mount Radford, Exeter. This gentleman, one of the most practical bee-keepers in this country, has published some observations on the new theory, and has also added to them in a communication addressed to myself, in answer to some inquiries of my own. I have extracted the following from Mr. Woodbury's communication to the 'Journal of Horticulture and Cottage Gardener:'—"After noticing the power which bees possess of increasing the temperature of any part of their hive by an accelerated respiration, Dr. Leitch says: 'Viewing this power in connexion with the isolation of the queen's cell, we have a clew to the mystery of development. We soon see why the bees should be at so much pains to drag the royal larva out from the midst of its companions and place it in an insulated position, where a special temperature may be applied. Were the royal larva allowed to remain in its original position, a higher temperature could be applied only to the end of the cell, and the end of the cell is so small that it would be difficult to apply a differential temperature to it. To meet this difficulty, the queen is made to slide out of her old position into a new one, where she can be completely surrounded by the hatching bees, and have an elevated temperature applied to all parts; and when you look into a hive, you see the bees constantly clustering all over the insulated cell.

"The surmise that temperature furnished the clew to the secret was confirmed by actually testing it; small thermometers were inserted into the hive, one in contact with the queen's cell, the others in different parts of the comb: we found that the difference of temperature bore out our hypothesis, that a higher temperature was steadily applied to the queen's cell. The inference is then legitimate, that temperature, if not the cause, is one of the causes which account for this, the greatest marvel of insect life.'"

* The paper to which this refers is published in the February number of the 'Zoologist' (Zool. 7903).

“As the Rev. Principal does not particularize any experiments beyond thermometrical observations, we may be excused for doubting whether these are quite so conclusive as he imagines, as well as for suggesting that it is just possible that he may have mistaken effect for cause, since it by no means follows that because the process of queen-raising is generally attended with an increase of temperature, the insulation of a queen's cell, or even a special temperature, is absolutely essential to its success. In frame-hives, especially, we have often found queens hatched out of cells which were so placed as to render it impossible for the bees to cluster all over them, whilst the general position of queens' cells on the edges of combs, and, therefore, in the coldest parts of the hives, is such as of itself to raise a doubt as to the correctness of the new theory.

“Our own impression is, that the immortal Huber was most probably correct in assigning as the cause of this wonderful transformation the quality as well as the quantity of food with which the royal larva is supplied. To this hypothesis Dr. Leitch objects that it has by no means been conclusively proved, either by chemical analysis or by any other means, that the so-called royal jelly differs in any respect from the ordinary food supplied to the worker-larva.

“We now come to a circumstance which appears to us so conclusive, as to the fact of the food with which it is supplied being the true cause of this marvellous transformation of a worker-larva into a queen-bee, that we fancy, if it had come under the notice of the Reverend Principal, it would have prevented his promulgating a theory which we believe to be entirely erroneous.

“In the German ‘*Bienezeitung*,’ or Bee Journal, is an article by the Rev. M. Kleine, one of the ablest German Apiarians, in which the following statement occurs: ‘Dzierzon recently intimated, that as Huber, by introducing some royal jelly into cells containing worker-brood obtained queens, it may be possible to induce bees to construct royal cells, where the Apiarian prefers to have them, by inserting a small portion of royal jelly in cells containing worker-larvæ. If left to themselves, the bees often so crowd their royal cells together that it is difficult to remove one without fatally injuring the others; as, when such a cell is cut into, the destruction and removal of the larva usually follows. To prevent such losses I usually proceed as follows:—When I have selected a comb with unsealed brood for rearing queens, I shake or brush off the bees and trim off, if necessary, the empty cells at the margin. Then take an unsealed royal cell—which usually contains an excess of royal jelly—and remove from it a portion of the jelly, on the point of a knife or pen, and by placing it on the inner margin of any worker-cells, feel confident that the larvæ in them will be reared as queens; and, as the royal cells are separate, and on the margin of the comb, they can be easily and safely removed. This is another and important advance in practical bee-culture, for which we are indebted to the sagacity of Dzierzon.’

“The foregoing fact appears to us sufficiently conclusive as to the truth of Huber's theory, regarding the influence of food in producing the astonishing development of a worker-larva into a queen-bee, and, after giving the whole subject our best consideration, we feel warranted in pronouncing the special-temperature theory of the Rev. Mr. Leitch to be ‘not proven.’

“I am very glad to find that our ideas on the queen-rearing problem are so similar. With regard to the cells of queens, they are formed of wax like all the others, and although, from being more substantial, they might not collapse so readily, their destruction would be only slightly delayed, the melting point being the same.

The only difference is in the cocoon with which they are lined, which is spun by the royal larva, and is more substantial than that of the ordinary worker-larva. This cocoon, however, does not line the upper end of the cell, as that would melt and the lower part must then drop off if an extreme temperature were applied. It has been too much the fashion of late years to decry and discredit the theories of Huber; some throw doubt on the influence or even the existence of royal jelly, but in this case, as in similar ones, I believe that accurate investigation will prove Huber to be right."

Professor Westwood remarked that the question of the development of the queen-bee, by increased heat, did not appear to him at all proved by Principal Leitch's observations. The position of the cell itself, generally on the outer edge of the comb, and never, or but very rarely, in the centre of the upper part of the hive, where the greatest heat is concentrated, seemed to militate against this new theory; whilst Professor Westwood considered that (as it was satisfactorily established that the working bee was only an abortive queen, and that a queen might be developed from an egg which in ordinary circumstances would only produce a worker), he was justified by analogy, in regarding the numerous queen wasps in a vespiary as produced from the same kind of eggs as the workers, and also that the working ant, the soldier working ant and the female ants are also only modifications produced from the same kind of eggs. He considered, therefore, that the development of the queen-bee must be explained on the same principle as that which is adopted in those other social insects, and not that a special system, namely, that of heat, is required for the queen of the hive alone.

Mr. Tegetmeier observed that, in bringing the theory of Principal Leitch under the notice of the Society, he did not wish it to be understood that he considered the evidence advanced in its favour to be conclusive, still he could not but think that the isolated position of the queen-cell very much favoured the supposition that increased heat is at least one of the causes of the perfect development of the female bee; whilst the royal jelly theory does not offer the slightest explanation of this extraordinary deviation in structure and position from the ordinary or worker cells.

Mr. Stainton read, "Descriptions of Nine New Exotic Species of Gracillaria," and exhibited a beautiful coloured plate with which he proposed to illustrate the paper in the Society's 'Transactions': five of these species were collected near Calcutta by Mr. Atkinson, and the remaining four were sent from Moreton Bay by Mr. Diggles.

Mr. M'Lachlan read "Characters of New Species of Exotic Trichoptera, and of four New Species Inhabiting Britain."—*E. S.*

Anniversary Meeting, January 27, 1862.—J. W. DOUGLAS, Esq., President, in the chair.

Messrs. R. H. Mitford, F. P. Pascoe, F. Smith and Alexander Wallace were elected Members of the Council, in the room of Messrs. Douglas, Janson, M'Lachlan and Stainton.

Mr. F. Smith was elected President; Mr. S. Stevens, Treasurer; and Messrs. E. Shepherd and Dunning, Secretaries.

A Report from the Council on the state of the Library and Collections was read and received.

An abstract of the Treasurer's accounts was read by Mr. M'Lachlan, one of the Auditors, and showed a balance in favour of the Society of £122 6s. 4d.

The President delivered an Address on the state and prospects of the Society and of Entomology in general; the Meeting passed a vote of thanks to the President for his Address, and ordered it to be published in the 'Proceedings' of the Society.

A vote of thanks to the President for the courteous and able manner in which he had fulfilled the duties of his position during the two years that he had occupied the Presidential Chair; to Mr. Janson, the retiring Secretary; and to the other retiring Members of the Council, was also unanimously agreed to by the Meeting.

February 3, 1862.—FREDERICK SMITH, Esq., President, in the chair.

The President thanked the Society for having selected him to fill the chair; and nominated Messrs. Lubbock, Pascoe and W. Wilson Saunders to be his Vice-Presidents.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—'The Journal of Entomology,' No. 4; presented by the Proprietors. 'The Athenæum' for January; by the Editor. 'The Journal of the Society of Arts' for January; by the Editor. 'The Zoologist' for February; by the Editor. 'Sitzungsberichte der Königl. Bayer. Akad. der Wissenschaften zu München,' 1861, Heft V.; by the Academy.

Exhibitions.

Mr. Dunning suggested that the accuracy of the minutes would be increased, and the value of the Society's 'Proceedings' materially enhanced, if each Member who made exhibitions, or took part in the discussions or conversations thereupon, would have the goodness to hand to the Secretary, either during or at the close of the Meeting, or to transmit to him by post, a brief note containing the substance of his communication to the Society, the names of insects referred to, and the authorities for those names, references to authors quoted, and generally any facts narrated or opinions expressed by the Member, which he thinks it desirable to have recorded. It was scarcely advisable to trust more than necessary to the Secretary's memory or power of rapid reporting; and Mr. Dunning thought that whilst the carrying the above suggestion into effect would be a great convenience to the Secretary, it would entail but slight inconvenience on each individual Member.

Mr. Lubbock exhibited a magnified drawing of a singular dipterous larva found under logs of wood; he was unable to state to what family it belonged, but hoped to breed the perfect insect.

Professor Westwood, though at first inclined to consider it the larva of one of the Muscidae, thought it most probably referable to some species allied to *Platypeza*.

Mr. Walker remembered having, some years ago, found flat larvæ adhering closely to damp wood, and somewhat resembling that represented in Mr. Lubbock's figure: he agreed with Professor Westwood that the larva did not belong to the Muscidae.

Mr. Stainton exhibited a living pupa of the lepidopterous genus *Micropteryx*, and

a highly-magnified coloured drawing of the same, and read the following notes thereon:—

“The wing-cases, legs and antennæ are perfectly free from the body, the abdomen being able to move away from them to a considerable extent.

“The abdomen of the pupa I examined was in almost constant motion, both to and from the wing-cases, and with slight lateral motion.

“Neither the wing-cases nor the legs appear to have any individual power of motion, but the end of the abdomen would frequently move the ends of the legs by knocking against them.

“The abdomen was remarkably soft and flexible, reminding one rather of a female *Psyche*.

“In front of the head one seems to distinguish both pair of palpi, the antennæ and legs, the legs being longer than the antennæ, for which I at first mistook them.

“The antennæ were not symmetrical in the specimen I examined, that on the left side being close to the leg-cases, that on the right side lying nearly across the centre of the wing.

“Below the eyes and above the palpi appears a brown knob, which may possibly represent the tongue; it bears numerous bristles: immediately beneath it are two large brown projections, the use of which I am utterly at a loss to conjecture; they expand towards the tips, which are scalloped obliquely.

“Between the eyes, but above them, is a slight protuberance or beak, which is nearly transparent; above it are again some strong bristles.

“On the back a slender semi-transparent membrane projects upwards from the first abdominal segment.

“The head is very clearly separated from the thorax, and between the two is a neck or collar.”

The larva was a birch-feeder, but, the perfect insect not having yet been bred, the species was unknown. The appearance of the imago of *Micropteryx* had long since suggested a doubt whether that genus was truly lepidopterous or trichopterous: the pupa now proved to be, as it were, midway between the proper pupa-forms of those orders.

Mr. M'Lachlan remarked that though the pupa was certainly a connecting link between Lepidoptera and Trichoptera, it could not be claimed as belonging to the latter order: the legs and antennæ did not appear to be entirely free, as was always the case in trichopterous pupæ. Moreover, the form of the larva showed that the insect was properly retained among the Lepidoptera.

Professor Westwood thought the curious neck-tie-like appendage with scalloped edges must be the covering of one of the pairs of palpi.

Mr. Janson exhibited seven species of Coleoptera, hitherto unrecorded as inhabitants of Britain, *viz.*:—

“1. *Patrobus clavipes*, Thomson, *Sk. Coll.* 25, 2 (1857); *Skand. Coll.* i. 214, 2 (1859). Taken by the late H. Squire near Lerwick, Shetland, in August, 1858.

“2. *Harpalus (Ophonus) diffinis*, Dejean, *Spec. gen.* iv. 196, 4 (1829); *Icon.* iv. 95, 4, tab. 179, f. 4 (1834). *Fairm. et Laboulb. Faune Ent. Franç.* col. i. 121, 2 (1854). *Schaum, Naturgesch. d. Ins. Deutschl.* i. 573, 3 (1860). Taken by himself near Croydon, Surrey, in September, 1860.

"3. *Harpalus* (*Ophonus*) *parallelus*, *Dejean*, *Sp. gen.* iv. 219, 25 (1829); *Icon.* 120, 25, tab. 183, f. 4 (1834). *Schaum*, *Naturgesch. d. Ins. Deutschl.* i. 580, 12 (1860). Captured by the late H. Squire, on the Sussex coast, February, 1858.

"4. *Aleochara mœrens*, *Gyll. Ins. Suec.* iv. 493, 53—54 (1827). *Eric. Gen. et Spec. Staph.* 169, 22 (1839). *Kraatz*, *Naturgesch. d. Ins. Deutschl.* ii. 103, 23 (1856).

"*Aleochara lugubris*, *Aubé*, *Ann. Ent. Soc. Fr.* 2me Ser. viii. 313 (1850); *Fairm. et Laboulb. Faune Ent. Franç.* col. i. 448, 19 (1856). Found by the late J. Foxcroft, in Perthshire, in 1855.

"5. *Homalota Thomsoni*, *Janson*.

"*Homalota nigricornis*, *Thomson*, *Ofv. af Kön. Vet. Acad. Förh.* 142, 42 (1850). *Kraatz*, *Naturgesch. d. Ins. Deutschl.* ii. 281, 88 (1856), *nec Steph.*

"*Aleochara excavata?* *Gyll. Ins. Suec.* iv. 490, 30—31 (1827). Captured by himself, near Hampstead, Middlesex, April, 1857.

"6. *Xantholinus atratus*, *Heer*, *Faun. Col. Helv.* i. 246, 7 (1839). *Kraatz*, *Naturgesch. d. Ins. Deutschl.* ii. 636, 5 (1857). Discovered by himself in a nest of *Formica rufa*, near Highgate, Middlesex, October, 1856.

"7. *Thinobius brevipennis*, *v. Kiesenw. Stettin. Ent. Zeit.* xi. 221 (1850). *Kraatz*, *Naturgesch. d. Ins. Deutschl.* ii. 885, 5 (1858). Taken by himself in Holme Fen, Huntingdonshire, May, 1859."

Mr. Ruspini exhibited a coloured figure of a variety of *Lycæna Phlæas*. The specimen was captured on Norwood Common in the autumn of 1858, and was principally remarkable for the absence of the usual coppery border of the posterior wings, and for the presence on each of the same pair of wings of three straight rather broad sharply-defined radiating bars, of a bright copper colour.

Mr. Lubbock requested Members of the Society to supply him with any specimens of *Thysanura* which it might be in their power to furnish.

Dr. Wallace, after recalling to the recollection of the Meeting a letter addressed to him by Captain Russell, of Monk's Eleigh, Suffolk, and which was read at the Meeting of the Society, held on the 2nd of December, 1861, now introduced Captain Russell to the Society, and exhibited on his behalf specimens of *Callimorpha Hera*, *Argynnis Lathonia*, *Eulepia grammica*, a suffused dark variety of *Vanessa Urticæ*, *Anesychia Echiella*, and an insect which was apparently *Cabera rotundaria*.

Captain Russell said that of *Callimorpha Hera* (which in Doubleday's 'List of Lepidoptera' was included amongst the "Reputed British Species") he captured five specimens on the 27th of July, 1859. The following is an extract from his diary for that day:—"Drove from Rhuabon to Wrexham; beautiful day, but very hot; about two miles from Wrexham some beautiful butterflies, one sort with brilliant scarlet wings; country very hilly, not well cultivated." Captain Russell was at that time unable to distinguish between *Rhopalocera* and *Heterocera*; and the "butterflies with brilliant scarlet wings" turned out to be *C. Hera*. The place where they were captured was a stony hill-side, quite uncultivated; the time about 5 P. M. The flight of the insects was sluggish, and from full flight their subsidence to perfect rest was apparently instantaneous. The wings lay flat upon the surface on which the insect rested, and none of the scarlet of the under wings was then visible. Each of the five specimens captured was taken off a bramble-leaf. The spot was revisited about 11 A. M. on the following day, but not a specimen was to be seen.

A. *Lathonia* was taken by Captain Russell on two occasions in August, 1859; on the first occasion five specimens; on the second two, in a meadow-field on the S.W. side of a wood belonging to Mr. T. P. Hitchcock, at Lavenham, Suffolk. The insects were shown, shortly after their capture, and whilst yet limp and not set out, to the late Professor Henslow, whose living of Hitcham was an adjoining parish to Monk's Eleigh: the Professor told him they were specimens of A. *Lathonia*, and added that he did not regard them as indigenous, but thought they must have been blown over from the Continent.

The specimen of *Eulepia grammica* was taken at the same place as C. *Hera*, on the occasion of Captain Russell's second visit to that spot, on the 28th of July, 1859. It was disturbed by a lighted fusee falling among some long grass; it flew with amazing rapidity for a few yards and then suddenly disappeared: all efforts to discover it were unavailing, and the search was abandoned, when the insect was again disturbed by a stone casually thrown at a butterfly sitting on a neighbouring flower, when Captain Russell succeeded in securing it in his net.

The variety of *Vanessa Urticæ* was captured by Captain Russell, flying in a garden at Waltisham, Suffolk. The specimen was somewhat crippled, and he had at first thought it a hybrid between V. *Urticæ* and V. *Antiopa*.

The specimen of *Anesychia Echiella*, W. V. (*A. bipunctella*, F.), which was also placed amongst the "Reputed British Species" in Mr. Doubleday's List, was taken by Captain Russell in a chalk-pit at Chelworth, Suffolk, in the summer of 1861.

The specimen of *Cabera* was bred from the larva, and the reason for its exhibition was, that out of sixteen larvæ precisely similar in appearance, and all fed upon alder, fifteen produced insects of the form known as *Câbera pusaria*, whilst the sixteenth produced the exhibited specimen, which was of the form known as C. *rotundaria*.

Mr. Rye exhibited specimens of *Lathrobium geminum*, *Kraatz*, and read the following notes on the characters which distinguish it from the allied species:—

"*Lathrobium geminum*, *Kraatz* (= *L. elongatum*, *Gyll.*) Hitherto confounded in our collections with *L. elongatum*, *Linn.*, and apparently almost as common.

"*L. brunnipes*, the first of the larger species, apart from its very distinct characters underneath in both sexes, is at once to be distinguished by its entirely black upper surface, all the others near it in size having the elytra more or less barred on the apical half with red or reddish brown; and although this colour is sometimes suffused all over the elytron, it is never so dark as in *L. brunnipes*.

"The next species, *L. elongatum*, *Linn.*, most closely resembles *L. geminum* in colour, punctuation and size; the only character on the upper side being the relative length and width of the thorax and elytra.

"In *L. elongatum*, *Linn.*, the thorax is decidedly narrower than, and not so long as, the elytra, whereas in *L. geminum* it is very nearly, if not quite, as wide and long as the elytra, imparting a broader and more robust look to the insect.

"It is, however, underneath that the chief differences are to be found, as usual, in this genus.

"The male *L. elongatum*, *Linn.*, has on the middle of the lower surface of the penultimate segment of the abdomen a shallow longitudinal fovea, widening behind,

with a thickly-elevated ridge of stiff black hairs on each side, and distinctly and acutely excised where it meets the hinder margin.

“In *L. geminum* the male has (in the same place) two short parallel ridges of black hairs and no acute marginal excision, each ridge terminating in a very gentle and scarcely perceptible flexuosity.

“The females of both, as in nearly all the genus, present no decided characters, the penultimate segment in each having the hinder margin beneath somewhat in the form of a cone truncated at its thick end with the corners slightly rounded, and this is perhaps more distinct in *L. elongatum*, but in both sexes the under-surface of the head presents sufficient difference to separate the two species, since in *L. elongatum* it is roughly and thickly punctured, and in *L. geminum* more sparsely and finely.

“The only remaining species at all like *L. geminum* is *L. fulvipenne*, which resembles it in the relative proportions of the thorax and elytra, but is altogether as distinctly elongate and slender as *L. geminum* is robust and broad. In *L. fulvipenne* also the penultimate segment of the male beneath is quite destitute of hairy ridges, having simply a shallow and somewhat oval excision in the middle of the hinder margin. The punctuation of the under surface of the head is much the same as in *L. geminum*, but the general facies of the insect will at once distinguish it.

“Erichson appears to have remarked the difference in structure of the present *L. geminum*, but referred it to a *var.* of *L. elongatum*, *Linn.*”

Mr. Crotch exhibited *Dermestes Frischii*, *Kugelan*, and read the following notes:—

“*Dermestes Frischii*, *Kugelan*, *Erichson*, = *D. vulpinus*, *Illiger*, non *Fab.*

“This species, hitherto unrecorded as British, was taken somewhat plentifully by Mr. W. Farren, of Cambridge, under a dead horse in the New Forest, in the early part of the summer of 1860, in company with *Dermestes murinus*; hence it would appear to be a truly indigenous species, whereas *D. vulpinus* is in all probability introduced.

“It most closely resembles *D. vulpinus*, *Fab.*, from which it may be distinguished by the brighter colouring of the pubescence on the sides of the thorax, which is also conspicuously marked with a black spot at each hinder angle. Underneath the middle spot on the last segment of the abdomen is purely terminal, whereas in *D. vulpinus*, *Fab.*, the spot is produced for the entire length of the segment. In *D. vulpinus*, *Fab.*, the apex of each elytron forms a small acute mucro, which is entirely wanting in *D. Frischii*. The scutellum also appears to be of a much brighter yellow in *D. vulpinus*, *Fab.*

“It may be as well here to observe that the insect termed *Dermestes tessellatus* of Waterhouse’s Catalogue is evidently the *D. undulatus* of Erichson and Sturm, and Mr. Waterhouse agrees with me in this opinion.”—*J. W. D.*

ENTOMOLOGICAL CLUB.

February 18, 1862.—HENRY ADAMS, Esq., F.L.S., in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—Two boxes filled with Hymenoptera, 150 specimens of *Zygæna Minos*

and 150 specimens of *Nyssia zonaria*; presented by Edwin Birchall, Esq. Twelve specimens of *Nonagria Bondii*; by Dr. Knaggs. A series of *Agrotis Ripæ* and a series of *Oporabia filigrammata*; by George Mawson, Esq. A pair of *Agrotis Ripæ* and a specimen of *Xanthia gilvago*; by Mr. Henry Rogers. A series of *Phryganidæ*, beautifully set, and all of them named in accordance with Mr. M'Lachlan's lately printed list; by Percy C. Wormald, Esq.

Mr. Stevens asked whether the munificent present from Mr. Birchall did not contain more specimens than were required for the collection.

The Curator said that the large number was sent more especially for distribution, every visitor to the cabinets on a Thursday evening being always invited to help himself.—*E. N.*

Scales on the Wings of Lepidoptera.—I am led to believe, from a number of observations I have made, that scales of *Lepidoptera* differ in the number of membranes of which they are formed, and in the granulations and striæ which cover them. When the scales are uninjured it is impossible to discover if they are composed of one or more membranes, but as we often find some with damaged portions, these defective scales permit us to study their formation. Scales covering the wings of *Lepidoptera* seem to be composed of two or generally three membranes or lamellæ placed one over the other. It is always upon the upper membrane that the granulations composing the colouring matter of the scale are found. The form of these granulations is generally pretty regular; they are rounded, and sometimes a little lengthened; their number is sometimes so considerable that the scale is entirely opaque. When striæ are observed it is always upon the second lamella that they are placed. It would be often very difficult to assert with certainty the existence of these striæ in a great number of opaque scales, did not the border, which on each side of the foot is generally transparent, permit their examination. Sometimes they are irregular, consisting of cylindrical fragments placed on the membrane at unequal distances, but always parallel; sometimes they are perfectly regular. These are either small parallel cylinders, clearly marked, and placed at equal distances, or equal parallel lines formed of granulations, like small round or oval pearls. It often happens that these striæ are alternately transparent and opaque. Sometimes there are small intervals divided into small squares. When the intervals are greater, the squares which they form are found transversely lengthened. On scales from *P. Teucer*, there are upon the striæ series of small pearls. It appears to me that in all the transparent scales upon which striæ are found without any appearance of granulation there are only two membranes. There can be little doubt on this point, when regular striæ, close to each other, are, so to say, soldered together. But when, as on the large scales found on *P. Telemachus*, and equally transparent, the striæ have very little adherence with the membrane receiving them, and are easily detached, the case is different. The striæ seen, and which often are over one hundred in each scale, are, when untouched, composed of little cylinders like harp strings, and when broken, like the same cords, they show the fractured extremities. Nothing in these scales at first proved to me the existence of a double membrane, and the intervals between the striæ, where they are wanting, never show any trace of a tear. This may, however, arise from the adherence of the two membranes. Fresh observations have convinced me that these two membranes really do exist, but that the upper one, upon which are the striæ, is so light that it is

seen with difficulty, and only upon a few scales. The regular undulations which are often seen between the striæ, and which are sometimes wanting in the part where the striæ have been rubbed off, have much assisted me in forming this conclusion. If, as I have before said, the upper membrane carries the granulations forming the colouring matter, and rendering the scales more or less opaque, and the lower membrane is laden with striæ, then the existence of a third membrane must be admitted, otherwise the scales upon which are only seen striæ without granulations would have but one membrane, which is contrary to observation. It might be argued, without doubt, that it is possible that the same membrane might carry both striæ and granulations; and this belief might be strengthened by the examination of opaque scales partly stripped of their striæ, and where the spaces evidently show that both granulations and striæ have been removed. The discovery of certain scales showing similar defects has proved to me that this is not the case. In truth, the portion of the said scale upon which the granulations are found indicates clearly the existence of the upper membrane, of which the tear seen is a complete proof, and the removal of that portion which has been torn away lays open very regular series of striæ before concealed. It seems to me that this last portion presents the appearance of scales with striæ, and without granulations, and in which the existence of a double membrane is proved. It is also shown in the same scale in the spots where the striæ appear to have been removed. In fact, I am led to believe that three membranes exist in all scales, and that where there are no granulations the upper membrane is so transparent that it does not interfere with the appearance of the striæ. It often happens that the lamellæ of which the scales are composed, and which are united by a border more solid than the other portions, are tinged with a reddish brown, which appears at first sight to penetrate the substance of the membrane. In examining these membranes with a very high power, it appears that this tinge is due to a multitude of irregular points touching on the transparent foundation. Slight striæ, very difficult to observe, can also be perceived. It is probable that these granulations and striæ, often colourless, are always present, and according to the laws of the organisation of scales, the first upon the upper, the latter upon the lower membrane. After having described the use of the two upper membranes of the scales, I will now speak of the third. The lower surface of this lamella, or of the second in the scales, where only two are apparent, possesses, in all the diurnal and even in most of the nocturnal Lepidoptera, the power of reflecting rich and varied colours, always more beautiful than those on the insect itself. The rich and brilliant scales found in abundance in the various species of the genus *Vaessa* will alone show the most magnificent colours. The most remarkable in this respect of the indigenous species are *Vanessa Antiopa*, *V. Atalanta*, *V. Polychlorus* and *V. Io*. The scales of the exotic Lepidoptera, composing the genus *Vanessa*, *Nymphalis*, and many others, reflect colours perhaps even richer than those of the indigenous species. It must be remarked that it is generally upon the dark parts of the wings that the most brilliant scales are to be found. They are often opaque, and taken from any portion of the wing of the same insect; they never vary in colour, though they sometimes do in brilliancy, in the same species. The flutings of scales terminating in notches are often seen very distinctly upon these coloured lamellæ, but less so in the upper membranes. The same thing occurs with the undulations seen in the lamellæ, and which are often finely marked in the scales covering the bodies of the diurnal Lepidoptera. The lower lamellæ of a number of the nocturnal Lepidoptera also reflect very beautiful colours, though not to

be compared with those of the diurnal Lepidoptera. The most remarkable species in this respect appertains to the subgenus of the Bombyces, those called "Ecailles." The genera *Noctua* and *Sphinx* have scales less brilliant, but perhaps from their soft and quiet colouring they are more beautiful. The upper surfaces of the wings of some of the exotic diurnal Lepidoptera exhibit portions of more or less size of a beautiful blue or brilliant green. These bright colours, the microscope shows, are due to a particular and special formation of the scales. The intervals between the striæ are pretty regularly transversely divided into longish squares. Each of these squares has a small circular cavity diminishing and rounded to the bottom, like the interior of a common mortar. The scales from the butterfly *Ulysses*, which is a beautiful blue, and those from *Paris*, a brilliant green, show these markings. It should be remarked here that the upper surface of scales of this description are more brilliant than the surface next to the membrane of the wing, just contrary to almost all other scales, as has been already shown. It should be observed that the colours of these beautiful scales are somewhat dull upon the butterfly, and have only all their brilliancy when seen under the microscope. Another property of some scales is that when they are examined by transmitted light they produce the brilliant reflections of precious stones. Numerous observations show that almost all scales, even those which are opaque, decompose light more or less when observed with the flame of a candle or a lamp. The scales which best produce this effect are somewhat rare. They are sometimes found in the diurnal butterflies upon the white part of the wing, especially when tinged with the blue or violet, such as are found in certain of the exotic *Nymphalidæ*. Among the numerous species of this genus I would cite the *Bolina Alcithous* and *Lasinassa*. Some of the nocturnal Lepidoptera have scales producing these brilliant colours. The most remarkable come from the genus *Noctua*. They are those which form the pearly or golden bands which are seen below their first wings on the inner margin, starting from the base. The inner margin of the top of the lower wing, and which is equally pearly or golden, has also very beautiful scales. The *Noctua P. Gamma*, or *M. glyphica*, are some of the best for this kind of observation. My investigations on the decomposition of the rays of light by the scales of Lepidoptera, have shown me that a portion of those which possess this property most effectually, whether opaque or transparent, have very fine and indistinct cylindrical striæ, covered by very crowded granulations. These granulations appear to add much to the beauty of the reflections, which are always more vivid than in scales without granulations, whatever may be the simplicity or transparency of the striæ. When the granulations are only semi-transparent, the reflections of the scales, which vary according to the direction of the light, are always very brilliant; if, on the contrary, they are only slightly opaque, these reflections are darker, but richer in colour. Some splendid examples of this kind are found in scales which have only the appearance of slight granulations and no striæ, such as those of the *Nymphalidæ*, *Bolina*, *Alcithous* and *Lasinassa*, of which I have already spoken. It seems to result from these different observations that the most brilliant reflections produced by the scales of Lepidoptera are due rather to the arrangement of their lamellæ than to the regularity and transparency of their striæ.—*Bernard Deschamps*, in the '*Annales des Sciences Naturelles*,' translated and communicated by *A. G. Latham*, Manchester, February 17, 1862.

Lasiocampa Rubi bred in January.—Captain Russell states that he kept a larva of *Lasiocampa Rubi* in his study, which has a constant fire in it, and is very warm with a southern aspect, since October 8th, 1861. On November 27th it turned to pupa.

It ate nothing since November 1st, but made a sort of nest in the dry mould, where it lay coiled up, only exhibiting signs of life when breathed upon, being quite uncovered at the top: it emerged January 24th a perfect female.—*Alexander Wallace*; 23, *Bedford Place, February 6, 1862.*

Great abundance of Wasps in 1861.—Captain Russell states that in the autumn of 1861 the number of wasps in Chelsworth was enormous, that he himself assisted in taking 117 wasps'-nest in that parish, in order to check their depredations on the meat and sweets in the village.—*Id.*

Capture of Cryphalus Abietis and Cryphalus Picææ near Market Harborough.—In May, 1858, I found some specimens of *Cryphalus Abietis* in a wood near this place, the only instance of its capture in England until last summer, when I had the good fortune to meet with it again in the same locality. I will also take this opportunity of recording the capture of a fourth species of the same genus, the *Cryphalus Picææ* of Ratzeburgh. Of this last I met with a single specimen near Weston-on-the-Green, in Oxfordshire, in the month of October, many years ago, and, subsequently a second specimen occurred near the same spot. It is, I fear, my own fault that the *Cryphalus Picææ* was not enumerated in Mr. Waterhouse's recently published List, although I fully believed that he had seen our specimens. *C. Picææ* somewhat resembles *C. Abietis*, but may be known by the acuminate capitulum of the antennæ, which in the latter is nearly circular.—*A. Matthews*; *Gumley, Market Harborough, February, 1862.*

Notes on the Entomology of the Isle of Man.

By the Rev. HUGH A. STOWELL, M.A.

(Concluded from p. 7901.)

Serica brunnea. A perfect pest at light in July and August, often accompanied by *Aphodius rufipes*. Is it generally known how thoroughly nocturnal in its habits this species is? In the neighbourhood of Faversham I was unaware of its existence till I tried Mr. Stevens' plan of after-dark sweeping, when I found that it swarmed upon ground which I had been in the habit of constantly exploring by daylight, without detecting a trace of it.

Limonium Lythodes. Occasional; by sweeping meadows. May, June.

Cryptohypnus riparius. Abundant; under stones, often in very dry places and to an elevation of 850 feet. April, May.

Corymbites tessellatus. One example; in moss, &c. March.

Elodes marginata. Occasional; on shallows, &c., by brook-sides. May, June.

Malthodes brevicollis. Occasional; by sweeping meadows. May.

Rhynchites germanicus. Local but frequent; by raking. April, May.

Apion marchicum. Frequent; by raking. August, September.

A. Sedi. Abundant on *Sedum anglicum* (not *S. acre*, as at Deal and Southend), on the cliffs and under-cliff of the coast, but never found on its food-plant when it grows inland.

Apion scutellare. Frequent; on *Ulex nanus*, never, I think, on *U. europæus*. August, September.

A. immune. Rare; on *Calluna vulgaris*. August.

Strophosomus Coryli. This common species occurs frequently on *Ulex* here, and occasionally on *Calluna*, its usual food-plant, the hazel, not being found in this neighbourhood.

S. obesus. Rarely, and *S. limbatus* abundantly, on *Calluna*. April—October.

Sitones saturalis. Frequent; on *Ulex*. May—September.

S. cambricus. Rare; by raking. May—August.

Tropiphorus Mercurialis. Occasional; under stones. April, May. The *var.* (?) *Terricola*, *Newman*, is its only form here.

Phytonomus Polygoni. Frequent; by sweeping borders of corn fields. August, September.

P. murinus. Occasional; under stones. May, June.

P. Plantaginis. Frequent; by raking. May—September.

Cænopsis (*Trachyphlæus*) *Waltoni*. Frequent; by raking. April—September.

Omius sulcifrons. Frequent; under stones and by raking. March, April. Rarely in autumn.

Eirrhinus pectoralis. Rare; on willows. August.

Miccotrogus picirostris. Rare; by raking. April.

Tachyerges Saliceti. Frequent; on willows. May—August.

Orthochætes setiger. Occasional; by raking. April—September.

Acalles misellus. Frequent; by raking and sweeping heather. April—September.

Pachyrhinus 4-tuberculatus. Rare; by sweeping meadows. May.

Ceuthorhynchus Ericæ. Frequent; on *Calluna*. May—August.

C. quadridens. Occasional; on turnips in garden. April.*

C. Chrysanthemii. Rare; on *Erodium cicutarium*. August.

C. Litura. Occasional; by raking. August, September.

Orobitis cyaneus. Rare; by raking. May—September.

* On the same bed of turnips occurred *Ceuthorhynchus sulcicollis* and *C. contractus* in plenty; also *Phyllotreta undulata*, *P. Nemorum*, *Plectroscelis concinna*, *Psylliodes Napi*, *P. chrysocephala* and *P. cupro-nictens*.

Lema melanopa. Rare; by raking. April—August.

Chrysomela Banksii. Rare; by raking. April, May.

C. fucata. Occasional; on *Hypericum pulchrum*. June—Sept.

Adimonia Capreæ. Occurs on *Calluna*, no species of willow growing near.

Crepidodera Modeeri. Occasional; by sweeping moist meadows. May.

Mantura Chrysanthemi. Frequent; by raking. April—October.

Aphthona Euphorbiæ. Occasional; on grassy banks. March—June.

Phyllotreta undulata. Occasional; on turnips and by raking. April—September.

P. Brassicæ. Frequent; in moss, &c., and on moist banks. March—September.

Chætocnema aridella. Frequent; on moist banks. August, September.

Thyamis holsatica. Locally abundant; in moss, March; and on banks of a swampy pasture, September.

Psylliodes cupro-nitens. Occasional; on turnips. April.

Apteropoda Graminis. Rare; by sweeping borders of corn-fields. August, September.

Clambus Armadillo. Occasional; in moss, &c. March.

Comazus dubius. Rare; by raking. September.

Ptenidium apicale. Abundant; in moss, &c. February—April; September—November.

Pselaphus Heisii. Frequent; in moss, &c. March, April.

Bryaxis Juncorum. Very abundant; in moss, &c., on banks and by sweeping meadows. February—November.

Bythinus Curtisii. Frequent; in moss, &c. March, April.

Tychus niger. Rare; in moss, &c. April.

In conclusion, it may be interesting to note that of the 153 species enumerated by Mr. Wollaston as natives of Lundy Island (Zool. 897, 1753) 102 have been observed in the Isle of Man. It would be very instructive to be able to compare our Coleoptera with those of the Cumberland and Lancashire coast, the Mull of Galloway and the county Down, our nearest neighbours. Unfortunately, however, Mr. Hogan's valuable "Catalogue of Coleoptera found in the Neighbourhood of Dublin" (Zool. 4134) offers the only fair opportunity available for the purpose of comparison. From a careful comparison of the Dublin and Manx lists I obtain the following result:—

	Dublin.	Isle of Man.	Common to both.
Geodephaga	103	71	59
Hydradephaga	33	8	5
Brachelytra	103	94	51
Necrophaga	92	58	40
Lamellicornes	21	18	15
Sternoxi	14	11	9
Malacodermi	30	13	11
Heteromera	15	5	4
Rhynchophora	104	77	49
Xylophagi	2	0	0
Longicornes	5	0	0
Eupoda	49	33	22
Pseudotrimeria	28	18	13
	599	406	278

On Raking for Coleoptera, &c.—Doubtless other entomologists besides myself are located in a neighbourhood where the sweeping-net can find but little employment in its own proper way. For their benefit the following note is penned. Our upland herbage is generally scanty and short; even the meadows are hardly “sweepable” much before midsummer. Hedges, moreover, are supplanted by banks, from five to eight feet high, originally compacted of sod and stone, but soon buried beneath a tangled vegetation of Aira and other grasses, foxgloves, sorrel, dog-violets, plantain, knapweed, bird’s-foot trefoil, meadow vetchling, wood sage, Cotyledon Umbilicus, &c., so well guarded withal by sturdy gorse bushes and many-toothed brambles, that the strongest canvass is soon reduced to its component particles of thread if it rashly attempts to invade the repose of their weaker *protégées*. Now then for the way by which these tantalizing coverts may be compelled to yeild their insect treasures. A roomy sweeping-net and an ordinary garden-rake are the instruments, and a fine evening after sunset in dry weather the time of times for the sport. The net is to be thrust through the herbage till it reaches the earthen bank, and kept in position by the handle pressed against the breast or leg, according to the height selected for attack, thus leaving both hands at liberty to wield the rake. With it the herbage above the net is to be violently torn up and down, to and fro, until its iron teeth have scored the earth beneath. This to be repeated on new ground as often as desired, while daylight holds out. The immediately visible results of the process are grass, leaves, and bits of stick, earth and small stones. Do

not pause to examine these at the time; only, in order to prevent the bag of the net filling up too rapidly, take out a handful or two of the larger fragments after each rake, and, shaking them well over the net, throw them aside. All that remains to be done the same night is to close the net, and secure its neck somewhat above the contents with a piece of twine. Next day, gently emptying it, you will find on opening the net sundry larvæ of Noctuæ and Geometræ, which have crawled aloft as far as might be from the dusty *débris* below. These duly cared for, pour out a portion of said *débris* upon a newspaper; shake out, run through your hand, reject all large leaves, &c., pick out the stones, and then proceed very carefully to examine the finer *residuum*. It is only by the most close and patient search that such insects as Orthochætès setiger, Acalles misellus and Trachyphlæus Waltoni can be detected, so closely do they resemble the surrounding *débris*, and so perseveringly do they sham death. By the time that all its contents have been thus treated, the knight of the net, if as fortunate as I have been, will be astonished at the number of nocturnal species thus taken, whose presence in his locality was not previously suspected.

I desire, before laying down my pen, to add my testimony to the value of another mode of capturing Coleoptera, to which Mr. Douglas called attention at a meeting of the Entomological Society, some time ago, and which was also recommended by Mr. Scott in the 'Zoologist.' Any tolerably mild day in February or March, armed with a stout Wharncliffe blade and a good sized bag, proceed to the nearest swampy pasture, where the turf is old and mossy and rushy; if little hillocky tufts, rather drier than the surrounding swamp, stud its surface, so much the better. Wherever the moss grows long, especially on the said tuft-hillocks, cut below its roots and those of the grass, rushes, Luzula, Carex, Pedicularis, &c., that are intermingled with it, and deposit the little turfs as you cut them in the bag to be carried home and examined at leisure, which examination must consist not in merely shaking them but in tearing them in pieces over paper. In this way may be obtained many species, especially of Pselaphidæ and Staphylinidæ, in plenty, which will only be met with occasionally and singly when once they have broken up their winter quarters. As soon as the sun begins to wax powerful, as was the case here early in April, this year, this plan ceases to be worth trying.

HUGH A. STOWELL.

Christchurch, Manghold, Isle of Man,
December, 1861.

PS.—I find that in the remarks which commence this paper I have inadvertently omitted all mention of the bulkiest and perhaps the most important contribution to the Natural History of the island,—namely, the Rev. J. G. Cumming's 'Isle of Man; its History, &c.,' which treats very fully of its Geology, Palæontology and Meteorology. I ought also perhaps to have named the lists of Messrs. Doubleday and Waterhouse, as my authorities for the nomenclature employed for the Lepidoptera and Coleoptera respectively.

H. A. S.

February 13, 1862.

A Summary of the History of the Leporines.

By E. W. H. HOLDSWORTH, Esq., F.L.S., F.Z.S., &c.*

THE interest now generally felt in the question of hybridism, especially in the reputed successful inter-breeding of the hare and rabbit, induces me to send you an abstract of an important paper on the subject, which I have met with in the course of my inquiries about the experiments at Angoulême.

This paper is one of a series of four memoirs, by M. Paul Broca, "Sur l'Hybridité et sur les Métis du Lièvre et du Lapin," and published in the 'Journal de la Physiologie,' whose editor is the well-known physiologist, Dr. E. Brown-Séguard.

In the first two memoirs, M. Broca discusses the probable origin of the different races of dogs and men; in the third, published in July, 1859, he gives an account of the production of leporines, and his concluding paper is devoted to the results of hybridism, or inter-breeding among the various types of the human race.

I shall confine myself to that embodying his observations on the hare and rabbit cross, his remarks being chiefly founded on the experiments carried out by M. Roux, at Angoulême, which had been made the special subject of his investigations.

Before speaking of the leporines, M. Broca makes some remarks on other authenticated hybrids, and points out that M. Chevreuil was mistaken in disputing the Rev. John Bachman's statement of the fertility of the cross between the goat and sheep. Every one who, under suitable conditions, had repeated the experiments of Buffon, had succeeded in producing such fertile hybrids; and if similar attempts in the Jardin des Plantes had failed, it was probably

* Printed in the 'Field' newspaper, and kindly communicated by the author.

because, being kept closely confined, the animals had not enjoyed sufficient liberty;* but whenever a he-goat had been folded with sheep alliances and fertile hybrids had been the result. The author then refers to the success which has attended this cross-breeding in Chili, where thousands of "pellions," or the skins prepared with the wool on, are annually exported to Peru. These animals, as well as their skins, are called "pellions" in Chili, but are known elsewhere as "chabins," and are the produce only of the male goat and the ewe, the best wool being procured by recrossing the first generation of "chabins" with the sheep.

After referring to the more or less fertile hybrids between the camel and dromedary, the Llama family, the wolf and dog, &c., and among several species of birds, M. Broca says the decisive experiment must be made with nearly-allied animals, living in a wild state in the same country, but with different instincts, which prevent their crossing whilst in a free condition. These requirements the author believes to be perfectly satisfied in the case of the hare (*Lepus timidus*) and the rabbit (*Lepus cuniculus*).

No one, he says, can doubt these two animals being specifically distinct. They certainly differ less in their anatomical characters than many animals reputed to be of the same species; but their instincts, tastes and habits are so opposed, that it is impossible to confound them. The hare is solitary, the rabbit gregarious; the hare lives above-ground, and hides in the brakes; the rabbit burrows, forms subterranean colonies, where each family has its nest, and the young are sheltered during lactation. Gestation lasts thirty days in both species (?), but the hare has only two or three litters in the year, and from two to four young ones in a litter. The rabbit bears eight times annually, and on each occasion produces at least four young,—usually six or eight,—often more. The rabbit was early and readily domesticated. Young wild rabbits are constantly captured, and easily tamed. They reproduce in confinement, and become domesticated in the second generation. All attempts, however, to domesticate the hare have entirely failed, some have been tamed, but have very rarely bred, and their descendants have been nearly barren. This sterility

* In a note, the author says, "I have authentic information that many species of animals, though kept pure, become barren after three or four generations at the Jardin des Plantes. Domestication rarely diminishes the fertility of animals, and even frequently increases it; but it appears that want of exercise, or the nature of their food, may, in many cases, impede reproduction. Perhaps, also, in the experiments at the Museum, the union of near relations has not been sufficiently avoided."

is complete in the female. Pregnant hares have been captured, and their young, born in captivity, reared artificially, but have failed to reproduce. The two species are natural enemies. The hare avoids the rabbit, and, although stronger, is generally worsted in a combat. Sportsmen well know that where rabbits are abundant there are few hares; and, if the latter are to increase, the former must be destroyed. These distinctions, with others, external and internal, cannot be attributed to accidental influences, and no one has even imagined that two species so distinct could have had a common origin; yet they can be crossed, although only with the greatest difficulty.

Buffon's unsuccessful experiments are then referred to, but M. Broca points out that in those cases no union was effected between the male hare and doe rabbit; with the contrary arrangement coupling took place, but there was no produce.

The first decided success in crossing the hare and rabbit appears to have been obtained in 1774, and an account of it was published at Milan in 1780. In this instance a young female hare was reared in company with a young rabbit of the opposite sex by the Abbé Domenico Gagliari, at Maro, in Northern Italy. When about seven months old, the hare produced two young—one resembling the mother, the other like a rabbit; a litter of four was afterwards born, and all the hybrids grew up. Some time after the rabbit died, but the hare continued to breed with her descendants, and they also reproduced *inter se*. The naturalist Carlo Amoretti investigated this case of fertile hybridism, and published an account of it at Milan, in a work devoted to science and art. M. Broca considers this experiment well authenticated, and says it is impossible to exaggerate its importance. He comes then to the experiment at Angoulême, conducted by M. Alfred Roux, President of the Agricultural Society of Charente.

The first attempts by M. Roux were made in 1847, but it is only since 1850 that he has seen his way clear, and proceeded on a regular system. The results he has obtained may be considered definite: these results are known to all the inhabitants of Angoulême; they are as important from an economical as from a scientific point of view, and yet, strangely, remarks M. Broca, they have not yet been published. Chance alone, in 1857, made M. Broca acquainted with them, and soon afterwards he went to Angoulême to see for himself. In March, 1859, he writes, "Now the establishment of M. Roux is in full prosperity. I have just made a second journey to Angoulême to satisfy myself; the leporines are in their tenth generation. The hybrid race is by no means etiolated, and the produce, on the contrary, are finer

than at first. They are superior in beauty, strength and size to the two species whence they derive their origin. Apart from all scientific consideration, M. Roux has, then, obtained one of the most important practical results: he has created a new race, which promises to be of great service, and which probably will soon become generally distributed."

But if the practical experiment was concluded, there was still something to be desired by Science. M. Roux only endeavoured to produce the most profitable race, without considering the question of species, or the requirements of Physiology. These points M. Broca takes under his own consideration, after a long series of experiments have been tried. He now proceeds to describe what he saw and heard at M. Roux's establishment, and states that he cannot question the truth of M. Roux's information.

It is found that when a full-grown male hare and doe rabbit are placed together, the two animals usually fight to the death, or, if not, they never unite. Coupling does not even take place if animals only three or four months old are brought up together: it is necessary to take male leverets three or four weeks old, when they can leave their mother, and bring them up with domesticated rabbits of the same age, and to separate them from every other animal of their own species. The female rabbits, never having known their natural partners, believe the hares to be such, and *vice versa*. The young hares become accustomed to confinement, and, under the influence of example, lose part of their wild instincts. When full grown the hares must be separated from one another, and one or more of the doe rabbits, reared in their company, given to them. The cross is then effected without difficulty. M. Roux had not tried the buck rabbit with the doe hare.

The domesticated rabbits chosen by M. Roux for his experiments naturally produce from eight to twelve young in a litter; united with the hare they rarely have more than eight little ones, sometimes only five or six, the number being generally intermediate between those of the parents.

To effect the crossing at his will, and not to exhaust the hares by too frequent unions, M. Roux separated them from the rabbits when they had once performed their duties. He also isolated, in as many separate cages, the females he intended for them. When he wished to effect the cross he placed the hare at nightfall in a cage with a rabbit in heat, and withdrew him the next morning: that invariably sufficed; union took place as certainly as between two rabbits. But it was observed that the hare—more continent or timid than the

rabbit—never united by daylight, or even at night, if it saw any one near. M. Roux was therefore obliged to go behind the cage, and await with patience, and in silence, the particular moment. He was thus enabled to ascertain that—unlike the buck rabbit, or even the hare in a wild state—the tamed hare was very gentle in his advances to his strange partner.

The leporines of the first generation resemble the rabbit much more than the hare, and, altogether, might be easily confounded with rabbits. No advantage was gained by propagating this race: they bred *inter se*, and also with the rabbit; and, in the latter case, the produce appeared almost identical with the pure species. M. Roux believed this return to the rabbit was without any practical utility. It was, however, otherwise with a return to the hare. The leporines, the issue of the hare and a female of the first cross, are finer, stronger and larger than the animals of the pure species. These new hybrids, although three-quarters hare and one-quarter rabbit, appear directly intermediate between the two species, so that it may be said, other things being equal, the rabbit impresses its characters on the leporines more strongly than the hare. M. Broca calls these hybrids “quadroons” (*quarterons*), and says they are fertile *inter se*, but not very prolific—in this respect approaching the hare. Their litters consist only of from two to five young, and, to obtain a more productive race, M. Roux determined to recross them with the first generation of hybrids. This union results in a breed five-eighths hare and three-eighths rabbit, and is the one to which M. Roux gives his principal attention. The “three-eighths,” as M. Broca designates this race, are quite as fine as the quadroons, and much more prolific. Their litters contain from five to eight young, which are reared without any difficulty, and are as hardy as the pure rabbit. They grow rapidly, and are capable of reproducing when four months old. Gestation lasts thirty days, and the young are suckled about three weeks. The female again receives the male seventeen days after littering. She may thus without difficulty bear six times in the year. This breed of leporines costs the least to bring up, and produces the most flesh for a given quantity of food; it consequently makes the best return.

M. Broca takes the weight of the domesticated rabbit and that of the hare reared in confinement as being each about 6 lbs.; the “three-eighths” leporine, he says, when a year old, or sooner, weighs from 8 lbs. to 10 lbs., many reach 12 lbs. or 14 lbs., and one has attained even 16 lbs. Leporines, at four months, are worth two francs each—double the price of the domesticated rabbit; and as they grow older the fur

becomes very valuable, since it is finer than that of the hare. The author points out one curious character in the ears of the leporine. The young of all these breeds have one ear erect, the other hanging down; this peculiarity disappears with age in animals of the first cross, but is more decided and persistent as hare-blood increases.

Albino and angora varieties are sometimes produced among leporines as among rabbits, but they are not so frequent; the albinos have not been allowed to breed, as they are considered inferior animals. The angoras have been permitted to unite, but they do not breed readily; their litters are small, and the young are not always angoras.

All leporines, of whatever breed, have the flesh like that of the wild rabbit, that is to say, hardly deeper in colour than that of the domesticated rabbit; and the quadrons themselves, in this respect, are nearer the rabbit than the hare. It is worthy of remark, that the influence of the rabbit is even here predominant. The flesh of the leporines, however, has not the taste of either the wild or tame rabbit; it has a peculiar flavour, which is not unlike, says M. Macquet, that of the wing of a turkey. M. Roux has succeeded in producing leporines with only one-eighth rabbit in them, but only two were produced, and the experiment was not continued. M. Broca, however, expresses his intention to try some of his own experiments in this direction, with the view of ultimately obtaining a pure domesticated hare.

Upon the whole, continues M. Broca, although M. Roux has not satisfied all the requirements of Physiology,—though he has not entered in a register the particular genealogy of each of his leporines, —though he has not been anxious to perpetuate especially the hybrid race of the first cross, and has preferred, with an exclusively practical purpose, to cross it with that of the second blood, to create the more productive and more lucrative race of the “three-eighths,” everything tells us that the cross of the male hare and female rabbit constitutes an example of hybridity fertile *inter se* (*engénérique*). Never, in uniting the hybrids of different bloods, either among themselves or with the others, has M. Roux found an instance of sterility. The limits of the fecundity of the first generation of hybrids are not ascertained, but it is known that the fertility of the three-eighths has continued for ten generations.

M. Broca is willing to admit, if desired by the advocates of the permanence of species, that the hybrids of the first generation have not been sufficiently studied; but, he asks, “What will they gain by the concession? Will there not always remain, between the two

primitive types of the hare and the rabbit, the intermediate and lasting race of the three-eighths; a new race which returns to neither of the parent species, and which, fruitful with both, fertile also among themselves, will henceforth oblige zoologists either to throw into one species hares, rabbits and leporines,—a thing perfectly absurd,—or else to confess that new types may be produced by crossing animals of entirely different origins; that species consequently are not inviolable, that Nature has not raised between them insurmountable barriers, and that, in short, the classic doctrine of the permanence of species is altogether erroneous?"

M. Broca here concludes his account of the leporines. His object is to prove that crossing has produced several new races of animals, for he considers it impossible to attribute to climatic causes and accidental influences the formation of the races, so numerous and so diverse, which compose the family of domestic dogs; and that of the races, quite as different and as numerous, of which the human family is constituted. These questions he discusses at length in his other papers.

In the absence of direct information, I have before given my reasons for doubting the existence of the hare and rabbit cross; M. Broca's statements, however, are, I think, conclusive evidence in its favour, and I believe I cannot act more fairly than by sending you the above abstract containing the essential details of M. Roux's successful experiments at Angoulême.

E. W. H. HOLDSWORTH.

Mildness of the Season.—In consequence of the extreme mildness of the season the birds have been exceedingly tuneful. Thrushes and hedge accentors have been in full chorus around my dwelling; the only bird I have missed during the winter here is the missel thrush, which used to sing regularly within a couple of hundred yards, and also in the "Old Well avenue of elms," in the town of Cheltenham. The number of petty sportsmen during the preceding winter is no doubt the cause of the disappearance of these birds: with the exception of a few days, in which frost occurred, there has been little cessation of the feathered choir since the end of October. The last week the cole tomtit has been giving us warning of vernal days, and the crocus has been in full bloom for several days—symptoms of premature spring. Thermometer for six days ranging from 45° to 57° in the shade. Birds in many places have commenced "nidification." In fact, but for the want of our migratory feathered friends, the poet's description is almost verified, for we have had already the "hum of bees," the "linnet's lay of love," and the "full choir that wakes the grove;" but how soon it may

be all changed, when the north-east wind, arrives with its "blackthorn winter" in April succeeding—

" Ask not the cause why sullen spring
So long delays her flowers to bear,
Why warbling birds forget to sing
And winter storms invest the year."

I fully anticipate that the first six days of April may be ten degrees colder than those of February just expiring.—*H. W. Newman; Hillside, Cheltenham, February 6, 1862.*

Song of Birds.—The Linnæan name of the garden warbler was omitted in my communication of January last (Zool. 7829): the bird is the *Silvia hortensis*.—*Id.*

Occurrence of the Common Buzzard at Rifley, near Lynn.—A fine adult male specimen of this bird was sent to me a few days back for preservation. The brown colour extended over nearly the whole body.—*W. Wilson; Lynn, January 13, 1862.*

Occurrence of the Short-toed Lark (Alauda brachydactyla) and other rare Birds in Hampshire.—It may be interesting to your ornithological readers to know that I have now in my possession a living specimen of the short-toed lark (*Alauda brachydactyla*.) It was caught by a birdcatcher in the neighbourhood of Southampton. It is now getting reconciled to its captivity; indeed, from the first, it was restless rather than wild. Not knowing anything of its domestic habits I placed it in a large cage, with perches, thus giving it the option of roosting either on a perch or at the bottom of the cage. It chose the perch, where it roosts on the same spot nightly, which makes it probable that when at liberty it roosts in trees. A tuft of grass is kept in its cage, but it does not appear to care for it. It spends the day in flitting from perch to perch, occasionally running along the bottom of the cage, from end to end. Not knowing what to feed it on, I at first supplied it with bruised hemp-seed and bread-crumbs, German paste, canary and maw seed; it appears to prefer the hemp-seed and bread, and does not eat the canary seed at all, and but little of the German paste. In order to gain its confidence, I give it daily a couple of meal-worms, of which it appears very fond. The way in which it treats the meal-worms is curious, and different from a fauvette who hangs in a neighbouring cage, and who, upon getting one of those dainties, gives it a pinch with his beak and a tap or two on the perch, and then bolts it whole; my short-toed friend, however, seizes the worm, pinches a hole in him near the head, and then sucks out the entire contents of its interior, leaving the skin perfectly empty! The only sound it has as yet favoured me with, is a clear and silvery call-note. Never having seen one before, I am unable to decide if it be male or female. In Morris's 'British Birds,' the male is described as having "chin, throat and breast, white." Now my bird has no white anywhere about it, save the two outer feathers on either side of the tail. The chin, throat and breast are of a lighter tint than the back, but by no means white. It may be a female, or there may be a change of plumage in the winter. In other respects the description answers well. The attitude and expression of the portrait in that work are decidedly good; the colouring not so good. The appearances of the short-toed lark in Great Britain seem to have been few and far between. The man who caught the one I have had once taken another ten years ago. I have looked through the nineteen volumes of the 'Zoologist,' and the only notices of its appearance there recorded are one in Sussex in 1854, in the possession of Mr. Swaysland, of Brighton, and one shot at the Scilly Islands, by Mr. Augustus Pechell, in the same year. The

only other British specimen I can hear of is the one mentioned by Mr. Morris, in his 'British Birds,' as having been caught in a net near Shrewsbury, in October, 1841. In volume 6th of the 'Zoologist' (Zool. 1958), the Rev. C. A. Bury mentions seeing it in the South of Spain, and in volume 15th (Zool. 5357), Lieutenant Irby records it as being found in the Crimea. I may, therefore, think myself fortunate in adding so rare a bird to my collection of British songsters. I have this winter caught in my garden here a fine male mountain finch (*Fringilla montifringilla*) and a male ciril bunting (*Emberiza cirilus*). I have also a male and female hawfinch (*Coccothraustes vulgaris*). The female I had last spring, and in May she laid three eggs in the cage, which was remarkable, as she had been in captivity since the preceding autumn. I hope this year, by turning the pair into a small aviary, they may be induced to breed. I have also three crossbills (*Loxia curvirostra*), which are very tame and amusing birds. Both the hawfinch and crossbill generally visit this county every year: I suspect the former breeds in certain parts of the New Forest.—*J. Pemberton Bartlett; Exbury Parsonage, Hampshire, February 3, 1862.*

Note on the Shore Lark (Alauda alpestris) and Little Owl (Strix passerina) in Norfolk.—In the 'Zoologist' (Zool. 7845), I recorded the capture of three shore larks on our coast between the 9th and 12th of November last. Since then two more have been killed at Sherringham, and these, like the previous specimens, proved on dissection to be male birds. Of the two last, obtained on the 9th or 10th of January, one was evidently older than the other, with a perfect black gorget and bright yellow tints on the throat and neck, the horns well developed and the cheeks black. The forehead, however, was more white than yellow, with a very indistinct black band, mixed with yellow on the upper part of the head; the points of the wings vinous. The younger specimen had a smaller gorget, each black feather being tipped with yellow, the black on the cheeks also blended in the same manner. The horns slight, but quite distinguishable; no perceptible band across the head; forehead yellowish white, and several reddish longitudinal spots on the breast, immediately below the gorget. It is worthy of remark that on the 15th or 16th of November, only three days later than the last specimen was procured in this county during the same month, three shore larks out of a flock of five were netted near Brighton, as recorded by Mr. G. D. Rowley in the last number of the 'Ibis.' An adult male of the little owl was taken alive on board a fishing smack during the first week in February. This bird was brought into Yarmouth for sale, and on the 7th inst. was sent up to Norwich to be stuffed. The plumage was ragged and dirty and the stomach quite empty, occasioned most probably by the bird having been placed in some box or cage, where it had refused all nourishment in its fruitless efforts to escape. The last specimen of this rare little owl that occurred in Norfolk was also taken alive, in 1846, by Mr. J. H. Gurney's gamekeeper at Easton, near Norwich.—*H. Stevenson; Norwich; February 19, 1862.*

Occurrence of the Crossbill in England.—This being anything but a rare visitor, I conclude that the particular notice of it of late in the 'Zoologist' is to show how widely and generally it is spread over the country; I have therefore to record that I observed one a few weeks since in my garden, feeding in the sycamore trees, up the branches and twigs of which it climbed in a somewhat parrot-like manner, the body frequently reversed or suspended. It was allowed to depart unmolested.—*Henry Hadfield; Ventnor, Isle of Wight, February 15, 1862.*

Gatherings of Magpies.—With regard to the flocking together of magpies, as recorded by more than one correspondent in the 'Zoologist,' I may perhaps be permitted to point out that this habit (though observed at a different season) is referred

to by Gilbert White ('White's Selborne,' p. 175): "I observed in my garden that several magpies came determined to storm the nest of a missel thrush." The editor observes: "In various places in England and Ireland, a reward is given for their heads at Quarter Sessions." Never having heard of an instance in this division of the county, I am inclined to believe that such a custom, if it ever prevailed, must have long fallen into disuse; this, together with the less strict, or less general preservation of game of late years, may account for the greater abundance of the magpie, as well as its gregarious habits becoming more observable.—*Id.*

Three Ravens feeding on a dead Hare at Higham.—On the 15th of October I shot a hare at Higham, in Suffolk, which was not picked up, and our keeper on going round, about three weeks afterwards, found three ravens devouring it, one of which he shot, and this is now in my possession.—*W. L. Barclay; Knott's Green, Leyton, Essex, February 22, 1862.*

Notes on the Spotted Woodpecker. By HENRY L. SAXBY, Esq.

IN remarking the unusual abundance of this bird in Cambridgeshire last autumn, Mr. Saville inquires (Zool. 7847) whether it has been as numerous in any other neighbourhood. With regard to its occurrence in Shetland during the months of September and October, I beg to offer such information as may be gathered from the following particulars:—In a recent number of the 'Zoologist' (Zool. 7754) I recorded the capture of two specimens of the spotted woodpecker (*Picus major*) in the island of Unst. During the next few weeks many more were killed, not only in Unst but also throughout nearly the whole extent of the Shetland Isles: the wind was blowing steadily from the south-east at the time. I am also informed that at about the same time several were killed in Orkney.

The sudden and almost simultaneous appearance of large numbers of this species in various localities, where it is evidently considered an uncommon visitor, is a fact well worthy of the attention of ornithologists, inasmuch as a careful investigation might tend to throw considerable light upon the question of migration. It would be interesting to ascertain the proportion of the sexes among those specimens which were obtained, as well as the direction of the wind at the time of their arrival.

Having heard that woodpeckers only attack such trees as are unsound, I was at first unwilling to kill more than the two already mentioned, but as the leaves began to fall, observing that large portions of the bark had been stripped from some of the healthiest and most vigorous of the trees in Dr. Edmonston's garden at Halligarth, I at length obtained a very reluctant permission to shoot as many of the unfortunate but mischievous birds as ventured within the forbidden

enclosure. To those of my countrymen in Old England who have never wandered far from their own green woods, and to whom the loss of a few small trees would be a matter of little importance, the above may appear a somewhat cruel proceeding, but for all that it was a necessary one, otherwise it would not have been sanctioned by Dr. Edmondston, who is too thorough a naturalist to countenance anything like wanton destruction of life, and who, it should be borne in mind, has for the last twenty years and upwards been very successfully endeavouring to introduce trees and shrubs into the island, notwithstanding the ill-natured ridicule with which his early attempts were received by certain of the inhabitants who ought to have known better. Having thus so far justified myself, I will confess that no less than seven birds fell to my gun alone; besides this, many others were brought to me from various parts of the island, but, strange to say, not one female was to be found among them, and with one single exception all were first-year's birds.

The first two presented nothing unusual in their appearance, but on taking the third one into my hand, I at once remarked the worn look of the bill, tail and claws. I immediately suspected that this was caused by the scarcity of trees having driven the bird to seek its food among stones and rocks, and, upon opening the stomach, my suspicions were confirmed by the discovery, among other insects, of several small beetles which are found only upon the hills.

I may mention that these beetles are very abundant in Shetland, although I do not remember having seen any of the kind in England: they are about the size and shape of one half of a split-pea, black, edged with scarlet.

I afterwards saw spotted woodpeckers on various parts of the hills, on walls, and even in high sea-cliffs; I also saw them on roofs of houses and upon dunghills, and although several were killed upon corn-stacks I never found any grain in the stomach. They were frequently to be met with upon the ground among heather, where at all times they were easily approached, but more particularly in rainy or misty weather, when their plumage becoming saturated with moisture and rendering them too heavy for a long flight, many were stoned to death by boys.

Those in the garden fed largely upon seeds of the mountain-ash, which they broke open the berries to procure, sometimes dropping a whole cluster upon the ground and descending to feed, but more frequently breaking the berries to pieces as they hung upon the trees. But even in the garden they did not confine themselves to the trees:

at one time they might be seen busily searching among moss and dead leaves; at another, in the midst of a tuft of coarse weeds; and again intently examining the spider's webs upon the walls.

It was quite a common occurrence to see them in open meadows scattering aside the horse-dung with their bills, and thus procuring abundant supplies of worms and grubs. I once crept very close to one thus engaged, and was amused to observe how cleverly it used its bill, first striking off large masses, and then dashing them into fragments in all directions by a rapid and peculiar movement of the head from side to side. Although *telescopic* evidence is usually of a somewhat doubtful nature, yet I spent many a happy half hour in observing these interesting birds by means of a powerful pocket-glass. In this manner I could see them climbing the face of a large rock or of a rough stone wall, curiously peering into every crevice, and occasionally varying the amusement by a smart tap or two upon the unyielding surface of the stone.

I once saw two upon the ground engaged in desperate combat, tearing, fluttering, and tumbling about in a most comical manner, at the same time uttering a shrill noise which was half scream and half chatter. Upon my approaching a little too near, they hastily took wing, and were immediately afterwards to be seen perched upon the top of a neighbouring rock, enjoying the warm sunshine, and apparently already in happy forgetfulness of their "little difference." The longer the birds remained in the island the more worn their tails and claws became, but it was only in a very few instances that any injury to the bill could be detected.

I carefully dissected several of the victims above-mentioned, but without observing anything particularly worthy of note, with the exception, perhaps, of the large size of the cutaneous nerves, and the closeness with which the skin adhered to the body. I should be glad to ascertain whether these peculiarities have been remarked in the green woodpecker, for possibly that bird's well-known susceptibility to atmospheric influences may thus be in some measure accounted for, though why such a peculiarity should be so strongly developed only in certain genera is a question of a totally different nature, and one upon which I will not at present hazard my own imperfectly-matured conjectures.

HENRY L. SAXBY.

54, Gilmore Place, Edinburgh,
February 1, 1862.

Food of the Wren—Under this title Mr. Doubleday calls a statement of mine, made in an article read before the Literary and Philosophical Society of Liverpool and published in the 'Proceedings' of that Society, an error. The majority of the patrons of the 'Zoologist' will probably not have read the article, so that I may perhaps be excused for quoting the passage in question here, and making a few remarks upon it. "In winter, this bird, though so small, feeds extensively on snails, extracting them from the shells in an ingenious manner. When a snail is found, it is conveyed to a selected stone, and tapped upon it until the shell breaks, or the animal otherwise becomes detached. It is then easily taken out and devoured. The same stone will often be resorted to for a long time, so that a considerable number of shells will frequently be accumulated. These remains may often be noticed, and as often perhaps have puzzled the beholder." I have certainly never watched the wren operate upon a snail, but I have often seen more or less of broken shells round a stone in spots where I never saw a thrush, and that in places where the thrush would not be likely to frequent. These accumulations of broken snail-shells are not infrequent on the Cheshire and Welsh sand-hills, sometimes occurring near the margin of the shore at a long distance from even tree or bush. A wren generally frequented the neighbourhood of each of these localities, and was constantly seen near the broken fragments. This, of course, is not conclusive evidence, but it is presumptive. With regard to Mr. Doubleday's remark, "that a wren could not by any possibility break the shell of a snail, and if it could detach the animal in any other way it would not swallow it." I fancy that the wren could break a snail's shell by tapping it on a stone, and that it could devour the animal, not by swallowing it entire, but by eating it piecemeal. No one would suppose that the blue tit could swallow a thrown-out bone, yet this bird often feasts on these remains. The raven also gorges himself upon a sheep's carcase, yet who would say that he takes it entire. Concerning Mr. Doubleday's remark as to wrens congregating to roost, I beg to say that these birds are no rarity in Lancashire and Cheshire, and to quote my statement on the subject. "In winter, also, wrens congregate in numbers in warm sheltered roosting-places. At dusk, the observer, by remaining quiet, may see them coming singly from all directions to a favourite haystack. On arrival, they locate themselves in holes previously made round the sides by their own species, or other small birds. By going after dark, the observer may sometimes take them by the dozen in a handful from one hole." I have caught numbers in the way described, and, in one instance, I remember almost filling the pockets of my then boy's clothes out of a few holes in a stack; I afterwards let the birds go. In support of my statement that wrens do so congregate, I need only refer to Yarrell on the subject; to a note in the 'Zoologist' (Zool. 564), by S. H. Haslam; to a second note in the 'Zoologist' (Zool. 4702), by Jonathan Couch; and to a third in the 'Zoologist' (Zool. 5516), by S. C. Tress Beale.—*James Fitzherbert Brockholes; Puddington, near Neston, Cheshire, February 19, 1862.*

Deposition of Eggs by the Cuckoo.—The following passage occurs in the preface to the 'Zoologist' for 1861:—"Ornithologists have not yet shown us how the cuckoo's egg is introduced into nests which, from their situation, the cuckoo herself could not enter." I think there can be little doubt to the reflecting mind that the only method by which the cuckoo *could* by any possibility effect her object in the cases referred to is by taking the eggs in her beak; there never having been a nest (as far as I am aware) found with a cuckoo's egg in it, into which the mother-bird could

not have stretched her head and neck for the purpose of depositing an egg. This idea is as old as the time of Le Vaillant, and all that was needed to demonstrate its truth was the actual discovery that the cuckoo has power to carry its eggs in its beak or throat. It so happened that I was present at a meeting of the Dublin University Zoological Association some years ago, when the fact of this discovery was announced in a paper by Professor Kinahan, and established to the satisfaction of every one present. He actually squeezed the egg out of the throat of a living cuckoo, shot upon the wing. The account was published in more than one form at the time, but must I suppose, have escaped either the eye or the memory of the editor of the 'Zoologist,' so I doubt not that he will be glad to see it produced again for the benefit of his readers. I quote the following from the 'Natural History Review,' vol. 2: Proceedings of Societies, p. 25:—"At Clondalkin, on the 17th June, 1848, I had, while in company with my friend Dr. W. Haughton, the pleasure of having the truth of Le Vaillant's theory, concerning the manner in which the cuckoo deposits its egg in its future niches, entirely confirmed. My friend succeeded in winging a female cuckoo as she was rising; she fell into a ditch, owing to the depth of which several minutes elapsed before we could get her out. Having obtained the bird, I proceeded to kill her, by pressing on her breast, having my thumb on the cavity formed by the *os furcatum*, when I felt something slip from under my thumb, with a gurgling sound. Dr. Haughton, attracted by the sound, turned at the same moment, and we both saw an egg in the act of falling to the ground, from whence I picked it up, perfectly uninjured. This egg agrees with all descriptions I could obtain, and on being shown to Dr. Ball, he at once recognized it as a cuckoo's. On dissection, by Professor Allnan, the bird proved to be a young female, and had in her ovary two full-grown eggs, one ready to pass into the oviduct. No remains of eggs could be detected in her stomach, even when examined with a powerful microscope. Full details may be found in the Appendix to 'Thompson's Birds,' p. 442. The egg and the skin are in the collection of the Dublin Natural History Society." I have quoted Professor Kinahan's own words, and I do not think anything can be more clear and satisfactory than the account he gives. I do not see how any one, however sceptical, can set aside the facts thus detailed. To say that the occurrence was accidental would be absurd; for what accident could induce a cuckoo to have, *contrary to its habits*, an egg of its own, whole and uninjured, in its throat when on the wing? I hope that if any ornithologist who may read this note should know of any facts, tending to confirm the above, he will not neglect to bring them forward.—*A. R. Hogan; Puddleston, Dorchester, February, 1862*

Occurrence of Caprimulgus ruficollis in England.—On the 6th October, so far back as 1856, I obtained a fresh-killed specimen of this rare European goatsucker, of Mr. Pape, game dealer, of this town. It was shot the previous day at Killingworth, near Newcastle. I could not determine the sex from dissection, but I think it is most probably a male, as the first primaries have each a spot upon their inner webs, and the first two spots are white. I have delayed until now making this announcement, for I found, on comparison, that the bird in question differed slightly from a Hungarian specimen in my collection, and I was consequently anxious to see others before doing so. I have now had an opportunity of referring to a specimen in the British Museum, and find that it quite agrees with my bird. I have, therefore, no longer any hesitation in stating that it is the true *Caprimulgus ruficollis* of authors; and I have much pleasure in adding this fine species to the British list of occasional visitors, though I am far from

believing that this is really its first occurrence in our island. It very closely resembles the *C. europæus*, and is almost sure to be confounded with that species by the casual observer.—*John Hancock ; Newcastle-on-Tyne, in 'Transactions of the Tyneside Naturalists' Field Club,' Vol. v. p. 84.*

Nesting of the Chimney Swallow.—This pretty bird is, in my opinion, erroneously called the chimney swallow, because it is by no means partial to that place as a place for building in. Last year two pairs built their nests in my stable, and as they are generally locked up the only mode of entrance was through a slit (a brick in length and breadth) at one end of the building. One pair built a nest upon a rafter, in shape and size about that of a basin. To render it secure the parent-birds made a good foundation on the wood, and the clay or composition of which the nest was built was continued down each side of the rafter, evidently with the intention of rendering the nest perfectly secure. This pair succeeded in getting five young ones away. The other pair built their nest at the other end of the stable, and they placed it, by the side of a large rafter, the rafter forming one side of the nest, which was open at the top. This pair laid two eggs and then deserted them. The end of the stable where this nest was contained the firewood and coals, consequently the birds were frequently disturbed, which may account for their desertion. In 1854 and two following years, a pair built their nest in the bell-tower of the chapelry and school at Appletou-le-Moors, in the North Riding of Yorkshire. The nest was so situated that every time the bell rang it swung within six inches of it. The bell was generally rung four times a day, and frequently oftener. In 1856 the nest was destroyed by a mechanic, who had to go up to the bell, and the nest, which was kept for some time in my study, had a very sickly smell; it smelled strong of some saline matter. During my stay in the village, there never was another nest built there. Last year a pair began to build a nest in a shed in our back-yard. The shed at the eaves was only four feet high, and, being in constant use, they were too frequently disturbed to finish the nest, but finally took possession of the chimney of an outhouse. On the north moors of Yorkshire their nests are very common in the outhouse of the farms and in field-sheds.—*J. Ranson ; York, February, 1862.*

Migration of Swallows.—On the 2nd of November, 1861, I observed, towards sunset, more than a dozen martins alight on a neighbour's house, and enter, one by one, a small hole under the eaves. On the following day, between four and five o'clock, I saw twenty-two martins hawking flies before retiring to roost. They were first seen at a considerable distance and elevation, but gradually descending and contracting their circular sweeps as they approached their roosting quarters, and, apparently aware that but few minutes of daylight remained, exerting their utmost powers of wing to snap up every stray fly. Occasionally a few, detaching themselves from the main body, dart off with a direct flight till lost in the distance; but a little before 5 o'clock all had reassembled and began to inspect their dormitory, creeping in at the narrow aperture in an awkward, hurried manner, till satisfied that all was safe. Seeing them to roost is a trial of patience, for after watching them in one by one—it may be for the twentieth time—out they come again, as if scared by some vampyre inhabitant of their dark retreat. The whole scene has then to be reenacted, but in a still more confused and hurried manner. There was now a general scramble: some were to be seen clinging round the opening; others were endeavouring to fly in. A few relaxing their hold or missing their footing were compelled to take another sweep to regain their lost position. The thermometer had at the above hour fallen to 47°. The martins were occasionally

observed, but in smaller numbers, up to the first week in December. I have reason to believe that they were all birds of the season.—*Henry Hadfield; Ventnor, Isle of Wight.*

Early Appearance of the Swallow.—On the morning of the 4th of February, whilst walking out, I observed a swallow flying about quite as active as if it was July. That I am not deceived I am quite certain, as I watched it for upwards of five minutes. I may state that the weather here has been very mild and warm for the last two weeks, and the sun was shining brightly at the time.—*George H. Parke; Halifax, Yorkshire.*

[I think this bird could not have been a this-year's arrival.—*E. N.*]

Occurrence of the Little Bustard in Yorkshire.—A fine mature female specimen of the little bustard (*Otis tetrax*) was shot on Friday, the 31st of January, at Leven, in Holderness, East Riding of Yorkshire, by Mr. Hudson, gamekeeper to the Rev. Canon Wray of that place. It was feeding in a turnip field.—*W. W. Boulton; Beverley, February 1, 1862.*

Re-examination of Sabine's Snipe.—Since I communicated to you the capture of *Scolopax Sabini* in the central part of Cornwall, I have had an opportunity of re-examining the bird with Mr. Gould, and discussing the merits of the points at issue as to its specific value. One great character of distinction, as I before told you, is extinguished in this specimen, *viz.*, in the number of its tail-feathers being undoubtedly fourteen and not twelve. There can be no doubt that the striking tone of uniform dark colour pervading the whole upper and lower surface of the plumage is calculated to startle any observer as to its identity with our common snipe, but I think Mr. Gould has quite made up his mind as to its being only a variety, and not specifically distinct. It may be urged that all the specimens hitherto obtained of *S. Sabini* have agreed in their general tone of colouring, without showing any intermediate plumage characters of the common snipe in the partial development of the dorsal longitudinal lines and the white under surface, but it is well known that all birds, in assuming a dark variety of plumage, exhibit a general uniformity over the entire plumage. I adduce by way of familiar examples the dark varieties of bulfinches, larks, sparrows, &c. It so happened, in corroboration of this argument, when Mr. Gould was examining this specimen in Mr. Vingoe's laboratory, that there was at the same time before him almost a black variety of the male Montagu's harrier, killed near Helston, and on examining the under surface of the wings of this specimen, the entire dark tone prevailed, without the slightest vestige of the rufous markings peculiar to the male of this harrier. There is, therefore, a strong probability that the specimens may all agree in colouring without thereby establishing a specific distinction.—*Edward Hearle Rodd; Penzance, January 17, 1862.*

Correction of an Error.—In the article on *Scolopax Sabini* (Zool. 7882) you will observe a very palpable error in the insertion of the word "not," the seventh line from the bottom. I am made to say that "I had little hesitation in *not* thinking the bird a distinct species," &c., or words to that effect, but I am writing without the book before me. It should be, "I had little hesitation *in thinking*," &c.—*Id.*

Variety of Snipe.—I have lately examined two examples of the large brown variety of snipe, so accurately described by Mr. Rodd (Zool. 4704). One of these birds, killed at Dartmoor in December last, quite equalled in size some specimens of *S. major*, but differed from that species in having the belly white and only fourteen feathers in the tail. The general markings were very similar to those of the ordinary sized common snipe, but the plumage was altogether of a more ruddy cast, and the light stripes on

the scapulars narrower and much less conspicuous. The bill and the tarsi especially appear very short when compared with the large size of the body. I observed that the second quill-feather of the wing was the longest, which is not the case in the common snipe, the first primary having the advantage almost invariably. This might probably be the result of age, but the wing of the variety mentioned appears altogether short. All sportsmen who have killed the bird remark that it rises without noise. This variety has puzzled me for many years.—*John Gatcombe; Wyndham Place, Plymouth.*

Occurrence of the Green Sandpiper at Leyton.—Specimens of this bird have been observed in this locality almost every autumn, and two have been killed this season. The first was in October, and the second on the 8th inst. It is an extremely good one, and is now in my possession.—*W. L. Barclay; Knott's Green, Leyton, Essex, February 22, 1862.*

Occurrence of the Egyptian Goose near Dublin.—On the 8th of last December I shot a fine specimen of the Egyptian goose (*Anser Ægyptiacus*) near Dublin. I mentioned this to Dr. Carte, Professor of the Dublin Society, who said that it must have been a domesticated bird. When I first observed it, it was flying from the east, straight for the shore, but as soon as it perceived me it turned for the south-east, in direction of some rocks called the "Muglius," when I fired. It then turned again towards shore, and fell in the sea, when I picked it up. Whether it ever had been domesticated I cannot say, but it appeared decidedly wild when I killed it.—*H. Blake Knox; Bartragh, Dalkey, County Dublin.*

Pochards in the Serpentine.—Yesterday I saw two and to day eleven pochards in the middle of the Serpentine, opposite the boat-house. Whether these were genuine wild birds, or birds bred in the Zoological Gardens or St. James's Park (see Zool. 6922), I will not pretend to say, but from their number I think it is most probable they were the former. I have seen no pochards on the Serpentine for many years, except two wretched pinioned birds about two or three years ago, which of course disappeared in a very short time. Putting crippled birds in the Serpentine, to be harried to death by the boats, bathers, fishers and dog-swimmers, is a species of cruelty which ignorance alone can justify.—*Henry Hussey; 7, Hyde Park Square, January 23, 1862.*

Occurrence of the Little Gull and Little Auk near Lynn.—A fine specimen of the little gull was shot at St. Germain's, Lincolnshire, in November, 1861: it is now in the Lynn Museum. A fine specimen of the little auk was also shot at Lynn.—*W. Wilson; Lynn, January 13, 1862.*

The Little Gull.—I have been fortunate enough to obtain two specimens of this pretty bird lately; one a young male, shot off Brighton early last year (see Zool. 7387); the other a fine adult female, shot at Freshwater, Isle of Wight, by Mr. H. Rogers, on the 21st of January last. The plumage of this specimen differs much from the young bird; the whole of the upper parts are one uniform pearly gray; the quill-feathers the same, except the tips, which are white; the back of the head and neck is mottled a good deal with black; the tail and rest of the plumage pure white; while in the young bird the shoulders and some of the scapulars are black, forming a broad band; the quill-feathers black, with the inner margin and the tips white; the back pearly gray, with a black patch on the hump; the tail white, broadly tipped with black; the throat, breast and under parts pure white; the feet and legs, in the adult, bright red,—beak reddish black; in the young bird the feet and legs dirty cream colour,—beak black. There is a difference in the under parts of the wings in these birds that I do not recollect to have noticed in any other gull; the quill-feathers in

the adult bird are dark lead-colour, with the shaft and tips white; in the young bird the same feathers are white, with a narrow stripe of black on each side of the shaft, which is white, the ends black, with a minute speck of white at the extreme point of each feather.—*Frederick Bond; Kingsbury, February 20, 1862.*

Occurrence of the Little Gull at Plymouth — A very interesting specimen of the little gull was killed in Plymouth Sound on Monday, February 3rd. It was fishing in company with several common gulls, and mistaken by the person who shot it for a tern; but ultimately it fell into the hands of a person who knew better, and was thus fortunately preserved. The specimen was a female, in excellent condition, weighing 7 ounces. The contents of the stomach was not examined, but in the gullet was found a fly. Having been obtained so late in the season, the plumage, though immature, was very interesting. Notwithstanding dark markings on the wings and a broad black band on the tail, the black head of the breeding season was already partially assumed, dark feathers appearing on the cheeks and throat, forming a complete circle round the neck,—showing how far that colour would have extended, and also that the little gull attains the black head very early in the spring, and before it has arrived at perfect maturity. The bill was black, the legs flesh-colour, and the length of wing from the carpal joint $8\frac{1}{2}$ inches. The bird is now in the collection of Mr. T. C. Hingston, of Plymouth.—*John Gatcombe; Wyndham Place, Plymouth, February 15, 1862.*

Breeding Habits of the Petrel. — The Rev. I. Ambrose, of Halifax, N.A., in a letter read to the Boston Society of Natural History, U. S., communicates some interesting particulars relative to a visit to Green Island, about ten miles out at sea, off the mouth of Chester Bay, Nova Scotia. He landed on the north side of the island. Not a puffin or any other kind of bird was to be seen, save a large number of "steering" gulls and some "mackerel" gulls flying overhead; whilst the whole island under foot was perforated and undermined by the petrels. He says:—"I first took a tour all round the grassy edge of the cliffs to look for gulls' eggs. I got two dozen of the steering gulls' eggs, and the men eight dozen. Tore up the turf with my hands, following the little galleries with my fingers, and soon secured four dozen and a half of petrel's eggs, and two of the parent birds as specimens. I could have obtained, I suppose, a thousand dozen of the eggs if I had wished, and every mother bird with them, as the poor little things crowd back into their holes, making not the slightest noise or resistance whilst they beheld the roof rudely torn from their dwelling and their eggs taken away. In no instance, except one, did I find more than one egg in a nest, and in that there were but two; and yet some of the birds were hatching, as some of the eggs contained the embryo, with its head and body so far developed as to clearly identify the species. The smell of the birds is at first very offensive; indeed we perceived it at a distance of two miles from the island. This smell is not occasioned by any decayed fish or other extraneous matter, as the nests and surrounding turf are invariably very clean, the nest itself being lined at the bottom with a very little dry fine grass. The odour is peculiar to the bird and its egg, and is particularly perceptible in the dark brown oily fluid which, seemingly in self-defence, these birds eject from their bills. The sun was just rising when we landed on the island; and although we had seen several petrels flying about the boat in the night and at dawn of day on our passage, yet on the island not one was to be seen: all were underground, where at first you could hear them twittering, as if arranging about nests and accommodation; but soon after sunrise they became almost entirely silent, at least so far as the screaming of the gulls, which was always about the same, would enable you

to judge. On taking a petrel out of its nest it would not, on being set down, attempt to fly at first, but would endeavour to dig its way down into some of the broken holes. Most of the nests seemed to be old ones newly fitted up, and I found several such where the bird had brought quite a sprinkling of fresh dirt to the surface. They seem to form their galleries not so much by carrying out the surplus dirt, however, as by pressing themselves through the soft turfy soil. A great many ants had made their nests among the galleries, but did not seem to incommode the birds; perhaps, indeed, they serve them for food at times."—*S. P. Saville; Dover House, Cambridge, January 14, 1862.*

An Unexpected Arrival.—In one of the compartments of the reptile-house, in the Zoological Gardens, there has lived for many years a fine specimen of the West African rock-snake (*Python Sebæ*). It is now at least nineteen feet long, and about twenty inches in circumference at its thickest part. Its companion, a snake of the same species, but of much smaller dimensions, has been associated with it for, I believe, the last two or three years, and the two reptiles have lived together in the utmost amity. On the morning of the 12th inst. it was discovered that the large snake had, during the previous night, deposited about a hundred eggs, of the size of those of a goose, with a soft leathery envelope, and, for the most part, of a dirty yellowish colour, two or three, however, being of a decided brown. When first observed the eggs were piled up in a heap, but the snake soon reduced them all to the same level, and, having arranged them in a suitable manner, coiled herself up on them, and completely covered them with the thick folds of her body. During the last week the snake has once or twice come off her eggs, and two days ago she was coiled round them, and the eggs were slightly heaped together. The temperature of the compartment is about 70°, and under the blanket which covers the python and her eggs it is probably 20° higher. This snake has always been a spiteful one, and under her present circumstances she is more than ever disposed to resent any interference, so that the precise number of the eggs, and other particulars relating to the interesting event, have not yet been ascertained. The fact of the python incubating her eggs was, I believe, first noticed at these Zoological Gardens many years ago, but was then generally discredited. It has since been observed at Paris, where some young snakes were produced, and the present behaviour of the python in the Regent's Park confirms the belief that incubation is the rule with this division of the family Boidæ. This snake has not fed for the last twenty-one weeks.—*E. W. H. Holdsworth, in the 'Field' Newspaper.*

*The Great Pythoness at the Zoological Gardens.**

AMONG advertisements to seekers of amusement, one from the Zoological Society has, probably, been observed by our readers. It announces that at the Society's Gardens "the large python may be now seen incubating her eggs." We confess that this advertisement somewhat surprised us; for, having recently read in the Treatise on

* From the 'Athenæum' of February 8, 1862.

Reptiles, published in the last edition of the 'Encyclopædia Britannica,' that "no reptile is known to hatch its eggs," we were not prepared for an announcement from the Zoological Society so directly in opposition to that of the author of this recent treatise, which is supposed to be a high authority on reptiles. True, herpetology has by no means kept pace with other sciences, many important features still remaining obscure; yet we thought that the question of reptiles hatching their eggs had been as firmly settled as that all ophidians are oviparous. But from the days of Pliny, who tells us that young boars feed on cow's milk, and that they are indebted to this mythical connexion with the bovine family for their name, mighty serpents, worse

"Than fables yet have feigned or fear conceived,"

have always been subjects of mystery, and it is not, therefore, any very great wonder that opinions should differ respecting the hatching of their eggs. The pythoness which has suddenly become a celebrated and interesting character in the great London world, where almost daily some event or person is elevated to a prominent position only to be put aside when a new wonder appears, is one of the large varieties of the great boa family. It was born in West Africa, and been eleven years in the Gardens, during which period it has thriven well, waxing yearly in strength, girth and length, until now it is a very giant among the serpents in the Zoological Society's collection.

It is better off than many animals in the Gardens which live in single blessedness in their narrow prison-houses, for the great lady python has a husband. We must say, however, as will be seen presently, she does not seem to derive any great comfort from his society. It may be that, because her mate is much less than herself, she regards and treats him with contempt. He is a dwarf compared to her, being a kind of reptilian Brummel, toying as it were with peas, while his wife eats scores of animals. She has gorged ten full-grown rabbits at a sitting, or coiling rather; and on the last occasion that we saw the interesting couple at their dinner (provided every Friday at the fashionable hour of seven) she stowed four rabbits in her elongated maw in an amazingly short time (how many more followed we know not), while her husband not only turned away from a rabbit, but was absolutely insensible to the attraction of a dainty duck which quacked provokingly under his very nose. Do not, however, suppose that the male serpent is puny or powerless. Waterton himself, who came forth from a cavern with a boa encircling him with its muscular coils,

would have succumbed under the grip of such a reptile as this. We only wish it to be understood that it is small compared to the pytho-ness.

The great egg-laying event occurred four weeks ago. The phlethoric condition of the serpent occasioned uneasiness. Some supposed that she had bolted a stray blanket; it was considered whether something might not be done to relieve the great reptile, when she extruded, as well as the keeper can estimate, about one hundred eggs. These, enclosed in a white leather-like substance, are about the size of those of a goose, the majority of a dirty white appearance, connected by a membrane. Among them are two small red eggs, and many are indented, probably by the great pressure of the serpent's body. It is remarkable that this prolific extrusion of eggs, which might be supposed to have exhausted the animal and consequently excited hunger, has had apparently an opposite effect. At all events, the reptile has not broken fast for twenty-three weeks, her husband having, meanwhile, indulged in occasional rabbits. Indeed, the sight of these animals, pleasantly provocative at other seasons, seemingly only irritates the pytho-ness: a few days since, an unsuspecting rabbit having frisked near her ladyship, she straightway seized it by the throat and cast the affrighted beast savagely from her. And on more than one occasion, when her husband, doubtless actuated by proper paternal pride and feeling, approached his wife in order to see how domestic matters were going on, she has, to use the keeper's words, shouldered him away with one of her great coils, showing plainly that by thus giving him the cold shoulder she prefers performing her maternal duties unassisted. Once, and once only, has the keeper seen her absent from her interesting incubatory operation; and then, before he could get round to the back of the cage to have a better view of the eggs, she was on them again. In fact, she much resembles an old hen with a brood, puffed up by maternal pride and conceit, and is in a highly excitable condition; spiteful too, according to the keeper, for she has struck more than once at objects outside the glass which have irritated her. Though she does not eat, she drinks freely; but as water is near her, she is not obliged to leave her eggs to assuage thirst. Having communicated these interesting particulars, the keeper kindly went round to the back of the cage, opened the door and removed the blanket cautiously. There, true enough, in direct opposition to the non-hatching theory, was the mighty pytho-ness in great coils—

“Fold above fold, a surgy maze, her head
Crested aloft,”

not a whit attenuated by her long fast, while beneath the lowest coil were bunches of eggs, some plainly visible between the folds of the coil, others, as the keeper said, being only partially seen in consequence of their being overlaid by the serpent's body. Some of the eggs were of a dirty green-white, decomposition having probably taken place,—a supposition strengthened by the odour emanating from them and also from the serpent. The removal of the blanket, though effected most quietly, immediately excited the pythoiness. Her head, which was lying on the topmost coil, in the best position for observation, was suddenly raised; she became restless, darted out her long quivering tongue with great rapidity, and would have struck the keeper had he not recovered her with the blanket and put an end to her irritation.

It will be interesting to watch the result. Immediately opposite the pythoiness's cage is a lively member of the viper family, which was hatched in the Gardens in 1860 from an egg; and we understand that a boa was born in Paris from an egg hatched by the female. Thus the Zoological Society may reasonably look forward to an increase of its interesting collection of reptiles; and though the Fellows are not probably particularly desirous to have an accession of one hundred pythons to their stock, yet a few lively baby pythons would undoubtedly be an important addition to the attraction of their unrivalled Gardens during the ensuing season, when our metropolis will be crowded by sight-seeing visitors. We trust, however, that, apart from this financial consideration, the Society will take care that the pythoiness shall be carefully and closely observed while she is incubating.

[I entertain considerable doubts as to the term "incubating," which I find employed by all our zoologists on this interesting occasion: without consulting a dictionary or lexicon as to the meaning of the word, it is quite certain that we naturalists have applied it to a phenomenon which cannot be exhibited by a pythoiness; that phenomenon is the application of heat to the egg by means of the superimposed body of one or other of the parents. Viewing incubation in this light, we must apply some other term to the exhibition in Regent's Park. The design of the parent may be to cool the eggs by contact with her body; it may be to protect them from any unnatural taste for juvenile pythons on the part of father python,—a taste of which we have had many instances within the range of our zoological researches: indeed it is of little use to speculate: we know that the imposition of a body colder than the surrounding atmosphere can have no tendency to vivify the eggs, and *that* we generally believe to be the object of incubation.—*Edward Newman.*]

List of New and Rare Spiders captured in 1861; being a Supplement to the Lists in Zool. 6493, 6862, 7553. By the Rev. O. PICKARD-CAMBRIDGE, M.A.

THE effect of the cold, wet season of 1860 was very visible in the scanty crop of spiders during the spring of 1861. Though, however, the *quantity* was short, the *quality* was good, and the result of the season's work was nearly equal to that of the previous year (1860). By the month of September, the summer having been a tolerably genial one, spiders appeared in most places to have regained their ordinary numbers; in fact I hardly ever saw a greater abundance of some of our commoner species than during last autumn; such, for instance, as *Epëira solers*, *E. inclinata*, and *Linyphia montana*, whose webs on a dewy September or October morning show so conspicuously among the heath and furze. The following list comprises, among other rare spiders, *ten* species discovered or ascertained, during the past season, as new to Science; *seven* species recorded for the first time as inhabitants of Great Britain; *three* others of which only one sex had been previously discovered; and nineteen species known to me as British, but which until this last season I had never met with myself.

Family SALTICIDÆ.

**Salticus floricola*, *Koch*. I met with this pretty little *Salticus* in tolerable numbers on dry sandy patches on Bloxworth Heath, about the middle of May, 1861: both sexes were adult. Previously only two specimens had been captured in England, and those were taken on the sand-hills at Southport, Lancashire, in 1859. The activity of this little spider surpassed everything I have yet observed. Although in length it does not exceed one-tenth of an inch, many of its leaps were more than eight inches in extent.

**S. nidicolens*, *Walck*. Not infrequent in the same places as *S. floricola*.

**S. quinque-partitus*, *Walck*. Of this rare *Salticus* I captured two adult males in the same locality as the two last.

S. fasciatus, *Walck*. I received an adult female of this very distinct and well-marked *Salticus* (now recorded for the first time as British) from Mr. William Farren, of Cambridge, who captured it on a gate near Brockenhurst, in the New Forest, in June, 1861. I am also indebted to Mr. Farren for several other rare spiders captured in the same locality.

**S. reticulatus*, *Blackw.* Rare; at heath-roots and under pieces of wood and stone, and among moss in woods at Bloxworth, Dorset; also under stones at Portland, and on Arthur's Seat, Edinburgh, in July, 1861.

**S. tardigradus*, *Walck.* Being at Calke, near Derby, at the beginning of August, I searched some palings where, in April, 1860, I had captured a very young specimen, and was pleased to find adults of both sexes of this fine large *Salticus* in tolerable abundance.]

Family THOMISIDÆ.

**Thomisus floricolens*, *Walck.* Adult males on iron railings, Bloxworth, in May.

T. morio, *Koch.* An adult male of this species, now recorded for the first time as British, was captured on Bloxworth Heath, by myself, in 1857; but it was mistaken, until lately, for *T. luctuosus*, from which, however, it differs very remarkably, especially in the form of the palpi.

**T. Cambridgii*, *Blackwall.* The female only of this species has been as yet recorded; but on an examination of some adult males of *T. bifasciatus*, I found among them an adult male of this fine species, which was captured by myself some time back, on Bloxworth Heath.

T. versutus, *Blackw.* An adult male, captured on Bloxworth Heath, in May, 1861.

T. trux, *Blackw.* Immature specimens swept off flowers in woods, in September, 1861, at Bloxworth.

T. incertus, *Blackw.* Adult females at the roots of trees, Bloxworth, in May; and adult males among dead leaves and rubbish in a plantation at Drayton-Beauchamp, Bucks, in August, 1861.

T. simplex, *Cambridge.* I discovered this very distinct new species at the base of large trees on the lawn at Bloxworth Rectory; the males were adult in May, and the females in June, 1861.

**T. lanio*, *Koch.* Adults of both sexes beaten frequently from underwood at Bloxworth, in May and June.

**Philodromus pallidus*, *Walck.* Adult males of this species were beaten by myself and Mr. Tuffen West, off Scotch firs near Bloxworth, in May, 1861.

**P. elegans*, *Blackw.* An immature male was sent me, among other spiders from Shirley Heath, by Dr. Knaggs, M.D. The only locality in which this species has been met with before, is that in which I discovered it, near Lyndhurst, New Forest, in 1858.

Family DRASSIDÆ.

Clubiona assimilata, *Camb.* New to Science. Among specimens of *C. amarantha* captured at Bloxworth and Southport I found an adult male of this species (taken, I believe, at Southport), and received another from the Rev. T. W. Huthwaite, taken at Coven, Staffordshire. Since preparing a description of it I have found adult males of this same species, included under the name "amarantha," in the collection of Mr. Meade, of Bradford, Yorkshire.

C. neglecta, *Camb.* New to Science. This species was also mistaken for *C. amarantha*, to which, like the last, it bears a strong general resemblance; it (an adult male) was captured at Bloxworth.

C. deinognatha, *Camb.* New to Science. An adult male of this very distinct *Clubiona* was captured at Bloxworth several years ago, but was overlooked among a large number of specimens of *C. amarantha*, from which the large size of the palces at once distinguishes it.

C. diversa, *Camb.* New to Science. An adult male of this minute *Clubiona* was received from Mr. C. H. Brown, who captured it at Southport, Lancashire, in June.

C. trivialis, *Koch.* Adult males and females of this species (now first recorded as British) have been captured by myself at Southport, Lancashire; Hursley and Lyndhurst, Hampshire; and at Bloxworth, on furze-bushes and among heath. Mr. Blackwall tells me he finds females of this species in his collection, that he met with in similar situations, some years ago, in North Wales. I also captured it on the Pentland Hills, Scotland, in July last.

Family CINIFLONIDÆ.

Ergatis arborea, *Camb.* New to Science. Adults of both sexes of this spider were captured by myself in May, 1860, at Hursley and Lyndhurst, and subsequently at Bloxworth. It is closely allied to *E. benigna*, but is smaller, different in the structure of the palpi, and in its habitat.

Family AGELENIDÆ.

**Agelena subfusca*, *Camb.* I have found, occasionally, adult males of this species on walls and posts at Bloxworth, apparently intercepted while on an aërial excursion. The female has hitherto escaped notice.

Tegenaria silvicola, *Walck.* I found an adult female, and many immature specimens of both sexes, under moss and loose stones on walls, at the foot of the Pentland Hills, in June.

Family THERIDIIDÆ.

Theridion tinctum, *Walck.* I met with both sexes of this species, adult and in considerable numbers, on furze-bushes at Hursley, in May, 1860. It has not before been recorded as British.

T. projectum, *Camb.* New to Science. An adult male, and females adult and immature, of this minute but very distinct species, were found by myself at the roots of heath, Bloxworth, in April and May.

**T. angulatum*, *Blackw.* Among spiders kindly collected for me at Folkestone last summer, by Dr. Knaggs, M.D., I found an adult male of this remarkable species, which I had met with before at Hursley, and in some abundance on Bloxworth Heath, though nearly all immature.

Family LINYPHIIDÆ.

Linyphia triangularis, *Walck.* I met with adult females of this spider in corners and crevices of rocks on the banks of Loch Katrine; in July last.

L. longidens, *Wider.* At heath-roots, Bloxworth; under stones between Loch Katrine and Inversnaid, and also received from Hursley from the Rev. S. M. Scroggs.

**L. frenata*, *Wider.* Adults of both sexes in abundance among low plants in plantations at Drayton-Beauchamp, Buckinghamshire, in August.

L. obscura, *Blackw.* The female of this species has not before been recorded. Adults of this sex, and immature males, were captured by myself at Wychwood Forest, Oxfordshire, and on the Pentland Hills, in June; and at Hursley and Bloxworth, in August and September last. Mr. Meade also met with both sexes, adult, in Ireland, in June last.

L. circumspecta, *Blackw.* Adults of both sexes among grass at Formby, Lancashire, in June, 1859.

L. flavipes, *Blackw.* Adults of both sexes at heath-roots, Bloxworth, in May.

Neriene corticea, *Camb.* New to Science. Adults of both sexes among moss and rugged bark of ash and apple trees at Bloxworth, in May and October last.

N. elevata, *Camb.* New to Science. Adults of both sexes were discovered in 1859, under sea-weed and at the roots of grass and dwarf willows, on the sand-hills, Southport.

N. vagans, *Blackw.* Adult males were captured at heath-roots,

Bloxworth, in May last; and one at the foot of Ben Nevis, in Inverness-shire, in July.

**N. affinis*, *Blackw.* Both sexes, adult, at heath-roots, Bloxworth, in May last.

N. pygmæa, *Blackw.* An adult male and female were contained among other spiders kindly collected for me in Ross-shire last September, by the Rev. J. F. Montgomery, of Edinburgh.

N. flavipes, *Blackw.* Adult males and females on bare ground, door-steps, &c., at Bloxworth; and at Dalswinton, in Dumfriesshire, in July.

N. bituberculata, *Wider.* Adults of both sexes (now recorded for the first time as British) were discovered by myself at roots of heath, Bloxworth, in May.

**N. nigra*, *Blackw.* Adults of both sexes on iron railings, Bloxworth, in November.

N. herbigrada, *Blackw.* An adult male and female were captured by myself under a rooty ledge on the banks of the Conway, N. Wales, in April, 1860.

**Walckenæra unicornis*, *Camb.* Males and females, adult, on furze-bushes, Bloxworth, in May.

W. bicolor, *Blackw.* An adult male, under a stone on Arthur's Seat, Edinburgh, in June.

W. borealis, *Camb.* New to Science. Adult males under loose stones on a wall near the Pentland Hills, in June.

**W. humilis*, *Blackw.* Not infrequent, running in sunshine, on the pavements of Edinburgh, at the end of June.

W. cristata, *Blackw.* Adults of both sexes among lichens on apple trees, Bloxworth, in October.

W. antica, *Wider.* Adults of both sexes at the base of trees, among roots and grass, in April, 1861, and at heath-roots, Bloxworth, in the first week in February, 1862.

W. nemoralis, *Blackw.* Adults of both sexes not infrequent among lichens on apple trees, Bloxworth, in October and November.

W. pratensis, *Blackw.* Both sexes, adult (now recorded for the first time), under ledges of the banks of the Conway, North Wales, in April, 1860.

**Pachygnatha Listeri*, *Sunderall.* Adults of both sexes numerous among low herbage in woods, Bloxworth, in September, 1861. I had never met with but one solitary specimen until this last season, when it appeared so abundantly.

**P. Clerckii*, *Sund.* Adult males at Bloxworth, in company with *P. Listeri*.

Family EPEIRIDÆ.

Epëira lutea, *Koch.* I discovered adult females of this fine *Epëira* (now first recorded as British), among low plants in plantations at Drayton-Beauchamp, Bucks, in August last.

E. sericata, *Koch.* In September, 1858, I met with two adult males on the city wall at Chester; Mr. Blackwall has only lately ascertained them to be of this species. It is now recorded for the first time as British.

**E. bella*, *Meude.* Adult males (the male adult hitherto unknown) of this very pretty species were captured by myself, together with adult females, among low plants at Drayton-Beauchamp, in company with *E. lutea*.

**E. calva*, *Blackw.* Abundant among rough grass on the Downs, Hursley, in August.

In giving the above simple and unscientific list, I must repeat again here that my sole object has been to draw the attention of the "collector" to the subject of spiders. I have tried to show that, looked upon not only as objects of great interest, both in variety of form, colour and habits, but looked upon merely as an object "to collect," spiders offer a far more fertile field than most orders of insects. It would be difficult to name any order of insects to our indigenous lists of which upwards of sixty species might be added, as the result of a limited amount of leisure bestowed on them during eight years! One great recommendation to the study of spiders is, that but little or no time is required for mounting or preserving them, and this, to the collector who has but little leisure to devote to his hobby indoors, is a very great point. Another recommendation is, that all the parts on the structure of which, generic and other characters are based, are easily observed and examined, either through the spirit in the tubes or else out of them, the spirit having been allowed to evaporate, a process which a few minutes will complete. But in spite of all that has been or can be said, there seems to be a kind of general aversion to a spider, and with numbers of persons a sort of creeping against handling them. I have found this the case even with collectors who would not scruple to dive down into a putrid mass to capture a beetle. How long this will be the case seems doubtful; certainly the converts to Arachnology are as yet few and far between, while to some other branches of Entomology recruits are numbered almost by scores. Perhaps when the Ray Society has completed the publication of Mr.

Blackwall's work on 'British Spiders,' Arachnology will obtain her share of students. No doubt the want of a work on the subject in "the mother tongue" is, among others, one chief hindrance to the study.

The asterisk affixed to the name of any spider in the above list denotes that some notice of such spider has been given in one of the previous lists (see Zool. 6493, &c.).

O. PICKARD-CAMBRIDGE.

Bloxworth, Dorset,
February 15, 1862.

Descriptions of Ten New Species of British Spiders.

By the Rev. O. PICKARD-CAMBRIDGE, M.A.

Tribe OCTONOCULINA. Family THOMISIDÆ.

THOMISUS SIMPLEX.

General colour pale murky yellowish brown. Cephalothorax mottled and marked on the sides and front with brownish black. Abdomen marked on the upper side with several transverse dark streaks on the hinder half, and a longitudinal fusiform band, bordered with a fine blackish line, reaches nearly two-thirds of the length towards the spinners. In adult males the femoral joints of the legs and the palpi, except the humeral joint, suffused with dark sooty brown. Radial joint of the palpi has a strong projection on the outer side, ending with a long, nearly straight, fine, pointed, black spine, which runs alongside of the digital joint.

Adult male. Length, 1-eighth of an inch; length of cephalothorax, 1-sixteenth. Breadth, 1-sixteenth. Relative length of legs, 2, 1, 4, 3.

Cephalothorax compressed in front, abruptly depressed behind, thinly clothed with short hairs, and some bristles project from the frontal margin. Its colour is pale yellowish brown, in strongly marked males tinged with reddish brown, especially towards the front, and in such specimens the pointed spade-shaped mark so characteristic of the genus is distinctly visible, and contains generally two longitudinal parallel spots of dark brownish black, with which colour the sides and the region of the eyes are more more or less mottled and marked.

Eyes in two almost concentric, curved rows, the front row being the shortest, the curves directed forwards. The lateral eyes of the

front row are the largest of the eight, though but very little larger than the corresponding ones of the hinder row.

Legs furnished with hairs and spines; two parallel rows of the latter extend along the under side of the tibiæ and metatarsi of the first and second pairs. Colour pale yellowish brown, with the femoral joints, in most specimens of adult males, more or less suffused with brownish black. Relative length, 2, 1, 4, 3.

Palpi short. Colour yellowish brown, and, excepting the humeral joint, suffused with brownish black. The radial joint has a large crescent-shaped projection on its under side, and on its outer side a strong one, ending in a long, fine, pointed, nearly straight, black spine, which projects along the side of the digital joint. This last joint is oval; the palpal organs contained in it are well developed, prominent, and with a filiform black spine, curved from their base round the inner side to their extremity, and so down the outer side.

Falces in most specimens slightly darker coloured than the maxillæ, labium and sternum, which are of a pale yellowish brown, the latter obscurely freckled with brown. None of these parts offer any variation from the generic type.

Abdomen of a dull yellow-brown colour, thinly clothed with short dark hairs. The upper side is obscurely freckled with brown, and in some specimens the margins, especially near the cephalothorax, mottled with whitish. Two fine dark lines commencing near the cephalothorax join in an acute angle at rather more than halfway to the spinners, forming a longish fusiform band; in strongly marked specimens this band is rather darker coloured than the rest. On the hinder half of the abdomen are several transverse dark lines; the first interrupted by the fusiform band, the rest at regular intervals towards the spinners. These lines and the fusiform band are obsolete in some specimens, and variously defined, from a mere spot or two to perfect lines in others. The under part and sides are spotted and streaked with dark brown, in various degrees of depth and distinctness in different specimens. The branchial opercula are reddish brown. The five depressed dots on the front half of the upper side of the abdomen, so characteristic of the genus *Thomisus*, are also plainly marked in this species.

The female is lighter coloured than the male, and almost entirely unicolorous; the characteristic markings generally visible in the male being in most females obsolete. The sexual organs, which

are fully developed at the end of May and beginning of June, are reddish brown.

I captured adult males of this species at the end of April, 1861, at the bases of large trees on the lawn of Bloxworth Rectory, Dorset. Its habitat appears to be in the crevices where the turf and the trunk of the tree meet, among bits of dead bark, leaves and grass. The male is rather more active than many species of Thomisi, but the female is very sluggish. I found in the same places females adult throughout the summer, and immature specimens of both sexes in November. This species is closely allied to *Thomisus trux*, but may readily be distinguished, not only by its colour and markings, but especially by the long, pointed, nearly straight, black spine issuing from the outer projection on the radial joint of the palpi.

Family DRASSIDÆ.
CLUBIONA ASSIMILATA.

Cephalothorax dull yellow, tinged in front with red, behind with green. Abdomen red-brown, thickly freckled with minute paler spots and thinly clothed with hoary hairs. A dark red-brown fusiform band, palest down the middle, reaches a third of the length from the cephalothorax; this band has two oblique, oval, yellowish red spots on each side, and is followed towards the spinners by some obscure, pale, transverse, curved lines. Eyes very nearly equal in size, and those of the front row equidistant from each other. Digital joint of palpi of moderate size. Palpal organs simple in structure, but well developed; they have a strong spine curving obliquely over them, from their base on the outer side over to the inner side, thence underneath and round their extremity, coming up and projecting on the outer side again. In contact with the point of this spine is some semi-transparent membrane.

Adult male. Length, 1-fifth of an inch. Length of cephalothorax, 1-tenth. Breadth, 1-twelfth. Relative length of legs, 4, 1, 2, 3.

Cephalothorax oval, slightly compressed laterally in front; frontal margin curved, and but very slightly depressed from the centre to the eyes; it has a narrow indentation in the medial line. Colour dull yellow, with a red tinge in front and a green tinge behind.

Eyes very nearly equal in size, placed on black spots in two transverse rows on the front of the cephalothorax. The front row is immediately above the frontal margin, and the eyes composing it are equidistant from each other, while in the hinder row the two central eyes are a little wider apart than the two end ones on either side. The central eyes of the front row are the darkest of the eight.

Legs furnished with hairs and brownish black sessile spines. The first and second pairs are of equal length, and their relative length is 4, 1, 2, 3. Their colour is dull yellow, and each tarsus ends with two curved pectinated claws, below which is a small scopula.

Palpi same colour as the legs. Radial joint rather shorter than the cubital, and has a dark brown crescent-shaped projection at its extremity on the outer side. The outer limb of the crescent is very much longer, stronger and darker than the inner one. Digital joint of moderate size, oval, rather broader at the end than near the radial joint. Palpal organs highly developed, but of simple structure. They have a strong corneous spine connected with them. This spine issues from the outer side near the radial joint, passes obliquely over to the inner side, and so underneath and round their extremity, coming up again on the outer side, and ending in a sharp prominent point, in contact with which is some semi-transparent membrane. The colour of these organs and the spine connected with them is dark red-brown.

Falces long, very prominent, subcylindrical, slightly hollowed on the inner side, especially towards the ends.

Labium oblong, slightly prominent at the top, where it is broader than at the bottom. This and the falces are of a dark brown colour, tinged with red, the top of the labium being slightly paler.

Maxillæ long, straight, convex at the base, enlarged and rounded at the ends, and of a reddish yellow colour.

Sternum oval, with eminences on the sides, opposite the legs. Colour dull yellow.

Abdomen oblong-oviform in shape, thinly clothed with hoary hairs. Colour red-brown, thickly freckled with minute spots of a paler hue. On the upper side a dark red-brown fusiform band, palest in the medial line, begins at the end near the cephalothorax, and runs about a third of the length towards the spinners. On each

side of this band are two oblique yellowish red oval spots, and between it and the spinners is a series of indistinct, slightly curved, transverse, yellowish red lines. The under part is paler than the upper, and has four or five longitudinal yellowish lines converging slightly towards the spinners, which project considerably and are yellow tinged with brown. Branchial opercula pale yellow.

This species was captured by myself at Southport, Lancashire, in 1859, but was mistaken for *Clubiona amarantha* until the examination of another specimen, captured by the Rev. T. W. Huthwaite at Coven, near Wolverhampton, in July, 1861, proved its distinctness from that species. Since writing the above I have received specimens of this species from Mr. Meade, of Bradford, who had also overlooked its distinctness from *C. amarantha*, for which it may easily be mistaken, unless the palpal organs are carefully examined, when the strong spine that envelopes the palpal organs will readily distinguish it. It differs also from *C. amarantha* in several other points.

CLUBIONA NEGLECTA.

Cephalothorax dull brownish yellow. Abdomen red-brown, thickly freckled with small yellowish spots, and thinly clothed with grayish hairs; a narrow, dark brown, fusiform band, divided longitudinally by a yellowish red line, runs about one-third of the length towards the spinners; near the point of this band, on either side, is an oblique line; between it and the spinners are two transverse angular ones and several short curved ones, all of an obscure yellowish colour. Radial joint of palpi has at its extremity on the outer side a dark brown crescent-shaped projection, of which the upper limb is the stoutest and darkest. Digital joint large, and of an obtuse oval shape, enlarged at the extremity. A long filiform spine springs from the inner side of the palpal organs, curves round their extremity on the edge of the digital joint, and, running down the edge on the outer side, curves back over the middle, ending in a fine prominent point towards the inner side.

Adult male. Length, 1-fifth of an inch. Length of cephalothorax, 1-tenth. Breadth, 1-sixteenth. Relative length of legs, 4, 2, 1, 3.

Cephalothorax of a longish oval shape, considerably depressed in front; frontal margin curved; a slight narrow indentation in the medial line. Colour dull brownish yellow.

Eyes in two transverse rows on the front of the cephalothorax, more unequal in size than in *C. assimilata*, the intermediate ones of the front row being the largest and darkest of the eight. All the eyes are on black spots.

Legs provided with hairs and dark brown sessile spines. Relative length, 4, 2, 1, 3. Each tarsus ends with two curved pectinated claws, below which is a small scopula. Colour similar to that of the cephalothorax.

Palpi similar to the legs in colour, except the digital joint, which is brownish. Radial rather shorter than the cubital joint, and has a dark brown crescent-shaped projection at its end on the outer side; the limbs of this projection are short, but the upper one is much the stoutest and darkest. Digital joint large, and of an obtuse-ended oval shape. Palpal organs highly developed, prominent, and moderately complex in structure; a long filiform spine is connected with them; it issues from the inner side, curves round their extremity on the edge of the digital joint, and, running down that edge on the outer side, curves back up the middle, ending in a fine projecting point, curved towards the most prominent part of the palpal organs. These organs are of a dark reddish brown colour.

Falces moderate in length, conical, and rather projecting. Colour dark red-brown.

Maxillæ straight, convex at the base, enlarged and rounded at the top.

Labium oval, notched at the top, which with the maxillæ are rather paler coloured than the falces.

Sternum oval, with eminences on the sides opposite to the legs. Colour dull brownish yellow, slightly darker on the margin.

Abdomen narrow, oval in shape. Colour red-brown, thickly freckled with small yellowish spots, somewhat regularly arranged, especially on the sides, and thinly clothed with grayish hairs. The upper side has a longitudinal, dark brown, narrow, fusiform band for about a third of its length, ending in a point; an obscure yellowish red line runs down the middle of this band, which has an oblique line near its point on each side, followed towards the spinners by two transverse angular lines and several short very slightly curved ones; all these lines are pale and obscure. The extremity of the abdomen close to the base of the spinners is encircled by a deep red-brown ring, outside of which is a broader one of pale yellow. The under side is slightly paler than the

upper, and has four fine pale-coloured longitudinal lines meeting at the spinners. Branchial opercula pale yellow.

This species was taken by myself at Bloxworth, Dorset, but was for some time confounded with *C. amarantha*, from which it differs in many minor points, but especially in the palpal organs and the long filiform spine connected with them. It is also very nearly allied to *C. assimilata* (last described), but the differences in the palpi will, on a close inspection, readily distinguish it, as will also several other minor differences, such as the top of the labium, the eyes and the length of the falces. But without a close comparison these two species, and several others nearly allied in size and general appearance, may easily be mistaken for each other, and it requires a very practised eye to distinguish them readily.

CLUBIONA DEINOGNATHA.

Cephalothorax very broad; almost without lateral compression forwards. Colour dull yellow, tinged with reddish brown towards the eyes. Central eyes of front row nearest together and slightly the largest; lateral eyes of hinder row slightly the smallest of the eight. Abdomen red-brown, with a broad, long, wedge-shaped band on the upper side. Palpi short, slight. Radial joint with a small crescent-shaped projection on outer side. Digital joint small, with a small slender black spine towards its extremity, issuing from its inner edge. Palpal organs simple, with a strong corneous red-brown curved spine issuing from their extremity on the inner side, curving slightly downwards and outwards, and so round just below the outer margin of the digital joint, ending near its base. Falces very powerful, long, prominent and arched, of a deep rich red-brown colour. Labium slightly notched at the top.

Adult male. Length, 1-fourth of an inch. Length of cephalothorax, 1-seventh. Breadth, 1-eighth. Relative length of legs, 4, 1, 2, 3.

Cephalothorax broad in proportion to its length, and with little or no compression on the sides forwards, and very slightly depressed from its highest point to the eyes. Frontal margin nearly straight. Colour dull yellow, with a red-brown tinge towards the eyes. A slight narrow indentation in the medial line.

Eyes nearly equal in size. The two middle ones of the front row are the closest together and rather the largest and darkest of the eight, while the end ones of the hinder row are slightly the

smallest, and are each rather nearer the centre one on its side than the centre ones are to each other.

Legs moderately long and stout, very sparingly furnished with hairs and a few black sessile spines. Each tarsus ends with two curved pectinated claws, below which is a small scopula. Colour pale dull yellow, with a small reddish mark or two at the joints.

Palpi short and slight. The cubital joint has a small red-brown projection at its end on the under side. Radial joint shorter than the cubital, and has a small crescent-shaped projection on the outer side, the upper limb of which is rather the smallest and shortest; this projection is edged and tipped with dark reddish brown. Digital joint small, oblong-oval, with a minute slender black spine towards its extremity, issuing among the hairs from its inner margin. Palpal organs neither complex nor highly developed; they have a corneous red-brown spine issuing from their extremity on the inner side, curving slightly downwards and outwards, and so round just below the outer margin of the digital joint, ending near its base. The colour of these organs is brown, tinged with red.

Falces very powerful, long, prominent and convex; when looked at in profile they describe an arc of a circle. They are slightly hollowed on the inner side toward the extremity, and are of a rich deep red-brown colour.

Maxillæ straight, enlarged and rounded at the extremity on the outer side, abruptly sloping on the inner side to the labium.

Labium broad, enlarged at the top, which is slightly hollowed or notched. This and the maxillæ are dark brown, paler at the top.

Sternum heart-shaped, with eminences on the sides opposite the legs. Colour dull yellow, with a fine broken edging of reddish.

Abdomen long, oviform, but rather shorter than the cephalothorax, of a red-brown colour, paler on the under side, and sparingly clothed with short pale yellowish hairs. It has on the upper side a large wedge-shaped band; at its commencement at the upper end nearly as wide as the abdomen. This band extends about two-thirds of the length towards the spinners, and its edges are boldly but irregularly dentated; it is most visible, like all the markings of most of the allied species, when in spirits of wine. The plates of the spiracles are pale dull yellow.

An adult male of this very distinct *Clubiona* was captured by myself

some time ago at Bloxworth, Dorset, but was mistaken for *C. holose-ricea*. Although in general colouring it resembles several of the allied species, yet the more massive cephalothorax and falces, with the comparatively short and feeble palpi, give it an appearance at once striking and distinctive.

CLUBIONA DIVERSA.

Cephalothorax pale dull straw-colour. Abdomen brightish yellow, mottled chiefly in the medial line and towards the spinners with brownish red, and with some obscure slightly curved transverse pale lines on the hinder part, and some oblique indistinct spots on the front part. Radial joint of palpi has a longish pointed projection on the outer side, of a dark reddish brown colour. Palpal organs prominent, but not complex. A strong sharply curved corneous spine issues from their extremity on the inner side, the fine point of which projects over the end on the outer side, and has a small semitransparent protuberance in contact with it. The eyes are almost of equal size and are all dark-coloured; those of the front row, with the lateral ones of the hinder row, form an exact arc of a circle and are equidistant from each other.

Adult male. Length, 1-ninth of an inch. Length of cephalothorax, 1-nineteenth. Breadth, 1-twentieth. Relative length of legs, 4, 2, 1, 3.

Cephalothorax very slightly compressed on the sides before, abruptly depressed behind; and from the summit depressed continuously in a curved line to the frontal margin, which is rounded. Colour pale dull straw.

Eyes very nearly equal in size, seated on black spots, and all dark-coloured. Six of them describe an exact arc of a circle, and are equidistant from each other.

Legs long, furnished with a few hairs and black sessile spines, and dull straw-coloured. Relative length, 4, 2, 1, 3.

Palpi same colour as the legs and cephalothorax, except the digital joint, which is dark brown. Cubital joint bent inwards, and has a minute red-brown projection at its extremity on the inner side. Radial joint has a longish pointed projection at the end, on the outer side, of a deep reddish brown colour. Palpal organs highly developed and prominent, but not very complex in structure. From their extremity on the inner side a strong corneous red-brown spine curves sharply round towards the outer side, and has its sharp prominent point in contact with a small semitransparent

protuberance. The surface of the basal half of the palpal organs is marked with a sinuous, dark, well-defined line.

Falces of moderate size, straight and hollowed out on the inner sides towards the ends. Colour dull yellow, slightly tinged with light reddish brown.

Maxillæ long, straight, much enlarged, and rounded at the top, same colour as the falces.

Labium broad, slightly enlarged and rounded at the top, slightly darker coloured than the maxillæ.

Sternum oval, and same colour as the cephalothorax.

Abdomen oviform, longer than the cephalothorax, of a brightish yellow, mottled on the upper side, chiefly in the medial line and towards the spinners, with bright brownish red. On the upper half are some indistinct pale oblique spots on either side of the medial line, followed by some obscure transverse slightly curved lines, of a pale yellow edged with reddish. Spinners not very prominent, and of a dull yellow colour.

I obtained the specimen above described from Mr. C. H. Brown, of Southport, Lancashire, by whom it was captured on the sand-hills near the town, in June, 1861. It is closely allied to *Clubiona trivialis*, Koch, for which I at first mistook it, but it may readily be distinguished by its smaller size, brighter colours, and the difference in the shape of the projection at the end of the radial joint. This projection in *C. trivialis* is spatular-shaped and concave inside, while in *C. diversa* it is pointed.

Family CINIFLONIDÆ.

ERGATIS ARBOREA.

Cephalothorax reddish brown, very elevated towards the front, where it is clothed with coarse white hairs. Four central eyes form a square. The side pairs placed obliquely on a small tubercle. Abdomen yellow-brown, with an oblong dark brown band on the upper side, succeeded towards the spinners by several transverse curved bars of the same colour; these bars are generally formed of two lines, with a short oblique line or spot at each end. Palpi short. Humeral joint gouty. Radial joint with a long dark-pointed, erect spur at its base, and an obtuse, rounded projection at its extremity. Falces of the male hollowed out on the inner surface, with a large prominence on their under side and a minute one at their base in front towards the outer side.

Adult male. Length, 1-tenth of an inch. Length of cephalothorax, 1-twentieth. Breadth, 1-twenty-fourth. Relative length of legs, 1, 2, 4, 3.

Cephalothorax very convex and elevated in front, slightly depressed from the highest point to the eyes, much depressed behind and also on the sides, where some furrows converge towards the middle. Colour dark brown, tinged with red, darkest behind the elevated part, which, with the frontal margin, is clothed with coarse white hairs.

Eyes nearly equal in size. The four middle ones form a square, and those of each side pair are placed obliquely on a small tubercle.

Legs moderately stout and furnished with hairs. Relative length, 1, 2, 4, 3. The fourth pair has a calamistrum (or combing apparatus) on the upper side of their metatarsi, a peculiarity on which Mr. Blackwall has founded the family Ciniflonidæ. Each tarsus ends with three claws; the two upper ones curved and pectinated and the lower one inflected near its base. The colour of the legs is a pale yellow-brown.

Palpi short and strong, of the same colour as the legs. Humeral joint gouty at the end on the outer side. Cubital joint strong, convex on its upper surface and strongly curved inwards. Radial joint longer than the cubital and has two projections, one (which is a leading characteristic of the species) in the form of a long stoutish, pointed spur, tipped with dark brown, springing at right angles from the upper side of its extremity; the other, an obtuse rounded one, is at the extremity on the outer side. The digital joint is dark brown, pointed at the end. Palpal organs highly developed, with a strong process curved from their extremity round the outer side, and ending in a kind of twisted or spiral point, which reaches to the articulation of the radial with the cubital joint.

Falces yellow-brown, long, with a large prominence on the under side and a minute one at their base in front towards the outer side; they are curved a little forwards at the ends and hollowed out about the middle of their inner surface, leaving the ends very prominent.

Maxillæ similar in colour to the falces, convex at the base, rounded at the ends, which are more abruptly curved on the inner than on the outer side. They are inclined towards the labium.

Labium yellow-brown, with the base dark brown. Its shape is triangular, rounded off at top.

Sternum heart-shaped, thinly clothed with coarse white hairs, and of a dark brown colour.

Abdomen oviform, yellowish brown, with a strong reddish tinge, clothed with short brown and hoary hairs. On the upper side a dark brown oblong band, sometimes slightly pointed at the end, occupies the upper end to rather more than a third of its length; between this band and the spinners are several dark transverse curved bars (in most specimens composed of two fine parallel lines), with an oblique spot or short line at the ends: these bars are more or less strongly marked in different specimens, in some being almost obsolete, in others parts only are visible. The sides of the abdomen are mottled more or less with dark brown. The under side is yellow-brown, with a broad brown band along the middle. Spinners eight in number.

The female is rather paler coloured than the male, but resembles it in markings. Its falces are wanting in the peculiarities described as characteristic of the male.

I discovered this spider in tolerable abundance on trees and bushes in a hedge on Hursley Down, near Winchester, in May, 1860, and since then at Bloxworth, Dorset, and Lyndhurst, Hampshire, in similar situations. Except from its smaller size it might easily be mistaken, on a casual glance, for its ally *Ergatis benigna*, but it may readily be distinguished, not only by size, but by the band on the upper side of the abdomen not being dentated on the edges, as in *Ergatis benigna*, by the bars that succeed the band being curved and not angular, and by the very peculiar spur at the base of the radial joint of the palpi. This spur, though found in *E. benigna*, is in that species quite rudimentary and very dark-coloured. Moreover, as far as my observations have gone, the habitat of *E. benigna* is on low plants and very dwarf bushes, while all I have yet found of *E. arborea* have been beaten from trees and high bushes.

Family THERIDIIDÆ.

THERIDION PROJECTUM.

Colour red-brown. Abdomen with a projecting ridge round the margin. Two central eyes of front row very minute. On each side of these is a group of three others almost contiguous, in the form of an equilateral triangle. The eyes of these two groups

are disproportionately large compared to the size of the spider, the two middle ones of the hinder row being the largest. Palpal organs prominent and complex, with a black filiform spine curved from the outer side round their base to the inner side.

Adult male, 1-sixteenth of an inch. Length of cephalothorax, 1-twenty-fourth. Breadth, 1-thirty-second. Relative length of legs, 1, 4, 2, 3.

Cephalothorax small, slight, compressed laterally, but elevated in front, and with a broad shallow indentation in the medial line.

Colour red-brown, which is also that of the whole spider.

Eyes very unequal in size, in two transverse curved rows, the two centre ones of the hinder row the largest, and the two centre ones of the front row the smallest and darkest of the eight. They form three groups. The two side groups consist each of three almost contiguous large eyes, in the shape of an equilateral triangle. Between these groups are the two centre eyes of the front row, which are very minute and almost contiguous. The extreme dissimilarity in size between these two eyes and the rest, and their position, is a striking characteristic of the species, and would almost warrant its separation from the genus *Theridion*.

Legs robust and provided with hairs. Their relative length is 1, 4, 2, 3. The tarsi end with three claws.

Palpi. Radial joint stronger than the cubital, and slightly produced at the extremity on the outer side. Digital joint roundish oval and hairy outside. Palpal organs highly developed and complex in structure, with a black filiform spine curved from their outer side round the base to the inner side.

Falces small, conical and vertical.

Maxillæ obliquely truncated at the ends on the outer sides, and much inclined towards the labium, which is semicircular.

Sternum broad, flat and heart-shaped.

Abdomen considerably elevated towards, and projecting slightly over, the base of the cephalothorax. The upper side is, however, flattish. It is broader behind than in front, and is thinly clothed with hairs. The upper half, from a little below the highest point to the spinners, appears, when looked at from below or in profile, like a shield or case laid over the abdomen, with the edge projecting all round, like the eaves of a house. This is a remarkable feature in the spider, and will probably prove very characteristic of the adult male. The colour of the abdomen is slightly darker than the rest of the spider, the upper part being the

darkest. This part, when in spirits of wine, seems to be mottled with paler depressed spots, arranged with some regularity in transverse rows. The female differs from the male only in wanting the projecting edge round the abdomen.

I found an adult male of this very minute but most remarkable Theridion at the roots of heath, at Bloxworth, Dorset, in April, 1861, and shortly after, an adult and three immature females in a similar position on another part of the heath. By the position of the eyes this species seems to be allied to the genus *Pholcus*, though in general form and appearance it is much more like the true *Theridia*.

Family LINYPHIIDÆ.

NERIENE CORTICEA.

Cephalothorax blackish brown, with an olive-green tinge; it has a deepish transverse dip or depression about the centre. Abdomen black. Legs and palpi yellowish brown. Eyes of the hind row equal in size and equidistant from each other; end ones of front row largest, and centre ones smallest, of the eight. Radial joint of palpi has a tuft of strong bristly black hairs on its upper side, which is rather protuberant; at its extremity in front is a strong projection or elongation projecting obliquely outwards over the base of the digital joint, and ending in the form of a crescent, of which the limb nearest the tuft of hairs is the shortest and smallest.

Adult male. Length, 1-sixteenth of an inch. Length of cephalothorax, 1-thirty-fifth. Breadth, 1-fortieth. Relative length of legs, 4, 1, 2, 3.

Cephalothorax of a blackish brown colour, tinged with olive-green; margin edged with black; the hinder part slopes very abruptly in a hollowish line, and about halfway between the top of the slope and the eyes is a strong transverse dip or depression, and an indentation in the medial line of the hinder part; a single row of a few long bristly hairs, directed forwards, occupies the medial line, and there are some shorter ones in the region of the eyes.

Eyes, on black spots, in two rows curved away from each other, on the front of the cephalothorax; the front row is the most curved, and rather the shortest; the eyes of the hinder row are of the same size, and at equal distances from each other; the central ones of the front row are the smallest, and the end ones

the largest of the eight, and each of these last is further from the central one on its side than the central ones are from each other. The side pairs of eyes are seated on a tubercle, but not placed very obliquely.

Legs moderate in length, clothed with hairs, and of a pale yellowish brown colour; the margins of the joints slightly edged with dark brown, and occasionally there is a tinge of red, especially on the tarsal and metatarsal joints. Relative length, 4, 1, 2, 3.

Palpi shortish; same colour as the legs, except the radial joint, which has a bright reddish tinge, especially at its extremity. The cubital and radial joints are both short, the latter is the shortest, and is slightly prominent on the inner side underneath; it is rather protuberant on the upper side, with a tuft or fringe of straight bristly black hairs directed outwards, and has at its extremity in front a strong elongation projecting outwards over the base of the digital joint, and ending in the shape of a crescent, the upper limb of which is the longer and stronger; this limb is of a curved scimitar form, and both are of a deep red-brown colour. The palpal organs are highly developed, prominent and complicated in structure; they have a large semitransparent membranous process at their extremity, near which, on the outer side, a long black spine curves round backwards in a double coil.

Falces small, very slightly divergent at the extremities, a little inclined towards the sternum, and rather darker coloured than the cephalothorax.

Maxillæ considerably enlarged at the base, obliquely truncated on the outer sides, slightly rounded at the extremity, and strongly inclined towards the labium. They are lighter coloured than the falces.

Sternum broad, convex and heart-shaped, and with the labium, which is semicircular, of a brownish black colour.

Abdomen black, very sparingly clothed with short hairs; it has four small depressed dots, nearly in the form of a square, on the upper side towards the cephalothorax, over which the abdomen projects considerably.

The adult female resembles the male, but is rather larger, and the transverse dip on the cephalothorax is not so strong.

Adults of both sexes of this spider were captured by myself in the spring and autumn of 1861, among lichens and in crevices of the

bark of ash and apple trees, in the gardens at Bloxworth Rectory, Dorset. In the tuft of bristly hairs on the radial joint of the palpi it resembles *N. bicolor*, but differs from it in almost every other specific character, besides being greatly inferior in size.

NERIENE ELEVATA.

Colour yellowish brown, darkest and with a red tinge on the cephalothorax, which is elevated towards the front, rising abruptly behind the eyes, and with a deepish indentation on each side forwards, just below the elevation; radial joint of palpi short, strong, protuberant on the upper side, the protuberance squarish in profile, with a slightly curved black spine from its front corner, projecting obliquely towards the outer side, and with a stout blunt projection at the extremity of the joint underneath; this projection forms with the spine a kind of crescent.

Adult male. Length, 1-fifteenth of an inch. Length of cephalothorax, 1-twenty-fifth. Breadth, 1-thirtieth. Relative length of legs, 4, 1, 2, 3.

Cephalothorax dark yellow-brown, with a red tinge; immediately behind the eyes a moderately high elevation rises rather abruptly, and slopes away towards the abdomen; on each side of the elevation, towards the eyes, is a sharp vertical indentation.

Eyes in two transverse rows curved away from each other; the hinder row is the longest and most curved. The eyes of the front row are at about equal distances from each other; the two middle ones of the hinder row are the widest apart, the two outer ones of the front row the largest, and the two outer ones of the hinder row the smallest of the eight; those of each of the side pairs touch each other, and are placed obliquely.

Falces moderately long and strong, vertical and very slightly divergent at the extremity. Their colour is like that of the cephalothorax.

Legs moderately long and robust, sparingly clothed with hairs, and of a pale yellow-brown colour; each tarsus ends with three curved claws. Relative length, 4, 1, 2, 3.

Palpi moderately long; like the legs in colour. Humeral joint long and rather curved inwards towards the falces. Cubital joint longer than the radial and slightly clavate. Radial joint strong, and protuberant on the upper side; the protuberance is squarish in profile; its hinder corner is red-brown and pointed, though

sometimes the point is blunted off; the foremost corner ends with a black slightly curved spine, which projects obliquely towards the outer side; underneath the point of this spine, at the extremity of the outer side of the radial joint, is a stoutish blunt projection (which, with the spine, forms a kind of crescent), and on the inner side there is a slight dark-pointed one. The digital joint is oval, of moderate size, and slightly darker than the rest of the palpus. Palpal organs highly developed, prominent, and not very complicated in structure; at their extremity, just underneath the end of the digital joint, one of their processes ends with a small dark brown spiny curved rim with two prominent points.

Maxillæ slightly enlarged at the extremity on the inner side, obliquely truncated on the outer side, and strongly inclined towards the labium.

Labium short and semicircular.

Sternum broad, convex and heart-shaped.

Abdomen oviform, projecting considerably over the base of the cephalothorax. Its colour is yellow-brown, and it is sparingly clothed with yellowish hairs. On the upper side towards the spinners are several obtusely angular, pale, transverse lines. The female is larger than the male, and wants the elevation on the cephalothorax, but resembles it in other respects.

I discovered adult males and females of this species under dry seaweed on the shore at Southport, Lancashire; and at the roots of dwarf willows on the sand-hills at the same place, in the summer of 1859. Mr. Blackwall tells me that he received a male of this species from Scotland some years ago, but that the specimen was accidentally lost before he could make a description of it; and that Mr. Meade captured an adult male of it in Ireland, in June, 1861. I have since writing the above examined Mr. Meade's specimen, which is certainly of this species, but is a much darker-coloured spider, the cephalothorax being dark reddish yellow-brown, and the abdomen nearly black: it was captured in the county of Kerry.

WALCKENAERA BOREALIS.

Cephalothorax shining brownish black. Frontal elevation large, obtuse and sloping towards the frontal margin; central eyes of the front row largest of the eight, and not touching each other. Abdomen dark brown-black. Legs and palpi yellowish red, the

latter lightest in colour ; cubital joint short and comparatively slight ; radial joint strong and elongated in front, curving outwards more than half over the digital joint, and with a strong process issuing from within the curvature towards the outer side. The palpal organs have a curved black spine towards their extremity.

Adult male. Length, 1-twelfth of an inch. Length of the cephalothorax, 1-twenty-fourth. Breadth, 1-thirtieth. Relative length of legs, 4, 1, 2, 3.

Cephalothorax shining brownish black, with a slight indentation in the medial line ; it has a large obtuse elevation on the front part, with a strong indentation behind each lateral pair of eyes, and some fine short hairs in front ; the fore part of the elevation slopes off from the summit to the centre eyes of the lower row.

Eyes nearly equal in size ; in two transverse rows on the fore part of the frontal elevation ; the upper row is very much curved away from the lower row, which is nearly straight ; they form four pairs—one pair wide apart on the upper ridge of the elevation ; a pair below, but considerably above the frontal margin, closer together and rather larger than those above them ; and a pair on each side, placed obliquely on a small tubercle and nearly contiguous.

Legs moderately long and furnished with hairs. Colour yellowish red. Relative length, 4, 1, 2, 3. Each tarsus ends with three claws.

Palpi less red in colour than the legs. Digital joint tinged with brown. Radial joint larger than the cubital, and its extremity is much lengthened, hairy, and curved outwards in front of the digital joint over more than half its length, and, curving back again, ends in a dark-coloured bluntish point near its outer edge ; a conspicuous prominent process issues from within the first curvature, projecting towards the outer side of the digital joint. This joint is oval and hairy ; the palpal organs are highly developed, prominent, not very complex in structure ; they have a curved black spine at their extremity, and are of a red-brown colour.

Falces small, conical and inclined towards the sternum.

Maxillæ short and inclined towards the labium.

Labium semicircular and prominent at the top, and with the maxillæ and falces of a brownish colour.

Sternum broad, convex and heart-shaped. Colour brownish black.

Abdomen oviform, glossy, sparingly clothed with short hairs.
Colour deep brownish black.

Two adult males of this species were captured by myself under loose stones on a wall close to the Pentland Hills, Scotland, in June, 1861.

O. PICKARD-CAMBRIDGE.

Bloxworth, Dorset,
February 15, 1862.

Lepidoptera of Rarer Kinds taken at Martinhoe, North Devon.—During a fortnight's visit, commencing July 21, 1861, I captured the following:—*Toxocampa Pastinum*, *Cidaria picata*, *Boarmia repandaria* (black-banded var.), *B. rhomboidaria* (small dark var. taken on sea cliff), *Eupithecia debiliata* (eight, rather worn), *Hypenodes costæstrigalis* (two very good, but remarkably plain-coloured), *Endotricha flammealis*, *Botys terrealis*, *Tortrix Corylana* (two of the "distinct var." mentioned in Wilkinson's 'Tortrices, without fasciæ; one of the specimens has the upper wings pale yellow, without reticulations, the hind margin of a rich orange-brown; the other has only a few reticulations towards the hind margin: they were both taken near the same spot). *Olindia Ulmana*, *Ditula semifasciana*, *Argyresthia Andereggiella*, *Pterophorus osteodactylus* (common, but local).—*E. Horton; Lower Wick, Worcester, January 14, 1862.*

Observations on several Lepidoptera.—I send for insertion in the 'Zoologist' a few of my entomological notes, made during the past year.

1. *Eupithecia debiliata*. I was rather too late for this insect, and my efforts to obtain eggs from the worn females were unsuccessful; but I am quite convinced that there is no necessary connexion between it and holly, as no holly grows anywhere near my locality, while I am strongly inclined to believe that *Vaccinium Myrtillus*, which is plentiful there, is the proper food of the larva, as the Rev. H. H. Crewe's correspondent in the last 'Annual' correctly supposes.

2. *Eupithecia assimilata*. The double-broodedness of this "pug" I have known for some time to be a fact. Last year I took a fresh specimen on the 23rd of April, which was unusually early: I generally take and breed this brood about the second week in May; the second brood I begin to take the first week in August, in fine condition.

3. *Ditula semifasciana*. Bred from a pupa between willow leaves, July 15, 1861; the pupa was brought from South Wales. I have never met with it common, but it seems to be widely distributed, as I have single specimens taken in South Wales, North Devon and Worcestershire.

4. *Scotosia undulata*. Larva taken on willow, October 1, 1860; spun up between leaves, October 17; came out June 15, 1861. Shortish and thick; above light glaucous; dorsal vessel darker, edged with whitish; subdorsal line rather wide, drab; spiracular line whitish; spiracles in black rings. Head light brown; second segment with brown blotches on subdorsal line.

5. *Are Pupæ killed by Floods?* In searching some poplars near the Severn, the other day, I found several living pupæ under the loose bark a yard from the ground,

and many more pupa-cases whence the perfect insects had escaped without let or hindrance; but, lower down, though I now and then found a living pupa (there having been no flood in the Severn during the past year, at least during the larva season); empty pupa-cases were rare, and mouldy pupæ common—the result, I conclude, of former floods. I searched the soil at the roots in vain. With this question one naturally connects that of the damping or not of pupæ which we keep in our boxes or flower-pots. The Rev. J. Greene seems to leave it open, and experience rather tends to make one cautious of applying damp. Larvæ seem to resort to the roots of trees as sheltered places to form their pupæ, and usually select the driest nooks the tree affords. This seems to indicate that we should keep them from the wet as well as from the sun; and I am disposed to think that if you keep your pupæ out of doors the moisture of the atmosphere is almost sufficient for them.

6. *Is the growth of the Wings of Insects fresh from the Pupa affected by the Temperature?*—On the first day of this year a male *Phigalia pilosaria* issued from the pupa, and I was rather surprised to see it, as the morning was rather frosty; the wings had not begun to grow, but were otherwise perfect. The next morning I looked into the pot again; the moth was still there by itself, and its wings in the same state. I gave up all hope of a perfect specimen, but left it for the chance of breeding. The next day, January 3, I went again to the pot, and its wings were fully grown, but not quite stiff, which, however, they became in due course of the afternoon: now the 3rd of January was about five degrees warmer than the two preceding days, and I am inclined to attribute the non-development of the wings for two whole days to the want of sufficient vital heat for that purpose. I should be glad to know whether similar observations have been made by others.—*E. Horton; Lower Wick, Worcester, January 14, 1862.*

Pupæ destroyed by a Caterpillar.—At this period of the year I usually examine the different boxes which contain my pupæ. I have been doing so during the past few days, and great has been my dismay at the result. I find that they have been supplying a luxurious winter repast to an odious caterpillar, of which the following is a description:—Length about half an inch; semi-transparent. The interior, which is blackish, can easily be seen. The ground colour is grayish white, and when the reptile is crawling the segments appear white. Head brown, and on the next segment is a black patch. The sides are graced with a row of bristly hairs. If any one recognises the beast from the above description, and will, either through the pages of the 'Zoologist' or by private communication, tell me what it is, I shall feel obliged. I trace the evil to my having used moss (taken off walls) for the purpose of covering the pupæ. The caterpillar forms a kind of tough leathery cocoon, in which, apparently, it moves about. At any rate it attaches itself, with its cocoon, to the unfortunate pupa. To give some idea of the havoc caused by it among my pupæ, I append the names of some which, either in whole or part, have been destroyed by it, *viz.* *Cymatophora ocularis*, *Clostera reclusa*, *Corycia taminata*, *Eupithecia pimpinellata*, *E. expallidata*, *E. innotata*, *E. helveticaria*, *E. tripunctata*, *Ephyra orbicularia*, *E. Omicronaria*, &c., &c.—*Joseph Greene; Cubley Rectory, Doveridge, Derbyshire, February 20, 1862.*

Periodical of the nature of the late 'Intelligencer' wanted.—I take this opportunity, on my own part, of expressing a wish (shared, I believe, by many others) that some enterprising entomologist would undertake the editing of a weekly periodical of the nature of the late 'Intelligencer.' Only do not let it be a medium for either editor

or correspondents to indulge in coarse vulgarisms and personalities. It is to this cause, and to this cause alone, that we are to attribute the gradual decay and final extinction of the 'Intelligencer.' That such a periodical, conducted in a gentleman-like and impartial spirit, would be well supported I entertain no doubt whatever.—*Joseph Greene.*

Argynnis Lathonia in Suffolk.—The account in the 'Zoologist' (Zool. 7913) of the capture of *Argynnis Lathonia*, by Captain Russell, in a meadow-field near Lavenham, Suffolk, confirms my opinion that *A. Lathonia* has claims to be considered a truly indigenous species. It was said in a former paper on the subject that there ought to be localities where it could be collected annually: now if such localities do not exist, there are those in which it is often to be met with; one, for instance, is the Devil's Ditch, near Newmarket, where, during my residence at Burwell, from the year 1848 to 1854, I saw three specimens which were taken there, and heard of others, and on my first going to Sudbury I called on a Mr. Barwick, a bird-stuffer (who endeavoured, but without much success, to collect insects for sale), and requested him to point out to me the most favourable localities of the neighbourhood, when he mentioned Assington Thickets as the one he had been the most successful in, gave me the names of many good and local species which he had found there, and stated that on one of his visits he found a caterpillar suspended by the tail from a branch of hazel, which he left undisturbed till his next visit, when it was changed into a chrysalis; this he took home, and in a short time it produced a fine specimen of *A. Lathonia*: his son, who generally accompanied him in his excursions, visited the Thickets next day, and captured two more specimens of *A. Lathonia* on the wing; the three specimens he sold to Mansfield, a travelling dealer in insects, for five shillings, and although I did not see the specimens I am inclined to think the account correct, because I found all his other statements of the productions of that locality correct, and also because he immediately pointed out the insect on my showing him my cabinet, the specimen in which was taken by me about six miles from the Thickets and two and a half from Lavenham, as recorded in the 'Zoologist' (Zool. 30). I have little doubt that I saw two more on the wing the following year, one in a meadow near Lavenham Church, and the other in a pasture on the Monk's Eleigh road. Assington Thickets being surrounded by high wood (not "high road," as misprinted in the 'Zoologist,' p. 401), is a very unlikely place for specimens from the Continent to be blown into.—*William Gaze; Great Thurlow, near Newmarket, Suffolk, March 3, 1862.*

Occurrence of Chærocampa Celerio at Upper Tooting.—On Saturday last was captured a very good specimen of *Chærocampa Celerio*, at Upper Tooting, and kindly sent alive to me. Is this not a very unusual time for its appearance? It is not very lively, but I should think that might be owing to the cold weather.—*William Rogers; Grove Cottage, Merton Road, Lower Tooting, S., March 19, 1862.*

Food-plants of Eupithecia pumilata and Boarmia repandata.—Mr. Stowell, in his interesting paper on "The Entomology of the Isle of Man" (Zool. 7898), remarks that though *Eupithecia pumilata* is rather common in the imago state, he cannot find the larva, and does not know the food-plant. It has never been my good fortune to meet with this larva in the wild state, though I have reared a good many from the egg. My friends and correspondents Messrs. Hellins, D'Orville, Greene and Buckler, have taken it upon the following plants:—*Spartium scoparium*, *Eupatorium cannabinum*, *Senecio Jacobæa*, *Potentilla reptans*, *Clematis vitalba* (growing wild), *Clematis*

odorata, *Solidago canadensis*, *Scabiosa atropurpurea* (in gardens). It varies in colour according to the flower it feeds on, being whitish and greenish on *Clematis*, yellow on *Senecio* and *Potentilla*, pink on *Eupatorium*, and deep purplish red on *Scabiosa*. I believe it is polyphagous. When reared from the egg in confinement it will eat almost any flower that is given it. It has a way of most effectually concealing itself in the petals of the flower upon which it is feeding. I have seen one work itself quite down into the calyx of a flower of *Centaurea nigra* or *Apargia hispida*. Mr. Stainton is certainly right in saying that the larva of *Boarmia repandata* feeds upon trees, or rather underwood. Some few years since my friend Mr. Hawker and myself bred several dozen most beautifully marked specimens from larvæ taken by lanthorn-light in the Forest of Brill, Hampshire. The underwood upon which they were feeding was two-years growth, and consisted of blackthorn, whitethorn, crab, aspen, cherry, birch, hornbeam, hazel, willow and ash. They preferred the three first-named bushes, and were by no means uncommon upon birch.—*H. Harpur Crewe; The Rectory, Drayton-Beauchamp, Tring, March 4, 1862.*

Description of the Larva of Scotosia vetulata.—Short and stout; in form much resembling *Cheimatobia brumata*. Back and central dorsal line black, the latter bordered with white. Sides yellow. Spiracular line black, broken and unconnected. Spiracles black. Head black; collar yellow, with a transverse blackish dotted line. Feeds between spun-up leaves of *Rhamnus catharticus*. Eats the outer cuticle of the leaf, leaving the membrane bare. Full fed the first week in June. Pupa inclosed in an earthen cocoon, long and slender. Abdomen tapering, bright red. Abdominal divisions dark red. Wing-cases paler and more transparent. The perfect insect appears in about three weeks.—*Id.*

Description of the Larva of Scotosia dubitata.—Ground colour pale yellowish green. Central dorsal lines, two in number, whitish yellow. Subdorsal lines, two in number, whitish yellow. Spiracular line bright yellow and orange. Back and sides occasionally studded with a few black tubercles, and always with a few short whitish hairs. Belly destitute of markings. Feeds on *Rhamnus catharticus*. Full fed the middle of June. Pupa dark reddish brown, inclosed in an earthen cocoon. Perfect insect appears in about a month.—*Id.*

Description of the Larva of Scotosia rhamnata.—Ground colour vivid green. Central dorsal line dark green; circulation very apparent underneath. Subdorsal lines very slender and indistinct, yellowish. Segmental divisions deep yellow. Spiracular line pale yellow. Subspiracular line pale yellow, slender. On each side of the three posterior segments below the spiracles a broad purple stripe. Anal plate, tip and prolegs deep purple. Belly traversed longitudinally by three whitish lines, the central one broader than the others, and bordered with small yellowish spots. Feeds on *Rhamnus catharticus*. Full fed first week in June. Pupa dark reddish brown, inclosed in an earthen cocoon. Perfect insect appears in from three weeks to a month.—*Id.*

Acronyeta Alni bred in February.—On the 22nd of last month a male specimen of this insect was produced from the larva I obtained last August, a description of which was given in the 'Zoologist' (*Zool.* 7717). The pupa was kept during the winter in a recess near the fire-place of a warm room, which accounts for the appearance of the perfect insect at a period so unusually early.—*S. Stone; Brixthampton, March 17, 1862.*

Economy of Volucella Larvæ.—I have a number of larvæ of one or more species of

Volucella, which were obtained last summer from wasps' nests. They have been hibernating throughout the winter, and are now just beginning to assume the pupa state. The change is taking place inside the larva-skin, the only external evidence of the change being a decrease in the length and an increase in girth, with a slight hardening of the larva-skin: and, moreover, one larva from the above number, which was separated from the rest and kept during winter in a very cold situation, is also, I perceive, undergoing its change into a pupa. The larvæ have been identified as those of Volucella by Professor Westwood, by whom a specimen was exhibited at the October meeting of the Entomological Society. They have been kept through the winter in the same recess as the pupa of Acronycta Alni, but the temperature does not appear to have had much effect upon them, for, if I am not mistaken, I have seen a species of Volucella upon wing in March.—S. Stone.

“Bees and the Art of Queen making” (Zool. 7907).—I was pleased to see that my friend Mr. Woodbury had answered Dr. Leitch's new theory of excess of temperature having an effect on the royal cells in hives, and agree most thoroughly with what that accomplished apiarian advances. It is quite true that it is too much the fashion to find fault with the great Huber's well-authenticated observations on the subject. What could induce Dr. Leitch to suppose that in the upper edges of the combs in a hive the temperature was higher than in the centre, I cannot conceive. In numerous observations in my unicomb hives, a few years ago, the queen was less frequently near the edges of the comb than in any other place, generally traversing near the centre, and laying her eggs there first, and, when one side was finished, passing through an aperture made by the bees to save time to go from one side to the other: this aperture, all observers know, is situated near the centre towards the top of the comb, and is another instance of the wonderful and Divine guidance of the bees in economizing time and distance. In these observations I do not allude to the time of swarming, as in that case there is an increased heat, from the number of bees collected. Although M. Huber is right in all his great discoveries, yet he is now and then careless (*“Aliquando dormitat bonus Homerus”*): where he should say, “With now and then an exception,” in his zeal he says, “After the old queen has conducted the first swarm from the hive the remaining bees take particular care of the royal cells, and prevent the young queens successively hatched from leaving them, unless at an interval of several days between each.” In ninety-nine cases in a hundred this is the fact; but even to this there is sometimes an exception. In the year 1836 I had a second swarm about to go off from one of my hives, and as they came out more slowly than usual I went within half a yard of the hive, and observed no less than three queens at one moment on the alighting-board. The swarm went off and divided, and settled on three different bushes and trees; the whole were united and did not form a quantity of more than a quarter of a peck: they were very unsettled all the day of swarming after being hived, but next morning I found two dead queens under the hive: the hive worked well afterwards. It is right to mention that the weather had been very showery and unsettled: it must also be mentioned that the last batch of young bees which left the hive were scarcely able to fly with their juvenile queen; they were of a different colour, nearly a leaden colour, and upwards of two hundred of those which issued from the hive fell within three or four yards, unable to fly; they appeared to me to have been hatched not more than an hour previously. I picked nearly the whole of these bees up, and they entered the new hive with the rest, by creeping up the sides. It seems that for a few hours a plurality of queens will sometimes be allowed.

I observed that bees never carry a dead queen any distance from the hive, as they do a worker, but allow her to drop near the entrance,—the size may be partly the cause,—yet we constantly see them carry out dead drones, but seldom at the general slaughter; these are generally left close to the hive. In the case mentioned there is no doubt that these queens, had the weather been dry and sunny, instead of wet and unsettled, would have issued at an interval of, most likely, three days between, at least, as to two of their numbers. The great discovery of the manner of the impregnation of the queen bee, the peculiarity also, at certain times, of her laying only the eggs of drones, and other circumstances enumerated by Huber, will hand down that great and unassuming naturalist's name to the latest posterity.—*H. W. Newman; Hillside, Cheltenham, March 13, 1862.*

Note on Anomalon Vesparum.—It is somewhat singular that of two nests of *Vespa vulgaris* I had at work during the summer of 1859 in a window of the house I have used as a vespiary for some years, one should have produced vast numbers of a coleopterous parasite,—*Ripiphorus paradoxus* (see Zool. 6906),—while the other was full of an hymenopterous one, for the name of which (*Anomalon Vesparum*) I am indebted to Professor Westwood. But the most remarkable thing is that, although a few of the latter have from time to time made their appearance in the winged state, the combs still contain immense numbers that have not yet showed themselves openly. On opening several of the cocoons, a few days ago, I found that each contained a living example of the insect perfectly formed, and who, the moment the top of the cocoon was removed, marched out, stretched its legs, passed its fore feet rapidly over its head and antennæ, for the purpose apparently of removing any superfluous moisture, cleaned its abdomen and smoothed out its wings by means of its hinder feet, and was then prepared for immediate flight. Now the question (and I take it to be a curious physiological one) is, How long had it been lying in that perfectly-formed state, and how much longer would it have remained cooped up and still retain its vitality, had it not been released from its prison by artificial means? On opening the cocoons a strong smell of something akin to formic acid was emitted. Each cocoon had a beautifully delicate gold-coloured lining, in which the insect was enwrapped.—*S. Stone; March 15, 1862.*

Musical powers of Agabus bipunctatus.—We have heard of singing fish and singing beetles in the Tropics and at the Antipodes, but I have never heard of any of the latter at home, except those mentioned by Mr. Westwood, in his 'Introduction, or Modern Classification,' vol. i. p. 103, where he speaks of *Pælobius Hermanni*, which makes a noise when held in the fingers. Mr. Westwood also quotes Frisch, who says that *Acilius sulcatus* makes a noise under water; and Kirby, vol. ii. p. 393, says, "Concerning their shouts of joy and cries of sorrow I have little to record; that pleasure or pain makes a difference in the tones of vocal insects is not improbable; but our auditory organs are not fine enough to catch all their different modulations." Having had in an aquarium in my sitting-room, for a long time, two specimens of *Agabus bipunctatus*, these two beetles puzzled me for a long time, or rather, I should say, a voice proceeding from the aquarium, very much like the faint gryllous noise of a grasshopper; it begins very faint and gradually increases in intensity until it reaches that of a grasshopper. This noise is only made in the night, and is probably the sexual call, as they appear to answer each other from either end of the aquarium. I have frequently taken the light and looked into the water to see where they were; sometimes I have seen them at the bottom (about a foot deep) and sometimes at the

top, and they make equally as much noise under water as when at the top; but I have never been able to discover the *modus operandi*. They always appear perfectly still when making this singing noise: several of my entomological friends have heard it, but have never before heard anything like it proceeding from beetle-musicians. The singing talent was discovered in this way: a friend of mine was sitting writing at a table close by the aquarium, the other evening, when the scratching of the quill pen upon the paper somewhat imitated the noise or singing of the beetles, who must have heard this, for they distinctly answered the noise made by the pen. After we had discovered the beetles had an ear for music we repeated the scratching, so as to imitate them as nearly as possible, and they as distinctly answered after each scratching. I am persuaded that the noise or singing is oral and not made by the rubbing of one part against another, as some of the Longicornes do when handled or held in the hand. Again, the answering the scratching imitation, I think, settles the question as to the singing noise being a sexual one, being produced by both sexes, and as one of mine appears to sing more than the other, this is most likely the male; but of this I am not certain, as I have not captured him when singing, but this I am certain of, that it is male and female I have in the tank.—*Edward Parfit; Devon and Exeter Institution, March 5, 1862.*

[My correspondent has overlooked the interesting paper by Mr. Smith on the musical powers of the British species of Acalles (Zool. 7218): the genera *Aromia*, *Necrophorus* and *Cychrus* are the most celebrated among the beetle-musicians of Britain.—*E. N.*]

Capture of Scydmanus Godarti and other Coleoptera new to the British Fauna.—

A short time ago M. Aubé examined a great number of our unknown Coleoptera, and through his kindness I am enabled to add the following names to the list of our indigenous species, viz.:—*Scydmanus Godarti*, *Latreille*; *S. pumilio*, *Schaum*; *Trichopteryx attenuata*, *Gillm.*; *T. Guerinii*, *Fairmaire*.

Scydmanus Godarti is the largest of the British *Scydmani*, being nearly equal in size to *E. tarsatus*; it also resembles that species in colour, but may be distinguished from it by the shape of the head and thorax, and by the pointed elytra.

Scydmanus pumilio is allied to *S. Sparshallii*, but differs from that species in its darker colour, wider form and more obtusely pointed elytra.

Trichopteryx attenuata may be known from the other species of the same genus by the transverse foveæ at the posterior angles of the thorax, and also by having the elytra much attenuated towards the apex, and by the colour of the antennæ, which are almost entirely black.

Trichopteryx Guerinii is intermediate in size between *T. sericans* and *T. pygmæa*; it is much depressed in shape, and the elytra are usually more or less red; in some specimens they are wholly of that colour.

Of the above the three last were taken at different periods during the last two or three years, by myself, near this place; I have also received *T. Guerinii* from Dr. Power. Of *S. Godarti* I captured several specimens, last July, from Sherwood Forest.

To these I must add—not, however, on the authority of M. Aubé—*Cephennium intermedium*, *Aubé*, and *Ptenidium Formicetorum*, *Kraatz*.

Cephennium intermedium may be known from *C. thoracicum* by its dark colour, smaller thorax, more elongate shape and rather longer antennæ.

I found a single specimen of this insect, among moss, near Silchester, in Hampshire, in July, 1869.

Plenidium Formicetorum is allied to *P. apicale*, but is smaller and narrower than that species, with the thorax less convex and the elytra more pointed at the apex; the elytra are also entirely of a bright rufo-piceous colour.

It is highly probable that this species exists in many collections, confounded, as it was until very lately in my own cabinet, with *P. apicale*.

This part of the kingdom seems to be unusually productive of Scydmanæ; during the last few years we have taken the following rare species, besides the two already mentioned, viz.:—*S. pusillus*, *S. exilis*, *S. angulatus*, *S. elongatulus*, *S. Sparshallii* and *S. nanus*.—*A. Matthews*; *Gumley, Market Harborough, March 20, 1862.*

Dragonflies captured at Sea.—When my brother-in-law, Captain J. C. Tyrwhitt-Drake, 1st Battalion 2nd Queen's Royals, was returning from China with his regiment, in the transport "Alfred," on the 22nd of January, 1861, great numbers of dragonflies came on board about 6 A.M., and remained flying about the vessel until about 8.30 P.M., when they disappeared. The vessel was then in lat. 23° 38' South, long. 77° 3' East, wind fresh from North-West; Rodriguesbore N.W. 600 miles. I have shown the specimens captured by my brother-in-law to Mr. R. M'Lachlan, who believes them to be *Libellula mauriciana* of Rambur, a species which inhabits the Mauritius.—*W. S. M. D'Urban*; *Newport, near Exeter, February 3, 1862.*

Note on the Habits of Phryganidæ.—In a paper by Herr Nietner on "The Natural History of the Enemies of the Coffee Tree," published in the 'Edinburgh New Philosophical Journal' for January, 1862, that gentleman adds some supplementary notes on insects, which, though not actually injurious, frequent the trees when covered with that peculiar insect-secretion called "honey dew," and mentions that, among others, several species of Phryganidæ are attracted thereby, especially *Chimarra auriceps*, *Hagen*. He also takes occasion to remark that this is opposed to the once-received opinion that these insects take no nutriment in the perfect state. I fancy that this latter idea has been successfully exploded since it became fashionable to "sugar" for Noctuæ. Every lepidopterist is aware that on certain nights many species of caddisflies will frequent the sugared trees, especially *Phryganea varia* and several species of the genus *Stenophylax*. It may be interesting to remark also, in relation to this subject, that the nectar of flowers possesses considerable powers of attraction. Mr. Wormald has several times taken a species of *Limnophilus* on thistle blossoms, and I myself have captured individuals at sugar, which possessed so powerful an odour of the flowers of the *Echium*, that I have not the slightest doubt that they had been regaling themselves on that plant, which grew in abundance close by, and only left it for the more powerful attraction of the sugar.—*R. M'Lachlan*; *Forest Hill, March 17, 1862.*

Immense Cephalopod near Teneriffe.—In case the readers of the 'Zoologist' have not observed it, I would call their attention to the account, in the 'Illustrated London News' of January 18, of an immense cephalopod seen and almost captured by the crew of a French boat near Teneriffe. It was estimated at fifteen or sixteen feet

in length. It appears to have attracted the attention of the scientific in France, and allusion is made to a specimen in the Museum of the College of Surgeons, London, which I believe was found during Captain Cook's first voyage, floating dead. This individual was judged, from its remains, to have been four feet long in the body, or with arms seven feet; very respectable dimensions, but far inferior to the one now under consideration. Such a specimen might tempt one to believe that some foundation existed for the Indian accounts of enormous cuttle-fish sinking luckless vessels by clasping them in their gigantic arms. At least it is to be regretted that such a specimen could not be secured, though it is said consideration for the safety of his men induced the commander to forbid further attempts. Shell-collecting on this scale would be hazardous employment, as such a mollusk might make short work of the conchologist.—*George Guyon; Ventnor, Isle of Wight, January 23, 1862.*

Helix rufescens of Montagu hairy in the Young state.—Having lately become acquainted with your valuable publication as a medium of communication between those interested in Natural History, I feel that I should be hiding my light under a bushel were I to abstain from bringing to your notice, for the information of such of your readers as may be conchologists, the settlement of a doubt of long standing with regard to *Helix rufescens* of Montagu. I observe in Dr. Gray's edition of Turton's 'British Shells,' p. 157, that "Montagu represented the young of this species as clothed with hairs." This fact, however, Dr. Turton and Dr. Gray doubted, and say that Montagu "probably mistook the *Helix hispida* for it," and "both the young and old shells are quite bald." Mr. Kenyon also expressed the same opinion in his admirable "Remarks on British Land and Fresh-water Shells," in Loudon's 'Magazine of Natural History,' i. 425. I was induced to adopt Montagu's view in 1860 by finding, in a walled garden near Bath, numerous specimens of a minute hairy shell, evidently young, from the unfinished state of the mouth. In this garden I have failed to discover more than three kinds of *Helix*, viz., *H. aspersa*, *H. pulchella* and *H. rufescens*, and therefore feel obliged to identify it with the latter as the species which it most resembles. It is probable that Dr. Turton and Mr. Kenyon fell into their mistake through not having examined the young shells under a magnifier. I am supported in my view by the opinion of Mr. J. G. Jeffreys, to whom I lately sent some specimens. After examining about a hundred specimens, I find that the shell is thickly clothed with hair when from one-sixteenth to one-eighth of an inch in size, after which the hair seems to fall off. The maximum and minimum size of the shells in my collection is from one-fourth to one-sixteenth of an inch; all found in the same locality.—*Bruce Hutton; 61st Regiment, South Camp, Aldershott.*

*Notes on Sea-Anemones.**—As a humble disciple of that branch of Natural History which your valuable researches have tended so greatly to develope, I think it will not be uninteresting to you to receive a report of a circumstance which I do not remember to have seen recorded in your own delightful books, or in those of Mr. Kingsley or Mr. Lewis. In a tank containing about sixty anemones, &c., are eight fine specimens of the *Sagartia nivea*, which I obtained from Ilfracombe in August last: they have been

* Addressed to P. H. Gosse, Esq., F.R.S., and kindly communicated by him for publication in the 'Zoologist.'

fed regularly since captivity with raw meat, oysters, &c. about twice a week. Two individuals, measuring each about one inch in diameter, when expanded, were located on a piece of rock. On Saturday morning, about half-past nine o'clock, on syringing the tank, according to custom, I observed that the mouth of one of them was unusually and very greatly distended; the fissure reaching almost across the disk of the anemone, whose circular appearance was thereby changed for an irregular loop-shaped form.* On reaching home, about five o'clock, I found, to my astonishment, that fission had taken place, and that the object of interest had, by some wonderful metamorphosis, become two distinct creatures, each about as large as a fourpenny-piece. They had moved apart and were partially expanded, looking none the worse for Nature's operation. I have since fed them and they appear quite at home, though a little ragged at one side of the column where the fissure occurred. I had noticed for several weeks past that the opaque whiteness of my snowy friends had changed for a pearly hue; and I had a strong impression that one, if not two others, will eventually multiply in this manner. With the exception of *A. Cerens*, if my memory is correct, I do not find any other instance of this kind mentioned in your 'Actinologia,' to which I immediately referred for a precedent. Have you met with any other of the *S. Ichthystome* since the two described in your 'Actinologia'? I have what appears to me a specimen, although its colours are not so brilliant as the figure in your plate ii. It was brought from Weymouth (the correct locality), on an oyster-shell, a wee little thing, which I have once fed up (when expanded) to the size of a silver twopenny-piece: it seems very hardy. A fine *A. Dianthus* (of orange-buff colour), in my possession, has just moved its quarters, and left a small portion of its base, which is rapidly assuming the shape of a young individual. This is further in confirmation of your excellent description of this beautiful anemone.—*W. R. Hughes; the General Hospital, Birmingham, February 20, 1862.*

Proceedings of Societies.

ENTOMOLOGICAL SOCIETY.

March 3, 1862.—FREDERICK SMITH, Esq., President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be given to the donors:—'Proceedings of the Royal Society,' vol. xi. No. 47; presented by the Royal Society. 'The Canadian Naturalist and Geologist, and Proceedings of the Natural History Society of Montreal, conducted by a Committee of the Natural History Society,' vol. vi.; by the Society. 'The Zoologist' for March; by the Editor. 'The Intellectual Observer,' Nos. 1 and 2; by the publishers, Messrs. Groombridge and Sons. 'The Journal of the Society of Arts' for February; by the Society. 'The Literary Gazette' for February; by the Editor. 'The Athenæum' for February; by the Editor. 'List of the Specimens of Lepidopterous Insects in the Collection of the

* My correspondent subsequently suggested a figure of 8, or two circles slightly overlapping, as conveying a clearer idea of the form.—*P. H. G.*

British Museum, part xxiii. Geometrites; by the Author, Francis Walker, Esq., F.L.S., &c.

Certificates in favour of George Robert Gray, Esq., the Rev. T. H. Browne and Alfred Haward, Esq., as Members of the Society, were read a first time and ordered to be suspended in the Meeting Room.

There were on the table, for distribution among the Members, copies of the Address delivered at the Anniversary Meeting on the 27th of January, 1862, by J. W. Douglas, Esq., President; also copies of an Address delivered at the ordinary Meeting on the 3rd of February, 1862, by H. T. Stainton, Esq.

The Society's Collection.

The President, by the desire of the Council, stated to the Meeting the steps taken by the Council in consequence of their attention having been called to the state of the Society's Collections: the Council had held two Special Meetings, had obtained from the Curator an explanation of the manner in which his time was employed, and, after full consideration thereof, had passed the following Resolution:—"That the thanks of the Council be given to the members of the late Library and Cabinet Committee for their very careful Report on the state of the Society's Collections; and the Council, having requested and obtained from the Curator an explanation with respect to the employment of his time when at the Society's Rooms, considers such explanation satisfactory."

The 'Transactions' of the Society.

The President announced that the Council had rescinded the Resolution of Council of the 7th of February, 1859, by virtue of which all Members and Subscribers whose subscriptions were not in arrear received the 'Transactions' gratis; that in future Members and Subscribers resident in or within fifteen miles of London would have to purchase the 'Transactions,' as was the case prior to February, 1859 (and see 'By-Laws,' ch. xxi.), but that the price to Members and Subscribers would be one-half the price to the public. It was also announced that with the forthcoming first part of a new volume would be commenced the "Third Series" of the Society's 'Transactions,' and that a general index to the five volumes of the second or "New Series" would be prepared and published as soon as possible.

Exhibitions.

Mr. Newman exhibited series of bred specimens of two British species of the genus *Cabera*. He remarked that each series had been arranged with the view of showing that the particular colouring supposed to be distinctive of *Cabera rotundaria* was nothing more than an intermediate state between an insect with two and one with three transverse lines or bars. In the upper specimens in each series there were but two transverse bars; in the specimens next following the first or basal bar appeared separating into two bars, yet these were almost contiguous; in the succeeding specimens they grew more and more distant, until at the bottom of the series, both in *C. pusaria* and *C. exanthemaria*, the three transverse bars were equally distinct and equally equidistant. The rounded form of the wings, which was supposed to have suggested the name of "rotundaria," was proved by this series to be equally instable.

Mr. Newman expressed his obligations to Mr. Thomas Hockett, who had bred the whole of the insects exhibited, and had arranged them as they now stood, affording a

convincing proof that *C. rotundaria* was a mere variation, to which both the acknowledged species *C. pusaria* and *C. exanthemaria* were liable.

Mr. Hockett, who was present as a visitor, stated that the larvæ from which he had bred the specimens exhibited were all taken at the same time and place, and that he had but two species of larva, *viz.*, those usually known as the larvæ of *C. pusaria* and *C. exanthemaria*.

Mr. Dunning referred to the exhibition of *Cabera rotundaria* by Captain Russell, at the February Meeting of the Society, as corroborating Mr. Newman's conclusion, and stated that the question of the specific distinctness of that form had on several occasions been brought under the notice of the Northern Entomological Society, the members of which, who had had frequent opportunities of raising *Cabera* from the larva, had satisfied themselves that *C. rotundaria* was in fact but a variety.

Mr. S. Stevens exhibited some butterflies' eggs, sent to him by Mr. Nathaniel Plant, from Rio Grande. He was not able to give any further information concerning them.

Mr. W. Wilson Saunders exhibited the larva and pupa of *Endomychus coccineus*, which had been recently taken in the neighbourhood of Reigate, under the bark of a log of elm which was lying on the ground. The larvæ were found fifty together, and were apparently feeding on a white fibrous flocculent fungoid substance underneath the bark. They bore a very close resemblance to the larvæ of some species of *Coccinella*. Many of the perfect insects were found at the same time in company with the larvæ. It was a curious question how the parent insect, when laying her eggs, discovered the presence of the fungoid substance which was necessary for the sustenance of the larvæ to be born. It could not be by sight, and Mr. Saunders thought it was most probably by smell, which seemed to be the only sense that we know insects to possess to which such a discovery could be attributed.

Mr. Saunders also exhibited a piece of a branch of dead wood from South Africa, where it had been found by Mr. Cooper, tunnelled down the centre by a species of bee, *Xylocopa divisa*. The tunnel was round, very neatly constructed, with a circular orifice pierced through the bark, and was made for the purpose of nidification.

Mr. Saunders also exhibited two portions of the stem of a greenhouse creeper (*Jacsonia*), to show the effect of the punctures of the common mealy bug (*Coccus*) upon the bark. These punctures produce warty elevations, which are covered with a whitish skin, and are internally green and somewhat succulent. When the punctures are very numerous and the bark becomes covered with warts, the functions of the bark appear to cease, and great injury to the plant ensues. Mr. Saunders made some remarks on the desirability of a history of the insects peculiarly destructive to plants, of which so many new discoveries had of late years been made.

Mr. Saunders also exhibited the female, the egg and the young larva (?) of *Extalosoma Hopei*, a rare and interesting insect of the family *Phasmidæ*, from the New Hebrides. The eggs were polished, oval, of a dull mottled brown colour, and about one-tenth of an inch in length. The larva escaped from the egg at one end, throwing off from it a rounded operculum, in which was a deep circular impression. The larvæ forwarded as those of *E. Hopei* had no resemblance to the perfect insect, and, although evidently of the family *Phasmidæ*, it seemed very doubtful whether they belonged to the insect in question. They were long and thin in the body, with very long legs, and short rather stout antennæ. In the dried state they were of a dull black-brown colour.

Professor Westwood agreed with Mr. Saunders in doubting whether the larvæ could

be those of *Extalosoma Hopei*, and thought they must be the larvæ of one of the long-legged species of *Phasma*.

Mr. Stainton exhibited a specimen of a *Noctua* new to the British Fauna, *Toxocampa Craccæ*, *W. V.*, a species stated by Guenée to feed on *Vicia multiflora*, and to be common in Austria, Germany and France, in July and August. The specimen exhibited had been taken, along with two or three others of the same species, by the Rev. E. Horton, on the north coast of Devonshire.

Dr. Knaggs exhibited a box of insects collected by Mr. James A. Carrighan, at Ararat, Victoria.

The President exhibited a case containing a fine collection of insect architecture, consisting of nests of bees, wasps and fossorial Hymenoptera. Amongst the more remarkable was a nest of a species of *Larra*, which closely resembled a piece of sponge, but which was no doubt composed of the scrapings of the stems and leaves of woolly plants. This nest was attached to the under side of a leaf, though the species of the genus to which the constructor of the nest belonged were usually burrowers in sandy banks, &c. Nests of a species of *Pelopæus*, composed of the dung of animals and attached to reeds, were also remarkable. The *Pelopæi* were the mud-daubers of North America, but the nest exhibited was from Port Natal. Many specimens of exquisite structure from Brazil were also exhibited, particularly the nests built by the wasps comprised in the genus *Polybia*. Altogether the case contained upwards of a hundred specimens of the architecture of insects.

The President also exhibited a Coleopterous insect which he characterized as not only a species new to Britain, but as belonging to a genus hitherto not represented in the British Fauna. The insect in question was brought to him by Dr. Power. Two specimens had very recently been taken in the New Forest. It appeared to the President to be identical with the species which in the British Museum collection was labelled "*Endophlæus spinosulus*, *Latr.*"

Mr. Pascoe, Mr. Janson and Professor Westwood, however, doubted whether the specimen exhibited were the true *Endophlæus spinosulus* of Latreille.

Mr. W. F. Kirby showed some specimen sheets of Dr. Hagen's '*Bibliotheca Entomologica*,' which it was expected would be published in July next, at the price of ten shillings or thereabouts.

Dr. Wallace called the attention of the Meeting to a plan he had recently adopted of mounting Micro-Lepidoptera. He employed common wax lights, simply rolled and flattened out: they were at once soft and retentive of the small pins; portions could be cut of any length that might be requisite to hold the number of specimens which the collector placed in his cabinet, and the whole series of the insects be fixed in the cabinet by means of a strong pin passing through either end of the flat strip of wax. Dr. Wallace had found this plan very advantageous in moving large numbers of specimens, and especially so in averting accidents from letting the insects fall. The strip of wax acted as a parachute, and by its lightness averted the destruction which might otherwise befall the specimens.

The Secretary read, on behalf of Mr. George Wailes, of Newcastle, the following paper:—

Notes on Bembidium nigricorne, Gyll.

"It may not be uninteresting if I state the source whence the specimens of *Bembidium nigricorne*, *Gyll.*, alluded to by Mr. Waterhouse at the Meeting of the Society

on the 6th of February, 1860, were derived, especially as the species has hitherto only been recorded as captured in the Scandinavian district of Europe. I first took it in this vicinity (Newcastle), in May, 1827, in some numbers, and not finding it agree with any of the species described by Marsham, I waited till Mr. Stephens' 'Illustrations,' then just commencing, had reached the Bembidiidæ. Being equally unable to identify it with any of his descriptions I named it *Tachypus nigripes*, and during that and the two or three following years distributed it amongst my correspondents under that name. In this way the cabinets of Mr. Dale, Mr. Waterhouse, Mr. Babington, Mr. Sparshall, Dr. Howitt, Mr. Rudd, Mr. Stephens, Mr. Curtis, and no doubt others, were supplied; and when I arranged my own cabinet of Coleoptera, on the appearance of the second edition of Stephens' 'Nomenclature,' in 1833, I placed it there under the above name. Here the specimens remained, and the circumstances had escaped my memory until just before Mr. Waterhouse's notice was read before the Society, when my old friend Mr. Dale reminded me of them, saying he had forwarded a specimen to Mr. Waterhouse.

"It would appear that Gyllenhal had detected the species before me, as his volume was published in 1827. His description, as well as that of Jacquelin du Val, accords very well with my specimens, though I cannot help thinking that my name was the more appropriate one, as well as distinguishing it at once from Marsham's *rufipes*.

"I am sorry to trouble the Society with this trifling communication, but as our 'Transactions' afford the only printed means of intercourse with our continental brethren I may perhaps be excused doing so."

Mr. Walker read a description of a new genus and species of Noctuides. The insect described was unique. It was discovered at Halifax, Nova Scotia, by B. Piffard, Esq., and by him presented to the British Museum. It belonged to the family Glottulidæ of Guenée, and was described by Mr. Walker under the name of *Phornacisa Piffardi*.

Mr. W. F. Kirby read some "Notes and Observations on the Lepidoptera Rhopalocera occurring in the county of Sussex," and exhibited some specimens in illustration.

Captain Cox, after referring to certain letters and articles which had recently appeared in the 'Times' and other papers on the subject of the ravages committed by *Scolytus destructor*, objected to some of the statements therein contained, and in particular to the assertions that this subject seemed scarcely to have received from scientific men the attention it deserved, and that any method of prevention or cure seemed to be unknown. Captain Cox reminded the Society of the nature, extent and successful result of the experiments made by himself during the last twenty years, and maintained that his plan of partially barking the affected trees was completely successful. He said that he had that morning been with the First Commissioner of Public Works to inspect the trees in the Parks, which were in a bad state.

Captain Cox also made some remarks on the injury done to the oaks by *Sesia Cynipiformis*, and to the lime trees by *Chrysoclysta Linneella*, and suggested that the lime trees should be treated in the same way as the elms which were attacked by *Scolytus*.—*J. W. D.*

Correction of an Error.—In the article on “Leporines” in last month’s ‘Zoo-logist’ there is a misprint of sufficient importance to require correction. At p. 7928, line 10 from bottom, (*engénérique*) should be (*engénési-que*), a word constructed by M. Broca to express that class of hybrids in which the animals are perfectly fertile *inter se*, as well as with either parent.—*E. W. H. Holdsworth.*

The Hare catching Mice.—It is stated by Bishop Pontoppidan, in his ‘Natural History of Norway,’ fol. 1755, p. 9, part 2, “that hares are frequent in Norway, and are very cheap in winter. They are smaller than in Denmark, and change colour, in the cold season, from brown or gray to snow-white. In the woods they catch mice like cats, and pursue them under the snow; they otherwise in necessity live upon birch catkins.” Did any of our Norwegian naturalists observe or confirm this singular and abnormal habit of the hare mentioned by this old divine? Bell distinctly states “the hare is as exclusively a vegetable feeder as perhaps any known mammiferous animal.”—*Edward Parfitt.*

Notes on the Snake Rat (Mus Alexandrinus).—The Society will doubtless recollect that last year I exhibited at one of our Meetings two living rats, one of which I believed to be new to the British fauna, at least so far new as that, till then, it had been unrecognized and undescribed as distinct. The other was a specimen of the old English black rat (*Mus rattus*); and this was shown, not on its own account, but for contrast and comparison. And I selected the black rat for this comparison because it so much more closely resembles the new one than does the brown rat (*M. decumanus*), which is quite different. If therefore the new rat is a mere variety of either of the two species which have been long known as members of the British mammalian fauna, and which have always been specifically distinct, it must be deemed a variety of *M. rattus*; but I claim for it distinctive characters separating it from the rat, quite as marked as those which distinguish the brown from the old English black rat. Indeed *M. decumanus* more nearly resembles *M. rattus* than does the new rat. It was suggested to me, at the time I exhibited living specimens, that an appeal must be made to the cranial characters of each before the distinctness and the degree of distinctness between the two could be established. The result of this investigation I now give to the Society. [Mr. Salter here figures and differentiates the skulls of the two species.]

P.S.—Since the foregoing was written I have had reason to conclude that the snake rat is certainly the same species, race, or variety, as was first described by Geoffroy St. Hilaire under the name *Mus Alexandrinus*. But at the same time my further investigations into the subject have convinced me that our knowledge of the rats of Great Britain, or of rats in general, is not so satisfactory or definite as descriptions in works on Natural History would lead us to suppose. Undoubtedly, characteristic specimens of *M. rattus*, *M. decumanus* and *M. Alexandrinus* may be obtained; but there are intermediate forms in endless variety, as one may satisfy himself by an inspection of the cages of a ratcatcher after his visit to the rat-homes about the docks of London. There can be no question that the typical forms enumerated above as three species are constantly being merged and reduced under favouring conditions by interbreeding. The most superficial examination of many specimens will convince any one of this fact. This circumstance was demonstrated some years since at the Zoological Gardens, Regent’s Park. Some individuals of *Mus Alexandrinus*, which had been sent from Alexandria, got loose in the gardens; and for a long time afterwards the keepers frequently caught cross-bred rats, at first

half-bred, and afterwards with less and less qualities of the snake-rat, till at length all traces of it disappeared. In the language of horse-breeders, the new "strain of blood" was "bred out" or eliminated, or, more correctly, it was overpowered by the repeated crossing always on the line of the common brown rat. Had the circumstance been reversed, and a few of the *Mus decumanus* had escaped among a multitude of *M. Alexandrinus*, the characters of the latter would undoubtedly have prevailed in the end. The capacity for interbreeding appears to be endless and indefinite. There are sorts of rats which will not come within the category of those recognized, or as their intermediate crosses. We have in this country a black rat with a white chest; in the British Museum are two stuffed rats, chestnut coloured with white breasts, which were captured in Cambridgeshire. The distinguished Irish naturalist, Mr. W. Thompson, has described a black rat with a white chest as a new species, under the name of *Mus Hibernicus*. On the occasion of the reading of my paper on the cranium of the snake-rat, it was suggested by Mr. Lubbock that it might be a "variety" of one of our other rats. Subsequently, in a discussion in the 'Field' newspaper, by which a great deal of interesting information regarding rats was brought out, Mr. Newman put forward the idea that these cosmopolitan rodents are, in their differences, not so many species, but mere "geographical races," and I am much inclined to believe that this is the truth of the matter. Certainly, if interbreeding and a resultant fertile offspring determine the specific identity of varying individuals, there is an end of the question. The different rats *do* interbreed, and their progeny *are* fruitful for any length of time and any number of generations. Rats hold a curious intermediate position between wild and domestic animals. They are not absolutely either, and they are both. They are wild as they are their own masters and roam at will; they approach a domestic condition, inasmuch as they are nearly always associated with man, and are indirectly dependent on him for their food. Rats are cosmopolitan—they inhabit nearly, if not quite, every region where the human race dwells. In violation, or at least not in keeping, with their dentition and organs of primary assimilation, rats are omnivorous: they can live entirely on animal food; they can even resort to the predaceous habits of Carnivora; or they may have the barest vegetable diet for their sole sustenance. Such constitutional capacities and such adaptability of habit afford wonderful conditions for the development of races. *Mus Alexandrinus* appears to be spreading all over the world; its extreme agility and the ready way in which it accommodates itself to shipboard naturally tend to such a result. Besides the eastern localities where it was first found, according to Blasius, it was observed by Savi in Italy, in 1825, and named by him *Mus tectorum*; it was found by Pictet near Geneva, in 1841, and described by him under the title of *Mus leucogaster*; Blasius states that he himself saw it at Antibes, in the South of France, and he repeatedly obtained it from the Alps in South-Eastern France. It has also been taken at Stuttgart; and Rüppell mentions that it has been sent to him from America. In this country it has been known to rat-catchers in the neighbourhood of the docks both of London and Liverpool.—*Journal of the Proceedings of the Linnean Society*, Vol. vi. p. 66.

The Apes at Gibraltar.

By the Rev. ALFRED CHARLES SMITH, M.A.

DURING a recent tour through Spain I chanced to spend three days, or parts of days, in a French steamer, and as we crossed over from the African coast at Tangier, and neared Gibraltar, among other topics of conversation, the well-known monkeys of the Rock were naturally and very prominently made the subjects of inquiry, when, to our surprise, and not a little to our disgust, M. le Capitaine treated the whole story as a myth, and declared that no monkeys had ever really existed there, but that it was a thorough English hoax, a *badinage* very amusing to the "subs of Gib," but not to be credited for a moment by any man of sense or science. I own to a feeling of very considerable disappointment when these words fell from the lips of the captain, and, as it did not occur to me to doubt his accuracy (for I thought that, as his vocation took him to that locality every week, he *must* know the real state of the case), and as I did not then reflect that everything connected with the English at Gibraltar (that marvellous key to the Mediterranean, which is the envy of so many) is an object of jealousy and suspicion to the foreigner, Frenchman no less than Spaniard, and as I had totally forgotten our worthy Editor's account of these apes ('Zoologist' for 1846, p. 1292), wherein he calls attention to the marvellous scepticism of Frenchmen generally, even the *savans* of Paris, as to the existence of apes at Gibraltar, I landed with the weight on my mind that, after all, there were no apes, and never had been any apes, on the rock.

And so, after a thorough English breakfast, in a thorough English inn, which was a pleasant change after the abominations we had endured in the *fondas, posadas* and *ventas* of the Peninsula, it was with every thought of the monkeys banished from our minds that we started forth to scale the rock, and view all the wondrous galleries and overwhelming batteries of this most impregnable fortress. And when we had satiated our unmilitary minds with an ample allowance of cannons, mortars and shells, whose respective numbers, strength and size were duly detailed by the smart artilleryman who acted as our cicerone, so different to the untidy, unmilitary sons of Spain, with whom we had of late become familiar, we bethought ourselves (still with minds free from the thought of monkeys, of which our once dearly-cherished visions had been so rudely put to flight) that it would be well to climb on to the flagstaff on the top of the rock,

and enjoy the view, thus acting up to the taunt so frequent in the mouth of the unenterprising foreigner, and *meant* to be very severe, though in reality a tribute to the energy, perseverance and pluck of our countrymen, that the travelling Englishman is never satisfied with seeing any place until he has mounted to the highest point. Slowly we sauntered up the path, for we had the whole day before us, and though in the month of November, the heat was very oppressive (in summer it is sometimes terrific, the thermometer of the signal-house on the top of the rock, exposed to the sea-breeze, in July last, having risen to 98° in the shade), and ever and anon we sat down to admire the beautiful scene. There was that wondrous rock, on which we now stood, aptly called "the sentinel watch-tower of the Mediterranean," a veritable crumb of England, so unlike all near it, jutting out southward into the sea below, now smooth as glass, though yesterday lashed into frenzy by the dreaded Levanter, as we slowly and with difficulty ploughed our way across from the coast of Africa; behind us, to the North, stretched the mountains of Spain; from the West rolled the broad waters of the Atlantic; to the East lay the blue Mediterranean.

And now we had gained the flagstaff on the top, and were lazily refreshing ourselves with that which, to be thoroughly appreciated, should be unexpectedly met with in a southern climate, after a hot walk on a sultry day, *viz.* a genuine bottle of "Bass," imported from England, when all our languor was put to flight and our energy restored by the casual observation of the signal-man, that "the monkeys were on the move," and had been seen several times that morning, and might probably be seen again. First, to overwhelm the man with questions, and then to rush out to the parapet at the flagstaff, and peer amongst the grass and bushes which fringe the steep face of the rock, in the attempt to behold the monkeys with our own eyes, was a moment's work; but though we gazed long and anxiously, and for a considerable time narrowly watched the rocks and bushes all around, the fates were not propitious to us on this occasion, and we could not, as we longed to do, carry back to the captain of the steamer, when we re-embarked in the evening, the conclusive assurance that we had ourselves had ocular testimony of the veritable existence of "los monos" on the rock of Gibraltar. We did not, however, leave the spot till we had obtained all the information we could glean upon the subject from the signal-man at the flagstaff, every particular of which was amply corroborated by many who had repeatedly seen the apes.

It appears that they are of the species commonly called the Barbary Ape or Magot (*Macacus Inuus*), which though universally so called, is not, I believe, in reality a true ape, for it has something more than the rudiments of a tail, every vestige of which the true Simians entirely want. From time immemorial these monkeys have had a footing on the rock, and must have had their origin on the opposite coast of Morocco, for they do not exist in a wild state in any other part of Europe; but at what period they came over the sea is not so easy to determine, neither is it very apparent *how* they came, unless we accept the somewhat romantic Moorish tradition, that they pass backwards and forwards to the coast of Morocco by a subterranean passage under the Straits!! but be that as it may, there they undeniably are, though sadly reduced in number, for a little band of four only has for some years constituted their whole force. They are seldom seen, unless when the wind changes, but being delicate, and very susceptible of any sudden rise or fall of temperature, the shifting of the wind from E. to W., or *vice versá*, is sure to put them on the move, when they may generally be seen changing their quarters to the leeward side of the rock. They are very active, and prefer the higher and steeper precipices for their abode, where they live in undisturbed possession of the many caves and hollows in the loose rocks which compose the summit. That they have no difficulty in finding a sufficiency of food on the rock is manifest from their apparently good condition. There are many plants growing luxuriously among the loose stones, whose leaves and fruits they eat, more especially the sweet] roots of the *palmito*, or dwarf palm, which is very abundant there, but they vary this diet with coleopterous and other insect food, which is always abundant in southern latitudes; and they are also said, I know not with what truth, to descend at times and rob the gardens of the town below, when darkness favours such marauding forays, and ripe fruit presents temptation enough to overcome their natural love of retirement. They are generally supposed to be extremely shy, and to scamper away on the least alarm; but my informant denied this, and, in proof of his assertion, pointed out some rocks where he had seen them sitting that morning and staring at him, by no means disconcerted at the British uniform or the gaze of the sergeant, while they remained for a considerable time within twenty-five or thirty yards below the parapet of the flagstaff on which he was leaning, and only moved away leisurely at last. At the same time the fact of their being so seldom seen, unless during their migrations to the opposite side of the rock, seems to indicate a very retiring, unfamiliar

disposition, while the fact of their not being hunted, but, on the contrary, strictly preserved from the slightest molestation, would in time give a certain degree of boldness to the most timorous animals; so that, though they have learned confidence from protection, they are undoubtedly by nature extremely timid. From what date such protection has been afforded them my informant could not say, though he had understood they had always been strictly preserved during British occupation of the rock; but from the year 1855 the quartermaster has not only taken them under his special care, but has also instituted a systematic registering of their appearance and numbers, and, with this object in view, has provided the signal master with a book, which he showed me, wherein might be seen very carefully entered the details of the dates of their appearance, and their numbers during the last six years. From a careful examination of this very interesting register I found that they were seen, on an average, once in ten days, sometimes rather oftener; that they moved in summer as much as in winter, always anxious to avoid the wind, from whichever quarter it blew; and that in 1856 they numbered ten, but have gradually dwindled down to four, the sad remnant which now exists, and which bids fair to die out altogether, as it is supposed that the only individuals left all belong to one sex.

Such is the present condition of the apes at Gibraltar. That they are almost an "institution," and certainly the greatest lions of the place, is notorious; but there is a certain prospect that, unless replenished in numbers, they will in the course of a very few years become as extinct on the rock as the great bustard is on Salisbury Plain. But among the many British officers quartered at Gibraltar, keen sportsmen and probably enthusiastic naturalists as many are, is there no one patriotic enough and energetic enough to import a few apes from the opposite coast of Barbary, with which there is weekly communication at least, and whence all the beef which feeds those bold Britons is derived? Can no one be found to purchase, if but half-a-dozen, and turn them loose among their congeners on the rock? [A subscription for an object of such general interest, set on foot among the officers of the five regiments generally in garrison would be certain to be responded to, to the full extent required.] Then we might hope they would once more flourish, and continue for generations to come to pilfer and chatter and grin and grimace, as only monkeys can do. But it does seem to me a subject of sincere regret that for lack of a little timely precaution this interesting order of

Mammalia, the Quadrumana, should cease to be represented in Europe.

ALFRED CHARLES SMITH.

Yatesbury Rectory, Calne,
March 11, 1862.

*Economic Uses of Canadian Suckling Animals among the
Chipewyan Indians.* By B. R. Ross, Esq.*

WHILE collecting and arranging a series of specimens of the industrial arts of the natives of Mackenzie's River District, for the Royal Industrial Museum of Edinburgh, I was struck, not only with their number, but also with their importance to the domestic comfort of these races.

Though doubtless much of the skill of the Chipewyan tribes has been lost since the period of Sir Alexander Mackenzie's visit, by the introduction of European manufactures, enough yet remains to prove interesting as exhibiting the arts and manufactures of a people still in the first stages of social existence and civilization. The manufactures are in themselves rude, and, with the exception of porcupine work, I know of none that would obtain the name of Art, or win in a Museum the meed of more than a passing glance from any one save an ethnologist. To the unreflecting, or to those who for mere pleasure visit these "repositories of science," they must indeed be *caviare*, but to the philosophic mind they would speak volumes, as showing the human intellect, though in its lowest stages, attempting, not unsuccessfully, to break through the surrounding crust of animalism, and struggling to emerge into a sphere of higher intelligence.

In the present sketch I entirely exclude the Eskimos and Loucheux, —though recent researches almost confirm me in the opinion that the latter tribe is a branch of the Chipewyan family,—as it would swell the paper much beyond the limits to which I have restricted myself to pass their handicrafts also in review.

The Chipewyan tribes, including the Montaignais, Yellowknives, Beavers, Dog-ribs, Slaves, Sickannies, Nehaunies and Hare Indians, draw their resources from the animal, vegetable and mineral kingdoms; but I must at present restrict myself to the first of these great sections,

* From the 'Canadian Naturalist' for December, 1861.

hoping, at some future period, to have the pleasure of noticing the others.

In the manufactures of the Indians no articles hold a more important or more conspicuous position than those drawn from animals; but this must naturally be expected in a people who subsist almost solely on the products of the chase. The climate of these regions, moreover, in a manner prohibits agriculture, even were the natives willing to turn their attention to such pursuits, which they are not.

I shall pass briefly in review all the species of animals from which they derive any material, noting with each the various purposes to which it is applied.

Foxes. The various species of foxes found in this district are the red, cross, silver, white and blue. The latter is not, as some writers affirm, the young of the white, nor is it that animal in its summer garb, though it is closely allied to it. The only article furnished by these animals is a fine sinew thread for bead-work, and is taken from the tail.

Black Bear (*Ursus americanus*), Grizzly Bear (*U. horribilis*) and Barren-ground Bear (*U. arctos*). The black bear is found throughout the wooded portions of the districts, but is replaced on the barren grounds by a species bearing a strong resemblance to the *U. arctos* of Europe. The grizzly bear dwells among the Rocky Mountains. From the black, and indeed from all, the natives derive food; they also cut the summer hides into cords. The prepared fat is extensively used as a pomatum, but I cannot coincide with those who state bear's grease to be a good hair renovator; on the contrary, it will in all likelihood, if used pure, cause the hairs to split and fall out. Grizzly and barren-ground bears' claws are much prized for necklaces and coronets by the Indians.

Marmots. There are three, if not four, species of this animal in the Mackenzie's River District, *viz.*, *Arctomys pruinosus* (inhabiting the northern Rocky Mountains and Nehaunay Hills), *A. Kennicottii* (dwelling in the same localities, with a more northern range, and extending eastward to the Anderson River), and *A. monax* (coming as far north, though rare, as the Liard's River). Out of all these the mountain tribes make robes, and the flesh is counted sweet and fat. As I do not think that the marmot, which I have named *A. Kennicottii* (after my friend the enterprising naturalist Mr. Robert Kennicott), has been yet described, I shall here insert a brief note concerning it. It is in size as large as a small musk rat, and in colour a silvery gray, interspersed with orange hairs on the back, but changing on the flanks

into a decided yellow, palest on the belly; the tail is short. It has cheek pouches, and is decidedly smaller than *A. monax*. In habits, so far as is known, it assimilates closely to the other marmots. It is a social animal, and digs its den on the mountain's side, or in the banks of rivers. When these animals are outside, a sentinel is placed at a short distance from their habitations, where it sits on its hams, and will, when surprised, lower itself, uttering a peculiar cry or whistle; that, when twice repeated, causes all the party to seek for shelter in their holes. They lay up stores of winter provender. Very far north there is a variety which is perfectly black, instead of hoary and yellow. The robes made from the skins of this species smell very badly.

Beaver (*Castor canadensis*). The beaver exists some distance within the arctic circle, and the darkest coloured pelts that I have seen are from Fort Good Hope. The Slave and Dog-rib tribes make capotes and robes out of the skin, and the castoreum is extensively used in the manufacture of a medicine or perfume for enticing the lynx to enter into the snaring cabins. The flesh and tail are among the most prized dainties of Indian epicures.

Porcupines. These animals are scattered all over the district, principally in the vicinity of the Rocky Mountain ranges, but I do not think that they are often found around the shores of Great Slave Lake. The flesh is considered a great treat, and the quills furnish the materials for embroidering the only really tasteful articles to be found among the natives of these regions. The Slave Indians, dwelling along the Mackenzie and Liard's Rivers, are reckoned the most skilful fabricators of this manufacture. The things made out of them consist of belts, bands, garters, bracelets; and they are also used for ornamenting bark-work, dresses and shoes. In manufacturing belts, &c., a framework of sinew-thread is first laid, through which the quilts are interwoven in squares, something in the manner of Berlin wool work. The articles when finished are very pretty, and some of the women are sufficiently adepts to follow any angular pattern which may be set them. The dyes used are procured principally from the vegetable kingdom, though the natives residing in the vicinity of the Forts often apply to the wives of our servants to tint the quills with imported dye-stuffs.

Rabbit (*Lepus americanus*). This animal, so essential to the welfare of the Chipewyan nation, is spread all over the district, except upon the barren grounds. It is subject to periodical failures, which occur with great regularity, and which cause no small amount of privation and suffering to the Indians when they happen. When the

animals are numerous the Tinné tribes of the Mackenzie valley subsist altogether on them, and the skins furnish almost entirely their winter clothing—robes, shirts, capotes, mittens and socks being made, which afford a sufficient protection against the most severe cold, though they do not form lasting garments, as the hair falls out very quickly.

Moose (*Alces americanus*). Is found in greater or lesser numbers throughout the wooded portions of the district. Its food consists of the coarse grass of the swamps and the shoots of various kinds of willows. It produces from one to two at a birth. In size it is rather larger than a horse, and a buck in its grease will weigh as high as 800 lbs. without the offal. When in good condition the flesh is sweet and tender, and is highly esteemed as an article of food, but should the animal be poor, or have been subjected to violent exertion previously to death, the meat is scarcely eatable. The nose or moufle is considered by some the greatest delicacy of the North-west, contesting the palm with bear's paw, beaver tail, reindeer tongue, buffalo boss and sheep ribs. The Indians sometimes snare the moose, and in the spring, when the action of the sun has formed a thick crust upon the snow, they drive them into drifts and spear them in numbers. It is not a gregarious animal, and to hunt it requires more skill than is necessary in the pursuit of either reindeer or buffalo. In the winter, for some time before the hunter comes on his chase, he removes his snow shoes, and despite the thermometer being many degrees below zero, sometimes takes off his leggins; he then makes his approach cautiously, cutting such twigs of willows as may be in his way with his teeth, and avoiding, when possible, dry brush and fallen timber. As the slightest unusual sound is sufficient to frighten this animal, the chosen period for hunting it is during the continuance of a heavy gale of wind. During the rutting season, which happens in the fall, the males are rather dangerous to follow, and instances have occurred of native hunters having been severely injured and even killed by them. They fight rather with their fore feet than with their horns. The uses to which the various parts of the moose are put are many. The hide supplies parchment, leather, lines and cords; the sinews yield thread and glue; the horns serve for handles to knives and awls, as well as to make spoons of; the shank bones are employed as tools to dress leather with; and with a particular portion of the hair, when dyed, the Indian women embroider garments. To make leather and parchment the hide is first divested of hair by scraping, and all pieces of raw flesh being cut away, if then washed, stretched and dried, it will become parchment. In converting this into leather a further process of steeping, scraping, rubbing and

smearing with brains is gone through, after which it is stretched and dried, and then smoked over a fire of rotten wood, which imparts a lively yellow colour to it. The article is then ready for service. Of parchment, as such, the Chipewyans make little use, but the residents avail themselves of it in place of glass for windows, for constructing the sides of dog-carriages, and for making glue. The leather is serviceable in a variety of ways, but is principally made up into tents and articles of clothing, and in the fabrication of dog-harnesses and fine cords, wallets, &c. The capotes, gowns, firebags, mittens, moccasins and trousers made of it are often richly ornamented with quills and beads, and when new look very neat and becoming. The best dressers of leather in these parts are the Slave Lake Chipewyans and Liard's River Slaves. The lines and cords are of various sizes, the largest being used for sled lines and pack-cords, the smaller answer for lacing snow shoes and other purposes. In order to make sled lines pliant—a very necessary quality when the temperature is 40° or 50° below the zero of Fahr.—the cord is first soaked in fat-fish liquor; it is then dried in the frost, and afterwards rubbed by hauling it through the eye of an axe; to complete the operation it is well greased, and any hard lumps masticated until they become soft, by which process a line is produced of great strength and pliancy, and which is not liable to crack in the most severe cold. To obtain thread the fibres of the sinews are separated and twisted into the required sizes. The moose furnishes the best quality of this article, which is used by the natives to sew both leather and cloth, to make rabbit-snares and to weave into fishing nets. Sinews can be boiled down into an excellent glue or size. In mounting knives and awls with the horns, lead, copper and iron are used for inlaying, and rather handsome articles are sometimes produced. The making of spoons, tipping of arrows and carving of fish-hooks require little explanation, nor does the stuffing of dog-collars and embroidering with the hair need any particular comment, so I shall conclude this imperfect notice of a very valuable animal, which yields food, shelter and clothing to the savage inhabitants of this remote and dreary portion of the globe.

Reindeer. Two species inhabit this district, the strong-wood reindeer (*Rangifer caribou*) and the barren-ground reindeer (*R. arcticus*), which, though very nearly allied, are certainly distinct one from the other. The strong-wood reindeer inhabit the thickly wooded parts of the district, particularly among and in the vicinity of the mountain ranges, where they are of very large size. Though smaller than the moose these deer are of considerable bulk, and weigh up to 300 lbs.

In most particulars they resemble the barren-ground species, differing from it in the following points:—smaller horns, darker colour, larger size, not being so gregarious and not migrating. Both species are equally infested with the larvæ of a kind of gad-fly, which perforate the skins and cause the animals much pain. These larvæ, or others very similar to them, are also found under the mucous membrane at the root of the tongue and in the nostrils, and I have even found them in the brain. The only hides serviceable for converting into leather are those of animals killed early in the winter, which, when subjected to a process similar to that detailed under the head of Moose, and bleached in the frost instead of being smoked, furnish a most beautiful, even and white leather, which is used for shoe-tops, embroidered with quills and silk. The barren-ground reindeer during the summer and spring months frequent the barren plains lying between the wooded country and the shores of Hudson's Bay and the Arctic Sea. Their migrations, which are performed with wonderful regularity, are as follows. They leave the shelter of the woods in the end of March and beginning of April, and resort to the plains, where they feed on various kinds of lichens and mosses, gradually moving northward until they reach the coast, where they bring forth their young in the beginning of June; in July they begin to retire from the sea-board, and in October rest on the edge of the wood, where they remain during the cold of winter. In the northward movement the females lead, while the southward migration is almost invariably headed by a patriarchal male. The horns of these deer are much varied in shape, scarcely any two animals having them precisely alike. The old males shed theirs towards the end of December, the young males and barren females in April, and the gravid females in May. Their hair falls in July, but begins to loosen in May. The new coat is darkish brown and short, but it gradually lengthens and becomes lighter in colour until it obtains the slate-gray tint of winter. A full-grown buck will weigh about a hundredweight. The flesh when in prime condition is very sweet, but bucks, when in season, have their fat strongly impregnated with the flavour of garlic, which indeed is always present more or less. The summer food of the reindeer is lichens, moss and coarse grass; in the winter it consists of the dried hay of the swamps and the hairy moss adhering to the pine trees. I have seen it stated that these animals in the winter, in order to procure food, shovel away the snow from the ground with their horns, but this theory, however plausible, is entirely negatived by the facts of the case, for from my own knowledge, and all that I can learn, both from whites and natives, these

deer use their feet only for this purpose. Indeed when the horns would be necessary the males would have already lost them, and a supplemental addition would be required to the hypothesis of the females clearing a space for the males to graze on, as the gentler sex, at that period, reversing human fashions, wear the horns instead of their lords. The barren-ground reindeer furnishes the principal support of the Yellow-knife, Dog-rib and Hare Indians, and has the same value to them the moose has to the other branches of their nation. Their clothing for winter is made out of fawn-skins, dressed with the hair on, and consists of capotes, gowns, shirts, leggins, mittens, socks and robes, which are warm and when new nice looking. Hides which are so much perforated by the larvæ of the *Œstrus* as to be unfit for any other purpose are converted into *babiche*, to make which the skin is first divested of hair and all fleshy matter; it is then with a knife cut into the desired thickness, the operation beginning in the centre of the skin. There are two sizes of this article, the larger being used for barring sleds and for the foot-lacing of snow-shoes, the smaller as a species of thread for sewing leather, for the fine netting of snow-shoes, and for lacing fishing and beaver nets.

Buffalo. The strong-wood variety, which comes so far north and east as about twenty miles from the mouth of Little Buffalo River, near Fort Resolution, Great Slave Lake, is found most numerous in the vicinity of the salt plains of Salt River. It is unknown throughout the country inhabited by any of the Slave tribes, and the point mentioned above may be considered as its furthest limits. It is of larger size than the plain variety, of darker colour and more thickly furred. The Chipewyans eat its flesh and make robes and parchment from the hides. The horns are made into powder-flasks, and are used for mounting knives and awls; the tail mounted on a wooden shank, ornamented with goose or porcupine quills, is used as a fly-flapper. From its scarcity this animal does not contribute materially to the tribes under consideration.

Musk Ox (*Oribos moschatus*). This small but powerful animal is an inhabitant of the Barren-grounds and Arctic Coast, from 61° N. It frequents wild rocky situations, and possesses the agility of the antelope, between which and the buffalo it appears to form a connecting link. During the winter it feeds on lichens and in the summer on grass. From its remote habit it is of little service to the Chipewyan tribes, and though the Yellow-knives, Dog-ribs and Hare Indians sometimes hunt it, yet as it is very fierce, and the flesh is strongly impregnated with the flavour of musk, it is not much looked after. The calf skins

make excellent robes and caps, but the adult hides are almost too hairy for any purpose of that sort. The tails are made into fly-flappers similar to those obtained from the same part of the buffalo.

Mountain Goat (*Aplocerus montanus*). Is found throughout all the mountain ranges of this district to within a short distance of the Polar Sea, if, indeed, it does not reach it. It is a larger animal than the domestic goat, which it resembles only in name and in having a beard. It is covered with long and rather brittle white hairs, beneath which a coat of very fine white curly wool lies close to the skin. The flesh, though rank, is fat and tender, and is much relished by the Mountain Indians, who also make robes, clothing and leather from the hide. Curious dog-sleds are manufactured out of the skin covering the shank bones, by sewing numbers of the pieces together with the hair outside, which slides well over the snow.

B. R. Ross.

[It is most cheering to observe the interest awakened among our fellow subjects in Canada on the economic uses of these animals : the present is the second paper on this topic.—*E. N.*]

The Wolf-Days of Ireland.—My father, whose youth was spent in Ireland, and who died twenty-one years ago, at the age of seventy-four, could tell many very interesting anecdotes (related to himself by uncles and aunts on his mother's side) connected with the ravages of wolves in that country, in the days when these animals were very formidable there. Some of these accounts are but indistinctly remembered by me ; but it was a source of wonder and amusement in early childhood to hear them told by my dear father on a winter's evening. There are one or two very clearly impressed on my memory ; and, as the race is now extinct in the British islands, it may possibly interest the present and coming generations to have them recorded. An ancestor of my father's family led the humble yet pleasant life of a woodcutter, living in a little habitation at some distance from the scene of his labours. He possessed one of those noble and beautiful animals, now also nearly or quite extinct, the Irish wolf-dog,—Turnbull by name,—an almost necessary protection in that day, when a thickly-wooded country afforded abundant shelter for these ferocious masters of the forest, which, even singly, would attack men, and sometimes visit the cottages, and watch their opportunity to carry off young children. Malone (for that I believe was the man's name) went out to his work one day incautiously unprotected by his faithful dog. He worked later than usual that evening, and towards the close of his day's labour, when he had bound up many fagots of fallen wood, a large and savage wolf issued from the thicker part of the forest and made directly towards him, seeing, no doubt, that he was unarmed and alone. Malone immediately pulled one of the thickest stakes from a bundle of wood and prepared to make the best defence in his power, warding off the attacks of the furious brute, and walking backwards towards home, well knowing that to turn his back to the enemy would be immediately fatal. He also bethought himself that

his good friend Turnbull might be just within hearing, and had the presence of mind to call out repeatedly, at the top of his voice, "Turnbull! Turnbull!" Now it so happened that his wife at home felt a little anxious; and the more so, seeing that the dog, instead of being with his master, was lying comfortably asleep before the embers on the hearth. She went out, therefore, to try if she could see or hear anything of her husband, and stood, earnestly watching, on the top of a little hill near the house, when the distant call came upon her ear. In haste she descended, guessing well the nature of the impending danger, and taking the dog to the same spot, she made him stand beside her, gently patting him that he might be still and listen. In a few moments the faithful animal heard—as his mistress had done, and now a little nearer—the well-known call, "Turnbull! Turnbull!" No more was needed: the dog instantly darted off at his utmost speed, and was soon lost to the sight of the trembling wife, who gazed after him, rivetted, as it were, to the spot where she stood. It need hardly be said how thankful the poor man was to hear his bounding step, nor how quickly the cruel enemy fled on seeing his antagonist approaching. Turnbull, however, followed up the chase, and it was some time before he returned, bearing abundant evidence, in his wounded and blood-stained appearance, what a conflict had taken place between him and the wolf, and leaving little doubt that he had been the victor. Another case my dear father related, in which a wolf, taking up a little child by its clothes, was carrying it off as fast as such a heavy load would allow him. The child, just old enough to speak, and possibly having been accustomed to be played with, or even thus carried, by one of the large dogs, thought it very nice, and enjoying the ride, exclaimed in the Irish language "I'm a-going!" repeating the words in a singing tone, until rescued from its perilous situation by its parents, who were in time to follow and bring back their darling in safety. One more instance I remember, in which several wolves attacked one of the Malone family, when returning from a journey on horseback, one dark night. He put spurs to his terrified steed, but the wolves were close behind, and actually made several leaps on to the horse's hind quarters, inflicting severe wounds with their fangs. The traveller just reached his own door, however, himself unhurt, though frightened almost out of his senses, exclaiming to his brother at home, "Oh! James, James, let me in—my horse is ate with the wolves!"

—Jonathan Grubb; Sudbury.

Notes on Birds' Nests.—The following curious instances of materials used by birds in building were noticed by me last year at Ealing.

Pied Wagtail. I took a nest from the top thatch of a haystack. Another pair of these birds took possession of a deserted nest of the robin in an ivied wall: the young were reared.

Blackbird. A nest in a bed of nettles; another composed of dried stalks and leaves of cabbage; another with a considerable quantity of horse-hair in the lining.

Spotted Flycatcher. Fastened to two branches, projecting from the trunk, by a band of coarse cord.

Chaffinch. A nest covered outwardly with curled quill-shavings.

Magpie. Without a dome, though containing four eggs.

Hedge Accentor. A nest built and lined with hay; another composed of sticks about a foot in length, laid crosswise and projecting all round, resembling a *chevaux de frize*; lining red and white cow-hair; in the ivy on a wall.

Blackcap. Lined with the sprigs of a whalebone broom. — *H. Blake-Knox*; *Bartragh, Dalkey, Dublin, March 7, 1862.*

The Manner in which the Cuckoo deposits its Eggs.—In corroboration of what Mr. Cogan states of the deposition of the eggs of the cuckoo (Zool. 7935), I may mention that a few years ago a young cuckoo was discovered in the nest of a robin in an aperture of an old stone wall; there was only one cuckoo as usual, and no young robins. In about a month my friends where it happened were obliged to enlarge the hole or entrance to the nest, to allow the young cuckoo to escape. This bird was watched for five or six weeks by most of the members of the family, and was most attentively fed by its foster-parents, the robins, until it disappeared; but the inhabitants of the house particularly stated that they were always puzzled to know how the egg of the cuckoo had been introduced, as it was quite impossible that the body of the parent bird could have entered. The nest was about four inches from the entrance.—*H. W. Newman*; *Hillside, Cheltenham, March 11, 1862.*

Early Arrival of the Wheatear.—Yesterday, March 7th, I noticed a wheatear on the sea-shore. This is the earliest date at which the bird has been known to arrive at Bembridge. Up to the 5th of the month we had cold easterly winds; on the 6th and 7th it blew a gale, with much rain, from the south-west, the temperature rising more than twelve degrees. With this soft, warm wind came the wheatear.—*A. G. More*; *Vectis Lodge, Bembridge, March 8, 1862.*

Habits of the Crested Titmouse.—On Tuesday last I had the pleasure of observing several crested titmice among some Scotch firs near Craig Lockhart, within about an hour's walk of this city. Their presence was betrayed by their peculiar and incessantly repeated notes; but even after the discovery had been made it was no easy matter to keep the birds in view, owing to their continual restlessness, in which respect, as well as in the amusing variety of their motions, they bore a striking resemblance to the more familiar blue titmouse. They kept pretty near together, and for the first twenty minutes or so after my arrival they appeared to be making but a cursory examination of the trees, constantly flitting from branch to branch, and seemingly obtaining but little in the way of food. At length, without any apparent cause, they all flew off to a small clump of Scotch firs standing alone at a more sheltered part of the hill-side. Whether they had received a signal from one of their number who had been sent out to explore, or whether they preferred the comparative shelter of their new position, it is impossible to say; but at any rate it was evident that they had now found an abundant supply of food, for not only did they confine themselves to one single tree, but they also appeared to be directing their attention almost exclusively to the extremities of the smaller branches, to which they might frequently be seen hanging back downwards, at the same time making vigorous use of their bills. In this manner they were still continuing to employ themselves when I left the spot about half an hour later, after having repeatedly, but in vain, endeavoured to ascertain the nature of their food, by examining such of the small branches as could be obtained. Although I broke these from the same tree, by means of a long stick, the birds were so little alarmed as merely to fly to the opposite side of the tree (which, however, was one of considerable spread), and there remain curiously eyeing me until the interruption ceased. Several hundred yards from this spot I saw two more birds of the same species in a thick hedge. As far as could be ascertained, both of them were females, but so constantly were they in motion that a fair view of them could with difficulty be obtained. One of them suddenly flew out of the hedge, and made several snaps at a

few midges which were enjoying a passing gleam of evening sunshine in a sheltered corner close by. I have either heard or read that the note of the crested titmouse is first heard in March; but the early period of its commencement in the present instance can scarcely be wondered at when we consider the unusual mildness of the season.—*Henry L. Saxby; 54, Gilmore Place, Edinburgh, March 3, 1862.*

Unusual Number of the Grosbeak occurring in Cambridgeshire.—In many parts of this county, as also those of the adjacent counties on the eastern side, this species has been unusually numerous this winter, although almost unprecedented in mildness. Cambridgeshire hitherto has not been a locality in which this bird was by any means common. I am aware it is to be met with annually in various parts of England, such for instance as the New Forest, Hampshire, and particularly at Albury Park, Herts: at the latter place I have known as many as four or five to be bagged at one shot. They used to frequent a row of beech and hornbeam trees, the seeds of which it is particularly fond of. Their stay used to be from the beginning of winter till early in May, after which they were never seen. The grosbeak is excessively wary and shy in its habits.—*S. P. Saville; Dover House, Cambridge, March 11, 1862.*

Food of the Wren.—Mr. Brockholes having replied to my remarks upon the food of the wren, I wish to say a few more words on the same subject. I had no other motive in penning those remarks than to correct what I still believe to be an erroneous statement respecting the food of this little songster. Mr. Brockholes admits that he has never actually seen the wren feeding upon snails, and only supposes that it does so from having seen this bird near the broken shells: I consider such evidence of very little value. I have seen the thrush feeding upon snails scores of times, and this morning watched a pair fetching them out from a laurel hedge in our garden, and breaking their shells on a large stone close by. Gilbert White, in his ‘History of Selborne,’ mentions the fact of thrushes being very useful in gardens, in consequence of their destroying so many snails. As far as I am aware no other British bird feeds upon them; the blackbird may possibly do so sometimes, but I never saw one in the act, and I much doubt if they ever do eat snails in a wild state. I do not think the reference to the raven and blue tit has anything to do with the question: the powerful mandibles of the tits enable them to crack hard seeds, pull flesh to pieces, &c., which the wren, with its slender, feeble beak, could not possibly do; and with regard to its eating snails “peacemeal,” I wish to ask Mr. Brockholes if he can bring forward a single instance of a bird exclusively insectivorous, like the wren, feeding in this way? As far as I have observed they never capture an insect too large for them to swallow entire. I am aware that birds which are partly insectivorous and partly frugivorous or granivorous, like the sparrow, &c., swallow their prey “piecemeal,” but I cannot remember ever seeing a truly insectivorous bird feed in this manner.—*Henry Doubleday; Epping, March 5, 1862.*

Further Notes on the Common Wren.—Some years since I published the following notes on this species. The discussion in the pages of the ‘Zoologist’ has induced me to send you a copy of them. “Is it a fact generally known that the common wren, in sharp frosty weather, will resort, in numbers varying from twelve to twenty, to holes in any places affording suitable shelter? I myself, during a stay in Hertfordshire, have taken from one hole no less a number than twenty, and from others twelve and fifteen. The reason I attribute for so many wrens huddling together is to keep themselves warm. I think they are a very sociable species, or so many could not live in peace, taking for granted that they do. The holes from which I

took the wrens were in the eaves of a thatched sheep-shed in Albury Park, Herts."—*S. P. Saville.*

Notes on the Great Spotted Woodpecker.—I have to thank Mr. Saxby for his interesting notes on the spotted woodpecker, in answer to my inquiry (Zool. 7847), in which I expressed a wish to learn if this species had been similarly numerous in other localities. Mr. Saxby expresses a wish to ascertain the sexes of these birds. I have much pleasure in informing him that the examples which came under my notice were, on the average, three females to one male. I am sorry I cannot furnish the direction of the wind at the time. It was particularly observable that the captures were in every case on the eastern side of the county (Cambridgeshire).—*Id.*

Cuckoo depositing her Egg.—At a meeting of West Riding Consolidated Naturalists' Society, Mr. Halliday wished to bring before the meeting a subject advocated in the 'Zoologist,' respecting the means employed by the cuckoo in conveying her egg into the nest. He read the paragraph in the 'Zoologist' which appeared to support the statement that the egg was first laid by the cuckoo, then taken up by the bill and swallowed, and thus conveyed to and disgorged into the nest of what were to be its foster-parents. Mr. Pickles, of Queenshead, said that as the lark's foot was so formed that it could take its eggs in its claws and remove them from one nest to another, he thought it a deal more probable that the cuckoo might use its foot in conveying its eggs, in preference to using the bill, which he thought was not calculated at all as a means of conveyance of such delicate material. Mr. Heaton, of Halifax, said that he had taken a young cuckoo from a wagtail's nest in a wall, and had to pull the wall down before he could extract the intruder; and he would like to know by what means the cuckoo had placed her egg in that nest. Several theories were propounded, but no new facts were elicited, when Mr. Ellis said that it appeared none of the members present had ever seen the cuckoo deposit her egg, and, as she was a very shy bird, probably they never would: they must be satisfied for the present with the fact that the same instinct which tells her to place her egg in some other bird's nest for incubation, &c., will also teach her the best means of conveying it there.

Note on Sabine's Snipe.—I have for a long time considered this bird to be only a variety or "lusus" of the common snipe. I have had the opportunity of examining several specimens, among them the one noticed in the 'Zoologist' for 1857 (Zool. 5593), killed in Norfolk; and I think almost any one who will read Mr. Salvin's note carefully will be satisfied that it is no species. Mr. Gatcombe says (Zool. 7939), "All sportsmen who have killed this bird remark that it rises without noise." This is not quite correct. Mr. Thompson says, in his 'Birds of Ireland,' vol. ii. p. 277, of two birds shot, one that rose with some common snipes did not "squeak;" the other rose in company with a common snipe and uttered a similar cry, and but for its colour would have escaped, as the colour led the sportsman at first sight to believe it to be a water rail.—*F. Bond; Kingsbury, Middlesex, March 12, 1862.*

Jack Snipe.—It would appear that the jack snipe assumes the same dark plumage, as the variety of the common snipe which has received the name of Sabine's snipe, for I was sporting near Staines, in January of last year, when we flushed a jack snipe which appeared, on the wing, to be quite black. My companion fired at it, but missed. We could not find it again. It was, however, shot in the same field a few days afterwards, and I am sorry to say consigned to the spit. The person who shot it told me the plumage was suffused with brown, and not black as I supposed when I saw it on the wing.—*Id.*

On the Change of Plumage in the Crossbills and Pine Grosbeak. — Even now it appears that it is not quite clear what is the true mature plumage of these birds, and as little seems to be known with any certainty at what ages the change (in the males) from bright red to dull red and from dull red to yellow-green, takes place, and as I have lately turned my attention to this subject, and have had good opportunities of obtaining the old birds in every state of plumage, a few observations may not be uninteresting. Referring to every British authority that I can find, I am led to suppose that the mature plumage in both species is red, in extreme age tinged with yellow; and every coloured figure that I have seen, both of the old male crossbill and pine grosbeak, favours this supposition. But such is not the case: the red plumage is only an intermediate stage, and the full mature dress in the male of both species is bright yellow-green. This is contrary to the opinion of many naturalists; but I can prove it from many specimens. I am, however, pretty confident that none of us know for certain how long the birds wear this red livery, or at what age they assume the mature yellow-green dress. That the red plumage in both species lasts for more than two years, gradually passing from deep carmine to brickdust-red, I feel pretty confident. We may, therefore, describe the change of plumage in the male bird thus:—First, the nest plumage; dark brown, edged with yellow-green, especially on the head and rump, and this seems gradually to change, even before the first autumnal moult. After the first moult, carmine-red (and in this plumage the bird can breed); this colour gradually becomes, by moult and wearing, dull brickdust-red, and eventually yellow-green. I have been lucky enough to see specimens both of the pine grosbeak and crossbill in the mature yellow plumage; but that they are rare may be inferred from the fact that I never, among all the nests of the crossbill that I have taken, have found more than one belonging to a mature male, although I have occasionally shot the old yellow males in the winter in company with the young red birds. In April, 1860, I took a nest of the parrot crossbill with three eggs, the largest I ever saw and the finest coloured, evidently from a very old bird. The plumage of this male was bright yellow-green all over, most vivid on the rump and head, but without the slightest shade of red; the female of the usual gray-green, tinged on the rump with yellow. I can, however, hardly agree with Nilsson that they assume this mature dress at the third moult, else why should we see so few of these yellow-green males in proportion to the red birds? I have never yet seen more than two examples of the mature green pine grosbeak: one was this last winter, in a cage, where he had been confined ten years; he was a red bird when he was caught in the winter, but in the ensuing autumn he changed to bright yellow-green, and since then has undergone little or no change in his plumage: the other was shot in a wild state in Calmar Land, here, in February, 1855; I have the skin now before me, and it is precisely the same as the specimen I saw in the cage; his plumage very much resembles that of the female, but the head and rump are much brighter, and the breast and belly much yellower. There appears to be a more marked difference between these old yellow males and the green females in the crossbills than in the pine grosbeak. I never yet have had the luck to fall in with the pine grosbeak in breeding dress (and this is the only season when we can come to any safe conclusion). Again, with regard to the pine grosbeak, there is, I think another mystery wants clearing up. I never till this winter had much opportunity of studying this bird in a state of nature. It is true that every winter we have a few in our midland forests, but this winter they have been unusually numerous, and about forty specimens have passed through my hands. In the crossbills I observed that the

proportion of red birds of different shades is pretty equal to the green birds (which I suppose are all females, admitting that the young males attain their red plumage at the first moult, for the old yellow male can never by any chance be mistaken for the female in the crossbill); but this is not the case with the pine grosbeaks, for out of all the specimens I have obtained this winter not more than six have been red birds; all the rest have been dull brown-green, more or less shaded on the head, breast and rump with reddish yellow. It is not easy, at this season, to ascertain the males from the females by dissection, but I was lucky enough in one or two instances to do so. Still I can hardly suppose that so near a proportion of these yellow-green birds can be all females; nor do I think, as far as I can judge, that any of them were old males; and from this fact I draw the inference that the pine grosbeak does not attain its red plumage at the first moult, like the crossbills, or else why do we meet with so few red males? It is true that I have had but one winter's experience to judge from, and shall be very pleased if any other practical naturalist will give his opinion. To prove that I am not wrong in what I have written, take for instance the breeding habits of the green sandpiper and the crossbills. In no work on Natural History, either British or foreign, have I ever seen it noticed that this bird lays its eggs in an old deserted nest. Every one, in alluding to its breeding habits, states "that the nest of this species is either in sand or on a bank, or among grass by the side of a stream." Yet here, in a country where this bird is comparatively common (so much so that I generally procure four or six nests every year), I have never by any chance found the eggs otherwise than in an old nest in a fir tree. And, again, in Sweden, which may be called the very hot-bed of the crossbills, no one knew anything about their breeding habits (or if they did they kept it to themselves) till I set them right.—*Mr. Wheelwright, of Sweden, in the 'Field' Newspaper, March 22, 1862.*

Occurrence of the Wild Goose near Penzance.—A specimen of the gray-lag goose was shot a few days since in the marsh between this place and Marazion; and it appears that over a long series of years this is the first occurrence of this species. We have had, especially when heavy frosts from the North and East have driven birds to southern regions, repeated visits of bean, whitefronted and brent geese, and occasionally of bernicles; but I never remember seeing or hearing of any wild geese making their appearance in Cornwall. The character and shape of the beak, being bulkier and more elevated than that of the bean goose, with its uniformity of colour and white nail at the tip, are very striking at first sight; and there appears to be a light blue colour on the lesser wing-coverts and upper tail-coverts which the bean goose has not. The wild goose also has a rim of naked red skin around the outline of the eyes, not apparent in the other species. The bird now under notice agrees precisely with the various figures, excepting that there is a narrow border of white round the base of the bill, not to be confounded with the character of *Anser albifrons*, but rather giving one an impression of an accidental variety, or of its being a bird of last summer's hatching.—*Edward Hearle Rodd; Penzance, March 5, 1862.*

White Specimens of Redthroated Diver and Lapwing.—A few days since I saw a fine male redthroated diver which was perfectly white, with the exception of three or four feathers of a dark shade on the back; the legs and bill white, the former with a few dark markings on them. I also saw an albino of the lapwing. Mr. Wood, the eminent taxidermist, of Vere Street, London, at whose shop I saw the specimens, stated that the diver was shot off the Essex coast, and the lapwing in Ireland. This last bird

is not so perfect an albino as the former, as it has many dark feathers on the wings; the crest, head and body, however, are nearly pure white.—*R. H. T. Gilbert; March.*

Occurrence of the Little Gull in Kent.—Two little gulls were obtained for me on the Kentish coast last month; one was a bird of the first year; the other a very fine adult: they had far advanced towards the summer state of plumage. Four other instances of the occurrence of this gull were recently recorded (Zool. 7939, 7940). To what cause is the simultaneous appearance, in different districts, of these and other comparatively scarce birds to be attributed? The little auk, the hoopoe, and others, seldom occur in isolated instances; but when one is recorded, five or six others usually appear, about the same time, in various parts of the country.—*W. Hammond; St. Alban's Court, near Wingham, Kent, March 7, 1862.*

Puffins in Winter.—I have lately met with no less than eight puffins killed in December, January, February or March, and agreeing in certain peculiarities that I think worthy of notice. In the first place, the fact of their occurrence in winter is remarkable, since it is perfectly familiar to every ornithologist that the puffin arrives on our coast in May, and leaves us in August, after the duties of incubation are over and the young are able to fly. What becomes of these curious birds in winter, I have no means of ascertaining: it is one of those secrets ornithologists have not yet penetrated; and it is on this account we find them so frequently indulging in graceful platitudes, which convey no reliable information; such for instance as the following:—"Before the approach of winter these interesting visitors shun the rigours of our boisterous clime, and retire to the balmy shores of the Mediterranean, or find a still more congenial climate farther to the South;" or sometimes thus:—"As soon as the young puffins are sufficiently strong on the wing to brave the inclemency of boreal skies, they wing their way to the far-distant North, where they congregate in countless myriads, to the astonishment of the intrepid men who venture life and limb in the service of Science." All this is nice writing and agreeable reading, yet regarded from a Natural-History point of view it is scarcely satisfactory. But passing over a branch of the subject on which we are profoundly ignorant, these facts remain: the normal puffin only occurs here in summer, the abnormal puffin only in winter. *Secondly,* The shape of the beak is totally different in the two birds; in the winter bird it is more slender, more pointed, the upper outline much less convex and quite continuous with the outline of the forehead; the lower outline is produced into a conspicuous angle or tooth halfway between its apex and base; of this angle there is no trace in the summer bird. In the summer bird the gape opens beyond the mandibles and almost beneath the eye, terminating in a puckered naked skin of a bright yellow colour. The winter bird is without this extended gape, and totally without the naked skin. In the summer bird the eye is surrounded with a naked skin of bright orange colour; this orange circle or eyelid is entirely wanting in the winter bird. Some slight differences of colour are to be noticed; but these are of less importance than those in the structure of the beak, &c., already described; the cheeks and ear-coverts of the winter bird are smoke-coloured, while those of the summer bird are pure white. It has been suggested that the extraordinary difference in the shape of the beak is attributable to a difference of age; that the winter specimens are invariably young birds, and it is conjectured they have not been sufficiently advanced to accompany their parents on their southward journey. Thus Temminck, in his 'Manual of Ornithology,' vol. ii. p. 933, observes, "Les jeunes de l'année, ont le bec beaucoup plus petit, lisse sur les côtés, depourvu de sillons, d'un brun jaunâtre; l'espace entre l'œil et le bec d'un cendré noirâtre; les joues

et la gorge d'un cendré plus foncé que chez les vieux ; le large collier du cou nuancé, par devant, de cendre noirâtre ; les pieds d'un rouge terne." This is certainly the bird to which I desire to invite attention, but M. Temminck does not satisfactorily state how he has ascertained it to be the young of the common puffin, and it is difficult to conceive that a bird having such a beak as that shown in fig. 1 in February or March should acquire such a beak as that shown in fig. 2 before the breeding season in May, when the beaks of all the individuals breeding on our coasts certainly appear similar both in form and colouring. In the newly-hatched young of the snipe tribe the beak is short and dumpy, but acquires its normal proportions before the breeding season. I ought to add that Brunnich, quite as familiar with these birds as Temminck, describes the winter puffin as a distinct species, under the name of *Alca deleata* (Orn. Boreal. p. 25). The difference in the size and shape of the puffin's beak has not escaped the notice of other naturalists. The late Mr. Stephens, in his continuation of Shaw's 'Zoology,' figures a bird under the name of the northern puffin ; the figure is drawn from a specimen in the British Museum, obtained during Captain Ross's expedition in search of a north-west passage, and labelled *Fratercula glacialis* by the late lamented Dr. Leach. This bird has a larger beak than the common species, and Temminck, who in his Appendix adopts it from Stephens, thus differentiates the two. "Le puissant bec coloré d'une seule teinte ; la grande rosace a l'angle de la bouche ; des nudités

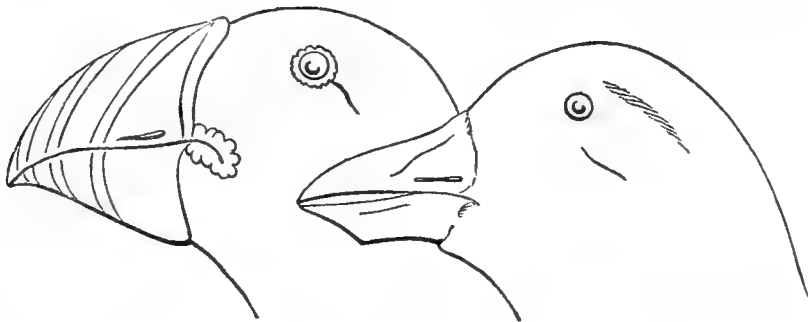


Fig. 2.

Fig. 1.

oblongues au dessus et derriere l'orbite, joints a des dimensions plus fortes, servent de moyen pour distinguer cette espèce de la suivante."—(Temminck, iv. 580.) Gould also, in his magnificent work, 'The Birds of Europe,' part 21, figures it as distinct. Mr. Selby, has, however, some admirable observations, which apply equally to the northern puffin of Stephens and to the winter puffin now under consideration, two birds which seem to depart from the normal or summer puffin in different directions. "I have found the beaks of different individuals on our coasts differ in depth and curvature: in one, which was taken in its burrow, the bill measures one inch and a half in depth, in the other scarcely one inch. In length they are nearly equal, by which the mandibles of the larger-billed bird are made to appear much more convex than the other ; and in the former the keel of the lower mandible is also very strong and arched ; in fact this specimen seems to possess the precise characters and relative proportions of beak of the northern puffin figured by Mr. Stephens." With these quotations and references I must leave the matter in the hands of my friends, but not without expressing the obligation I am under to the editor of the 'Field' and to Mr. Bond for the opportunities so kindly afforded me of examining specimens.—*Edward Newman.*

Occurrence of the Crane at Hartlepool.—Mr. Abbott, a birdstuffer, of Church Street, Hartlepool, has just received for preservation a fine and perfect specimen of the crane. It was seen in an open field near that place and was killed at a distance of eighty yards. This magnificent, ornamental and most docile bird is in all respects adapted for the climate of England, and was formerly so abundant here that Archbishop Neville, as reported in Leland's 'Collectanea,' served up two hundred and four cranes at a single feast. Without asking why an archbishop should have exceeded Heliogabalus in the extent and lavish prodigality of his banquets, we may ask why such a magnificent bird is killed whenever it sets foot on our inhospitable shore. Why should we perpetually seek to verify the satirical remarks of our acerb but truthful poet Rogers, who has said that whenever the sun happens to shine of a morning an Englishman exclaims, "See, here's a fine morning! let us kill something."—*Edward Newman.*

Occurrence of the Egyptian Goose at Alton.—About a month ago, I am not sure of the exact date, as I only heard of the fact yesterday, three Egyptian geese were killed at one shot, on Frensham Pond, about nine miles from here. The one I sent you an account of before was shot at Oakhanger Pond, which is only about four or five miles from Frensham. I know of no one near here who keeps any Egyptian geese, as from four being shot so nearly together one would almost suppose they must have escaped. I have only known of two shot in this neighbourhood before these four, and that was some years ago.—*P. Crowley; Alton, March 26, 1862.*

Occurrence of the Sclavonian Grebe at Halifax.—A female specimen of the Sclavonian grebe was shot on the 17th ult. by Mr. Marchant, at the Victoria Reservoir, Halifax.—*George H. Parke; Stanway Old Hall, Halifax, April 1, 1862.*

Occurrence of the Blackthroated Diver near Scarborough.—A young female bird of this species was found dead, washed ashore on the north beach here, a few mornings since, by a fisherman, having evidently perished from exhaustion. Several little auks and young of the great glaucous gull have been taken on the coast. A few common crossbills were noticed in a small plantation here near the sea, and one killed by a boy with a stone; another, a fine old male bird, was shot on alighting in the Castle Holmes. Birds, on the whole, though, have been scarcer here than usual this winter.—*Alwin S. Bell; Scarborough, March 15, 1862.*

Occurrence of the Manx Shearwater, Thickknee and Crossbills in the Neighbourhood of Huddersfield.—In the month of September last a fine male specimen of the Manx shearwater (*Puffinus Anglorum*) was taken by a boy in a mill-dam, where it had been seen for many weeks; the dam abounded with gold fish. On January 17th a very fine specimen of the thickknee (*Ædicnemus crepitans*) was caught at Toothill, in an exhausted state: it has been preserved by Mr. Williamson. In December last the gamekeeper of Mr. Taylor, Almondbury, shot fourteen crossbills (*Loxia curvirostra*) on Storthes Hall Moor, all in a fine state of plumage: these have been preserved by Mr. Mozley.—*James Varley; Almondbury Bank, Huddersfield, March 15, 1862.*

Birds of Paradise at the Zoological Gardens.—One of the most beautiful and interesting additions to the menagerie of the Zoological Society has just been made, by the safe arrival in the Regent's Park of two living birds of paradise (*Paradisea papuana*). The restricted habitat of these birds, and the dangers and difficulties attending an exploration of their haunts in the unhealthy climate of New Guinea, have hitherto rendered almost hopeless any attempt to procure living specimens of these lovely birds. There are but few instances known of birds of paradise having been kept in confinement,

and it is believed that the bird which died at Windsor about forty years ago, in the possession of the late Princess Augusta, is the only example which had been seen alive in Europe prior to the present arrival. Mr. A. R. Wallace, the indefatigable traveller and explorer of some of the rarely visited islands of the Indian Archipelago, has for some time been commissioned by the Zoological Society to fill up this gap in their collection; but all his endeavours failed to preserve alive some specimens he obtained. By chance, however, and after he had left the neighbourhood of New Guinea, he fell in with two of the much-desired birds, which had been a short time in confinement, and these, under his continued care and attention, were safely landed in England on Tuesday last. The birds are both males. They appear to have suffered little from their long journey, and, excepting that their plumes are apparently but half grown, their condition is as perfect as could be desired. Fortunately they are exceedingly tame, taking food readily from the hand, and displaying their beautiful plumage without showing any signs of fear. A dried skin of one of their brethren was immediately recognised, although at some little distance, and called forth loud and frequent caws, proclaiming their relationship to the Corvidæ, with which family ornithologists have associated them, and leading naturalists to hope that, like their congeners, they may prove hardy and long-lived in captivity. Their manners and customs will form an interesting study.—*E. W. H. Holdsworth.*

Tenacity of Life in an Iguana.—From a letter lately received by me from my brother Gordon, who writes from Quamby, Tasmania, I make the following extract, which I venture to hope may prove beneficial not only to generations of iguanas yet unborn, but also to such of their captors who may not be too proud to avail themselves of a useful hint:—“I have lately procured for you a very fine specimen of an iguana, of whose precise species, however, I am somewhat in doubt. I intended to skin him for you, but was prevented by a very formidable difficulty, *viz.*, I could not kill him! It is wonderful what an immense amount of vitality these creatures possess. He was brought to me struggling violently, with a string drawn round his neck: not dead indeed, but still a very interesting example of suspended animation. I put him into a box, when he became exceedingly savage, hissing and darting at me whenever I opened his prison. First of all I tried to kill him with chloroform, pouring what appeared to be half a dozen times more than sufficient upon a piece of wadding within the box, and then tightly closing the lid. On looking at him some time afterwards, I found that this had not taken the slightest effect, although the fumes were even then quite enough for me. So far from being in the smallest degree stupified, he darted about as actively as before, hissing furiously, with his tongue playing about like lightning. Well! I teased the poor reptile for a while, and then, as he evidently wished to bite somebody or something, I eased his mind by giving him the feather end of a quill pen: he instantly snapped at it, and when I paid him a visit next morning he still held it so firmly in his jaws that I lifted him up by it. What his jaws and his temper were made of I can't say; nor, by the way, do I know whether the bite is harmless; probably it is, but one does not like to try. Finding that he rather liked chloroform than otherwise, I next got a large tub of water, shut the iguana in a box with the lid partially propped open, and placed this at the bottom of the tub, with a few bricks piled upon the lid to keep all fast. And then I thought

I'd got him: but not a bit of it! Drowning seemed to be quite a joke; so after keeping him under water for *three hours and a half*, and finding that it only had the effect of making him rather drowsy, I took him out again, and in two minutes afterwards he was as lively and as fierce as ever. One would suppose that these strange creatures were partially aquatic in their mode of living; and yet it appears that they are always found in hot, dusty places. I have only seen two or three since my arrival, and they were lying in the thick dust of the road. As to the individual in question, as a last resource I jammed him (poor fellow!) head foremost into a pickle-bottle, and filled it up with strong whiskey; so that, however inhuman the proceeding may appear, I have nevertheless the satisfaction of knowing that he died in the best of spirits." A somewhat similar attempt to drown an iguana is related by Mr. Darwin; but this one, if I remember rightly, was a South American species of well-known aquatic habits.—*Henry L. Sarby; 54, Gilmore Place, Edinburgh, March 3.*

A Living Frog found in Coal.—The following is an extract from a letter received on Wednesday last in this city, by Mr. John Russell, from the manager of his Tyr Nicholas Colliery, Cwm Tybery, near Newport:—"Our men in the heading in the rock-vein coal yesterday (March 10), in a fall of coal in the face of the heading, found, in a hole in the pricking, in the top of the coal and in the nine-inch bed of coal, a live frog. The hole was not more $3\frac{1}{2}$ inches in diameter, and this found in the soft holing. There is a slight hollow over the coal where it was found. It began moving about as soon as it was released, but seems larger and more lively to-day. It is kept shut up in clay to exclude the air from it. Now this is two hundred yards below the surface where this little thing was found, and I do not suppose any one can form an idea how long it must have been there. I intend having it kept for you when you return."—(Signed), L. W. Rees. [Mr. Russell is going to send to the Great Exhibition a block of coal between seven and eight feet long, selecting the piece in which the frog was found, the *locus in quo* being exactly in the centre, and the block will be so cut that the frog and its strange domicile will be clearly shown in front.]—*Worcestershire Chronicle.*

Life-sustaining Power of the Toad.—On the 17th of this month, while engaged in superintending the delivery of a cargo of coals, on board the 'Vulture' screw steamer, from Newcastle, I was surprised at witnessing in one of the baskets a large toad, to all appearance dead: this occurred when about 150 tons of the cargo had been weighed, so that the pressure upon the animal in the hold of the ship must have been immense. It was of course very much compressed; but on placing it down by my side, my astonishment was increased, after a few minutes, when, after the gradual inflation of the lungs, the animal made a slight spring forward, and ultimately became as lively as though nothing had occurred prejudicial to its existence. I inquired of the mate of the vessel whether there was a probability of any one on board having thrown it into the hold, and he assured me that it must have been brought with the coals out of the pit.—*H. Davey; 1½, Bridge Street East, Mile End, March 20, 1862.*

Incubation of the Python.—The eggs of the python have proved to be bad. Dr. Gunther has examined some of them, and thinks they were impregnated, but they were in such a state of decomposition *inside* that it is difficult to say positively. After six weeks' incubation the snake came off her eggs to change her skin; she was away from them the whole night. Under these circumstances the experiment is incomplete, but as there was an increase of temperature in the snake of at least 9°

during the whole time she was on the eggs (and at one time as much as 20°), I think there can be no doubt of its being developed for hatching purposes.—*E. W. H. Holdsworth.*

Capture of Tæniocampa leucographa at Lindfield.—I captured two specimens of *Tæniocampa leucographa* on the willows, about a fortnight ago, in company with other *Tæniocampæ*, but have not been successful in meeting with more.—*George Stedman; Lindfield, Sussex, April 7, 1862.*

Pupæ are occasionally killed by Floods.—In the last number of the 'Zoologist' the Rev. E. Horton asks whether "pupæ are killed by floods?" There can, I think, be no question that they are so occasionally; that they are not, however, destroyed in this way so frequently as, at first sight, might appear probable, long experience has convinced me: led by a wonderful and almost unerring instinct, the larvæ rarely descend below the water-mark. I speak now of those which form their cocoons beneath the moss or under the bark of trees bordering on streams, rivers, &c. Through my parish runs a brook, each side of which is fringed with alder, poplar, ash, &c.: one day's heavy rain is quite sufficient to swell this brook beyond its usual bed, and consequently the lower part of the trunks of the trees is frequently submerged. When this is the case a clear water-mark is left on the trees. This is a very bad locality indeed for pupa-digging, but two rare insects, *Cirrædia Xerampelina* and *Eupithecia innotata*, both of which are ash-feeders, occur here, and accordingly I am diligent in my search for the pupæ: it is, I think, both a curious and an interesting fact that, in no single instance, have I ever found one below the water-mark alluded to. It appears to me evident that instinct warns them of their probable fate should they extend their journey too far. It may here be objected that this theory can scarcely apply to those insects which turn to pupæ at the roots of, or under the earth about, such trees. The objection is a plausible one, but twelve years' experience has taught me that pupæ will rarely be found at the roots of trees bordering streams which are ordinarily liable to overflow their banks: the larvæ, in this case, would seem to travel away from the trees, and enter the pupa state elsewhere. Perhaps some observant pupa-digger may be able to corroborate this statement. There will of course be seasons, as at present, when the floods are so unusually high as to baffle the caterpillar instinct, and a height or a place which, in ordinary years, would be quite safe, will then be submerged. In this case I have no doubt whatever that the pupæ are destroyed. Mr. Horton considers that this question may have some bearing on the disputed point as to whether pupæ in confinement should, or should not, be damped. I agree with him. At least it suggests the enquiry. In former years, as Mr. Horton rightly observes, I felt doubtful on the subject, but later experience has convinced me that, on the whole, it is better *not* to damp them. On the supposition that, in their natural state, pupæ require and have moisture, some collectors have felt themselves bound to try and supply it, and, in doing so, have experienced much difficulty in applying it in such a way as, on the one hand, not to give too little, or, on the other, too much. I am, however, most decidedly of opinion that this supposition is incorrect, and is not warranted by facts. In saying this I trust I shall not be thought to speak arrogantly or dogmatically. There is one fact, which every skilled pupa digger must have observed, *viz.* that in the vast majority of cases pupæ are found on the northern or eastern sides of trees, *i. e.* the sides least exposed to rain.

Moreover, so far from the larvæ choosing damp or moist places, the reverse is the case, as every pupa-digger knows. I am so satisfied now on these points that I rarely trouble myself to examine the moss, or dig, except on those sides or in dry places. From these well-known facts I infer, nay conclude, that pupæ in a state of nature do not necessarily require moisture, or at any rate very little. I therefore do not damp them, and am relieved from the difficulties which, more or less, stand in the way of those who do. I acknowledge that some dry up. The best way, in my judgment, to obviate this aggravating result is to keep them in a cool room, and if there be a current of air passing through the room so much the better. I may just add here, that many pupæ dry up through having been injured when dug up, or taken from bark, moss, &c. The slightest touch, especially when recently turned, is sufficient to kill them. In reference to Mr. Horton's second question, "Is the growth of the wings of an insect fresh from the pupa affected by the temperature?" I should say that there can be no manner of doubt about it. It may be proved in the simplest way. Take two perfect insects just emerged, say *H. progemmaria*. Leave one in a cold room, and bring the other down and place it on the chimney-piece in a room where there is a fire. I did this the other day. The one in the warm room expanded its wings in a quarter of an hour, while that in the cold required five hours to complete the operation.—*J. Greene; Cubley Rectory, Doveridge, Derby.*

On the Plan upon which Bees and Wasps construct their Cells.

By EDWIN BROWN, Esq.*

It has until lately been the universally received opinion^r that the hive-bee makes hexagonal cells, owing to an instinctive preference for that form above all others. Many profound calculations have been made, by Lord Brougham and others, to prove that intelligence or instinct has enabled the bee practically to solve the problem of the exact angle which ensures the greatest amount of internal space, co-existently with the smallest possible expenditure of wax.

I am prepared to admit that it is the desire of the bee to produce a commodious cell by an economical outlay of wax; but that the intent of the bee is instinctively to make a cell with exactly six sides, is an hypothesis the truth of which I cannot concede.

Bees, wasps, ichneumons, spiders and all other insects which construct nests, cocoons or cells, whether of paper, wax or silk, attempt in these structures to produce hollow cylinders having hemispherical terminations; and it is only, I believe, when a number of apartments are placed side by side that the hexagonal shape is arrived at. It is not difficult to see the reason for this. The hexagon is the only polygonal form into which an area can be uniformly divided; and it is

* Read before a Meeting of the Midland Scientific Association, April 2.

precisely that shape into which a series of cylinders, composed of any plastic material, would be forced on being subjected to uniform external pressure. In the basaltic columns of the Giant's Causeway, and of other places, we have the reverse operation of contraction; and notwithstanding the many disturbing influences during the cooling down of the once incandescent matter, the perpendicular fissures have separated the basaltic mass into columns, whose sections are mostly hexagonal.

It is a striking and an important fact that no instance has ever been brought forward of a bee of any species making a *detached* or isolated polygonal cell. Whenever wild bees make single cells they are invariably of the cylindrical shape. Hive-bees produce their ordinary comb-cells by the united efforts of many individuals. Owing to this circumstance, and also to their never building up cells at the margins of the combs unflanked by the foundations of other cells, they afford us, when so employed, no opportunity for observing the fundamental scheme upon which they build. Every cell during its progress is impinged upon by six other cells, and, as all progress at the same time, the united attempts of the workers to avoid interspaces, and to expend no more wax than is necessary to the making of firm walls, produce inevitably the hexagonal structure. The royal cells, or cells containing larvæ destined to become queens, are constructed upon the ordinary comb, and at right angles to the other cells. These cells are unconnected with each other, and it is an important fact that they are always cylindrical in shape: but the fact upon which I mainly found my disbelief in the hexagonal type is, that under exceptional circumstances, and where the hexagonal is not the shape that results from a compressed cylinder, *other shapes* are assumed. In the specimens which I now lay before you, examples are to be seen of pentagonal and also of heptagonal cells. This departure from the ordinary type has undoubtedly arisen either from the combs having been founded upon irregular base-lines, or, as in some cases, from the interspersing of large drone-cells among the series of the smaller cells which are destined for workers, and the consequent derangement of what may be called the ground-plan. These examples prove to my mind that bees, so far from aiming at producing a certain number of angles, attempt merely to form cylindrical cells, commodious as to size, and with as little expenditure of wax as possible; and whenever any particular cell impinges upon five, six or seven other cells, the thickness of the intervening wax being kept down to a minimum, the result is a cell with just so many corresponding sides,

and this without any controlling choice on the part of the constructing bees. In one of the pieces of comb submitted to you, there may be observed a large seven-sided cell founded upon the flooring of two pentagonal cells; but as in the course of construction it was found to be too large singly for one grub, and divided it would have been too small for two, it has been abandoned unfinished.

Much, in like manner, has been said and written upon the angles produced by the contact of the bottoms of the two series of cells in each comb; but it will be seen, on examination, that these angles vary greatly according to circumstances; and the peculiar result might safely be predicated on the conjoint action of a large number of individuals working on opposite sides of the comb, and each labouring to produce a form as nearly hemispherical as possible, and with the smallest possible consumption of wax. There is really no greater difficulty in the way of explaining the peculiar shape of the bottoms of the cells, upon simple mechanical principles, than there is in accounting for that of the sides; and it seems to me little less than marvellous how any naturalist can carefully have examined the contents of a hive, cell by cell, without arriving at what I believe to be the correct conclusion, *viz.*, that the primary idea of the hive-bee is to produce a cylindrical cell with a hemispherical base.

At the meeting of the British Association in 1858, Messrs. Lubbock, Tegetmeier and Darwin, in face of numerous opponents, advocated the cylindrical type as that used by hive-bees; but Mr. Lubbock at the same time stated it to be his belief that wasps make hexagonal cells by choice. Mr. Frederick Smith, one of the best authorities in this or any other country upon Hymenoptera, also maintains that wasps work on an hexagonal plan. Certainly either Mr. Smith has been unlucky in the examples selected for examination, or I have been so; for I have never examined a nest of either wasp or hornet without finding abundant evidence that it is only when another line of cells is in process of erection that the cells in the outer ring assume a hexagonal shape. I beg to direct your attention to the exterior rows in the specimens of combs now on the table. You will observe that where the lines have not been laid down for new cells, the outer ring consists of cells whose sections would represent internally three straight sides, and semicircles exteriorly.

Were it not that the admitted instincts of bees and wasps are sufficiently wonderful in their various manifestations, I should feel something like compunction in attempting to disprove the supposed

mathematical powers of these admirable little creatures ; but " truth before all things " should be the maxim of the naturalist.

EDWIN BROWN.

Life-Histories of Sawflies. Translated from the Dutch of
M. SNELLEN VAN VOLLENHOVEN, by J. W. MAY, Esq.

(Continued from p. 7857.)

CIMBEX BETULETI, *Klug.*

Imago. *Hartig, Blatt-und Holzwespen*, p. 70, No. 4.

Larva. *V. Voll. in Tijdschr. voor Nat. Gesch. en Physiol.* 1843,
10th Vol. p. 97, under the name of *C. Lucorum*. *Westwood,*
in Gardener's Chronicle, 1852, p. 68, b and c ; also under the
name of *C. Lucorum*.

Cimbex nigra subnitida, rufo-griseoque villosa, antennis nigris,
tibiarum apice, tarsisque luteis.

In the year 1843 I published a small contribution to the history of the Hymenoptera, in the journal of Professors J. van der Hoeven and W. H. de Vriese, under the title, "On the Larva of *Cimbex Lucorum*," in which the same insect was described as I am now about to treat of in this paper. It is certainly somewhat singular that Westwood should also have described this same insect under the name of *Lucorum* : we may conclude from this how very nearly allied the two species are. I shall refer in the sequel to the specific distinctions between the perfect insects, from which it will be seen that the difference is indeed small. This change of names appears to have arisen from the fact that neither Westwood nor I had sufficient confidence in De Geer, who, in the second volume of his 'Mémoires' (page 232 of the German translation), describes *Cimbex Lucorum*, although, it is true, under the name of *C. Amerinæ*, yet so accurately and clearly that every hymenopterist cannot fail to recognize in his description the perfect insect of *C. Lucorum*. It will be shown from later investigations, and especially the re-discovery of the larva of this last species, which according to De Geer lives on willows, that this author was not mistaken in referring the larva to the perfect insect, but only in his determination after Linneus, who was not acquainted with *C. Betuleti*.

The larvæ of the larger species of *Cimbex* appear to resemble each

other very closely ; so that the life-history of *C. variabilis* given by Rösels, Frisch, Hartig, Ratzeburg, Lyonet, and perhaps other authors, is far from being in a satisfactory state of clearness. It appears to me that these authors have made their observations on more than one species, and I should be much pleased if I could be enabled to reinvestigate this matter, for which purpose I shall be happy to receive contributions of larvæ. As Westwood informs us, the egg is laid in a slit made by the female with her saw in the soft shoots of the hawthorn ; this must take place in May. The larvæ are always of a greenish white colour ; in point of fact the skin is green, but covered as it were with a white powdery dust (see figs. 1, 2 and 3). Until the last moult but one the crown of the head is black, generally covered with a white exudation from the body ; the remainder of the head, from the top of the clypeus downwards, is white. The eyes can be clearly seen inserted in oblong black spots, and below them the little white antennæ. After the last moult but one the head of the larva is bright yellow, with a pretty large brownish orange-coloured spot on the crown, and the spots in which the eyes are inserted have become more circular.

The larvæ are nearly four centimetres long. The six anterior legs are whitish green, very pale, with brown claws, the penultimate joint being broad and somewhat flattened. There are eight pairs of abdominal legs light green, without claws or hooks ; making twenty-two legs in all. A darker green stripe runs along the back. On either side of the body are nine elliptical spiracles, and above each a small round orifice (fig. 6), this latter being the mouth of a duct from which this larva, the same as that of *Abia ænea*, discharges a colourless fluid on being touched. Westwood remarks that in the case of larvæ kept in confinement this discharge of fluid rapidly decreases, and at last ceases altogether. I imagine he must have fed his larvæ on too dry food, although I must at the same time admit that some individual swere rather apathetic as to touching and handling. If the larva is touched too roughly it immediately lets itself fall to the ground. They live until the end of July, feeding upon the leaves of the common hawthorn or whitethorn ; during the day they keep concealed among the foliage, and it is only on the approach of evening twilight that they creep out to feed. My larvæ always made cocoons at the end of July or the beginning of August ; these they fastened to the twigs of hawthorn or between the leaves, sometimes in the corners and on the bottom of their cage. These cocoons were hard and firm, similar to those of *C. variabilis*, but very different from those of *C. Amerinæ*,

which are reticulated. The best-fed and earliest-matured larvæ spin brown cocoons (fig. 7); those which are weaker, and later in attaining their full growth, spin yellow cocoons.

If the cocoons are cut open in March of the following year, the insect is found to be still in the larval state, although having undergone some change. It appears to be about half its former size, and is of a dull yellowish green colour; the head is still yellow, but the crown has become brown in place of orange. The trophi are piceous; below the mouth are seen the six thoracic legs lying close together; the abdominal legs, on the other hand, appear merely as wrinkles (see fig. 8). A short time afterwards, even in the course of the same month, pupæ are to be found in the cocoons; these are shining, dull green, with darker, blackish wing-sheaths; all the external parts are readily seen, and the antennæ, legs and wings distinct from the body, being merely covered with a thin transparent skin; the fluid which is beneath this skin gives a glassy appearance to all the parts; the abdomen is somewhat darker in colour; on the under side the saw of the female can be distinguished.

The imago made its appearance with me at the end of March, having been kept in a moderately warmed room; but I doubt if it is to be met with as early in the natural state. With its great jaws it bit a round piece out of the cocoon in about an hour (a gnawing sound was audible during this operation). When it emerged from its prison the wings were completely unfolded and nearly hardened. Other imagos were produced in the last days of the same month.

The perfect insects are 16 to 18 mm. long, their utmost expansion being 38 mm. They are sluggish animals, requiring the warmth of the sun to induce them either to run or fly. I do not know whether they take any food; I presume they do, as they appear to exist in the perfect state for a month or even six weeks.

The general colour of these sawflies is black; the head is broader in the male than in the female; in both sexes it is black, and clothed with black pubescence on the crown, that on the face and neck being ferruginous. In the male the mandibles are very long and acutely dentate, the eyes large and elliptical, the ocelli disposed in the form of a right-angled triangle on the crown. The antennæ are clavate and entirely black. Westwood states, in the 'Gardener's Chronicle,' and other English authors assert the same, that the antennæ contain eight joints, of which the first two are very short and thick, the third long and narrow, the fourth and fifth shorter and of equal length, the last three forming an ovoid club. I cannot help

thinking that the antennæ are thus described in order to make this insect fit into Leach's division of *Trichiosoma*, one of the six sub-genera into which this author, without any necessity, divides the genus *Cimbex* of Olivier. These sub-genera are founded on differences in the antennæ, the labrum, and the femora; but the characteristics are so uncertain, one form passing into the other, that it is better to abandon these divisions. A proof of this is to be found in the antennæ of our insect, these organs having very distinctly but seven joints, and the fifth joint belonging in some measure to the club; the seventh and eighth joints of Westwood are one joint, there not being even a trace of suture to be seen.

The thorax is shining black, with dense ferruginous pubescence. The legs are black to the ends of the tibiæ, thence reddish yellow. Coxæ and femora clothed with long velvety hairs; in the male the femora of the intermediate and hind pair are spined. The wings have a yellowish tint, which is darker towards the costal nervure; they are black at their insertion; the post-costal, externo-medial and anal nervures are yellow; stigma brownish black; on the outer edge are some smoke-coloured nugæ, which are darker in some individuals than in others. The abdomen is black, in the male elliptical or cylindric, in the female broader and flatter, having in both sexes a ferruginous pubescence at the base and under side, and a gray pubescence on the top (fig. 10).

The saw and ovipositor (represented in profile at fig. 13) have precisely the same general appearance as in the very nearly allied species, *C. variabilis*, the largest of our indigenous species, only there is a difference in the shape of the projections on the edge, which are not mushroom-shaped, but depressed leaf-shaped protuberances, represented very highly magnified at fig. 14. The difference between this species and *C. Lucorum* is but small; the latter is somewhat larger and a bolder insect; and, moreover, in *C. Lucorum* all the tibiæ are red, and only the knee or upper extremity brown. Supposing De Geer's description of the larva to be correct, and not to belong to any other species, then the larva of *C. Lucorum* has no spot on the crown of the head. I hope to be fortunate enough to meet with this larva in our own country; I imagine it lives on the birch.

C. Betuleti is not rare in this country: the larva has been more than once sent to me in some numbers from Utrecht, by Dr. Verloren. I have myself taken it near Leyden. Mr. Dozy met with it at Breda.

Proceedings of Societies.

ENTOMOLOGICAL SOCIETY.

April 7, 1862.—F. SMITH, Esq., President, in the chair.

Donations, &c.

The following donations were announced, and thanks ordered to be given to the donors:—‘The Transactions of the Linnean Society of London,’ Vol. xxiii. Part 2; presented by the Society. ‘Kongliga Svenska Fregatten Eugenie Resa omkring Jordan under befäl af C. A. Virgin åren 1851—1853, Insekter,’ Parts 4 and 5; by the Kongl. Svenska Akademien i Stockholm. ‘Notes on the Generative Organs, and on the Formation of the Egg in the Annulosa,’ by John Lubbock, Esq., F.R.S.; by the Author. ‘The Journal of the Royal Agricultural Society of England,’ Vol. xxii. Part 2; by the Society. ‘Exotic Butterflies,’ Part 42; by W.W. Saunders, Esq., F.R.S., &c. ‘Sitzungsberichte der Königl. bayer. Akademie der Wissenschaften zu München,’ 1861, ii. Heft 2; by the Academy. ‘The Canadian Naturalist and Geologist,’ Vol. vii. No. 1; by the Natural History Society of Montreal. ‘The Zoologist’ for April; by the Editor. ‘The Proceedings of the Royal Society,’ Vol. xi. No. 48; by the Society. ‘The Intellectual Observer,’ No. 3; by the publishers, Messrs. Groombridge & Sons. ‘Catalogus Coleopterorum Europæ auctore H. Schaum, Editio secunda aucta et emendata;’ by the Author. ‘The Athenæum’ for March; by the Editor. ‘The Literary Gazette’ for March; by the Editor. ‘The London Review’ for March; by the Editor. ‘The Journal of the Society of Arts’ for March; by the Society. ‘Stettiner Entomologische Zeitung,’ 1862, Nos. 1—3; by the Society. ‘A List of British Hemiptera (Heteroptera), with Allied Species found in Northern and Central Europe which may be expected to occur in Britain,’ by J. W. Douglas and John Scott; by the Authors. ‘List of the Specimens of Lepidopterous Insects in the Collection of the British Museum,’ by Francis Walker, F.L.S., Part XXIV., Geometrites (continued); by the Author. ‘Naturhistorisk Tidsskrift stiftet af Henrik Kroyer udgivet af Prof. J. C. Shroate;’ by the Editor.

The following addition to the Library, by purchase, was also announced:—‘Rhopalocera Africæ Australis; a Catalogue of South African Butterflies, comprising Descriptions of all the known Species, with Notices of their Larvæ, Pupæ, Localities, Habits, Seasons of Appearance, and Geographical Distribution,’ by Roland Trimen, M.E.S.L., Part I., Papilionidæ, Pieridæ, Danaidæ, Acraeidæ and Nymphalidæ.

Certificates in favour of W. H. L. Walcott, Esq., of 11, Vyvyan Terrace, Clifton, Bristol, and David Sharp, Esq., of 14, Newcastle Street, Strand, as Members of the Society, were read a first time, and ordered to be suspended in the Meeting Room. Certificates in favour of George Robert Gray, Esq., the Rev. T. H. Browne, and Alfred Haward, Esq., were read a second time.

Exhibitions.

Mr. Stevens exhibited a box of Coleoptera and Lepidoptera from the Cape of Good Hope, and a specimen of *Bryaxis Lefebvrei* taken some years ago in the North of England, probably in Cumberland.

Pseudogynous Specimen of Liparis dispar.

Mr. Stainton, on behalf of Mr. Newman, exhibited a pseudogynous specimen of *Liparis dispar*, and read the following notes thereon by Mr. Newman:—

“At page cxi. of the Appendix to the ‘Zoologist’ for 1851 I have attempted to differentiate four classes of phenomena usually comprehended and confounded under the word ‘hermaphrodite’: one of these phenomena I have called Pseudogynism, that is, falsely or imperfectly female. At that time I believed, and still believe, the phenomenon of pseudogynism chiefly confined to endosteate animals, and especially to the ox tribe, in which they are familiarly known as free martins. I have now the pleasure of submitting to your notice a pseudogynous specimen of *Liparis dispar*, being the first instance I have seen of pseudogynism among insects, or indeed among exosteate animals. The sexual characters are most singularly blended; the antennæ are those of a male; the outline of the wings is exactly as in a female; the spotted cilia, so conspicuous in the fore wings, is a female character; the termination of the abdomen is female, and the sexual organs are so completely female that the specimen now exhibited has been united for three hours with a male of the same species; but, although it lived for three days after the intercourse had taken place, no eggs were laid, and the abdomen is hollow, never having contained eggs. I am indebted to Mr. Parke, of Stanway Old Hall, near Halifax, for the opportunity of exhibiting this singular and at present unique illustration of aberration from the usual order of Nature.”

Dr. Wallace remarked that the circumstance of a female moth, in which no eggs had ever been developed, having nevertheless united in copulation with a male, was peculiarly interesting: he had frequently found that insects, whose appearance had been artificially forced by heat or otherwise, had their ovaries undeveloped; but in such cases he had never observed copulation to take place.

Orgyia Ericæ, &c.

Mr. Stainton exhibited a female of *Orgyia Ericæ*, a species not yet found in this country, though possibly it might be expected on heaths in the South of England, being not uncommon in the North of Germany and Belgium. He called attention to the shortness of the legs, and remarked that his attention had been attracted to the insect by a brief notice in the last volume of the ‘Annales de la Société Entomologique Belge,’ that this female did not quit the cocoon. It was well known that the female of *Orgyia antiqua* came out of its cocoon, and that the female of *O. Ericæ* should remain inside its cocoon seemed so extraordinary that he had been led to refer to what had been observed respecting other females of this genus, and rather to his surprise it had transpired that the non-exclusion from the cocoon of the female *Orgyia* was the rule. The earliest notice had appeared in the ‘Annales de la Société Entomologique de France’ in 1832, where Rambur had described *O. rupestris*, and had remarked that the female never came out of the cocoon, but had intercourse with the male through a hole at one end of the cocoon, and then deposited its eggs in the interior of the cocoon. In the ‘Annales de la Société Entomologique de France,’ in 1834, the Count de Saporta had made a similar observation with regard to *O. trigotephros*, and had described very graphically the result of the laying of eggs by the female, remarking that she seemed really to dissolve into eggs, for that after the eggs were all laid there was nothing of the female left, for her remains were so small as to

be hardly perceptible. In the Stettin 'Entomologische Zeitung' for 1858 a German entomologist, of the name of Schmidt, had observed that none of his females of *O. Ericæ* emerged from the cocoon, but not expecting such a habit, and being unaware of any previous similar observations, he had allowed them to remain and to die in their cocoons without any opportunity of pairing with the males. Herr Schmidt had, with true caution, not ventured to announce this anomalous habit as an established fact, but possibly as an accidental occurrence, which, however, rendered further observations desirable. Dr. Breyer, of Brussels, had lately made further observations respecting the female of *O. Ericæ*. But the most extraordinary observation that had yet appeared was in the last number of the Stettin 'Entomologische Zeitung,' where there was an account of the habits of *O. dubia* (a species not uncommon in the South of Russia), by Herr Christoph. The female of that species never left the cocoon; but instead of the male copulating with it through a hole at the end of the cocoon, he went into the interior of the cocoon, and copulation took place there, after which the male came out of the cocoon in a very deplorable condition, and not exactly fitted for a cabinet specimen. Of the six European species of the genus *Orgyia*, of which the females were known, it thus appeared that in four, the female never left the cocoon, the only two in which the female emerged from the cocoon being *O. antiqua* and *O. gonostigma*.

Mr. Stainton remarked that he had not himself had opportunities of observing the habits of the female of *O. gonostigma*, but possibly some gentleman present might be able to speak as to its quitting the cocoon. Looking at the specimens exhibited of *O. Ericæ*, *O. gonostigma* and *O. antiqua*, it would appear that the development of the legs in *O. gonostigma* was intermediate between the other two species; and doubtless the habits of the species, in quitting or not quitting the cocoon, corresponded with the greater or less development of the legs.

Mr. Shepherd stated that he had seen the living female of *O. gonostigma*, and that it did leave the cocoon.

Note on Xenocerus semiluctuosus.

Mr. Pascoe exhibited *Xenocerus semiluctuosus*, one of the Anthribidæ from the Moluccas, and read the following note thereon:—

"I have brought for exhibition specimens of *Xenocerus semiluctuosus*, *Blanch.*, two males and a female. The female differs remarkably from both, but one of the males is in the normal condition; the other is an example of 'dimorphism;' it is, in fact, so very different as to be readily taken for a distinct species. The whole antenna is scarcely longer than the penultimate joint of the normal male, while that joint in the dimorphous male is the shortest, if we except the first and third; indeed, nearly all the joints vary in relative length to an extraordinary degree. The differences between the two forms are generally very striking, and I need not enlarge upon them. Although I have seen specimens with the antennæ shorter than in the normal, and longer than in the dimorphous male, yet, so far as I know, there is a wide interval between the two forms, which, however, it is not unlikely may be filled up. There are four other species of *Xenocerus* known to me, and in each of them this dimorphous form occurs. I have also noticed it in two species of the allied genus *Mecocerus*. That a modification in one or other of some organs occasionally takes place in insects, I have long been convinced. When drawing up the list of *Longicornia* for Sir E. Tennent's work on Ceylon, I was so satisfied that *Olenecamptus serratus*, *Chev.*,

was a modified form of the common *O. bilobus*, *Fab.*, that I omitted it without hesitation; and I think it not improbable that many mimetic forms, especially among the Lepidoptera, are but cases of dimorphism, in some instances perhaps dependant on second broods. In another direction it shows that characters relied on as of the highest generic importance are in some cases not even of specific value."

A conversation on the subject of "dimorphism" ensued, in which Prof. Westwood, Mr. Waterhouse, Dr. Wallace, Rev. Hamlet Clark and Mr. Pascoe took part. Prof. Westwood recollected no instance of dimorphism in the antennæ, though instances of dimorphism in other parts, as *e.g.* the mandibles, had for some time been known; it was not uncommon in insects which possessed a remarkable development, in the male, of some particular organ (*e.g.* among the Lucanidæ, Onthophagi, &c.), to meet with specimens, in other respects of the male form, but which had that particular organ reduced to the female form. It had been suggested in Kirby and Spence that such specimens might be neuters; but Prof. Westwood regarded them rather as specimens whose full development had by some means or other been retarded and left incomplete.

Mr. Pascoe considered that there were many forms differing only in a single character from the characters of the male or female of well-established species, and that such were not entitled to rank as species or even sub-species, but were in fact only a third form.

Mr. Waterhouse thought that, in the division of insects to which reference had been made, it was the rule that three forms existed—the normal male and female, and the third intermediate, neuter or dimorphous, whatever its proper designation might be.

The President exhibited a monstrosity of *Chrysomela Banksii*, captured last season; it had the extremity of the right hind leg cleft into three distinct members, thus giving it very much the appearance of a bird's foot.

The President also, after referring to an exhibition made by him at the previous (March) Meeting of the Society, exhibited a living specimen of *Endophlæus spinosulus*, *Latr.* The insects, which had been captured by Mr. Turner in the New Forest, proved, on further examination, to be the true *E. spinosulus*.

Mr. Smith also exhibited what had been sent to him by Mr. Turner as the larva of *Endophlæus*, but which, in Prof. Westwood's opinion, was the larva of a *Musca*.

Mr. C. Fenn exhibited a specimen of *Laphygma exigua*, beaten from willow-blossoms at Lewisham, on the 24th of March last.

Note on Varieties.

Mr. Fereday exhibited some specimens of the genus *Tæniocampa*, and read the following observations on "Varieties," suggested by the exhibited specimens:—

"At the Meeting of this Society held in August last year, two specimens of Lepidoptera were exhibited by me, which were pronounced by the more learned and experienced of the gentlemen then present to be varieties of *Tæniocampa munda*. Both specimens were taken near Croydon, the one (a male) on the 29th of March, and the other (a female) on the 6th of April last year. I did not feel at all satisfied of their being specimens of *T. munda*, and it was on that account they were exhibited. There seemed to me to be a peculiarity in their form, colour and general appearance, which I could not reconcile with any variety of *T. munda* known to me; and it is rather a singular

circumstance, if they are truly *T. munda*, that I should have taken two insects of that species so much alike, and so widely differing from the ordinary type of *T. munda*, without meeting with one of the ordinary type or of any other description, although I visited the same locality very many nights in March and April.

"I have, however, been able to commence an investigation, which I hope may result in a satisfactory solution, of the ever-recurring question of distinct species and varieties of Lepidoptera,—a solution which seems to me of considerable importance, and to require but little trouble and attention to obtain; and I am surprised that amongst so many lepidopterists so little has been done towards promoting it. The received opinions on the subject are, I believe, grounded upon theory only, and have not been clearly proved to be correct; and it does appear to me that we ought not to accept as a fact anything which may be, but is not, established by direct and conclusive evidence.

"The female taken as before mentioned, on the 6th of April, 1861, produced a few eggs. The eight insects placed in a line below it I propose, for convenience, to call 'the specimens in question.' They are all the insects which I have been able to obtain from those eggs, and it will be observed that they are all, without any exception, as nearly as possible alike in colour, markings and general appearance, and only differ from the female parent in being a shade lighter and less red in colour. The larvæ were precisely similar to the larvæ of *T. munda*, so far as Dr. Knaggs and myself were able to judge by comparison with larvæ of the ordinary type of *T. munda* reared at the same time. Of the character of the male parent I am unfortunately ignorant,—whether it was an insect of the ordinary type of *T. munda*, or similar to the female, or otherwise,—the female having been already impregnated at the time she was captured.

"On the right of the specimens in question is a series of *T. munda*, the three top specimens having been bred (as I am informed by Dr. Knaggs, who has kindly lent them to me for comparison) from the eggs of a female of the ordinary type of *T. munda*, and it will be observed that they vary considerably in colour and markings.

"Messrs. Fenn have also lent me a long series of so-called 'varieties' of *T. munda*, collected by them from various sources.

"On the lid of the box are five specimens of *T. instabilis*, produced this year from the eggs of one female; and these also vary considerably.

"But of all these so-called 'varieties' there does not appear to be any evidence as to the male parents; and a question presents itself very strongly to my mind,—How are so-called 'varieties' produced, and have we any positive proof of their being the offspring of a male and female of one and the same species? I have not carried my experiments sufficiently far to enable me to furnish any decided proofs in answer to this question, and I am sorry that my departure to New Zealand will prevent my following up the experiments to any definite conclusion; but my friend Dr. Knaggs has kindly undertaken, although not holding similar views to mine upon the subject, to continue them, and is now feeding a quantity of larvæ produced from eggs which I have been fortunate enough to obtain from one of the specimens in question, after her copulation with her own brother. If these larvæ produce insects all alike, and similar in colour and markings to their parents and to the other specimens in question, I think it will afford a strong argument, in the absence of positive proof to the contrary, that what are called 'varieties' are in fact hybrids, the produce of the union of distinct species, and for the following reasons, *viz.*, — If the assumed fact, that from the

union of a female of any particular species with a male of the same species a variety of that species may be obtained, is correct, how would the absence of variety in this instance be explained? The specimens in question are said to be a variety of *T. munda*, a species described as particularly variable; and yet here would be a case of two generations in which no variety was produced. If it is said that the tendency of a variety of a species may be to propagate an offspring bearing its own type of colour and markings, then how is a species to be distinguished from a variety? But it may happen that the larvæ in question, now in the course of being reared, may produce a variety of insects. In that case the fact of the existence of varieties will be proved by the result of actual experiment, instead of resting, as I apprehend it now does, upon theory only. To prove that so-called 'varieties' are varieties and not hybrids, I contend that it is not sufficient to prove their descent from a particular female, but there must be evidence of the male parent having been an insect of a precisely similar type to that of the female parent, because, if the male varied from the female, the very question upon which I raise an issue is again involved.

"I shall be glad to know if any one has actually obtained varieties of any species of Lepidoptera from an union, which they have been able to prove, between a male and female of one and the same species and type. I do hope that some of the gentlemen here present will try the experiment. My desire is to obtain actual and positive proof, the only ground upon which received facts in any science ought to stand.

"I make these observations with all due deference to the opinions of those who have more experience and knowledge than myself, and shall be only too happy to be corrected by them in any error I may have fallen into upon the subject.

"I should observe that the specimens in question are not in such good condition as bred specimens usually are, in consequence of their having been kept for some time in the cage for the purpose of obtaining eggs; and I may also observe that their larvæ were some of them fed upon sallow and some upon apricot, and that so far Mr. Gregson's statement, as to creating varieties of insects by feeding the larvæ on different kinds of plants, is not borne out."

Note on Argynnis Cybele and A. Aphrodite.

The Secretary read the following paper, by Mr. Walker, "On *Argynnis Cybele* and *A. Aphrodite*":—

"I have received from Mr. Edwards, of Newburgh, U.S.A., a form of *Argynnis* allied to *Cybele* and *Aphrodite*, which throughout this communication is spoken of as No. 1. I wish to lay before the Society an extract from a letter addressed to me by Mr. Edwards, which has some reference to the geographical distribution of species or of varieties. Mr. Edwards writes as follows:—

"I have not a doubt of there being in this region three allied species of *Argynnis*. I have had before me a large number of *Cybele*, and of the No. 1, from many localities, and I have taken both myself in large numbers. The true *Cybele* is the common species of the Southern States and of New Jersey. In the vicinity of Newburgh, sixty miles north of New York, I find about as many of No. 1 as of *Cybele*. In the Catskill mountains, fifty miles north of Newburgh, I took during last summer only eight specimens of *Cybele*, while No. 1 was extremely abundant. From Connecticut and Massachusetts, from central New York and Canada West, all I have received have been No. 1. In a long series of both species the differences are constant and the distinctions plain. *Cybele* is larger, duller fulvous, and the fulvous is

not uniform, being lighter towards the hind margin and darker next to the base. The under side of the hind wings of No. 1 is of a rich cinnamon-brown, and the space between the two outer rows of silver spots is always, so far as I have seen, encroached on by the cinnamon colour. In Cybele this space is unclouded and immaculate, and the basal colour is quite another shade of brown. The silvering of No. 1 is very decided on the costa and on the abdominal margin. Kirby's description of Aphrodite applies to No. 1. The figure in Westwood's 'British Butterflies' is that of No. 1, and so is the description. Gosse, in his 'Canadian Naturalist,' p. 229, 261, speaks of two species as common, and which he had at first confounded. I do not think that No. 2 is common in that part of Canada; I only took thirty specimens last summer, though I looked for it carefully. This was in the Catskill mountains, and the next locality from which we have it is among the Green mountains of Vermont, and then the White mountains of New Hampshire; so it seems to be a mountain species in this latitude.'

"A. Cybele is much more different from Aphrodite than the latter is from No. 1, and it seems to me that the three will be generally considered as forming only two species, though some entomologists will describe them as three species, and others will maintain that they are only three local varieties, and that No. 1 is the transition from Cybele to Aphrodite. All the specimens in the British Museum are Cybele and Aphrodite. I have placed No. 1 in the Museum for inspection; it was forwarded to me by letter, and is consequently much injured."

Mr. F. Moore exhibited a collection, contained in fourteen drawers, of Asiatic silk-producing moths, illustrated with specimens and figures of their several transformations, and samples of the various raw and manufactured silk. Mr. Moore also read a paper on those insects, in which he enumerated the whole of the Asiatic silk-producing moths known to him, with remarks on their habits, localities, cultivation, and the quality of the silk produced. He also gave the characters of a new genus (*Caligula*), and described a new species of *Neoris* (*N. Huttoni*, *Moore*).

Proposed Restoration of Obsolete Names.

The Secretary read a paper by Dr. H. Schaum, "On the Restoration of Obsolete Names in Entomology," in which the author assigned the reasons which induced him not to adopt the names of Stephens and Marsham for many Coleoptera which continental authors had not been able to identify, but which the researches of Mr. Waterhouse had shown to belong to species known on the Continent by names posterior in date to the English authors'. Dr. Schaum contended that the law of priority of nomenclature was applicable, or at all events that a once-current name was to be dropped and an older one restored, only when the publication of the earlier name was accompanied by such a description of the insect as would give another entomologist a reasonable probability, or at least some possibility, of recognizing the species from the description. A description which did not come up to this standard was no description at all, and names accompanied only by such nondescript descriptions were in fact mere catalogue names, not entitled to priority.

Mr. Waterhouse, Prof. Westwood, Mr. Stainton, the Rev. Hamlet Clark and the President combatted the views of Dr. Schaum, and argued in favour of the law of priority of nomenclature as now received in this country. It seemed to be considered that Dr. Schaum's views were good in theory, but bad in practice; that it was impos-

sible to say where the line should be drawn between descriptions which did and those which did not entitle a name to priority; that what one entomologist would consider to be a good description, by another would be considered faulty and untrustworthy; that what in one age was a sufficient description became in a subsequent age insufficient, from the discovery of new species, and other reasons; that the consequence of a strict application of Dr. Schaum's rule would be the immediate abolition from our lists of all or most of the Linnean and Fabrician names; and lastly, that Dr. Schaum had in some degree shown the impracticability of his rule by himself not having acted up to it. In reference to some criticisms, contained in the paper on the descriptions in Stephens' works, and in Mr. Hope's paper on *Coccinella* in the 'Zoological Miscellany,' Prof. Westwood remarked that Dr. Schaum appeared to have forgotten that Stephens described his genera in two ways—*first*, a few words of description to each genus, pointing out the principal characters; *secondly*, a synoptical table of the genera in each family, wherein the most minute characters were noticed. As to Mr. Hope's descriptions, he might mention that the paper on *Coccinella*, as published, was a mere abstract of what Mr. Hope wrote; he knew it to be a fact that when the paper was written it was, for some reason or other, inconvenient to give it at length in the 'Zoological Miscellany,' and the elaborate descriptions of Mr. Hope were cut down to the meagre half-dozens of words which had incurred the censure of Dr. Schaum.

A new Part of the 'Transactions,' Vol. i., 3rd series, Part I., was on the table, ready for distribution among the members and subscribers.—*J. W. D.*

Note on a Species of Œstrus.—At the March meeting of the Northern Entomological Society, Mr. B. Cooke described a fly (taken by Mr. James Cooper, during the summer of 1854, in Perthshire), under the name of *Œstrus biangulatus*. At that time Mr. Bracy Clark said that this insect was parasitic on the reindeer. He had, however, lately been informed by Mr. Haliday that "It is stated in the 'Transactions' of the Zoological and Botanical Society of Vienna, 1858, pp. 385—414 and 449—470, in a paper by Brauer, giving much information on the natural history of the known European *Œstridæ*, and adding five new species to the sixteen known before, that the female of *Cephenemyia* is viviparous; *C. Trompe* is the species appropriated to the reindeer; *C. pecta* and *C. rufibarbis* to the red deer; *C. stimulator*, which I believe your specimen belongs to, probably to the roebuck, and that it is the parent of the faecal bots in this animal." Mr. Cooke said that if this is the fact the insect is indigenous to this country, and any collectors visiting Scotland should look out for specimens.

Sugar and Sallows.—As it may not be known to many that the "sugar-bait" can be advantageously used when the sallows are in or near their bloom, I send you the result of an experiment which quite exceeded my expectations. On the 3rd instant, finding that the sallows in my favourite locality were very backward, although others not far distant were in full flower, I adopted the expedient of "sugaring" the trees near at hand, which were soon crowded with hibernating *Noctuæ* and *Orthosidæ*. Whilst busy boxing *Tæniocampa munda* I was joined by my friend Mr. Birks, who had been unprofitably examining the sallows. We remained together, and during the

evening took twenty-nine *T. munda*, besides other things. The following evening we took twenty-two of the same species in like manner. Other evenings have been nearly as productive. I think the above is worthy of notice, as in previous years, when only the fallows have been searched, the capture here of one or two *T. munda* was considered satisfactory for one evening. It would therefore seem to be worth while trying "sugar" for some of the rarer species of this family out at this season.—*R. Anderson; York, April 17, 1862.*

Errata in "Notes on the Entomology of the Isle of Man."—P. 7896, line 20 from top, for Holiman read Holmian; line 10 from bottom, for Nortto read North; line 6 from bottom, for pretty read petty. P. 7921, line 11 from bottom, for yeild read yield. P. 7922, line 6 from top, for emptying read untying.

Hymenoptera and Diptera.—I take the liberty of reiterating my earnest entreaty that entomologists will kindly capture and preserve what Hymenoptera and Diptera come in their way when in pursuit of the more popular and attractive Lepidoptera and Coleoptera. I have been occupied very frequently during the winter in arranging and naming my specimens, greatly assisted, as far as regards bees, &c., by Mr. Smith, of the British Museum; and I trust before long not to have a single specimen unnamed.—*Edward Newman.*

Young Badgers.—So little is known of the breeding habits of some of our native quadrupeds that a notice of the reproduction of the badger may be acceptable to the readers of the 'Zoologist.' On the 14th of last month, at the Zoological Gardens, Regent's Park, were born four little badgers. They were produced alive, but unfortunately shared the fate of so many animals born in captivity: they were all killed by the mother in the course of a day or two. Their average weight was just three ounces. The measurements of the largest of the litter were—Extreme length 7 inches; length of the head $1\frac{3}{4}$ inch; length of tail $1\frac{1}{4}$; height at shoulder $2\frac{1}{2}$ inches. These young animals were born blind, but well covered with short grayish white hair, the two dark facial stripes being faintly marked. The anterior limbs were very stout, larger and apparently better developed than the posterior. The head was not so much elongated proportionately as in the adult, and altogether there was a striking resemblance between these little badgers and the newly-born polar bears, except in size, the bears being nearly double the length of the badgers. The structural affinity between these animals would lead one to expect a close correspondence in their breeding habits, but such does not appear to be the case. The young badgers were not remarkably small, and the mother showed no loss of appetite either before or after littering, as has been observed in the black, brown and polar bears. The time of year at which the badger brings forth, although early, is more in accordance, than in the bear tribe, with our ideas of the general breeding season; but it must not be forgotten that captivity and its attendant annoyances often materially affect the reproductive habits of all wild creatures. The essential differences between the bears and badger in this respect cannot, however, be due to confinement, but must be considered as characteristic distinctions. In 1852 a badger was born in the Gardens so early as the 20th of February. I have not been able to ascertain the period of gestation.—*E. W. H. Holdsworth; 18, Osnaburgh Street, April 10, 1862.*

Concerning a Dormouse.—On the 3rd of January, when in search of ferns, a lad who accompanied me, seeing a nest on the ground picked it up; it proved to be that of a dormouse, probably taken from a neighbouring thicket by boys, and thrown away under the impression of its being an old bird's nest; but the mouse apparently had been undisturbed by the rough handling, though the nest was in a disordered and ragged state. When brought into the house it was placed in a common bird-cage, being still in a deep slumber, but on removal to a warm room it soon began to stir itself, springing about the cage in the most agile manner, running up the wires with the greatest ease imaginable. When handled it made no attempt to resent the liberty. After perambulating the cage for awhile with a view to escape it became reconciled to its prison-house, settling quietly down, and ere long relapsing into its usual state of torpidity. It was fat and sleek, notwithstanding its long fast. On the 4th of March I carried it to have its photographic likeness taken. Though a frosty day—shortly after removal from the box compartment of its new cage—I perceived that it had slightly uncoiled itself, though held in a cold hand, and on reaching the photographer's I found that it had so far relaxed as to have assumed a semicircular form, not unlike the sign of the "Golden Fleece," and as inanimate too, and, its eyes being closed, a partial observer would have pronounced it dead, but it breathed nevertheless, and might, by an attentive ear, be heard to emit a faint and plaintive note, rather than a squeak or snore. Possibly the warmth of hand or room may have led the mouse to dream of verdant spring, hazel woods and absent mate. Though not weighed, I feel confident that it has fallen off in condition during the two months it has been in confinement; not that it could have fed had it been at liberty, seeing that it has been in a constant state of torpor. Shelled nuts and other food were provided for it, but nothing having been touched there is reason to doubt whether it feeds at all during the winter months, notwithstanding all that has been advanced to the contrary. For instance, Macgillivray says, "And rolling itself into a ball it falls into a state of torpidity, from which it is now and then aroused by an unusually mild day, when it partakes of its provision." If such be its habit, why are we not informed how and where it stores its food? When and by whom observed quitting its nest for the purpose of feeding? Mr. Salmon (quoted by the above author) states, "that it experienced no difficulty in either ascending or descending the polished backs of the chairs." But unless the backs of the chairs were greatly inclined, I do not see how a footing could be obtained, but as he says that "on being set at liberty it sprang at least two yards on to a table," I conclude that it ascended and descended the backs of the chairs in a similar manner. Up to this time (30th of March), the mouse had been in a profound sleep, but before daylight it left its box and entered the cage, the rotatory motion of which was heard for some time. It has eaten some barley and bread crumbs during the day, and all its natural functions are restored. March 31. In the morning it was found sleeping, partly coiled up, head downwards. It has been very sluggish both yesterday and to day, but its sense of hearing is very acute, raising its head at the slightest noise or whistle, and peering up at one with its large and prominent black eyes. April 1. At 9 A. M. found that the little animal had worked its way into the centre of a mass of cotton wool, so as to be completely concealed. At half-past 3 o'clock it was still sleeping, but on the cotton being moved it awoke, shook itself and resumed its nap. 2nd. At half-past 8 A. M. found the mouse snugly ensconced amid the cotton, looking like a ball, except that the head protruded somewhat; it was awake, however, and appeared to be eyeing me. At 10 P. M. it was sleeping on its side, partly rolled up. 3rd. At 8 A. M. on

removing the cotton covering, it appeared to be in a deep sleep, and at 2 P. M. was still sleeping; towards night it awoke, but did not stir. 4th. At 9 A. M. it was sleeping as before, and at 3 P. M., finding that it had neither moved nor touched its food, and thinking it might be ailing, I took it into my hand; it was stiff and cold and apparently dead, but on removal to a warm room—where it was also exposed to the sun—it gradually revived, but on attempting to run it went spinning round, owing possibly to its having one eye closed. It seemed stupified, however, knocking itself against the wall, window, &c., rejecting nuts and other kinds of food. 5th. At half-past 7 A. M. was still alive, but in a very weakly state; on being taken to the fire it recovered a little, but took no food till it had slaked its thirst; it drank long and deeply, and in the course of an hour or two it began to feed, taking up part of a nut in its fore paws like a squirrel. 6th. At 9 A. M., as usual of a morning, it seems chilled and cramped: one eye is partially closed, and it is evidently suffering from a cold or chill, but it has fed well during the day. 7th. It is much improved, and has consumed several nuts. 8th. It is lively and well, both eyes clear and bright. Though held in the hand for some time, while being examined and measured, it did not attempt to bite. 9th. At half-past 12 A. M. found it running about the cage. I had previously observed that it was more lively and inclined to feed at night, and think it may, like the common mouse, be nocturnal in its habits. Its full and prominent eye seems formed for catching every ray of light. Though restored to health it is still sluggish, sleeping the greater part of the day. On the 29th of March, its having been removed from an empty room to a sleeping apartment may possibly have caused it to wake up somewhat earlier than it otherwise would have done. A slight description may not be unacceptable. Sex, female. The back is yellowish brown, with a grayish tinge, it being covered with long black hairs, interspersed with white. Between the ears there is a darker shade, defining the forehead, which, as well as the cheeks and ears, is of a bright reddish brown. The mystachial bristles black. The centre line of the back and upper part of the tail are a shade or two darker than the rest; under part of tail of a yellowish gray. Chin light yellowish brown. Neck and breast of a pure white. The rest of the under parts reddish brown, but lighter towards the sides. Forehead bowed. Nose pointed, and of a flesh-colour. Ears rounded and very open. Eyes large, black, prominent, obliquely set. Legs short, flat and very muscular, of a reddish flesh-colour; paws large; toes very long, except the thumb, which is rudimentary, and nailless. Total length, $5\frac{8}{10}$ inches; length of tail, hair included, $2\frac{8}{10}$; width of tail, $\frac{3}{10}$; head, 1; ear, $\frac{3}{10}$; mystachial bristles, $1\frac{2}{10}$; longest toe, $\frac{3}{10}$; hind paw to end of claw, $\frac{11}{20}$, and $\frac{3}{10}$ in width; to first joint of leg, $\frac{7}{20}$, and $\frac{5}{20}$ in width. Its invariable position, except when in action, is a sitting one, with the back much curved, and the tail brought round the body. Though timid it never attempts to escape.—*Henry Hadfield; Ventnor, Isle of Wight, April 9, 1862.*

Early Arrival of Migratory Birds.—The mild weather which has prevailed during the greater part of the month of March seems to have had its influence on the movement of the migratory birds, if we may judge from the following dates observed at and near Bembridge. March 7. Wheatear; a single bird on the shore. March 18. Chiff-chaff; numerous. Also a fresh flight of wheatears and many titlarks on the shore. 18th. Swallow; one seen at Sandown. 28th. Wryneck; several times heard. 29th.

Redstart; a single male seen. Wheatears and chiff-chaffs numerous. 31st. Sandmartin; one off Bembridge Harbour. Though most of these have at different times been noticed in March, I believe the occurrence, at this early date, of no less than six of the summer birds of passage in one locality is very remarkable.—*A. G. More; Bembridge, Isle of Wight, April, 1862.*

Protection of Small Birds.— In the same way that it is found necessary by law to protect the workers in mines against their own folly and carelessness, by rendering the use of an unguarded light an indictable offence, it is no less important, at the present time, that some steps should be taken to stay the cruel and suicidal practice of many agriculturists of destroying indiscriminately our small birds, by means of poisoned wheat. Had we not the express warning before our eyes of the inevitable result of such a system, in the frightful ravages of insect life on the Continent, to abate which, at the present time, the most stringent laws are now being enforced to stay the slaughter of the “farmers’ friends,” the slightest reflection must convince any one, capable of reasoning power, that the wholesale destruction of one class of God’s creatures, purposely designed by their Maker to fill an appointed place in the order of Nature, must destroy that wonderful balance observable in the animal kingdom, by which the necessities of each particular class are made available to keep down the excess of others. The hawks and the owls prey on the surplus of the feathered tribe and the smaller vermin that infest our homesteads, and but for the almost total annihilation of the former by keepers, on account of the game, the large flocks of finches and other small birds would be thinned in a far more natural and legitimate way than by the arsenic and strychnine of the secret poisoner. To the small birds also, in their turn, is assigned the task of keeping down the teeming myriads of insect life which threaten, but for such intervention, to render the land a barren waste; and though man only too effectively can devise the means of exterminating the feathered tribes, where will he find a substitute for those little microscopic eyes that pry into every bud and plant and crevice, and pick up millions of little atoms from the soil, too small for human vision, yet terrible in their numbers. If, then, their allotted work throughout the universe is one of such immense importance, may we not consider them entitled, in return, to some portion of that grain they, and they only, have preserved to our use. We admit it is often a vexatious sight for the farmer to see the long rows of empty ears skirting the fences of his wheat and barley fields; but if the hawks are not with us to do their work, the gun, the snare, the net and the clappers will at least avail as much as they ever did before the reckless system now in vogue caused wholesale massacres in every county. The ‘Stamford Mercury’ states that at Spalding and Holbeach men have appeared on market days “with hundreds of linnets, finches, sparrows, and other small birds (which they have poisoned) strung round them like beads, as trophies and an advertisement of their odious calling.” The editor of the ‘Cambridge Independent’ also says:—“We saw on Thursday morning a labourer in Chesterton fields throwing poisoned wheat broadcast around the hedges and trees,” and that “one chemist alone in Cambridge prepares two bushels per week of wheat mixed with strychnine for the destruction of the harmless and beautiful feathered tribe.” Hitherto the poisoning has been apparently confined to the autumn and winter months, when old and young birds frequent the growing corn, or seek subsistence during frost and snow from the stores of grain in barns and stack-yards. Now, however, it is continued during the spring, with no doubt the stupid and short-sighted notion of destroying the old birds before breeding commences. Have these wisecracks never reflected that all our resi-

dent grain-eating birds are insect-eaters too, and that a large proportion of them subsist on insect food alone as long as they can obtain it? and when, we would ask, is insect life so destructive as in spring and summer, when our fruit trees are blossoming and the grain is young? No sooner is the warmth of the sun felt, after months of dreary winter, than the land teems with insect forms innumerable, which threaten, unchecked, to destroy all vegetation; but soon an all-wise Providence supplies the needed antidote, in the gaping mouths of hundreds of unfledged nestlings waiting the return of their untiring parents. The tender stomachs of these little creatures admit of no less digestible food than insects, grubs and caterpillars, and these, in numbers far beyond the powers of calculation, relieve their wants and save the farmers from inevitable ruin. We are sorry to own that this abominable practice is only too common in our own county; and whilst we feel it our duty thus to call attention to the subject, we trust that those in authority, who are capable of judging of the inevitable result, will bestir themselves to compel the ignorant and the thoughtless to desist from the perpetration of an undoubted crime.—*Norfolk Chronicle, May 5, 1862.*

Birds killed by flying against a Clock.—I have to record a circumstance in connexion with the migration of birds which, I believe, is not common in this locality. On Saturday morning, the 26th of April, a youth of the name of Rutter resorted to St. Mary's Church, Devizes, to ring the six o'clock bell, and on arriving at the building he discovered at the base of the tower from twenty to thirty small birds lying on the ground quite dead. The plumage of all of them was in fine condition, but some of the bills and heads were much damaged, apparently occasioned by a blow. Birds of passage usually travel at night, and in the present instance it may fairly be assumed that these little creatures were making their journey toward some favourite spot selected for their summer residence (for birds return every year to their former haunts), but coming in view of the illuminated clock on St. Mary's tower, they may have dashed against it with such force that they fell to the ground and were killed by the concussion. Several instances are recorded in ornithological works of birds coming to this country having dashed themselves against light-houses and other buildings on the sea-coast, but I never remember to have seen an account of birds having done so in inland towns, and I am unable to account for their having done so in the present instance, except from the extreme darkness of the night, or probably they hoped to escape a very heavy hail storm which occurred, which might have happened at the time of their arrival in Devizes. I have been favoured with a sight of three of the species so found, for which I am indebted to Mr. James Randle, builder: these were the reed warbler (*Sylvia arundinacea*), the grasshopper warbler (*S. locustella*) and the wryneck (*Yunx torquilla*); some numbers of the latter species had been seen in Wiltshire, where they are known as "the cuckoo's mate," nearly a fortnight. I regret to find that the lad Rutter set no value on the birds, and that he gave about twenty of them to the cat: I am informed that several of these differed considerably from those above named, and no doubt were of different species. Mr. Grant, of this town, intends to preserve the four birds which have been saved from the jaws of the voracious cat.—*John James Fox; Devizes, May 8, 1862.*

The Nightingale's Nest.

By the Rev. ALFRED CHARLES SMITH, M.A.

THERE is a tradesman living in this neighbourhood who is extremely well acquainted with the habits and notes of the whole family of warblers, and professes to have so accurate an ear as to distinguish the several species readily by their voices when they are hidden from his sight, but has devoted more attention to the nightingale than to any other of our British songsters, and has been more successful many consecutive years in rearing the young of that bird from the nest, and, by means of very carefully and judiciously prepared food (concocted of a variety of materials, which, when pounded together are meant to resemble, as nearly as possible, in all essential particulars, artificial caterpillars), has been enabled to preserve his melodious pets in full health and song throughout the winter.

I mention these particulars in order to show that he is no tyro in the art, nor a superficial observer likely to be deceived; indeed his manner in relating the following incident proved him to my satisfaction to be extremely cautious in coming to a conclusion, painstaking, accurate and business-like in satisfying himself on the point he was investigating, qualities of superlative value in the enquiring naturalist.

The circumstance which he described to me, and which I consider so remarkable as to be worthy of notice in the 'Zoologist,' is the discovery, on two occasions, of a strong thorn projecting upwards in the centre of the nightingale's nest, than which one can scarcely imagine a more uncomfortable and inconvenient intruder, and the object of which is extremely difficult to fathom. The one nest was at the bottom of a thorn bush, not upon the ground, but within six or eight inches of it, profusely garnished with beech leaves, and from the very centre a large and sharp thorn protruded through the bottom of the nest: when discovered it contained four newly-hatched young, which my informant subsequently reared, and which he describes as lying on either side of the thorn. The other nest was placed in the middle of a thick bush, not a thorn, but of what species he did not recollect, about three feet from the ground: it was a large nest, of somewhat loose workmanship, and, in like manner, a long thorn, or rather, in this instance, pointed stake, issued through the nest, projecting upwards above the top. In both cases there could be no mistake about the matter, for each nest was easily examined, tolerably neat and tidy, and the presence of the intruding thorn clearly not a matter of accident,

but design. What then can have been the motive in the builders of the nest in introducing so awkward a central pillar? Could it be (when the nest was not placed on the ground, as I believe is the more ordinary custom of the bird) in order to strengthen and consolidate so fragile a cradle, as a mast, to which the fibres should be tied? Yet no other bird, as far as I know, finds such support needful, or is in the habit of adopting so clumsy a device.

I at once sought for an explanation of this singular fancy in the pages of Hewitson, Yarrell, Selby, Bewick, and other standard works which I have at hand on the nesting of birds, but I do not find the projecting thorn alluded to by any of them; and yet, on farther investigation, the fact elicited by the observation of my informant, had been (though totally unknown to him) recorded by some of our poets from the sixteenth century. Thus I find Shakspeare, with that wonderful accuracy with which he delineates every subject he handles, and not the least so when he touches on Natural History, singing in the sonnet of the "Passionate Pilgrim,"

"Every thing did banish moan,
Save the nightingale alone;
She, poor, bird, as all forlorn,
Lean'd her breast up-till a thorn,
And there sung the dolefull'st ditty,
That to hear it was great pity."

And, again, in the "Poem of Lucrece,"

"And whiles against a thorn thou bear'st thy part
To keep thy sharp woes waking."

Again, Giles Fletcher, who wrote in the early part of the seventeenth century, says:—

"Tell me, sad Philomel, that yonder sit'st,
Piping thy songs unto the dancing twig,
And to the water-fall thy music fit'st.
So let the friendly prickle never dig
Thy watchful breast, with wound or small or big,
Whereon thou leanst."

And again,

"The bird forlorn
That singeth with her breast against a thorn."

And Pomfret, A. D. 1667—1703,

“ The finest music of the grove we owe
 To mourning Philomel’s harmonious woe ;
 And, while her griefs in charming notes express’d,
 A thorny bramble pricks her tender breast.
 In warbling melody she spends the night,
 And moves at once compassion and delight.”

And Hood, in the same strain,

“ Come let us set our careful breasts
 Like Philomel, against a thorn,
 To aggravate the inward grief
 That makes her accents so forlorn.”

Thus it was evidently believed by the poets, whether such an idea was founded on fact or not, that the nightingale leaned her breast on a thorn when she poured forth her mournful song. Now, I ask, what was the origin of such a supposition? Surely not a mere poetic fancy without foundation, such as the romance of the melodious accents of the dying swan. But I conceive that the finding a thorn projecting from the nest after the manner described above, if it be occasionally found in the nest of the nightingale, as in the two instances I have given, would furnish ample ground for such poetic embellishment.

But if this be so, still the original difficulty remains unexplained, namely, *Cui bono?* the why and wherefore of the thorn; and the enigma, scarcely more easy of solution, how does the sitting bird contrive to cover her eggs or callow young, with a stout and pointed thorn occupying the very centre of the nursery, an insuperable bar, as one would have conjectured, to all domestic convenience and comfort? These are questions which I should much like to see answered, and on which I earnestly entreat the opinion of those versed in nightingales and nightingales’ nests.

Other details respecting these birds, communicated from the same source, and those, too, very reliable, as resulting from close personal observation, are, that in Wiltshire at any rate they are considerably on the increase, and that notwithstanding the raid made on them by my informant and two friends, who in one day a few years back, and on one estate, took no less than fourteen birds, the greater part of which were tamed and kept in cages through the winter. The same observer has also satisfied himself that there are two distinct species of nightingales, which he describes as the darker and the redder sort, and which he states vary from one another, not only in colour, in size and in note, but also in locality, the one almost invariably frequenting hedgerows,

the other as generally the corners of woods. It must not, however, be inferred that either of these could by any means be the greater or true "thrush nightingale" of the Continent (*Motacilla philomela*, Gmel.), the "sprosser" of the Germans.

ALFRED CHARLES SMITH.

Yatesbury Rectory, Calne,
May 5, 1862.

Occurrence of the Golden Oriole in Essex.—A fine male specimen of the golden oriole (*Oriolus galbula*), in fresh breeding plumage, was shot last week at Tiptree, near this place. The specimen, which I saw in the flesh, was sent to Mr. Cator, of this town, to be preserved. There is no doubt, I think, but that this bird was after breeding. I hope the female will meet with a better fate than her mate.—*C. R. Bree; Colchester, May 16, 1862.*

Occurrence of the Black Redstart at Southampton.—A specimen of the black redstart (*Sylvia tithys*) was shot at Sholing Common, near Southampton, on the 20th of March last, by a young man named George Ward: he is an invalid, and was sitting by the door of the house where he and his parents live, when the bird flew round the corner of the house and settled on the ground; he went in directly and brought out a gun and shot it. It was stuffed by Mr. Taylor, of the Strand, and may now be seen, by any gentleman who is desirous of doing so, at 97, High Street, Southampton. Sholing Common is an extensive place, dotted here and there with houses and with pieces of broken-up land. The hawfinch and the crossbill have been rather numerous in this neighbourhood lately. One day a man brought ten or twelve of the crossbill to Mr. Taylor; they were tied by the neck, and looked something like a bunch of carrots dangling from the man's hand by a string: they were offered for sale, but were so much injured that no bargain could be made.—*J. Goatley; 97, High Street, Southampton.*

Occurrence of the Lapland Bunting in Norfolk.—A fine male of this rare and handsome bunting was netted near Norwich about two months since. The bird-catcher, unaware of its specific rarity, sold it soon afterwards, as a variety of the black-headed bunting, to the Rev. E. J. Bell, of Crostwich. In that gentleman's aviary the bird soon began to exhibit some of the peculiar markings of its breeding plumage, and a reference to Yarrell's plate and description identified it at once as *Emberiza lapponica* and not *E. schœnielus*. I know of but one previous instance of the Lapland bunting having been met with in Norfolk: a male, also netted near this city, in June, 1855, as noticed at the time in the 'Zoologist' (Zool. 4631).—*H. Stevenson; Norwich, April 21, 1862.*

Occurrence of the Parrot Crossbill near Colchester.—Three specimens of the above so-called species of crossbill (*Loxia pityopsittacus*) were brought to me in the flesh on the 21st of February last. They were one male and two females, and were killed on the Lexden or London road, just south of this town. As there is a good deal of interest attached to the natural history of the crossbill, and more particularly as to the specific difference of the common and parrot, I will, with your permission, give a description of the birds captured at Colchester, with one or two remarks. The male bird (all the measurements were taken in the flesh) was of the following dimensions:—

Length, $7\frac{1}{2}$ inches; carpus to tip, 4 inches; tarsus, $\frac{3}{4}$ inch; beak from rictus, $\frac{3}{4}$ inch; circumference of beak at base, 2 inches. One of the females differed from this measurement only in having the beak about a line less; the other was altogether smaller:—Length, 7 inches; carpus to tip, $3\frac{8}{10}$ inches; tarsus, $\frac{3}{4}$ inch; beak, $\frac{3}{4}$ inch; circumference of beak, $1\frac{8}{10}$ inch. In plumage the male bird was, on the top of the head and cheeks, middle of back, chest, abdomen and flanks, of a mottled brick-red and green, the former predominating; rump and upper tail-coverts bright vermilion-red, tinged with yellow; sides of throat-scapularies and upper wing-coverts dirty green; primaries and tail brown-black; under tail-coverts gray; feet dull brown; tarsi lighter; beak horn-colour; the lower mandible lightest. The female had those parts which were mottled with brick-red in the male, green; rump and upper tail-coverts bright yellow; throat and under tail-coverts gray; primaries and tail black-brown. No other differences. Their crops contained the seeds of what I believe to be the Scotch fir: I enclose some for your opinion. I have heard of one other specimen having been shot, which, from its size, I should infer was this species; and I have seen a male of the common crossbill which was entirely dark brick-red, which was shot in February near Walton-on-the-Naze. There is no difficulty in distinguishing the parrot crossbill, by its greater size and by the marked difference in the thickness and breadth and general parrot-like appearance of the beak. Whether they are distinct species or not I am not prepared to say. They are, however, sufficiently distinct to be kept and described separately, which is all we can say of many other closely-allied forms. Mr. Wheelwright has been good enough to send me a series of skins, old and young, with the nest and eggs, of the parrot crossbill from Sweden. There is no difference whatever in the plumage, but my specimens are rather larger than those from Sweden. Your ornithological readers will doubtless have seen Mr. Wheelwright's paper upon the plumage of these birds (Zool. 8001), in which he thinks the yellow dress that of the old male. He will, I have no doubt, work out this question satisfactorily, as he is in a country where any number of specimens can be procured. Mr. Wheelwright informs me that the parrot crossbill appears only in alternate years in the neighbourhood of where he resides. In fact, he only gets the common crossbill one year and the parrot the next, and *vice versâ*, one species replacing the other. This interesting fact looks, I think, very much like a question of maturity between the two forms. It cannot be that the stronger drives the weaker away in the struggle for existence.—*C. R. Bree; Colchester, April 14, 1862.*

Of the change of Plumage in the Crossbills and Pine Grosbeak.—In the May number of the 'Zoologist' (Zool. 8001), some observations are made by Mr. Wheelwright on the change of plumage of these birds. He begins by saying, "Even now it appears that it is not quite clear what is the true mature plumage of these birds," &c. "Referring to every British authority that I can find, I am led to suppose that the mature plumage in both species is red; in extreme age tinged with yellow," &c. "But such is not the case; the red plumage is only an intermediate stage," &c. I will not refer to British authors, but turn to Temminck, Vol. i. p. 325. "*Loxia Pityopsittacus*. Livrée du mâle adulte et vieux: couleurs principales du plumage d'un cendré olivâtre; joues, gorge et côtés du cou cendrés; sur la tête des taches brunes bordées de cendré verdâtre; croupion, d'un jaune verdâtre; poitrine et ventre de cette couleur, mais nuancés de grisâtre," &c. But the young male is described as having "Toutes les parties inférieures et supérieures du corps d'un rouge ponceau, plus ou moins pur, suivant que les individus sont plus ou moins éloignés du terme de leur

seconde mue, qui a lieu en Avril ou Mai," &c. It therefore appears that Temminck was fully aware that "the red plumage is only an intermediate stage." Mr. Wheelwright then remarks, "I have never yet seen more than two examples of the mature green pine grosbeak: one was this last winter in a cage, where he had been confined ten years; he was a red bird when he was caught in the winter, but in the ensuing autumn he changed to bright yellow-green, and since then has undergone little or no change in his plumage; the other was shot in a wild state," &c. This sudden transformation in a caged bird is no sign of maturity. Until Mr. Wheelwright has further proof to offer in support of his views, we cannot ignore or discredit Temminck, who thus describes the old male, *Pyrrhula enucleator*:—"Tête, gorge et parties supérieures du cou d'un rouge orange, qui devient plus clair sur le devant du cou," &c. We may reasonably protest against caged birds being cited as instances, for we well know the variations of plumage they are subject to under confinement. The brown linnet loses all traces of its crimson dress. But one more to the point is that of the bullfinch, which not unfrequently is transformed from red to black by confinement. Need I cite more to prove that Mr. Wheelwright is not justified in assuming, that because a caged pine grosbeak lost under confinement its more brilliant hues, it would have done so had it remained at large. Having, I think, disposed of the first—*i. e.* the caged bird—I would only suggest the possibility, not to say probability, of the second, *i. e.* the wild bird, being a female (or a variety, as it is said to "varie accidentellement"), as Mr. Wheelwright admits that "It is not easy at this season (winter) to ascertain the males from the females by dissection."—*Henry Hadfield; Ventnor, Isle of Wight, May 8, 1862.*

Occurrence of the Black Redstart in the County of Dublin.—This bird is considered exceedingly rare in this country, yet in this neighbourhood it is not so uncommon. In the winter of 1858-9 I saw four examples, three catching insects upon a sunny wall in December; the fourth was caught under the slates of an outhouse. They were all females or birds of the year. The next winter none were seen. In the autumn of 1860 and the winter of 1860-61 they were absolutely common. I am sure I saw from twenty to thirty, on the average of one adult male to five females or birds of the year. This year none visited us. I am inclined to think from this that they come at periods of two years. What appears very strange to me is their wintering with us, appearing about October and leaving in the middle or latter end of January. The only reason I can adduce for this is the number of flies which hybernate in the crevices of the sea-coast rocks about here, and to which locality the bird is very partial, as well as to dung-hills and sunny walls. The stomachs of birds dissected in 1860 (the ground at the time being covered with snow) were stuffed with flies, showing how plentiful the supply must be in mild winters. This bird about here is very local; I never met one beyond the limits of an imaginary circle with a diameter of about six hundred yards. The common redstart is rare, I believe, in all parts of Ireland alike.—*H. Blake-Knox; Bartragh, Dalkey, Co. Dublin; May 17, 1862.*

Occurrence of the Hoopoe in Essex.—A specimen of this bird was shot by the Rev. Mr. Keen, Rector of Erwarton, Suffolk, the beginning of the month. Mr. Keen saw the bird in his garden, and when he went with his gun the bird seemed inclined to dispute possession of the ground with its owner, as it raised its crest at him in a menacing manner. I do not know the sex of this bird. Erwarton is situated on the Stour, near Harwich.—*C. R. Bree; Colchester, May 16, 1862.*

First Appearance of the Cuckoo.—The cuckoo was heard for the first time in the neighbourhood of Shipton, on the 25th of April.—*J. Ransom; York.*

Appearance of the Swallow in 1862.—The first swallow seen in this neighbourhood was observed on Sunday, the 20th of April. The earliest observation on record is the 6th of April, and the average date, upon twenty years observation, is the 17th of April. The two swallows mentioned at Zool. 7937 were inspecting their nest upon the rafter in the stable on the 24th of April.—*J. Ransom.*

Singular Instance of Nidification of the Woodpigeon.—During a visit to Rotterdam, the following somewhat remarkable occurrence has been brought under my notice. It is well known that this town is intersected by canals, by which means vessels are enabled to lay alongside of the quays in the heart of the city and directly in front of the dwelling-houses on the opposite side of the street, the edge of these canals being generally lined with elm trees. Thither the wild pigeons resort in spring, and, heedless of the noise and stir of the traffic and loading and landing of goods on the pavement beneath, construct their nests in the top branches of the trees. Year after year many of them are plundered by juvenile depredators, but the pigeons still continue faithful to their adopted spots. This is in itself somewhat singular, considering the usually shy nature of the birds, but a more striking incident has occurred these last two years. The trees in one of the principal streets (the “Wynhaven,” for the information of those knowing the town) were lopped early in spring last year, and the pair of wild pigeons accustomed to resort to the trees in front of a certain house there, finding their wonted shelter gone, after apparently some search, established their nest in the mast of a vessel (the “Admiral Wyndham,” a Guernsey trader), lying alongside the quay, and two eggs were laid. Unfortunately the vessel, having completed her loading, put to sea, and the birds remained in Rotterdam while their nest and eggs were wasted away. This year, though the shelter of the trees would now seem to be sufficient, they again selected the mainmast crosstrees of a bark (the “Schuringa”), occupying the same berth, and had completed their domestic arrangements as before, when a boy belonging to a lighter conveying goods to the vessel espied the prize, and possessed himself of it. The young ornithologist met with deserved punishment, but the result could hardly have been otherwise than unfortunate for the venturesome pair, as the vessel put to sea a few days ago, whither, judging from the former case, the birds would hardly have followed their establishment.—*A. Dobrée; Rotterdam, May 10, 1862.*

Occurrence of the Squacco Heron near Redruth.—I saw a specimen of this small heron, without the dorsal or occipital plumes, just now, which I believe was obtained from the neighbourhood of Redruth. Nearly all the specimens of this small heron have come to hand in the spring of the year, and, like its congener, the bittern, at uncertain periods and at long intervals, generally, however, appearing in several instances when at all.—*Edward Hearle Rodd; Penzance, May 1, 1862.*

Note on Sabine's Snipe.—Mr. Bond, in his note on Sabine's snipe (Zool. 8000), makes the following statement:—“Mr. Gatcombe says (Zool. 7939) ‘All sportsmen who have killed this bird remark that it rises without noise.’” Now that is a mistake, as I have never written a word concerning Sabine's snipe in the ‘Zoologist;’ and if Mr. Bond will again refer to that publication he will find that the snipe alluded to by me was a large brown variety, similar to the one described by Mr. Rodd some years since, and very different in appearance from the so-called Sabine's snipe.—*John Gatcombe; Wyndham Place, Plymouth, May 13, 1861.*

The Common Bittern in Norfolk.—Though the bittern has ceased altogether to breed in this county, its former haunts being everywhere narrowed by drainage and cultivation, and in many districts its deep booming notes having given place to the

screech of the railway whistle, yet the few which regularly visit us during the winter months, and the large numbers thus occasionally met with, render it anything but a "rare bird," as generally described. Persecuted to death under this delusion, like that kindred martyr, in the spring and summer, the well-known hoopoe, each unlucky specimen is slaughtered wherever met with, and the record of one particular capture in the local papers, whilst many others pass wholly unnoticed, perpetuates from year to year the "rara avis" absurdity. From some cause not easily explained, since the cold during last winter was at no time so intense as in the previous winter of 1860-61, the arrival of bitterns on our eastern coast since January last has been altogether unprecedented. I have myself handled at least a dozen specimens sent up to Norwich for preservation, and have heard, on good authority, of quite as many more sent up to Yarmouth for sale. These birds have been killed on the different broads, chiefly in the vicinity of the coast, and, with one exception, have been met with singly between the 10th of January and the first week in April. On the 6th of March a fine pair were killed right and left as they rose from a thick tussack on Hickling Broad, and these, with a third specimen killed about the same time, I had the rare chance of dissecting in one morning. Of the two Hickling birds one was evidently older than the other, as shown by the plumage and the beautiful lilac colour, which still retained much of its vividness after death, pervading the lore or naked space between the beak and the eyes. I never had this tint so bright in any other specimen, the same parts being generally of a bluish horn-colour, but this was probably owing to its adult state and the full vigour of the nuptial season. The companion bird, which, from their rising together, I expected to find a female, proved on dissection a young male, the testes being small, about five-eighths of an inch long, and dark in colour, as contrasted with the same parts in the older bird, measuring an inch and three-quarters in length, and perfectly white. The third specimen also proved a male, exhibiting the same appearance exactly as No. 2. All three birds were in high condition, the breast and abdomen covered with layers of fat, and the stomachs of all were filled with half-digested food. From the first I took an eel quite entire, about six inches long; from the second, the remains of an eel and of several large water-boatmen (*Notonecta*), five or six at least, judging from the number of wing-cases; and from the third a roach, five inches and a half long, and the *débris* of black water-beetles (*Dytiscus marginalis*), with wing-cases complete. From a specimen killed a few weeks before, a small leach, about an inch long, was taken alive, some days after the death of the bird, and when placed in water revived and became as lively as ever. The following anecdote respecting the singular capture of a bittern, in the adjoining county of Suffolk, was communicated to Mr. J. H. Gurney by a gentleman well acquainted with the circumstance:—"Either the last week in January or first week in February four bitterns were seen near the lake at Ruslubrooke Hall, near Bury St. Edmunds. One was captured by a turnkey at Bury Gaol, who, on going his rounds at night, saw some dark object stalking along under cover of the wall, and thinking it was one of the prisoners attempting an escape, the turnkey closed with it, and after some time captured it, a fine male bird, in full plumage."—*H. Stevenson; Norwich, April 23, 1862.*

Occurrence of the Iceland Gull at Plymouth.—An immature example of the Iceland gull (*Larus leucopterus*) was obtained at Plymouth on the 21st of April, the plumage of which was exceedingly light in colour and much worn. This is the second example recorded as having been killed in Plymouth within the last few months.—*John Gatcombe.*

Dates of Appearance and Song of a few of our Migratory Birds near Penzance.—Chiffchaff (in song), March 22; Wheatear (seen), March 23; Sand Martin, April 2; Blackcap (in song), April 11; Willow Wren (in song), April 12; White-throat (in song), April 28; Sedge Warbler (in song), May 1; Cuckoo (in song), April 26; Cuckoo (reputed), April 21.—*Edward Hearle Rodd.*

Conclusion of the History of the Incubation of the Python.

By E. W. H. HOLDSWORTH, Esq., F.L.S., Z.S., &c.*

THE python and her doings in the Zoological Gardens have been so much commented on by the daily and weekly papers, that there appeared to me to be no occasion for sending you any further notice on the subject. Opinions published in your pages lead me, however to believe that all the facts of the case cannot be known to the whole of your correspondents. I will, therefore, shortly state what has been observed in this matter of the python and her eggs, and offer some reasons for believing the snake to have been really engaged in "incubation," as that word is ordinarily understood.

The eggs were deposited on the 12th of January, and the python at once devoted herself to their care, coiling herself in the most regular manner around and over them, so that it was necessary to move the snake's head on one side in order to obtain a fair view of any of the eggs. On two occasions the python came off her eggs to alter their position, but did not leave them, and resumed her place when the rearrangement was made. The continued attention of the snake to her charge soon gave rise to a suspicion that she was incubating; and it became an interesting question whether or not, under the circumstances, there was any unusual development of heat. No satisfactory result was obtained from the first experiments, in consequence of the difficulty of using the only available thermometers. This objection, however, was removed by Messrs. Negretti and Zambra, who kindly undertook the manufacture of a suitable instrument, and soon turned out the most sensitive thermometer they have ever constructed. The following table shows the results of the experiments made with this instrument; and to exclude all possible error in using it, the thermometer was on each occasion placed and read off either by Mr. Negretti or his partner. The temperatures of both male and female snakes were observed, and, from the first, great care was taken that both reptiles should be kept as much as possible under the same external

* Reprinted from the 'Field' newspaper, but kindly communicated by the author.

conditions. They were in the same compartment, each with moss under and a blanket over it.

Date.	Temperature on the surface.		Temperature between coils.		Air in den.
	Male.	Female.	Male.	Female.	
Feb. 12	70° 2'	73° 0'	74° 8'	81° 6'	58° 6'
Feb. 23	71 8	75 4	74 0	83 2	65 4
Mar. 2	71 6	84 0	76 0	96 0	60 0
Mar. 9	72 8	79 5	not taken	86 5	61 0
Mar. 16	72 4	77 6	77 6	86 0	66 0

It will be observed that every experiment showed an excess of temperature in the female python over the male, and especially between the coils. On the 2nd of March the excess was as much as 20°; but, at that time the appearance of the female showed that she was about to cast her skin, and two days after she left her eggs at 9 P. M., and remained off until seven the next morning. During the interval her skin came off in shreds—always an unhealthy symptom in snakes; the process lasted nearly ten, instead of the usual three or four hours. She then took up her old position on the eggs, but before she did so they were found to be nearly cold, and in the course of a day or two there was a great change in their appearance.

The temperature of the snake now became reduced to about the same as in the week previous to moulting, and remained so up to the last trial on the 16th of March. The python still kept closely on the eggs, but was very irritable and dangerous. By the end of the month it was thought advisable to remove the eggs, as they were evidently decomposing. Taking them away was no easy task, but at last it was accomplished, the snake fighting desperately to preserve her long-expected progeny. She had certainly not lost heart, or given up all hopes of bringing out her young family, as I have seen stated. The annual number of moults which snakes undergo, and the particular seasons at which they occur, are found to vary with the age, size, health and appetite of the species. As a rule, small snakes eat more frequently, and cast their skins at shorter intervals, than large ones. This applies to small species as well as to the young of larger ones. With this python the moult usually takes place twice in the year,—in the spring and autumn,—and it occurred this year at about the usual time. What I have just mentioned with regard to the moulting of snakes refers to what has been observed of these reptiles whilst in confinement; but as the observations have been made on numerous

individuals which have lived many years in captivity, they may be fairly considered as a close approximation to the natural habits of the animals. If a snake is sickly, the skin, as a rule, is frequently changed, and comes off in strips or small pieces; whereas, if the reptile be healthy and vigorous, the slough is cast, even in the large snakes, in two or three pieces, and sometimes entire. It is highly probable, indeed very likely, that moulting does not naturally take place whilst the pythons are looking after their eggs; but it is certainly unreasonable, with our very slight knowledge of the habits of the great pythons, to conclude, from this one case, that everything has been in precise accordance with their behaviour in a state of nature. I am especially disposed to this opinion, after reading the account of the incubation of the python at the Jardin des Plantes. A memoir on the subject by M. Valenciennes was published in the 'Comptes Rendus' for 1841, from which it appears that the python in question (a species closely allied to the one at the Zoological Gardens) did not deposit her eggs until May 6, having changed her skin a month previously. When we consider how exceedingly variable is the nesting time in the same species among our native birds, and that the same uncertainty prevails in the period of reproduction among other classes of animals in this country, it will be hardly necessary to say that some variation may be expected in creatures subject to the unnatural conditions incident to confinement. It appears to me, then, that the argument against incubation, founded on the coincidence of reproduction and moulting, falls to the ground. With regard to the want of appetite in the python whilst on her eggs, and the inattention of her husband in not offering her food, I may mention that the female snake had fasted for twenty weeks previous to the appearance of the eggs, she ate nothing whilst they were with her, and, up to the 19th inst., had taken no food since their removal. On several occasions, however, she has drunk water, of which a supply has been constantly within her reach. I regret to say that the male python has been always supremely indifferent to the state of his partner's condition and appetite, and, like a good many other creatures, thinks only of himself. The lady, however, has been well supplied with food, but rabbits or ducks have alike been considered intruders, and furiously driven away from the neighbourhood of the eggs. This snake has now fasted for thirty-four weeks; but, long time as that is, it has been exceeded before now by another python now alive in the collection, that snake having fasted for more than nine months.

That the continued attention of the python to her eggs has been for

something more than protection, is rendered likely from the fact that when other snakes at the gardens deposit any eggs (which sometimes occurs) they take not the slightest notice of them, but leave them to shift for themselves. In such cases the eggs have been taken away, and occasionally hatched by artificial means. But the strongest argument in favour of incubation is *the unusual development of heat in the python, and its continued application to the eggs, the heat being most apparent on the lower surface of the body.* How can this be accounted for except on the "incubation" hypothesis? It must be remembered that this is not the first instance of such a development of heat being observed where a snake was under similar conditions. In the case at Paris, the highest temperature noted in the python was during the first day or two, and it gradually diminished until the time when the first egg was hatched. Eight eggs out of the fifteen deposited proved to be good, and after fifty-six days the young snakes made their appearance. The remaining eggs contained partly-developed embryos. M. Valenciennes states that the incubation of snakes is well known in India, and is alluded to in popular tales. He also refers to the 'Arabian Nights,' where, in the account of his "Second Voyage," Sindbad speaks of looking into a cavern, and seeing at the bottom a large serpent asleep on her eggs. The gradual diminution of temperature in the Paris python has not been paralleled in the London snake. In the latter, for reasons before given, no very accurate experiments were made during the first month, but afterwards, except just before the moult, there was only a slight variation in the quantity of heat. There is reason to believe that several of the eggs had been in process of development. One that had become displaced during the first month was found to contain a living embryo; and an apparently fully-formed young python has been taken out of another egg since their removal from the reptile-house. This little snake is about nine inches long; it has all the characteristic markings of the parents, and was almost ready for hatching. The old python cast her skin after she had been fifty-three days on her eggs; now the first young snake was hatched at Paris after fifty-six days, so we may reasonably conclude that the long absence from her eggs of our London python was the immediate cause, almost at the last moment, of their going wrong. Only a few of the eggs have yet been examined.

We all have a great deal to learn about snakes and their habits, but we shall make little progress if we refuse to admit strong evidence simply because it bears against our long-cherished ideas. The notion

of a snake incubating her eggs at first took most persons by surprise, but the evidence in its favour appears to be very strong. My notice of the main facts of this case has extended to a greater length than I proposed, but I shall be very glad if what I have written should enable your readers to understand the grounds for believing that incubation is not altogether unknown among serpents.

E. W. H. HOLDSWORTH.

Sketch of an Arachnological Tour in Scotland in 1861; with a List of Scotch Spiders. By the Rev. O. PICKARD-CAMBRIDGE, M.A.

THERE are probably few persons who have not read of the feelings with which naturalists have before now entered on the search of a district of virgin ground,—the treasures, the rarities, the new forms that have flitted before their imaginations; the eagerness, the joy at each unknown acquisition. Some of us may have felt this even in our own now well-worked country; and I must confess that it was with anticipations and feelings somewhat akin to these that on the 22nd of June, 1861, I set forth on foot from Edinburgh for the first day of a month's tour, undertaken chiefly for the purpose of arachnology in Scotland. Scottish ground (*in re* spiders) was, as far as I knew, virgin ground; no one, to my knowledge, had ever made any researches in Scotch Arachnology, except Mr. Hardy, of Penmanshiels, in Berwickshire; his labours are recorded in different parts of Mr. Blackwall's work on British spiders (now being published by the Ray Society); and, as far as I have understood, Mr. Hardy's researches did not extend north of Berwickshire. The ground I proposed to search was just such wild, heathy, rocky districts as in the South of England I had found so abundant both in number of species and individuals; and being so far removed in latitude, I confidently looked forward to turn up many new and perhaps singular forms, and to swell considerably the list of our native spiders. My anticipations of these untold rarities were, however, destined to be in great measure disappointed, as the slight sketch I now propose to make of my month's doings will show.

My first three days were occupied in turning over the loose stones, and searching at the roots of grass and other herbage on Arthur's Seat. Here the ground appeared in every respect most favourable for spider-life, and, except one day, the weather was fine and warm; but while,

in situations similar in general characteristics, in the South of England there would have been, at this time of the year, a host almost under every stone, here a score of stones would be turned up entirely blank; and when any spiders did come to light, they were mostly of species common in most places and widely distributed, though here even individuals of common species were scarce. The only species I found here that had not come under my own eye before was an adult male of *Walckenäera bicolor*. After three hard days' search on Arthur's Seat, my next day was on the north side of the Pentland Hills, at the nearest point I could reach in a straight line from the Currie Station on the Caledonian Railway. Underneath the loose stones on a wall of a fir plantation, just before entering on the moor at the foot of the hills, I captured the only novelty met with in my tour, in the shape of two adult males of a very distinct species of the genus *Walckenäera*: to this species I have given the name of "borealis."

At the immediate foot of the hills, in a similar situation, I found an adult female (and immature specimens of both sexes tolerably abundant) of *Tegenaria silvicola*, of which only two British examples had before been captured—one in Norfolk, by the Rev. Hamlet Clarke; the other by Mr. Meade, in Buckinghamshire. This species would probably be found under the loose stones and lichens on all the walls in this district; and from the condition of the palpi in the males, when I was there, I should judge their time of maturity to be about the end of the summer or beginning of autumn. Should this paper meet the eye of any entomologist in the habit of working that or any similar Scotch district, he would confer a great favour on myself by giving half an hour to the bottling of all the spiders he can find under loose moss-grown stones on the tops of the walls in his beat; and among them I should confidently reckon he would bottle many of this species, and probably among them an adult male or two, — a sex, in the adult state, that I much wish to obtain. It is a small species and very active, slipping away like a shot directly the stone under which it lies is moved; sometimes it will be found on the under side of the stone lifted up. I found that the best way to capture it was to wet the fore finger and place it lightly, but quickly, on the specimen, the moment I saw it, and then, impeded by the moisture, there was not much difficulty in securing it. Several hours' severe work on the slopes of the hills, sweeping among the long heather or searching at its roots, produced only three or four species, and but very few specimens of those. An hour's beating in a fir plantation on my way

back to the station, with about the same result, finished my day in this district. The day had been a most lovely one, and, it being the first time I had ever heard the wild cries of the curlew in its nesting-ground, or seen the golden plover alive in its summer plumage, it was a day that I shall never forget, though not marked by the success in spider-hunting that I had anticipated. Those who are as fond as I am of wild scenery, with the birds and beasts that inhabit it, and can recollect their first introduction to a Scotch moor, its screaming curlews and its plaintive plovers, will readily understand the pleasure of that, my first introduction to the same.

The only other capture worth special notice in this neighbourhood was of adult males of *Walckenäera humilis*, running on the pavements in Edinburgh in bright sunshine. I had only met with this curious but very minute black spider once before, and so, though sometimes in the most crowded thoroughfares of Edinburgh, it was not to be slighted. The passers-by would occasionally stop, probably wondering what the tall parson could be about picking up and bottling small black specks off the pavements. If they had known I was bottling spiders I might have incurred their wrath, though I doubt whether the spider, whose success in fixing its web on its seventh trial determined Robert the Bruce to try his luck once more, was of the species *Walckenäera humilis*; if it was, that would be some sort of a title to run on the pavements of Edinburgh. However that may be, it certainly was not the fear of Scotch wrath on this point that made me feel uncomfortable, for I confess that I always do feel just a little so for the moment, when a spider has to be captured under public gaze. To care absolutely nothing for what people think (and sometimes say) on such an occasion, is a difficult lesson to learn thoroughly. Some entomologists of my acquaintance will walk through a town, net in hand, with the utmost indifference; but for my own part I much prefer secreting the implements of the craft in my pocket until far from the gaze even of an enlightened British public, and well out on my working ground. Still I must say, weakly sensitive though I may be, to ignorant wonder and ridicule, an unknown spider taking an airing on a pavement, however frequented, has charms for me that I cannot resist.

The 31st of June found myself, my cousin (the Rev. H. A. Pickard, of Christchurch, Oxford), and another companion, toiling up the steep ascent of Ben A'an, just behind the Trosachs hotel. My cousin's bent was Lepidoptera, that of our companion was "only to go up some 'Ben' or other," and, that done, his purpose and ambition in Scotch

travel would be accomplished. In the course of the ascent and descent I noted and bottled more species of spiders than I had yet seen in Scotland; but yet all were of species more or less common all over England; only one, *Lycosa rapax*, seemed to be rather more numerous here than I had seen it elsewhere, and much more strongly marked. This species I found (as also *Lycosa andrenivora*) quite on the summit of the mountain, which is only, however, about 1800 feet high. I was disappointed here in finding the juniper-bushes so very unproductive: in England I have found both juniper and furze generally swarming with spiders. The only spider found here that I had not captured before was *Epëira celata*, underneath dark and damp overhanging banks and rocks at the foot of the mountain. The next day was devoted to a search along the banks of the lovely Loch Katrine; but after a toilsome morning my only capture worth recording was several specimens of *Linyphia triangularis*, a very beautiful and distinctly marked spider that I had never seen before; it inhabits the angles and interstices of the rocky banks of the Loch, hanging head downwards in a rather irregular thin sheet of web. From the Trosachs, in the afternoon, we went on to the head of the Loch, and I immediately betook myself to a couple of hours' stone-turning on one of General Wade's abandoned military roads. These roads look now like (what in many cases they have become) the beds of winter torrents; the one I was in was then nearly dry, and covered with large boulders and water-worn stones; under these I captured immature specimens, both male and female, of the curiously shaped *Walckenäera acuminata*. The probable reason for the extraordinary position of the eyes in the adult male of this species has always been a great puzzle to me: instead of being placed, as in most spiders, on the more or less convex surface of the cephalothorax, they are hoisted up on a kind of stem or stalk, which issues perpendicularly from the front of the cephalothorax to a height equal to nearly half the entire length of the spider. On the summit of this stalk are placed two of the eyes, looking upwards; two more are seated just below, looking forwards; and the rest, two on each side of a slight enlargement of the stalk, a little below again, and looking out sideways. The relative situation of the eyes in the immature male is the same, but it seems that they are not forced up, as it were, to this great height until the spider is just attaining maturity, for in some that I captured, apparently with only one more moult to undergo before becoming adult, the eyes were on a sort of bluntish cone, which, though considerably elevated, yet bore no resemblance at all to the

fully-developed eye-stalk. Whether it is necessary or not that the female should be such a far-seeing personage as the male, one can only conjecture, but it is certain she never lifts her eyes as high as her better half, being content to look out from a much less lofty watch-tower. If this spider were of a roving nature we might see a kind of advantage that it would have over its congeners by a larger range of vision from such a disposition of the eyes, but as it is, as far as I have observed it, chiefly a dweller under a damp stone, it is difficult to conceive but that this long stalk on its head must, in such a situation, be rather in the way than otherwise. Perhaps such peculiarities of form are only analogous to the male appendages of hair, beard, &c., among animals of higher classes, and the highly-developed tails, combs, wattles, &c., among birds. All these are generally considered to be merely ornamental, although the necessary result of the male organization, and are almost invariably put on just at the period of maturity. Like the slender eye-stalk of this *Walckenäera*, too, these exaggerated parts seem to be, as far as we can judge, often not only superfluous, but also indirectly injurious to the individual.

Underneath these stones I also captured a good many of a rather rare and local spider, *Lycosa piratica*, mostly adult females, with egg-cocoons attached to their spinners. *Linyphia longidens* I also met with here for the first time, but all immature.

After a substantial dinner and night's rest at the Stronachlacher inn, at the head of the Loch, we reached Inversnaid (on Loch Lomond) in good time next morning. Here, while waiting for the steamer to Inverarnan, I occupied a couple of hours in exploring the wood at the back of the hotel, but found nothing of any rarity, and indeed scarcely a dozen specimens in the whole. At Inverarnan we found the coach waiting to convey us to Fort William through the far-famed and noble pass of Glencoe; but as my object here is not to describe the imposing scenery of that grand pass, I will only remark that those who have not seen it ought to see it. The next day was devoted to the ascent of Ben Nevis, picking up what insects and spiders we could on our way. We started on the ascent at half-past 11 A.M., and, without much loitering to entomologise, reached the summit at half-past 3, and arrived at Fort William again at 7 P.M.; the distance gone over in the bare ascent and descent being about eighteen miles. The ascent is easy enough, though rather tiring, but the descent is one unbroken rush "down the side of a house" for the last two hours of it. We found ourselves much shaken by the pitching from ledge to ledge of this almost semi-perpendicular descent, and

next day were quite content to explore quietly, and perhaps more thoroughly than we should otherwise have done, the moor lying between Fort William and Ben Nevis. The only capture of any value made here was an adult male of *Neriëne vagans*. I found here, as I had done on Ben A'an, *Lycosa rapax* abundant, and here as high up as 3000 feet from the level of the sea. After another day's work in this locality, we passed up the Caledonian Canal to Inverness, stopping to visit the Falls of Foyers, on the banks of Loch Ness. Here I found *Linyphia cauta*, and other species fond of dark damp situations. From Inverness (where it rained in torrents the whole time we were there) our next point for entomologising was Loch Rannoch, already so famed for Lepidoptera and Coleoptera. Here I had two hard days' work at spiders, during which time the only species of note discovered were *Lycosa fluviatilis* among the water-worn stones on the shores of the Loch, and *Tegenaria silvicola* in situations similar to that in which I had previously found it on the Pentlands. During the remainder of the ten days that we stayed here, my time was divided between spiders and Lepidoptera, many species of which last were in great abundance, and much wanted to fill gaps in my cabinet. Spiders were much more plentiful in some parts of the forest on the south side of the Loch than they had appeared to be anywhere since we left the Trosachs, but still nothing in number of species or individuals to what such a situation would have produced further south. I imagine the hosts of large black ants in the Rannoch district must make great havoc among the young broods of spiders: in my own neighbourhood in the South of England, where the same ant is very abundant, I find it is almost useless to search either for spiders or larvæ of Lepidoptera in the immediate vicinity of their nests. Loch Rannoch was the last regular working place we had; for the next few days after leaving it, except an hour or two's occasional search, we were constantly on the move, going first to Kenmore, thence down Loch Tay to Killin, from Killin by Loch Earnhead and Loch Lubnaig to Callander, and thence to Glasgow, winding up our tour with a pleasant day or two at the hospitable mansion of the Laird of Dalswinton (MacAlpine Leny, Esq.), near Dumfries. On the door-steps of this mansion I made the last addition to my list of Scotch spiders, by the capture of adult males of *Neriëne flavipes*.

As I observed before, I expected to find many novelties among Scotch spiders, but from what I could observe during this tour, especially among the more common species, I feel convinced now that

there are not so many new forms to be discovered in Scotland as I had imagined. It must be acknowledged that the time of my tour was not the most likely time to meet with adult specimens of many species, particularly in the genera *Thomisus* and *Salticus*; and from the time of our leaving Edinburgh the weather was for the most part wretchedly wet and cold, scarcely one completely fine day; so that I could not extend my search, either as to time or distance, as I had intended. Still no doubt there are many more species to be added to the Scotch list than those I met with, and perhaps a search about the end of May and beginning of June would, in warm sheltered spots, produce many adults of species I did not come across at all. The autumn, too, if fine, is about the most prolific season in numbers, and many species are not adult till then. I had expected to meet with more examples of the genus *Salticus*, the rocky and heathy ground being just such as they delight in, but, as the list subjoined will show, I only captured two species. Dr. Leach (in the Supplement to the fifth and sixth editions of the 'Encyclopædia Britannica,' article "Annulosa") records that the curious ant-like spider, *Salticus formicarius*, is found, though rarely, in Scotland. This is a species I have never seen, and much wished to meet with, but I had no clew to its locality.

I trust this slight sketch and list of Scotch spiders will induce some naturalists resident in Scotland to collect and study the order regularly, for it is only by residents working constantly and thoroughly their own localities, however circumscribed, that the species of a district will ever be known. In a flying tour, if weather and every other contingency fall out in one's favour, one may do a great deal; but in nine cases out of ten these fall out the other way. And then, again, with no special locality in view to work thoroughly, the desultory mode of operations necessitated by being often on the move, though a very pleasant and enjoyable way of working, is certainly far from the best for scientific purposes. That a large area is not required in all cases to ascertain the general spider-produce of a district, may be concluded from the fact that in one day last May, on Bloxworth Heath, Dorset, in company with Mr. Tuffen West (now engaged in illustrating Mr. Blackwall's work on British spiders), I captured upwards of forty species in a piece of heathy ridge not more than four feet square; and among these were one species new to Science, and another up to that time unrecorded as British. Such fertile spots are only to be found by knowing thoroughly all the ins and outs of a district, in a way that no one but a resident can ascertain them. In the

limited space of the southern half of the county of Dorset I have as yet captured about two hundred species, and I can hardly imagine Scotland to possess fewer than this. The Scotch list at present numbers eighty-three; so that on this supposition there is plenty of room for further discovery yet. I shall hope, therefore, that a sort of commencement, however meagre and imperfect, having been set on foot, some industrious collectors will soon add to it; and I can only repeat here again how much pleasure it will give me at any time to receive specimens from Scotland for examination, and to return them, if wished, with the names and such other observations as I may be able to make upon them.

Since writing the above I have received a small bottle of spiders from Sutherlandshire and Ross-shire, kindly collected for me by the Rev. J. F. Montgomery, of Edinburgh: this box contains, among others, seven species I did not meet with myself during my tour.

List of Spiders found.

Tribe OCTONOCULINA.—Fam. LYCOSIDÆ.

Lycosa agretyca. Arthur's Seat.

L. andrenivora. Ben A'an.

L. rapax. Ben A'an, Ben Nevis, Schiehallion, &c., &c.

L. saccata. In dry watercourses among water-worn stones, everywhere.

L. lugubris. In woods at foot of Ben A'an.

L. obscura. Among heath, Ben A'an, Ben Nevis, &c.

L. exigua. Everywhere.

L. fluviatilis. Among stones on shores of Loch Rannoch.

L. piratica. Under stones near head of Loch Katrine, and among wet moss at Loch Rannoch.

Dolomedes mirabilis. Foot of Ben A'an.

D. fimbriatus. Not met with by myself, but the late Mr. Foxcroft showed me several adult females captured at Loch Rannoch in 1858.

Fam. SALTICIDÆ.

Salticus scenicus. Arthur's Seat, &c., on posts and palings.

S. reticulatus. Under stones, Arthur's Seat.

Fam. THOMISIDÆ.

Thomisus cristatus. Everywhere.

T. erraticus. Arthur's Seat.

- Thomisus bifasciatus*. Arthur's Seat.
T. pallidus. Arthur's Seat, and on Pentlands.
T. Trux. Arthur's Seat.
Philodromus cespiticolis. On firs, &c., Loch Rannoch.

Fam. DRASSIDÆ.

- Drassus pusillus*. Under stones, Arthur's Seat.
D. sericeus. Under stones, Arthur's Seat.
D. cupreus. Under stones, Arthur's Seat.
D. nitens. Under stones, Arthur's Seat.
D. propinquus. Under stones, Arthur's Seat, frequent.
Clubiona amarantha. Among heath, Pentland Hills.
C. epimelas. In wood at Inversnaid (Loch Lomond).
C. brevipes. Among heath, Pentland Hills.
C. trivialis. One specimen, Pentland Hills.
C. erratica. Among heath, &c., Loch Rannoch.

Fam. CINIFLONIDÆ.

- Ciniflo atrox*. Loch Katrine, Loch Rannoch, &c.
C. similis. Everywhere.
Ergatis benigna. Among heather, foot of Ben Nevis.

Fam. AGELENIDÆ.

- Agelena montana*. At roots of heath, Pentland Hills.
Tegenaria civilis. Edinburgh, Trosachs, &c.
T. silvicola. Under stones on walls, Pentlands and Loch Rannoch.
Textrix lycosina. In crevices of rocks and walls, Ben A'an, Ben Nevis, Loch Rannoch, &c.

Fam. THERIDIIDÆ.

- Theridion lineatum*. Trosachs.
T. tepidarium. In greenhouses, Botanic Gardens, Edinburgh.
T. nervosum. Trosachs; Loch Rannoch; Edinburgh; and Dalswinton, Dumfries.
T. varians. Dalswinton.
T. filipes. Under stones, Loch Rannoch.

Fam. LINYPHIIDÆ.

- Linyphia montana*. Trosachs and Loch Rannoch.
L. triangularis. Banks of Loch Katrine.
L. fuliginea. Black Forest, Loch Rannoch.

- Linyphia rudea.* Received from Ross-shire and Sutherlandshire.
L. minuta. Trosachs, &c.
L. cauta. Falls of Foyers.
L. socialis. On trunks of trees, foot of Ben A'an.
L. alticeps. Received from Ross-shire.
L. longidens. Under stones, near head of Loch Katrine.
L. tenuis. Received from Ross-shire.
L. terricola. In wood at Inversnaid, and received from Ross-shire.
L. Claytoniæ. Loch Rannoch.
L. obscura. On firs near Pentland Hills.
Neriene marginata. Trosachs.
N. bicolor. Received from Ross-shire.
N. livida. Under stones, Arthur's Seat.
N. vagans. One on footway near Edinburgh, and one at foot of Ben Nevis.
N. pygmæa. Received from Ross-shire.
N. flavipes. On door-steps at Dalswinton, Dumfries.
N. longipalpis. Everywhere.
N. trilineata. Trosachs.
N. rubens. Received from Ross-shire.
N. variegata. Received from Ross-shire, and on Arthur's Seat.
N. rubripes. Under stones, head of Loch Katrine.
Walckenaëra acuminata. Under stones, head of Loch Katrine.
W. borealis. Under stones, on wall near Pentland Hills.
W. bicolor. One under a stone, Arthur's Seat.
W. depressa. Under stones, Arthur's Seat.
W. humilis. On pavements, Edinburgh.
Pachygnatha Degeerii. Arthur's Seat.

Fam. EPEIRIDÆ.

- Epeira quadrata.* Loch Rannoch.
E. apoclisia. Foot of Ben Nevis.
E. similis. Everywhere.
E. calophylla. Received from Ross-shire.
E. cucurbitina. Loch Rannoch.
E. fusca. Foot of Ben A'an.
E. autriada. Foot of Ben A'an.
E. celata. Foot of Ben A'an.
E. inclinata. Everywhere.
E. Diadema. Everywhere.
Tetragnatha extensa. Trosachs.

Tribe SENOCULINA.—Fam. DYSDERIDÆ.

Dysdera Hombergii. Trosachs.

Segestria senoculata. Trosachs, Pentlands, and Loch Rannoch.

O. PICKARD-CAMBRIDGE.

Bloxworth, Blandford, Dorset,
March 31, 1862.

On the use of Glycerine for preserving Shells.—I wish to call attention to the use of glycerine in preserving shells. My father having some fine specimens of *Crenatula* which betrayed a tendency to crack, we applied a few drops of purified glycerine to them, rubbing it in with the finger. This effectually cured them without giving the unnatural lustre of oil. We have also used the same substance with *Unios* and other bivalves with success, and to many univalves having a scaly epidermis. We also tried to get rid of the unsightly film of salt which a dry atmosphere brings out on so many univalves, but failed at first. We have now, however, found out the proper treatment. The shells should first be soaked in spring water for about a fortnight, the water being changed several times. When they are dried they appear as bad as ever, but are very rough to the touch. If a little glycerine be now rubbed in, the proper colour comes out perfectly. In this way we have restored *Phasianellæ* and others to a fine state. The method will not be found to succeed with shells that have a highly polished surface, as *Cyprææ*. An additional recommendation is that the glycerine may always be washed off.—*F. Archer.*

Occurrence of Deilephila lineata at Deal.—A specimen of this rare insect was brought in by a boy, who took it at rest on a stack. It was very little wasted, and far from a bad specimen. This must have lived through the winter.—*H. J. Harding*; 171, *Lower Street, Deal, May 6, 1862.*

Capture of Deilephila lineata and Heliothis peltigera near Plymouth.—On Monday, the 5th instant, I was called to inspect some recent lepidopterous captures, and amongst them found two specimens, male and female, of *Deilephila lineata*. The particulars of their capture are as follows:—During the evening of the 29th of April, Mr. Bolitho, of Laira, observed a large moth feeding on the wing, humming-bird fashion, and he, thinking it some rarity, was quickly on the spot, net in hand, but the moth would not allow a close approach, and was instantly out of sight. This insect was not observed again till the evening of the 2nd instant, when a female specimen came to the flowers in the garden, and whilst engaged absorbing the sweets therefrom was dexterously swept into a bag-net by Mr. Bolitho. A second specimen, a male, was captured, on the 4th instant, by the same hand, at the same place, and in the same manner as the first-mentioned specimen. A third specimen was also seen. The above-named gentleman also took a female of *Heliothis peltigera*: this species

was likewise visiting flowers in the evening; it was taken very early in the season, namely, on the 28th of April.—*J. J. Reading; Plymouth, May 17, 1862.*

Capture of Deilephila lineata at Colchester.—A specimen of this rare Sphinx was found by a boy on St. John's Green, in this town, on Wednesday, the 14th instant. It was carried to Mr. Laner, of St. John's Place, to whose collection it has been added. It is the only British specimen I ever saw on the setting-board.—*C. R. Bree; Colchester, May 16, 1862.*

Eupithecia arceuthata, Frey., and E. helveticata, Bdv.: are they distinct?—Towards the end of September, 1860, Mr. Wilson, of Edinburgh, kindly sent me a few full-fed larvæ of *Eupithecia helveticata*. These spun up immediately. Shortly afterwards I turned out upon our Buckinghamshire hills, armed with a stout stick and large umbrella, and thrashed the wild junipers, which in certain spots grow there pretty plentifully. I beat a few quite small larvæ, much resembling those which I had received from Scotland. These in process of time became full fed, and from the beginning of October to the end of November I beat a good many more from the juniper bushes. They were decidedly larger and stouter than the Scotch larvæ, and I fancied I could detect other slight differences, but, having none of the latter by me for comparison, I could not be sure. It also struck me as singular that the larvæ here in Buckinghamshire should be full fed from one to two months later than in Scotland. On the whole, however, I voted them *E. helveticata*. In May and the beginning of June the perfect insect appeared, and I was much surprised to breed a rather large leaden-gray pug, in markings certainly resembling *E. helveticata*, but very different in colour and much larger in size. A short time since I had an opportunity, through the kindness of Mr. Stainton, of sending a pair of these insects to Professor Zeller, at Mesnitz. He at once pronounced them to be *E. arceuthata, Frey.* (Gn. vol. ii. p. 321), an insect which occurs freely in his neighbourhood. He very obligingly sent me some bred specimens which precisely corresponded with my Buckinghamshire insects. Professor Zeller, in the course of his letter, however, remarked that this species and *E. helveticata, Bdv.* (Gn. vol. ii. p. 320), were identical. He had not, however, himself either taken or bred the latter insect. Mr. Doubleday and Mr. Bond are inclined also to think that *E. arceuthata* is merely a local variety of *E. helveticata*. I think myself they are very possibly right; but still I am of opinion that we can come to no decision till both insects have been bred from the egg, and a minute and careful examination and comparison of the larvæ made. This I believe has never been done by any entomologist at home or abroad, and the amalgamation of the species is therefore at present, to say the least, premature. In October and November, 1861, I again met with the larva of *E. arceuthata* on the Buckinghamshire hills. I have now a few pupæ, and I hope to obtain impregnated eggs the end of this month or beginning of June. If any Scotch entomologist can procure me a few eggs of *E. helveticata*, I will do my best to breed the two sets of larvæ side by side, and to set the matter at rest.—*H. Harpur Crewe; The Rectory, Drayton-Beauchamp, Tring, May 10, 1862.*

Capture of Stauropus Fagi at Henley-on-Thames.—On Wednesday, the 14th instant, I captured a very fine specimen of *Stauropus Fagi*, at rest on beech.—*H. Stubbs; Henley-on-Thames, May 16, 1862.*

Agrotis suffusa taken at Sugar in April.—On the 28th March I captured *Agrotis suffusa* at the shallows near here, and, as the 'Manual' gives September as the date of its appearance, and does not mention the fact of its hibernating, I think this will be

of general interest. It was a female, and during that night and the next day she laid about twenty-five eggs, which hatched on the 5th of April, and are now feeding on dock, seeming to prefer that to grass.—*H. Bartlett*; 33, *Old Steine, Brighton*, April 19, 1862.

Will 1862 pass over without an Entomological Intelligencer?—I read with much gratification the Rev. J. Greene's remarks (Zool. 7970) on the great want which all working entomologists cannot but feel, occasioned by the demise of the late 'Intelligencer,' and should like to know if this year is to pass without an effort being made to fill its place. If so, I fear the brightest days of Entomology are gone, which must be evident to most who remember that when the 'Intelligencer,' on the conclusion of its first volume, was to be discontinued for only six months, the ardour of entomologists led to the publication of the 'Substitute' for the brief intervening period, although it was well known that the former journal would reappear the following spring. If such was then required during the winter, still more do we now require a "substitute" during the summer. Will not some of our leading entomologists exert themselves and give their support for this purpose? Most would be contented to have a weekly journal from March to October, although more satisfied could it be had all the year round; and if it is thought that its circulation would not support it at previous prices, few would object to a moderate increase of charge, rather than be deprived of so pleasant a companion. I am sanguine that entomologists would unite to increase its circulation, and do their best to prevent its discontinuance for want of support. Cannot the now popular expedient of a guarantee fund be resorted to, or is it possible to conduct such a journal on the "limited liability" principle, which might make many of the shareholders so anxious for their *protégé's* well doing that they would not fail to supply it with proper sustenance, and with an experienced editor as its doctor, who would guard against any of the improper ingredients referred to by the Rev. J. Greene being introduced to affect its healthy action.—*R. Anderson*; *Coney Street, York*, May 5, 1862.

[I think this matter is in a nutshell: if any entomologist will find the money and the contributions, another 'Intelligencer' might be started to-morrow.—*Edward Newman*.]

A Review of the Genus Ptinella.
By the Rev. A. MATTHEWS, M.A.

THE summer of 1861 amply realized the expectations I had formed of the probable abundance of the species as well as the individuals of the genus *Ptinella*. Assisted by Mrs. Matthews and our friend Mr. Arthur Hildebrand, a zealous and successful entomologist, I collected and examined above seven hundred specimens during the months of June, July and August, although the scene of our operations was confined to the midland counties of Leicester, Nottingham and Derby. The examination of this immense number has brought to light many very interesting facts relating to the specific distinctions of these curious little animals, and has added at least one species to the list of those

already known. I am perhaps wrong in using the term "facts" for matters not yet positively proved, but I think the general evidence so strong in favour of the conclusion I have formed as to leave little doubt of its being correct.

Any entomologist who has looked, even in the most casual manner, at Gillmeister's valuable monograph on the Trichopterygidæ, can hardly fail to have noticed the great analogy between the three winged *Ptinellæ* figured on one side of pl. 324 (Sturm's 'Deutschland's Fauna'), and the three apterous species on the opposite side of the same plate, and this resemblance is rendered more remarkable by the circumstance that at the time the 'Monograph' was published no other species of *Ptinella* had been discovered. For my own part I always had an idea that there were in reality but three species, of which the corresponding winged and apterous individuals were respectively the sexes. And although my subsequent observations have not to its full extent verified this idea, yet quite enough has been discovered to prove that the wings form a sexual mark rather than a specific distinction. Of one species alone, *P. ratisbonensis*, I have before me more than five hundred examples. Of this multitude about one-fifth exhibit black wings conspicuously developed, although varying in size; in above two hundred others the wings may still be seen through the transparent elytra, but much diminished in bulk, and of a pale colour; the remainder on a superficial examination present no appearance at all of wings, but when dissected are found to possess those limbs in a rudimentary state. The variation in the size and colour of the wings is not occasioned by the more or less matured condition of the individual, since specimens recently hatched and in a soft state are found both with and without coloured wings. It is therefore evident in this case that no specific distinction can be formed on the apparent absence or presence of the wings. Again, the colour of the eyes and the depressions on the disk of the thorax are equally uncertain as marks of difference. In the immense series now before me the colour of the eyes varies in different individuals from a deep black to an orange of the same shade as the other parts of the head, so that it becomes difficult to tell whether there are any eyes at all. The depressions on the thorax are even more variable. A few of my specimens, and but a few, have two placed near the base of the thorax; in others these depressions are connected together, still occupying the same position; in others, again, there are two or more placed near the middle of the thorax; while by far the greater part have the thorax unmarked by depressions in any part. And here I must observe that in many of Gillmeister's figures the

foveolate markings are too abruptly defined. This is very evident in his figures of *Ptilium canaliculatum* and some of its allies. In all these the thorax exhibits a central channel with an equally clear line on either side; but in many of these species the lateral lines are so faintly impressed as to be perceptible only in a favourable light and under a high power; though the central channel can almost be seen with the naked eye. There is also another feature in Gillmeister's figures which requires notice; I mean the scale-like appendages at the ends of the elytra in some of his *Ptinellæ*. This is merely an optical illusion, and is caused by the hinder margin of the first segment of the abdomen seen through the transparent elytra and cutting off the rounded end of each, thereby giving it the appearance of a semicircular scale. The truth of this may be readily ascertained by raising the elytra with a fine point.

Except this short digression on Gillmeister's figures, all that I have hitherto said refers exclusively to the species which I suppose to be *P. Ratisbonensis*, and I think is sufficient to prove that all those varieties belong to one and the same species. It is, then, reasonable to suppose that a similar relation will be found to exist between other winged and apterous insects in this remarkable group; and although some species may be invariably apterous, yet these appear to form an exception to the general rule of the genus.

Two species, *P. gracilis* and *P. angustula*, both as well or better known on the Continent than any of their congeners, offer a good illustration of this theory. The black eyes and fully-developed wings of *P. gracilis* are the only points on which it materially differs from *P. angustula*, its apterous analogue; both of them exhibit the same distinctive characters in the shape of the head and thorax, and in the slender and pointed abdomen. Strong corroborative evidence on the same point may also be obtained from a new and very distinct species which we found near Bakewell, Derbyshire. Of this, which is widely removed from any known species by the shape of the thorax and abdomen, and especially by the length and slenderness of its legs, five specimens were taken, agreeing exactly with each other in all the characters I have mentioned, one specimen alone being furnished with ample wings, while the rest appear destitute of those limbs. The question of thoracic foveæ is also affected by this species, the thorax in two specimens showing two considerable depressions, although in the others its surface is smooth. On the whole I do not see how we can arrive at any other conclusion than that the wings are merely a sexual mark among the species of this genus, and that in future other

characters must be required to separate them from each other. The characters I would rely upon for specific distinction may readily be found in the general shape of the head and the prominence of the eyes, the outline of the thorax, the length of the elytra, and the more or less obtusely pointed abdomen; the comparative length of the legs and antennæ should also be taken into consideration, although the species do not differ so much in this respect. In colour they resemble each other very closely, and this is often so much affected by the manner in which they are killed that it cannot be considered of much importance as a mark of difference. Of these characters the length and shape of the abdomen is one of the most useful, and it is of all the most difficult to preserve. In specimens which have been killed in the usual manner by immersion in hot water the abdomen generally contracts so much in drying that its original form is altogether lost. Instead of the hot water system I would recommend equal proportions of spirits of wine and water. In this they may remain for some days without injury, but when once taken out of the bottle they must not be left for many minutes before they are gummed on card, and even then some will still shrink up. A better plan than this, under certain conditions, is to use benzine collas instead of spirits of wine and water, but it requires more care, and should only be used when they can be set soon after they have been killed; if allowed to remain in the liquid for many hours the limbs become rigid, and it is almost impossible to set them properly.

In searching for *Ptinellæ* the tree on which they are found will often assist the collector in distinguishing the species. It cannot always be relied upon, as the same species may occur on trees of various kinds, but nevertheless it so often happens that trees in different localities, although of the self same sort, are inhabited by different species of *Ptinellæ*, that all should be carefully examined; of course the chance of finding a fresh *Ptinella* is much increased when the tree is of a different species.

There is yet another circumstance respecting the affinity of the winged and apterous *Ptinellæ* which must not be overlooked, and which can be observed only in the act of collecting; it is this, that although winged examples are comparatively very rare we have invariably found them in company with that particular apterous species to which they bear the strongest resemblance.

In reviewing the nomenclature of the *Ptinellæ* I particularly wish to direct attention to this point, that all the British specimens of the genus now bearing the name of *P. denticollis* belong to the *P. aptera* of Guerin,

and, as I have been the cause of this error, it is necessary to add some explanation of its origin. When I was in Paris two years ago M. Fairmaire very kindly gave me a pair of *Ptinellæ*, supposing them to be specimens of his own *P. denticollis*, both of which have since been proved to be *P. aptera*. In justice to M. Fairmaire I must say that they were taken from his boxes by candle-light, and had he anticipated the purpose to which they have been applied, he would doubtless have been more careful in his selection. With these specimens all the British examples have been compared, and of course wrongly named. A few weeks ago M. Fairmaire gave me other, and this time authentic, specimens of *P. denticollis*, as widely different from the former as any two species of the genus. The true *P. denticollis* has occurred, though rarely, in England; all the insects at present bearing that name in British collections are *P. aptera*. As that species was first described by M. Guerin, there can be no doubt but that the French specimens represent the true *P. aptera*, though I cannot suppose that the species figured by Gillmeister under that name is identical with M. Guerin's insect; his description, his figure, and the natural size given in his plate, all combine to make it the largest of the apterous species, while in truth it is the smallest of all except *P. angustula*; indeed his figure and description appear more applicable to the apterous variety of *P. ratisbonensis* than to any other species.

The mistake I have just mentioned is the only one of general importance, though others have occurred, and have been in most instances already corrected. It could hardly be wondered at, when entering upon ground previously untrod by any British entomologist,* without a single type to guide me, and nothing but descriptions to refer to, that I should occasionally fall into a mistake of identity among insects so obscure and so little known as these. But I have lately spent a considerable time in Paris in investigating their nomenclature, and have compared all the British species of *Trichopterygidæ* with those contained in the collection of M. Aubé. Through the kind assistance of that gentleman, MM. Fairmaire and Reiche I have, I hope, reduced the names of the whole family to a strict uniformity with those in use on the Continent.

The *Trichopterygidæ* in the magnificent collection of M. Aubé were formerly examined and named by Gillmeister, and may justly be considered as the types of that author.

* In April, 1858, I announced the capture of *Ptinella britannica*, the first of the genus ever met with in this country (*vide* Zool. 6032). It is still unique, and totally distinct from any other known species.

In the case of *P. ratisbonensis* alone a doubt may still exist, as none of the French collections possessed that insect previously to my visit, but I have M. Aubé's authority for supposing the species which we found in such abundance last year to be identical with the *T. ratisbonensis* of Gillmeister.

The following is a list of the British *Ptinellæ*, with the diagnostic characters of each species. I have thought it best to retain the species, as they are separated in the new edition of Schaum's 'Catalogue,' noting those which I suspect will prove to be the sexes of other species.

Species *Ptinellarum* inter se distinguuntur signis his propriis, videlicet.

1. *P. ratisbonensis*, Gillm. L. c. $\frac{7}{16}$ — $\frac{9}{16}$ lin. Magnitudine majori, capite rotundato, et abdomine obtuso.
2. *P. Maria*, n. s. L. c. vix. $\frac{8}{16}$ lin. Totâ formâ latâ, ac præsertim pronoto rotundato, pedibusque longis, gracillimis.
3. *P. britannica*, Matth. L. c. $\frac{7}{16}$ lin. Toto corpore rugose-punctato, capite oblongo, basi latiori pronoti, atque membris robustis.
4. *P. denticollis*, Fairm. L. c. $\frac{7}{16}$ lin. Formâ convexâ, obovatâ; capite lato; capite et pronoto lævioribus, angulis posticis pronoti acutis, fere productis; elytris brevioribus, apicibus valde rotundatis, atque abdomine obtuso-conico.
5. *P. punctipennis*, Fairm. L. c. $\frac{7}{16}$ lin. Haud a *P. denticolle* differt, nisi colore fusco-piceo, alis amplis, elytrorumque apicibus validissime rotundatis. Sexum alterum ejusdem speciei credo.*
6. *P. tenella*, Erichs. L. c. vix. $\frac{7}{16}$ lin. Formâ elongatâ lineari; pronoto parvo; elytris prælongis, apicibus minime rotundatis; et abdomine acuto-conico.
7. *P. aptera*, Guerin. L. c. $\frac{6}{16}$ lin. Formâ, brevi, ovatâ, depressâ; latitudine et lateribus ovalibus pronoti.
8. *P. testacea*, Heer, (*limbata*. Heer). L. c. $\frac{6}{16}$ lin. An alter sexus præcedentis: alis amplis, atque oculis nigris prominentibus tantum differt.

* Only two examples of this insect have been found, *viz.*, the original specimen in M. Fairmaire's collection, and one in the collection of Mr. Janson. With the circumstances of the capture of M. Fairmaire's specimen I am not acquainted, but at the same season of the year, and in the same part of the country in which the latter specimen occurred, Mr. Janson also met with the true *P. denticollis*.

9. *P. angustula*, Gillm. L. c. $\frac{6}{16}$ — $\frac{7}{16}$ lin. Formâ angustâ, elongatâ; elytris brevissimis subquadratis; atque abdomine elongato-conico, segmentis sex apertis.
10. *P. gracilis*, Gillm. L. c. $\frac{6}{16}$ — $\frac{7}{16}$ lin. Sexus alter præcedentis: alis amplis, oculisque nigris tantum ab illâ differt.

The following is a description of the new species in the foregoing list:—

PTINELLA MARIA.

L. c. vix. $\frac{8}{16}$ lin. Per totum corpus subtilius punctata, sericeo-pubescentis; capite lato, prominulo, in frontem valde rotundato, ore producto; pronoto convexo, capite latiori, medio latissimo, lateribus valde rotundatis, ad basim paulo contractis, margine anteriori rectâ, angulis obtusioribus, angulis posticis parvis acutis; scutello modico triangulari; elytris pronoto fere duplo longioribus, dimidium abdominis tegentibus, pronoto latioribus, ac paulo profundius punctatis, apicibus rotundatis; abdomine lato, obtusissimo, segmentis quinque apertis, lateribus marginatis; pedibus longis, gracillimis.

Alata. Nigro-castanea, capite, pronoto, atque abdominis lateribus fere nigrescentibus, elytris, medio atque apice abdominis multo dilutioribus; alis amplis, nigris; oculis nigris prominulis; pedibus atque antennis pallide testaceis.

Aptera. Rufo-testacea, colore uno; oculis parvis distinctis. Alior-sum alatis haud differt.

Rarius pronotum foveas habet duas ad angulos posticos.

Hæc species præclara, in honore uxoris meæ, cujus operâ capta fuit Maria appellata, differt ab omnibus formâ latâ corporis totius, ac præsertim pronoto rotundato; pedibusque longis atque gracillimis.

Moderately punctured throughout, shining, clothed with a fine pubescence. Head broad and prominent, very much rounded in front, and abruptly narrowed towards the mouth. Thorax convex, wider than the head; the anterior margin straight, with the angles rather obtuse; the sides very much rounded and slightly contracted towards the base, with the posterior angles small and acute. Elytra about twice as long as the thorax, covering one-half of the abdomen, rather wider than the thorax, and rather more coarsely punctured, with the ends rounded. Abdomen wide and very obtuse, with five segments uncovered and the sides margined. Legs and antennæ long and slender. The thorax occasionally has two depressions near the base.

With Wings. Dark chesnut. Head, thorax and sides of the abdomen nearly black. Elytra, disk and apex of the abdomen much paler. Wings ample, black. Eyes black and prominent. Legs and antennæ pale testaceous.

Without Wings. Rufous-testaceous throughout. Eyes small, but distinct. Legs and antennæ pale testaceous.

This insect presents at first sight much the appearance of an *Omalium*. I have given it the name of *Mary* in honour of Mrs. Matthews, by whom the greater number of this species, together with many hundreds of its congeners, were taken.

It differs from every other species in the greater width of the whole body, the rounded shape of the thorax and the long slender legs.

A. MATTHEWS.

Gumley, Market Harborough,
April 17, 1862.

Proceedings of Societies.

ENTOMOLOGICAL SOCIETY.

May 5, 1862.—FREDERICK SMITH, Esq., President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be given to the donors:—‘*Journal of the Proceedings of the Linnean Society of London*,’ Vol. vi. No. 22; presented by the Society. ‘*The Zoologist*’ for May; by the Editor. ‘*Sitzungsberichte der Königl. bayer. Akademie der Wissenschaften zu München*,’ by the Academy. ‘*Journal de la Société Entomologique Belge*,’ Tome v.; by the Society. ‘*The Intellectual Observer*,’ No. 4; by Messrs. Groombridge & Sons. ‘*The Journal of the Society of Arts*’ for April; by the Society. ‘*The London Review*’ for April; by the Editor. ‘*The Athenæum*’ for April; by the Editor. ‘*The Journal of Entomology*,’ No. 5; by the Proprietors.

Election of Members.

George Robert Gray, Esq., the Rev. T. H. Browne, and Alfred Haward, Esq., were balloted for and elected Members of the Society.

Vacancy in the Council.

The President announced that a vacancy had occurred in the Council by the resignation of Dr. Knaggs; that the Council recommended to the Society the name of Mr. Stainton for election to the vacant seat; and that the next ordinary Meeting of the Society would be a Special General Meeting, for the purpose of electing a new member of Council.

General Index to the Second Series of the 'Transactions.'

The President also announced that the General Index to the Second or New Series of the 'Transactions' was on the table, ready for gratuitous distribution among the Members and Subscribers who had paid Subscriptions for 1861.

Exhibitions.

Professor Westwood exhibited a box containing a number of illustrations of the economy and transformations of various species of insects, which had recently been presented to the Oxford Museum by Mr. S. Stone, of Brighthampton. Amongst these were specimens of *Volucella pellucens* (together with its eggs and pupæ), reared from the nest of the common wasp, on the larva of which the larva of the *Volucella* feeds, and on the outside of the nest of which the eggs are deposited. Also *Anomalon Vesparum*, *Curt.*, reared from the comb of wasps' nests: some of the insects did not appear till the end of three years, as stated at a previous Meeting of the Society by Mr. Stone. Also specimens of various galls and their makers, or the parasites by which the makers were destroyed: amongst these was a beautiful white cottony mass, found on the ground-ivy, from which a small adscitory ichneumon had been produced; also two *Cecidomyia* galls and their makers. Various illustrations of the nests of insects made in the pith of bramble and elder twigs were exhibited, with the insects reared from them, including several species of sawflies, three species of *Cra-bronidæ*, one *Odynerus*, together with species of *Malachius*, *Dasytes* and *Anaspis*. Two beautiful varieties of *Acronycta Alni* were also contained in the box—one taken at sugar, recorded in the 'Entomologist's Intelligencer' for 1856, and one bred on the 22nd of February, 1862, the larva having fed on whitethorn and alder.

The President said he had bred *Anomalon Vesparum* from *Vespa rufa*, but he understood that Mr. Stone's specimens were bred from *Vespa vulgaris*; and it thus appeared that the same parasite attacked two different species of wasp.

Referring to Mr. Newman's exhibition, at the April Meeting of the Society, of a pseudogynous specimen of *Liparis dispar*, Professor Westwood remarked that he thought Mr. Newman's statement, that the antennæ were those of a male, was not strictly accurate; the antennæ were in fact intermediate between those of the male and female. Neither was the specimen exhibited by Mr. Newman unique, for the Berlin Museum possessed a pseudogynous specimen of *Liparis dispar*, which had been described and figured some years ago by Dr. Klug, and the figure had since been reproduced in several works published in this country.

Mr. F. Moore exhibited the cocoon of a new species of silkworm from Japan, probably allied to *Bombyx Paphia*; the silk was of a delicate pale green colour.

Mr. Lubbock exhibited the preparatory state of *Psocus*; the whole body of the larva was covered with hairs having terminal bulbs, which retained the grains of sand and other materials with which the creature came in contact, and this, coupled with its greenish colour, made it very difficult to distinguish from the trees on the bark of which it lived, and thus formed a protection from destruction. So completely was the body covered with these hairs that even the immediate neighbourhood of the eyes was not free from them; the consequence was that a quantity of foreign matter collected on and over the eye; and thus the singular result was attained, that an animal having very complicated eyes was at the same time provided with a complicated system to prevent it from seeing.

Mr. Pascoe stated that the *Ceutorhyncus biguttatus*, Schön. *Gen. et Spec. Curcul.* viii. pars 2da, p. 158, was identical with the *C. raphaelensis*, Chev.

Reverting to the subject of "dimorphism" discussed at the previous Meeting, Mr. Pascoe said that, in the opinion of Mr. Bates, neuter ants were only dimorphous females. Mr. Baly thought that every species of *Sagra* had a dimorphous female. The President said that he had in some cases found two forms of worker ants, which would make four forms instead of three. Mr. Lubbock would be glad to know precisely what was meant by dimorphism: no one denied that in certain orders of insects there were developed females and undeveloped females, or neuters or workers: was "dimorphism" anything more than a new name applied to an old-established fact?

Mr. Stevens exhibited a new species of *Eudicella* from Ovampo Land (South-Western Africa), and the nest of a trap-door spider (*Actinopus*) from Affghanistan.

Sir John Hearsey exhibited a collection of Noctuidæ and other Lepidoptera from India, and remarked upon the apparent identity of some of them with British species. Amongst them were specimens of *Deiopeia pulchella*, exactly similar to British specimens. Sir John said that that species was common in India: he remembered introducing from England the seeds of a plant never before taken to India; as soon as the plants grew up they were attacked by the larva of this moth, and he bred (he thought) as many as 500 specimens of the perfect insect.

Mr. Waterhouse exhibited a series of the British species of the genus *Tychius*, in illustration of the paper mentioned below.

Papers read.

Mr. Lubbock read a paper "On the Larva and Pupa of *Lonchoptera*." It contained an elaborate description of the dipterous larva of which Mr. Lubbock had exhibited a drawing at the February Meeting of the Society. Since that time he had obtained more specimens of the larva and the pupa, which also was minutely described. From two of the pupæ there had emerged two specimens of a species of *Lonchoptera*, probably *L. lutea*.

With reference to the description of the pupa, Prof. Westwood remarked that he could not understand a dipterous pupa without traces of the limbs lying on the breast. Mr. Lubbock's observations were full of interest, and he trusted they would be continued.

Mr. Waterhouse read "Descriptions of the British Species of the Genus *Tychius*." The number of species described was eleven, being two more than were enumerated in Mr. Walton's Catalogue; of these two, one had, by British coleopterists, been confounded with *T. Schneideri*, and the other (*T. brevicornis* of the paper) was apparently undescribed. A brief abstract of the characters of the less clearly distinguished species was thus furnished by the author:—

1. *T. hæmatocephalus*, Schönh. Of this insect only two supposed British specimens appear to be known—one in Kirby's collection, which was received from Mr. Spence; the other in the collection of Mr. Wollaston, to whom it was given, with other small Coleoptera, as having been taken in the Isle of Wight.

2. *T. 5-punctatus*, Linn.

3. *T. polylineatus*, Germ., Schönh. This insect is also described by Schönherr, in his 'Supplement' (vol. vii. p. 311), as *T. lineatulus*, Kirby, from English specimens sent by Mr. Walton; but the somewhat obtuse tooth of the hinder femora is overlooked, and I have no doubt that *T. lineatulus* and *T. polylineatus* will be found identical. With regard to the name *lineatulus*, as applied to different species of

Tychius, there is evidently great confusion. The following abstract from my notes I think will be found correct:—

T. lineatulus of Schönh. (not of Kirby) = *T. polylineatus*, Germ., Schönh.

T. lineatulus of Kirby's MSS. and collection = *T. Schneideri*, Schönh.

T. lineatulus of Stephens' 'Illustrations' = *T. Schneideri* (part), and *Miccotrogus picirostris* (part).

T. lineatulus of Stephens' collection = *T. polylineatus* (part) and *Miccotrogus picirostris* (part).

T. lineatulus of Germar = *T. nigrirostris* of Walton's Catalogue, and perhaps also the *T. tibialis*, Schönh.

The *T. polylineatus* of Schönh., in our collections, is generally, if not always, labelled "*Schneideri*," and is sometimes mixed with the true *T. Schneideri*. The name *lineatulus* is given as synonymous with *Schneideri* both in Walton's Catalogue and that of Dr. Schaum.

4. *T. venustus*, Fab.

5. *T. Kirbii* (*T. flavicollis*, var. β ., Schönh.; *T. flavicollis*, Walton, in the British Museum Collection, not of Kirby nor Stephens). Oblong-ovate, pitchy, densely clothed with broad ochraceous scales, those on the under parts and on the suture of the elytra whitish; rostrum, antennæ and legs testaceous; thorax rounded and contracted in front, the sides behind the middle line very nearly straight and parallel; elytra ample, with the humeral angles somewhat prominent, distinctly striated as seen denuded of the scales, and of a rufous colour, excepting at the base; rostrum long, nearly straight and cylindrical; posterior femora dentate in both sexes. Considerably smaller than *T. venustus*, which it most nearly approaches in form, and distinctly larger than either of the following species.

The above species all have some at least of the femora dentate: the following species have unarmed femora.

6. *T. junceus*, Germ., Schönh. Oblong-ovate, pitchy (the elytra posteriorly more or less red), densely clothed with elongate yellowish scales; rostrum distinctly arched, gradually attenuated from the base to the point of insertion of the antennæ, then rather more distinctly attenuated and somewhat pointed, especially in the males; antennæ, legs and the greater part of the rostrum testaceous; thorax with the sides distinctly rounded; elytra striato-punctate. General form shorter and more inclined to ovate than the following species. Schönherr's description of *T. flavicollis*, as it appears to me, belongs almost entirely to this species.

7. *T. tomentosus*, Germ., Schönh. Oblong, pitchy black (the apex of the elytra more or less rufescent), above clothed pretty densely with elongate pale yellowish scales, with filiform scales on the striæ of the elytra, and a few broad white scales on the suture; rostrum stout, very little bent, and of very nearly uniform width throughout; the apex only rufescent; sides of the thorax very little rounded; elytra distinctly striated; antennæ and legs testaceous; the femora more or less clouded with dusky, rarely entirely dark. More elongate than the preceding species, and is readily distinguished by its rostrum being stouter (the greater part dark coloured), less bent and having the apex not attenuated. The scales on the elytra are, moreover, of three distinct forms, whereas in *T. junceus* there is scarcely a perceptible difference in any of the scales. In the preceding species the anterior tibiæ are unarmed in either sex: in the following four species the anterior tibiæ of the males have a tooth or spine on the middle of the inner side.

8. *T. Schneideri* (Herbst), Schönh. Oblong, rather broad and but moderately convex; pitchy black; above pretty densely clothed with piliform, and for the most part ash-coloured scales, with broader white scales along the middle of the thorax, most abundant behind, and with broad snow-white scales on the suture of the elytra; antennæ at the base, tibiæ and tarsi ferruginous; rostrum thickish, bent and cylindrical; femora but little incrassated. The alternate interstices of the striæ of the elytra are often paler (sometimes whitish) than the others. The tooth on the anterior tibiæ of the male is but little prominent, smaller, shorter and less convex than *T. polylineatus*; general hue darker, being of a plumbeous gray; the scales much narrower, and furthermore distinguished by the unarmed femora and by the toothed anterior tibiæ of the male.

9. *T. Meliloti* (Kirby), Stephens, Germar, Schönh., Walton. Oblong, pitchy black (the apex of the elytra often rufescent), above clothed with yellowish elongated scales; rostrum arched, attenuated, and the part anterior to the antennæ somewhat depressed; antennæ, tibiæ and tarsi, as well as the apex of the rostrum testaceous; thorax constricted in front; the sides nearly parallel; elytra distinctly striated, and with the humeral angles rather prominent; legs, comparatively, rather slender; the anterior tibiæ with an acute tooth on the inner side, in the male sex. About equal in size to *T. tomentosus* and *Miccotrogus picirostris*, but a little broader than the last-mentioned insect.

10. *T. nigrirostris*, Walton Catal. (*T. tibialis*, Schöuh.?). Oblong, black, rather sparingly clothed with subpiliform ashy white scales; the scape and first joint of the funiculus of the antennæ, the tarsi and apical portion of the tibiæ rufo-testaceous; rostrum rather slender, linear and but little arched; elytra distinctly striated. Male with an acute tooth on the inner side of the anterior tibiæ. Of the very narrow scales on the elytra of the insect there are usually but two rows on the interstices of the striæ, and viewed under an ordinary lens the elytra appear to have whitish striæ; on the striæ themselves is a single row of still more slender scales; the posterior margin of the thorax is edged with broader white scales, and similar scales are scattered along the suture. In size, form and general appearance extremely like *Miccotrogus picirostris*. Schönher's description of *T. tibialis* agrees very closely with this insect, but no mention is made of the dentate tibiæ of the male; possibly he only possessed the female.

11. *T. brevicornis* (N. sp.). Minute; oblong, black, rather sparingly clothed with very narrow scales as in the preceding species; the base of the antennæ (including the scape and two of the joints of the funiculus), the tibiæ and tarsi rufo-testaceous; the third joint of the funiculus slightly transverse, the others gradually broader, though scarcely longer, the last joints very strongly transverse. Anterior tibiæ (in the male?) with an obtuse tooth on the inner side. About half the bulk of the medium-sized specimens of *Tychius picirostris*. Most closely resembles the preceding species, from which it can scarcely be said to differ, excepting in its very small size, and the comparatively short antennæ; the scape is relatively shorter and more clavate; and the separate joints of the funiculus are decidedly shorter when corresponding joints are compared. I have seen but three specimens of this insect; one specimen I found at Hawkhurst, in Kent, in the month of April, 1860; a second I took at Gravesend, in the following year, in the month of May; and the third is in Mr. S. Stevens' collection: they all have an obtuse tooth on the inner side of the anterior tibiæ.—
J. W. D.

The Macro-Lepidoptera of Ringwood, in Hampshire. By G. B. CORBIN, Esq.: with a Supplementary Note by the Rev. JOSEPH GREENE, M.A.

RINGWOOD is generally supposed to be a very good locality for Lepidoptera, and of the truthfulness of this assertion some idea might be formed by the observations and remarks given in the appended list, in compiling which I have confined myself to a circuit of twelve miles, which is a reasonable distance for a day's entomological hunt, and before I proceed I hope my more experienced brethren will look with a lenient eye upon this my first production for these pages, and I hope it may lead to something better at a subsequent period. I may here state that I am indebted to the Rev. J. Greene for naming most of my insects. The arrangement is according to Doubleday's 'List,' second edition.

Papilio Machaon. I have heard that this insect was formerly taken near here by my uncle, the late Mr. W. Bentley.

Leucophasia Sinapis and *Pieris Cratægi*. Both of these insects are to be taken in the Forest, although never taken by myself. Mr. Douglas in the 'World of Insects,' says he found the latter common near some of the young plantations.

Pieris Brassicæ, *P. Rapæ*, *P. Napi*, *Anthocharis Cardamines* and *Gonepteryx Rhamni*. All these are generally common.

Colias Edusa. This was very common in 1859: I took thirty in about three-quarters of an hour. They have been scarce since.

Argynnis Paphia, *A. Aglaja*, *A. Adippe*, *A. Euphrosyne* and *A. Selene*. All these are not uncommon in the Forest.

Melitæa Artemis. Common about five miles from here.

M. Athalia. I have heard that this species has been taken on Parley Heath. I have never seen it myself.

Vanessa C-album. This I have seen, but never taken.

V. Urticæ, *V. Io* and *V. Atalanta*. Common both before and after hybernation.

V. Polychloros and *V. Cardui*. Frequently taken after hybernation.

Limenitis Sibylla and *Apatura Iris*. Have seen both in the Forest, but never took either.

Arge Galathea. Common at a place called Migham, near Fording-bridge; also near Lyndhurst, just within my twelve-mile limit.

Satyrus Ægeria, *S. Megæra*, *S. Semele*, *S. Janira*, *S. Tithonus*, *S.*

Hyperanthus, *Chortobius Pamphilus*, *Thecla Rubi*, *T. Quercus* and *Polyommatus Phlæas*. All these may be taken within six miles.

Lycæna Ægon. Common on the heaths.

L. Agestis. Occasionally.

L. Alexis. Common.

L. Argiolus. Occasionally.

Hesperia Sylvanus and *H. Linea*. These are the only skippers I have ever met with here.

Smerinthus ocellatus. I have had the ova, larvæ and pupæ of this handsome species, but was never successful in rearing the imago, for which I am unable to give any reason.

S. Populi and *S. Tiliæ*. These species I frequently rear both from larvæ and pupæ.

Acherontia Atropos and *Sphinx Convolvuli*. These two species in 1859 were taken I may say in some plenty. I set no less than ten of the former. In one evening in 1859 a friend of mine took three of the latter. I scarcely knew the worth of such insects at that time, being the first season of my collecting, and since then I have not seen a specimen of either.

S. Ligustri. I have taken the larvæ several times, but like *Smerinthus ocellatus* I have never reared the imago. I have seen the moth on the wing.

Chærocampa Porcellus. I have heard of its capture near here, but I have doubts as to the truth of it.

C. Elpenor. This species Mr. S. R. Neave found common one evening, I believe, in 1859. He found they had a great partiality for the flowers (or rather the nectar they contained) of a large bush of honeysuckle, and he captured seventeen in half-an-hour; however, they have disappeared since, not a single specimen having been taken. These were taken about five or six miles from Ringwood; they have also been taken within three miles of it.

Macroglossa Stellatarum. I have occasionally taken this species. The Rev. J. Greene found the ova here.

M. fuciformis and *M. bombylifomis*. I am not sure which of these species (it may be both) Mr. Neave told me had been taken near Fordingbridge.

Sesia tipuliformis. Common in gardens where there is a large number of currant trees. I think this insect is attached to the black currant more than the red; I have bred it from the former.

Zeuzera Æsculi. I should judge this is to be found near here, as I

have seen pear and plum trees with the galleries produced by its larva.

Cossus ligniperda. The trees in some parts of Ringwood, particularly oaks (I believe they generally attack willows), are entirely perforated by the destructive larvæ of this odoriferous species, and yet I have never seen the perfect insect. While pupa-digging during the past winter, on the estate of the Earl of Normanton, I tore off a piece of loose bark, and in it were no less than eleven larvæ of this three-year wood-feeder, all about three-quarters of an inch in length. In 1860 I succeeded in getting three larvæ to turn to pupæ, but by some misfortune or other not a perfect insect appeared.

Hepialus hectus. I once found this species very common about three miles from here, but have taken them sparingly since.

H. lupulinus. May frequently be met with.

H. sylvinus. I took a single male in August last.

H. Humuli. Abundant in the meadows.

Procris Statices. Taken sometimes but never very common.

Zygæna Trifolii, *Z. Lonicæræ* and *Z. Filipendulæ*. These three species are all to be found here, but unlike most localities *Z. Filipendulæ* is the most uncommon.

Nola cristulalis. Taken once or twice.

Calligenia miniata. Taken both here and at Lyndhurst.

Lithosia mesomellâ. Sometimes to be taken not uncommon on the heaths of J. T. Turner, Esq., but alas! many uncommon species beside this are lost to me, for new proprietors of land have often a very prejudiced view of entomologists, and fancy they want others beside their "untaxed and undisputed game."

L. complanula, *L. griseola*, *L. stramineola*, *L. quadra* and *L. rubricollis*. All these I have met with, but far from common. Last July, while sweeping some heath by the side of a wood for the larvæ of *A. Myrtilli*, I got a moth into my sweeping-net which I believe was *L. complana*, as the costal stripe was parallel through its entire length. The moth was so mutilated that I did not preserve it.

Eulepia cribrum. I beg a little space for a few remarks on this species, as all know it is very local, not to say rare. I believe it is generally asserted that the insect appears in July, but this only happens in a late season. It is well known that the season of 1860 was extremely backward, and then the insect appeared as late as the 11th of July, my friend Mr. Greene having taken a specimen on that date, while during the season of 1861 I took all my specimens in the first two weeks of June; I did not see the insect in July. I have never

taken the female: I believe they are found on most of the New Forest heaths, but they favour particular spots. There is one of these spots on Parley Heath, which seems to be the metropolis for them, although there they are far from common. It is three miles from Ringwood to this heath, and although it extends to within a mile of my home this insect is of rare occurrence near here. I never saw but one instance of their flight in the day time: they generally begin to fly about half-past eight or nine o'clock, and continue on the wing for a short time, not more than an hour. They only appear for about a fortnight, so I must catch them then or not at all. I have seen them at rest on the tops of the heath, but to catch them requires a little care, as they will not fly off, but fall to the ground among the entangled stems; and you stand a good chance of not seeing them a second time, as they have a plan of sliding between the stems with agility, while their elongate form (characteristic of all the family Lithosidæ) greatly facilitates this means of escape. Their flight may be compared to that of the great caddis-fly (*P. grandis*), that is rather jerking, but they sometimes have an hovering flight, something similar to *Hepialus hectus*. When taken in the net they are to all appearance dead, falling to the bottom. Their flight is not swift, and, as far as my experience goes, they never fly very high. If you touch them with the net they immediately fall, and all chance of recovery is lost.

Enchelia Jacobææ. This species may be found common in an old gravel pit, where its food-plant (the ragwort) abounds.

Callimorpha dominula and *Euthemonia russula*. Both these species are not uncommon. The former I often find in the larva-state after hybernation. They both fly in the day time.

Chelonia caja. Common.

C. villica. I bred a pair of this species in 1861 from two larvæ found in April after hybernation. I have frequently taken them on the wing, but always in a mutilated state.

Arctia fuliginosa and *A. mendica*. May sometimes be taken, but not common.

A. lubricipeda and *A. Menthastris*. Both these species are sometimes abundant.

Liparis auriflua. Very common.

L. Salicis. The only specimen I have is one Mr. Greene bred from poplar during his stay here.

L. dispar. I never saw the species till I bred some from eggs sent me from Workington, although I have heard of their being found near here. I set several bred specimens at liberty.

Orgyia pudibunda. I remember finding the larvæ of this species quite common once, but most of them died, as then I did not know their food.

O. fascelina. I have found the larvæ of this pretty species twice, and bred the imago once, a female.

O. antiqua. Not uncommon.

Pæcilocampa Populi. Took a single male in 1861 at light. I have been informed by Mr. Wilkinson they are common at light about three miles from here.

Bombyx neustria and *B. Quercus*. Not uncommon in the larva state.

B. Rubi. I have succeeded in rearing this insect several times. They are common on the heaths.

B. Trifolii. Not common. Found two larvæ and bred them both in 1860.

Odonestis potatoria. Common.

Lasiocampa quercifolia. I found three of these curious-looking larvæ in 1860, and succeeded in rearing them, as the larvæ were very young when found. They fed on hawthorn. I took a poor female example of this species last year, but they appear to be rare.

Saturnia Carpini. Not uncommon on the heaths in the day time, but requires a quick eye and hand for their capture.

Ourapteryx sambucata. This species is something like *S. Carpini* in its mad gambols. They are not uncommon.

Epione apiciaria. This insect is common in some parts, in others scarce. I have not inserted *E. vespertaria*, although I have heard it has been taken in the Forest, but my informant was, like myself, a beginner, and I think imaginary forms often fill the heads of such, and if they take any common insect which has any resemblance to a rare one they always say it is the latter. It is a puzzle to many beginners to know these two insects apart, as they look at the colour and not the markings. If found here *E. vespertaria* is rare; I have never taken it.

Rumia cratægata. Often abundant, sometimes a pest.

Venilia maculata. This pretty little species I have met with very sparingly.

Metrocampa margaritata. I often take this in the neighbourhood of beech and birch trees.

Ellopiæ fasciaria. Not common.

Eurymene dolobraria. I never saw this insect but once, and then I took a very beautiful male, apparently just emerged from the pupa.

Pericallia syringaria. I have only one reared by Mr. Greene, off lilac, during his visit here.

Selenia illunaria. Abundant in all the lanes.

S. illustraria. I have taken this insect several times; I remember taking it once at sugar.

Odontopera bidentata. I frequently take this on the heath.

Crocallis elinguarina. Not uncommon.

Ennomos tiliaria, *E. fuscantaria* and *E. erosaria*. I have only taken one each of these three.

E. angularia. This species I bred from a larva found at Lyndhurst feeding on beech.

Himera pennaria. Although this insect is generally common I have only taken a single male.

Amphydasis prodromaria. I sometimes find the pupæ of this insect at the roots of oak. I have only bred it once.

A. betularia. I have reared this several times from pupæ found at roots of elm.

Hemerophila abruptaria. Taken once.

Cleora lichenaria. I have taken this insect several times, but it always appears to be injured.

Boarmia repandata. Common. This was the first insect I ever took at sugar.

B. rhomboidaria. May be taken occasionally.

Gnophos obscurata. Rare. I have only seen two examples, both being the dark variety.

Pseudoterpna cytisaria. Common on the heaths. It soon fades.

Geometra papilionaria. Rare. I took a single male flying round the trunk of a birch on a moonlight night, in 1861. I have been told this king of the emeralds is very partial to moonlight nights.

Nemoria viridata. This species appears to be very rare here; I have only seen a single specimen.

Iodis lactearia. Common about three miles from here, but unfortunately the beautiful green bloom on the wings fades soon after death.

Hemithea thymiaria. Common.

Ephyra porata, *E. punctaria* and *E. trilinearia*. The two former I have taken several times, the latter rarely.

Asthena luteata. Rather scarce.

A. candidata. I have taken this several times.

Acidalia scutulata. I have only taken this species once.

A. promutata. Scarce.

A. remutata. Common.

A. imitaria. Sometimes to be taken.

Timandra amataria. Frequently taken.

Cabera pusaria and *C. exanthemaria.* Common near a birch wood.

Macaria notata. This rather uncommon insect I have taken several times in different localities.

M. liturata. I have two specimens of this insect: one I took on a heath near here, and the other on a heath near Lyndhurst.

Halia wavaria. Common.

Panagra petraria. I have taken this species several times, but it cannot be called common.

Scodiona belgiaria. This uncommon moth I have taken several times on the heath. The thing which first struck me was the disparity in size of the two sexes, the males being as large again as the females and of a much lighter colour; in fact I did not believe they were the same species at first. The female of *S. belgiaria* has a striking resemblance to the female of *Fidonia atomaria* while on the wing. As far as my experience goes the males never fly in the day time, while the females fly in the hottest sunshine, or perhaps this was only caused by my intrusion upon their homes among the heath. The males I have taken on the wing about dusk, and they are very easy to catch.

Selidosema plumaria. This moth is rare here. I have taken males of this species, but never saw a female. The males differ very much in colour, some being very dark smoky brown, others ochreous. I have seen the moth on the wing both in the day time and in the evening.

Fidonia atomaria. Common on the heaths, both night and day.

Fidonia piniaria. This local species is also to be found here. It flies very high, and is therefore difficult to capture. I should think if *Apatura Iris* is said to have its throne on the top of an oak, *F. piniaria* may be said to hold sway supreme on the top of the fir. I have watched it for hours taking its trips round its food, and after all was obliged to abandon the pursuit. No person but those who have undergone this disappointment can imagine an entomologist's feelings, to see insects which are his chief desiderata and yet unable to procure them. *F. piniaria* flies in the day time, the male commonly, the female rarely.

Aspilates strigillaria. I am in the habit of taking this species on the heath of the Earl of Normanton, but not in any plenty. I used to find it common on a heath, but now in that locality there are many boards thrust before your notice at every turn with "Trespassers will be prosecuted with the utmost rigour of the law."

Abraxas grossulariata. Very common here.

Ligdia adustata. Sometimes rather common, at others scarce.

Lomaspilis marginata. Very common on one hedge of willows.

Hybernia ruficapraria and *H. progemmaria*. The males of these two species are common, the females I have bred but never taken.

H. aurantiaria. I had a beautiful pair of this moth developed in January last, from larvæ feeding on birch.

Anisopteryx æscularia. This species is not so common here as in some localities. I never caught but one male, but bred several.

Cheimatobia brumata and *Oporabia dilutata*. Both common.

Larentia didymata. Common where the stinging nettle abounds.

L. multistrigaria. In the spring of 1861 I found this species very abundant on the heaths.

Emmelesia albulata. Not uncommon in the meadows.

Eupithecia venosata. Scarce. I have never taken many. I only met with one during last season.

E. nanata. One spot on the heath seems to swarm with this species.

E. castigata. Not very common.

E. subnotata and *E. vulgata*. Not uncommon.

E. absynthiata. Last season I bred a large number of this species off the flowers of the ragwort.

E. exigua. Scarce.

E. rectangulata. Not uncommon.

Lobophora sexalata. Rare, as I believe it is in all other parts of the kingdom. I have only taken two, and these happen to be male and female. It is remarkable that the males have appendages on the hind wings, and when I took it I thought it was a moth with six wings. [Hence the name.—*E. N.*]

Thera variata. This species is very common. They differ very much in size.

Ypsipetes impluviata. Not common.

Y. elutata. Common, often abundant. Among them are some curious varieties.

Melanthia rubiginata. Taken once while beating an oak at Lyndhurst.

M. ocellata. Common.

M. albicillata. I took three of this species in 1861, but they appear to be scarce, as I only saw single specimens.

Melanippe rivata. Scarce.

M. montanata. Not uncommon.

M. galiata. Occasionally.

M. fluctuata. Common.

Anticlea rubidata. I have taken this insect several times, but mostly faded specimens.

A. badiata. I have also taken faded specimens of this species.

Coremia propugnata. Of frequent occurrence.

C. ferrugata. Common in the lanes.

Camptogramma bilineata. Very abundant.

Cidaria miata. Common.

C. picata. Scarce.

C. russata. Common, sometimes abundant. They vary much in colour.

C. suffumata. I have taken this insect several times.

C. testata. Common on the heath.

C. fulvata. Common in the same locality as *Hepialus hectus*.

C. pyraliata. Not common.

Eubolia cervinaria and *E. mensuraria*. Not uncommon.

Platypteryx lacertula. I have only taken one specimen of this insect, and that was flying round a willow.

Cilix spinula. I have taken this curiously-marked species several times.

Dicranura vinula. Sometimes taken, although I have never met with it. I have found the larva.

Pygæra bucephala. Very common in the larva state.

Ptilodontis palpina. I have only taken one specimen of this insect, but Mr. Greene during his visit here bred a pair, and with his accustomed liberality gave them to me.

Notodonta camelina. Of frequent occurrence in one locality.

N. dictæa. Rare. I have taken two at different times.

N. trepida. I have taken both the larva and pupa of this species, but have never reared it.

N. chaonia. I have never seen this insect, but Mr. Greene says "I know the insect occurs at Ringwood, as I found the larva."

N. dodonæa. I found an ichneumonid larva of this species in 1861.

Diloba cæruleocephala. Common in the larva state. The imago is not often seen.

Thyatira derasa. I have sometimes taken this, and once found the larva.

T. batis. I take this and the preceding species at sugar, but not commonly.

Bryophila Perla. Taken occasionally on lichen-covered walls.

Diphthera Orion. This rare species is found in the Forest, but I have never been the lucky captor of a single specimen.

Acronycta Psi. Of frequent occurrence at sugar.

A. megacephala. Not very common.

A. Ligustri. I have only taken one specimen of this insect, and that was at sugar after an extremely wet day.

A. Rumicis. I often find this species very abundant at sugar.

Leucania turca. This species is very local. I remember well my first sugaring with Mr. Greene, at Lyndhurst: we had sugared about fifty trees and searched about twenty without the sign of a moth, but as we proceeded we found *L. turca* rather common.

L. lithargyria. Not common.

L. impura and *L. pallens*. Of frequent occurrence, both at sugar and on the wing.

Xylophasia rurea. Not common.

X. lithoxylea and *X. polyodon*. Common at sugar.

X. hepatica. Rather scarce.

Dipterygia Pinastri. This species is rather common here at sugar; in fact in 1859 it was abundant.

Charæas Graminis. This destructive little insect I have never found common.

Cerigo cytherea. I sometimes capture this insect at sugar, but Mr. Greene informs me it is very partial to light.

Mamestra Brassicæ. Common. My first pupa-digging experience was with this species. I had purchased the little book of Mr. Greene's on the subject, and had read that oaks generally produced good insects, so I went digging, when I saw a large oak full of angles, which is just the sort recommended as prolific, and I went to it in a rather disconcerted mood (being unsuccessful), and inserted the trowel, when, on turning over the sod, I saw pupæ not in pairs but in dozens. I searched the tree, and found ninety-six in all. I took them home and put them very carefully into my breeding cage, and after awhile I was rewarded with *M. Brassicæ* in plenty. If the digging disconcerted me the rearing did so more, when I saw about twenty of this pest on the glass of my cage; however I let all the pupæ remain in the cage to see if there were any beside *M. Brassicæ*, and by this means I got two specimens of a moth nearly as common, *viz.*, *Hadena oleracea*.

M. Persicariæ. I bred a specimen of this insect from a larva feeding on peas. It appears to be scarce about here.

Apamea oculea and *Miana strigilis*. Both very common at sugar and at privet blossoms.

Caradrina Morpheus. Rather scarce ; once at sugar.

C. cubicularis. Not uncommon.

Rusina tenebrosa and *Agrotis suffusa*. I have taken both these species, the former at sugar and the latter at ivy blossoms, but neither common.

A. Segetum and *A. exclamationis*. Very abundant in 1860, but not so common last season.

A. nigricans. I took a rather worn specimen flying about some bramble blossoms, about three miles from here, also a very good example on the heath, both in August last.

A. porphyrea. Common on the heath, both at sugar and at the heather blooms.

Triphæna janthina, *T. fimbria* and *T. interjecta*. The two first may sometimes be met with at sugar. Of the last I have only taken a single mutilated specimen.

T. subsequa. This is one of the entomological prizes for sugarers and searchers of privet blossoms. Mr. Greene took a pair in 1860, both at the blossoms I believe. Although sugar is very well in its place, yet the blossoms of the privet and ivy surpass the best sugar mixture ever concocted.

T. orbona and *T. pronuba*. Both common at sugar.

Noctua plecta. Common at sugar and about bramble blossoms.

N. Rubi. I have taken this insect once or twice.

N. umbrosa. Not uncommon.

N. xanthographa. Abundant.

Trachea piniperda. This I have taken but once, though accounted so common an insect.

Tæniocampa gothica, *T. instabilis*, *T. stabilis*, *T. gracilis* and *T. cruda*. All these moths have a great love for the flowers of the willow. I have never taken any at sugar. *T. gracilis* and *T. cruda* are not common ; the others are.

Orthosia Ypsilon. Not common.

O. lota. Of frequent occurrence at the ivy blossoms.

Anchocelis pistacina and *Cerastis Vaccinii*. Common at the ivy blossoms. Some curious varieties of the latter species may be sometimes obtained.

C. spadicea. Abundant at ivy.

Scopelosoma satellitia. Of frequent occurrence at ivy and willows.

Dasyampa rubiginea. I took a very good example of this rarity at ivy last October.

Xanthia ferruginea. Not uncommon.

Cosmia trapezina and *C. diffinis*. These two species may sometimes be met with at sugar, but *C. trapezina* is much more common than *C. diffinis*.

C. affinis. Common at sugar.

Dianthœcia capsicola. I have never taken this insect on the wing, but have reared it twice from the seed-vessels of *Lychnis*.

Epunda viminalis. I have a rubbed specimen, but it is the only one I ever saw.

Miselia Oxyacanthæ. Not uncommon at ivy.

Agriopsis aprilina. Never taken on the wing. I found two pupæ in the forest, both of which came to perfection.

Phlogophora meticulosa. Common at sugar and at ivy. I often find the hibernating larvæ of this species in moss during the winter months.

Euplexia lucipara. I have frequently taken this species at sugar and hovering over bramble blossoms.

Hadena oleracea. Common.

H. contigua and *H. Genistæ*. Not common.

Xylocampa lithoriza. I have taken this species three or four times.

Xylina semibrunnea. Rare; I took a single example at ivy last October.

Cucullia Verbasci. I have bred this insect twice. The larva is very common, feeding on the yellow mullein, but they are so subject to the attacks of ichneumons that out of thirty or forty larvæ I only bred a single moth. It spins a very thick, tough cocoon underground, and changes to a yellowish pupa, in which state it passes the winter.

Anarta Myrtilli. This is certainly well named the "beautiful yellow underwing," as the combination of colours is truly lovely. This species flies in the day time and only in the hottest sunshine. It is extremely difficult to catch; it will often lead you a great distance, and then by a sudden sort of jerk or darting motion it is lost to your view. I never took more than four. When they are in the net they have the same restless propensity, and will damage themselves considerably even before you secure them. The best plan is to rear them from the larvæ (which like the moth is very beautiful), but get them ever so young they have nearly all been ichneumonated.

Heliodes Arbuti. This minute *Noctua* was not uncommon in 1859, although not of frequent occurrence since.

Erastria fuscula. This species appears to be rare; I have only taken a single specimen.

Abrostola Urticæ. Not uncommon where the stinging nettle abounds.

A. triplasia. Not common.

Plusia chrysis and *P. Gamma*. Common in same locality as *Abrostola Urticæ*.

Gonoptera Libatrix. Common in the early spring.

Amphipyra pyramidea. May sometimes be taken at sugar, but is not common.

A. Tragopogonis. Common at sugar, but has a remarkable plan of sliding away as soon as the light from the bull's-eye comes upon it.

A. maura. Common at sugar; often abundant.

Catocala nupta. Of frequent occurrence at sugar where willows abound.

Phytometra ænea. I have taken this species once in each year during the three years I have collected on the heath. They fly in the sunshine.

G. B. CORBIN.

Ringwood, Hants,
April 1, 1862.

Having written to my much-esteemed friend Mr. Greene he has kindly sent me the following additions to insert on his authority. I will give them in his own words.—*G. B. C.*

Trochilium culiciformis. I saw a beautiful specimen alive of this insect, which had been taken by a young entomologist, Mr. Reginald Frye.

T. apiformis. Larvæ common at roots of poplars.

Ennomos erosaria. Larvæ not uncommon on oaks.

Ephyra poraria and *E. pendularia*. Larvæ not uncommon on oak and birch.

Eupithecia virgaureata. Larvæ on golden rod.

E. minutata. Larvæ common on heath.

E. pusillata. Eggs on golden rod.

E. abbreviata. Larvæ not uncommon on oak.

E. pumilata. Larvæ on broom, but scarce.

Lobophora viretata. One larva beaten from sloe produced a fine female.

Anaitis plagiata. Common in the larva state feeding on St. John's

wort. Thinking it to be in its young state a larva of some *Eupithecia*, I spent many laborious hours in searching for them.

Clostera reclusa. Larvæ very common on dwarf shallows.

C. curtula. Larvæ scarce on aspen.

Acronycta leporina. One imago on bedroom window.

Triphæna subsequa. The locality in which these were taken is worth noticing. The insect has, I believe, generally been captured in or about the forest. These two, however, were taken on the blossoms of a privet hedge which bordered the high road, and was not more than a hundred yards from the town of Ringwood.

Trachea piniperda. I am surprised that Mr. Corbin should not have met with this insect, as the larva is common enough on firs in the middle and end of July.

Cirrædia xerampelina. Pupæ at the roots of ash.

Tethea subtusa. Common in the larva state on poplars.

Dianthæcia carpophaga. Larvæ not rare in the seed-vessels of *Silene inflata*, but difficult to rear. The same remarks apply to *D. conspersa*.

Hadena protea. Pupæ common at roots of oak.

J. GREENE.

Description of the Larva of Orgyia fascelina.—The eggs are laid in August, on the leaves of *Salix fusca*, which grows abundantly on the sand-hills at the mouth of the Mersey, and the larvæ are hatched in about twelve days: the young larva eats for a very short time, and then hibernates at the roots of the herbage. In the ensuing April it again commences feeding on the young and tender silken leaves of the willow. When disturbed it rolls itself into a tight ring with its head on one side, and not brought into contact with the tail; in this position it sometimes falls to the ground, but sometimes also clasps the twig of its food-plant, enclosing it in the ring, and is then difficult to remove without injury. Head prone, rather small, concealed by hair. Body obese, very hairy: the 2nd segment has a pencil of black hairs on each side the head; these are seated in the neck and stretch forward in a spreading manner. The 5th, 6th, 7th, 8th and 9th segments have each a broad thick brush of hairs standing erect on the back; the colour of each of these is intense black in the middle, and dingy white on the sides, so that the larva when at rest in a horizontal position seems to have a black stripe down the middle of the back, and a whitish stripe, rather interrupted, on each side of it: the black stripe is continued on the 10th and 11th segments, and terminates in a fascicle of black hairs on the 12th segment; this fascicle slopes backwards at an obtuse angle, and the hairs composing it are longest in the middle, gradually decreasing in length to the outside. In the very middle of the 10th and 11th segments on the back is a small valvular pore having a mucous surface, and susceptible of being opened or closed at the pleasure of the larva: the function or office of these pores is at present unknown to me, but their presence in other species is observable; their colour is pinkish. The head is black in front and

on the crown, but has a red patch on each side: the front or face is rough, but the other parts are brilliantly striking. All parts of the body not occupied by the brushes and fascicles are covered with hairs, which spring from wart-like tubercles, eight of which form a circular series on the 2nd, 3rd and 4th segments respectively; on each of the following, that is, from the 5th to the 9th, both inclusive, three on each side of each segment, below its dorsal brush, which evidently occupies the place of the two that are absent; the 10th and 11th segments have each eight of these hair-bearing tubercles: the hairs springing from them are of two colours, yellow and black: these are intermixed and apparently without order, so that they give the larva a yellow tinge. The skin is intensely velvety black, variegated on the sides with gray markings and on the belly with rivulet orange markings, which form a double stripe the whole length of the larva: the legs are black and shining, the claspers dingy flesh-coloured. I have never met with larvæ more quiet and sedentary than these: like silk-worms, they remained on the food-plant, *Salix caprea* (the willow), with which I provided them, and exhibited no disposition whatever to wander. All my specimens were full fed on the 13th of May, and then ascended to the highest accessible part of the breeding-cage, and there, in defiance of the laws of gravity, each spun a large and lax cocoon, through which the enclosed pupa is most distinctly visible: the cocoon is like very thin coarse felt in appearance, and is composed of the hairs of the larva and silk in about equal proportions, the hairs being those composing the dorsal tufts of the larva, and not the hairs scattered over other parts of the body, which still remain attached to the skin shed on assuming the pupa state: the pupa is short, obese and black, with a metallic bronze-like lustre: all the dorsal surface is uniformly covered with long silky brown hairs, but the wing-cases and ventral surface are entirely without hairs. The moths appeared on the 20th of June. I am indebted for a supply of this beautiful species to the unvarying kindness of my friend Mr. Edwin Birchall.—*Edward Newman.*

Captures near Cockermouth.—We have taken a few of each of the following insects:—*Notodonta carmelita*, *Cymatophora flavicornis*, *C. ridens*, *Lobophora viretata*, *L. polycommata*, and many other species of less note: the last two species I find to be very local and scarce, especially *L. viretata*; it is a very pretty insect, and is difficult to see, as it always chooses a tree the bark of which is similar in colour to itself to rest upon.—*George Mawson; Gill House, May 21, 1862.*

Life-Histories of Sawflies. Translated from the Dutch of M. SNELLEN VAN VOLLENHOVEN, by J. W. MAY, Esq.

(Continued from p. 7857.)

NEMATUS VENTRICOSUS, *Klug. Hartig, Aderfl. Deutschl. i. p. 196, No. 23. Bouché, Naturgesch. d. Ins. p. 140, No. 7. Dahlbom, Clavis novi Hym. Syst. p. 22, Nos. 18 & 25. Léon Dufour, in Ann. de la Soc. Entom., 2e serie, v. p. 571.*

Nematus luteo-flavus, capite, maculis tribus dorsalibus ac duabus

pectoralibus nigris, antennis supra, tibiarum apice tarsisque posterioribus fuscis ♀; partium omnium colore obscuriori ♂.

Some years the currant bushes (*Ribes rubrum*) are attacked by little caterpillars, which, from their feeding together in large numbers and being very voracious, soon eat bare whole rows of bushes. I imagine that in years favourable to their development there are three broods; the first imagos appear in the beginning of May, and the larvæ produced from the eggs of these have already undergone their metamorphosis in the beginning of June (see, on this head, the observations of Bouché), so that by the middle of that month a second brood of imagos has appeared. Now, in June, 1840, I found hundreds of larvæ, of which some that I reared produced perfect insects in August; and in the month of September of the year following I found all the currant bushes at Zwammerdam eaten bare, and many larvæ yet on the branches, so that this may have been the third generation. However, I think we must assume that there are generally but two broods in the year,—namely, imagos in May producing larvæ in May and June, these again producing imagos in July, the offspring of which pass the month of August in the larval state, and spin up by September, to pass the winter in the cocoon.

The larva (fig. 1), which is about 16 mm. long, is of a grayish green colour, with paler sides, the first and penultimate and sometimes the terminal segments being yellowish or orange. The head is shining black, with brownish yellow mouth. The whole body is covered with black points, which project more or less, and each bears a single little black hair. These points are arranged in curved rows, the first segment having one, the second two, and the following segments three rows. Besides these at the sides above each leg are one larger and two smaller black shining spots, each spot having little hairs growing on it. The spiracles are white. The larva has twenty legs, so that only the fourth and eleventh segments are apodal; the six thoracic legs are black and green ringed, with brown claws, the abdominal legs pale green, the anal claspers yellow; above these last on each side is a little black spine; I could not discover any trace of the so-called abdominal glands or other secretory apparatus.

These larvæ feed both day and night, and, beginning in company on a leaf, they eat on until there is nothing left but the stalk and some of the thickest veins. Before quitting the bush they moult once more, assuming a pale yellowish green colour, the first and terminal segments being orange, but they are now without the black

spots and hairs (fig. 2). After this they drop from the tree and construct a cocoon at the foot: this cocoon is made at no great depth in the ground, and is externally entirely covered with little grains of earth (fig. 3). They assume the pupa state, in the summer, in the space of three weeks, in the winter only after an interval of eight months. The pupæ are yellowish white, and display all the parts of the imago. They very soon change their colour, and in eight or ten days, having moulted for the last time, the perfect insect gnaws open the cocoon.

The imago is from 7 to 8 mm. long, expanding 15 to 16 mm. The female has the head black, the clypeus, labrum, bases of the mandibles and the antennæ dull yellow, the borders of the eyes reddish, which is also the tint of the under side of the antennæ; the back is black with yellow margins, or yellow with three black spots; scutellum red; cichri white; the abdomen is yellow; the ovipositor brown. On the breast are two pretty large shining black spots. The legs are yellow, the ends of the tibiæ and the tarsi of the hind legs are brown or black. Wings translucent, fulvous at the insertion, the nervures and stigma brown (fig. 4).

The following are the distinguishing marks of the male: the antennæ entirely black, the spot on the back never divided, scutellum black, sometimes with one or two brown spots, the basal segments of the abdomen black, and sometimes the coxæ of the last pair of legs also black.

Lastly, among a number of *Nematus ventricosus*, which I reared all from one brood, I found a female, which, from the description given by Hartig, in the 'Aderflügler Deutschlands,' p. 196, No. 22, appears to be *Nematus albipennis*, *Klug.*; this specific name would thus have to be dropped. It is of the same size as the type; the antennæ are entirely black, head black, with the labrum, palpi and bases of the jaws yellow; abdomen with five black lines on the upper surface, breast yellow, with the two usual spots; legs fulvous, the last pair with pale brown tarsi; and lastly, the wings have a large yellow stigma, the nervures and insertions of the wings being also of that colour. A fore wing is represented at fig. 6. Although I have observed a great number of these insects escape from the cocoon, I have only once met with this variety, and have never taken it on the wing. The saw of the female of this species greatly resembles that of *Nematus cæruleocarpus*, which I have already described, but it is somewhat less curved, as represented at fig. 7.

I am acquainted with the following as parasites on the larva of this

species, namely, *Mesoleptus limitaris*, Grav., *Tryphon cephalotes*, Grav., *T. melanoleucus*, Grav., *T. bipunctatus*, Grav. Probably all the parasites mentioned by Ratzeburg as having appeared from *Nematus Ribesii*, Scop. (?), will be found to harbour in this species. It is impossible to state with certainty whether Réaumur, in his 'Mémoires,' vol. v. pp. 94 and 125, pl. 10, figs. 4—11, had this or another species in view. Had not Dahlbom stated in his 'Synopsis,' quoted at the head of this paper, that his *Grossularia larvæ* fed on the leaves of the gooseberry as well as on those of the currant, I should have supposed that this otherwise so accurate naturalist had confused two species together, the more so that I am acquainted with two species of *Nematus* which have many points of agreement with this *N. ventricosus*. But Réaumur, in the body of the work, gives his larva twenty-two legs, and in the description of the plates only twenty: this appears to warrant us in supposing that in this matter Réaumur has not gone to work with his usual exactness, which would tend to do away with the interest we might have in determining whether his species was the same as ours.

Léon Dufour has treated of this subject in a paper entitled 'Etudes pour servir à l'Histoire du *Nematus Ribis*,' published in the 'Annales de la Soc. Ent. de France,' 2me série, tom. v. p. 571 (1847). According to this writer, Dahlbom has made the mistake of stating that the *Nematus* of Réaumur is identical with his *N. Grossulariæ*, and was quite inaccurate when he maintained that the writer of the 'Mémoires' had made an error in describing the number of legs.

Although we have no wish to enter into the vexed question about synonymy, which would lead to no result, we cannot help expressing our disapproval of the way in which Léon Dufour has treated the subject, calling his species *Ribis*, although he himself states that it is not the *Tenthredo Ribis* of Schrank. This employment of the same specific name can only give rise to confusion. Again, Léon Dufour states, "D'abord la larve du *Grossulariæ* a vingt pattes, et je ne conteste pas à M. Dahlbom son exactitude numérique; celle du *Ribis* n'en a que dix-huit," whilst, from what is said at p. 574, it appears that his larva had besides the eighteen legs, "une saillie inférieure du dernier segment de l'abdomen, saillie où se trouve l'anus, et sert, par son épanouissement bilobé, à s'appuyer sur le plan de support, soit pour favoriser la locomotion, soit pour maintenir la larve dans les attitudes souvent grotesques qu'elle prend sur les bordes des feuilles." Now, seeing that every one except Dahlbom counts this "épanouissement bilobé" for a pair of legs, Dufour should have

acknowledged that Dahlbom's larva and his had the same number of those appendages. It is also worthy of remark, as at p. 572, that the French author, who appears to read neither German nor English, seems to consider that during the interval of time between Réaumur and himself (1740—1847) nobody has said a word respecting the loss of colour and markings undergone by the larvæ of sawflies at their last change of skin.

On the other hand, I quite agree with Léon Dufour that there is no reason to consider Dahlbom's *Nematus grossulariatus* as a distinct species from his *Grossulariæ*. The larvæ of the two species, as well as the perfect insects, were as like as two peas, the only difference being that the first pupized on the branches and made a simple cocoon.

P.S. Since the above was written in the original, the following has been received from the author:—*Nematus ventricosus*, *Klug*. There was an incredible number of these larvæ in 1860. From observations made by Dr. Witterwaal at Utrecht, and by myself at Leyden, there seems to be no doubt that the first brood in May attacked exclusively the leaves of the gooseberry, some of the bushes being quite stripped, and that the second generation, appearing in July, principally confined itself to the currant, but small numbers having been seen on the gooseberry. I observed this myself in a garden where the two plants were growing intermixed; both larvæ and imagos were decidedly of but one species. From this second brood I reared the parasite *Campoplex argentatus*, *var.*, and a *Tachina*.

Notice of two Species of Coleoptera new to Britain.—While working out my specimens of *Oxytelus*, some time ago, I found a series of specimens agreeing with each other and differing from any species I had seen described; upon the appearance of Dr. Schaum's new edition of his Catalogue, I thought my species would prove to be *O. maritimus*, as in fact it does. It was taken on the Somersetshire coast under seaweed, and was tolerably abundant. It resembles *O. inustus* somewhat closely, but is easily distinguished by the testaceous antennæ and the more scattered punctuation. I should also like to call the attention of entomologists to the genus *Chalcoides*, of which we have at least one more species than is recorded, *viz.* *C. Chloris*, not uncommon on sallows. It is nearly allied to *C. versicolor*, but is of an unicolorous green, and has only four joints at the base of the antennæ pale, instead of five, as in *C. versicolor*. The male also furnishes a decisive character in the shape of the œdeagus, which is never emarginate as in *C. versicolor*.—*G. R. Crotch; St. John's College, Cambridge, June 18, 1862.*

Capture of Antherophagus silaceus, Herbst, *Agathidium rotundatum*, Gyll., and other Coleoptera.—I have much pleasure in recording the addition of *Antherophagus silaceus* to the list of our indigenous Coleoptera, as it completes the species of that genus at present known on the Continent. The specimen in question was taken by myself some years ago in Oxfordshire. *A. silaceus* may be distinguished from *A. pallens*, which it much resembles in size and colour, by the elongate tooth at the apex of the anterior tibiæ, and by its long pubescence. *Agathidium rotundatum* is most nearly allied to *A. mandibulare*, but may be known by the greater length of the sutural stria, and by the pale apical joint of the antennæ. Of *A. rotundatum* I have met with several examples in this neighbourhood. In the course of an excursion which I lately made into Derbyshire, in company with my friend Mr. G. R. Crotch, we were fortunate enough to capture the following rare species, viz.:—

Rhizophagus cæruleus. Two specimens.

Agathidium nigripenne. Several.

Clambus nitidus. In abundance.

Paramecosoma bicolor. In abundance.

Orsodacna Cerasi.

Scydmænus elongatulus.

„ *scutellaris*.

Stenus Guynemeri.

„ *tempestivus*.

Dianous cærulescens.

—*A. Matthews*; *Gumley, Market Harborough, June 15, 1862.*

Occurrence of Claviger foveolatus near Blandford.—I have taken *Claviger foveolatus*, during the past week, in some plenty on a chalk down near Blandford, which gives a new locality for this species, and confirms my previous suspicion that when well searched for, it will be found to have a wider distribution than is at present imagined. I may as well mention here that about three years ago I possessed a male example of *Bombyx Mori*, which, in the perfect state, retained the larval mask, but, not knowing at the time the rarity of the case (Zool. 7335), I subsequently allowed it to be lost: its sight appeared to be entirely obstructed by the unusual head-covering. — *B. Carrow*; *Witchampton Rectory, near Wimborne, Dorset, May 17, 1862.*

Occurrence of Pentarthrum Huttoni near Plymouth.—Last summer I purchased, with a lot of garden tools, an old cask, in the staves and hoops of which I had the good fortune to find nine specimens of this remarkable rarity. The cask was put away with fire-wood materials, logs, stumps and fagots of various timber, in an old out-house adjoining a garden attached to the premises formerly occupied by Colonel Pedlar, and situated on the road to Tavistock. It will be remembered by coleopterists that this insect was made known to Science by Mr. T. V. Wollaston, who named it after its captor, the Rev. H. W. Hutton, in the ‘Annals and Magazine of Natural History’ for August, 1854. After showing it to be new both in genus and species, Mr. Wollaston proceeds to state that four examples were found by the Rev. H. W. Hutton, in November, 1853, “amongst logs of wood recently cut up for burning, and Mr. Hutton states that it was from out of a hard and undecayed portion of cherry-tree (in which their winding burrows were very apparent) that he succeeded in extracting them.” I have since had a few specimens sent by Mr. Keys, bookseller, of this town, who accidentally met with them whilst turning over a pile of slates, the

frame of one of which broke in his hand and disclosed the insects. The wood in which this insect, in both instances, was found, was birch.—*J. J. Reading; Plymouth, May 17, 1862.*

Acentropus niveus: does it belong to the *Lepidoptera* or the *Phryganeina*? *—The ordinal position of *Acentropus* was brought before the Society by Mr. Brown, in a paper read on the 11th of September, 1857, and the question was then supposed to be settled; yet whenever a naturalist of distinguished ability and repute publishes an error it is astonishing with what pertinacity it sticks. *Narycia elegans* was removed from the *Phryganeina*, because, fortunately, it was found to correspond with an insect, under another name, placed among the *Lepidoptera*. *Acentropus* still remains to find a position generally acknowledged. Westwood, Dr. Hagen and Zeller may be cited among the principal authorities for including *Acentropus* with the *Lepidoptera*. Guenée and Doubleday, we are informed (Preface to 'Zoologist,' 1861), "absolutely and unhesitatingly reject it from that class." In the 'Intelligencer,' last year, there was some discussion, and a proposition was made to place it in the tribe *Phryganeina* near to the *Sericostomidæ*. Why it should be rejected from the *Lepidoptera*, or why it should belong to the *Phryganeina*, is what we want to know. One argument has been adduced, which is that "the extremity of the abdomen is adorned with quite trichopteriform anal appendages." This is an assertion which may be met by another, namely, that the anal appendages are similar to those of the *Lepidoptera*, more particularly to some of the *Tineina*. I think they will compare more favourably with *Cheimabacche*, or with *Tinea*, or even with *Depressaria*, than with any of the *Phryganeina*. Believing that the anal appendages of the *Lepidoptera* have not received the attention which they deserve, it may perhaps be excusable here to notice them more than would otherwise be expedient. In size, form and accompaniments they are almost as diversified as in the *Phryganeina*; and this is the case merely between widely separated genera, but between closely allied species they sometimes exhibit a very remarkable difference. As an instance, compare the appendages of *Triphæna pronuba* with those of *T. orbona*, and it is very probable that where doubts exist as to specific distinction a reference to these characters may solve them. In the *Phryganeina* the anal appendages are exposed, naked or but slightly clothed with hair, never so as to conceal them; in the *Lepidoptera* they are usually quite concealed by a clothing of scales and the caudal tuft. It frequently happens that in the death-struggle they are expanded and remain so; this must have been noticed by every possessor of a tolerably good collection, in the genera *Mamestra* and *Hadena* especially. When this is the case a fair view is obtained internally, but for careful examination they should be denuded. The anal appendages of *Acentropus* are clothed with scales as in the *Lepidoptera*. It may be that they are rather sparingly so, or that they are easily denuded, for I have not had a bred specimen to examine; but the fact is evident. In *Acentropus*, as was shown by Westwood more than twenty years ago, the wings are clothed with scales, and not only the wings, but the head and palpi, body and legs; the thorax is furnished with a pair of tippets, and the hind wings with a bristle. These three peculiarities, though not possessed by all the *Lepidoptera*, are characteristic of the order, and none of them are found in any of the *Phryganeina*. But this is not all: according to Mr. Brown, the pupa is enclosed in a silken cocoon in the axils of the leaves of *Potamogeton pectinatus*, and with regard to the pupa itself he speaks very positively. "I have proved *Acentropus niveus* to be a lepidopterous

* Read before the Northern Entomological Society.

insect," he says; and again, "the pupa-case puts the relationship of the *Acentropus* beyond a doubt; it is clearly the chrysalis of a moth."—(Zool. 5919). The anomalous characters of *Acentropus* are presented in its palpi and legs; the latter being destitute of spurs, the former differing in the sexes. In the male one pair of palpi are very conspicuous; in the female two pairs are distinguishable, both rudimentary, but one much larger than the other. I will not venture to say in either sex which are maxillary and which are labial, though it is an important point; yet to judge from these organs alone, the insect should belong to the Lepidoptera, for they are thickly clothed with scales, thus agreeing with that order only, and in other respects are totally different from the palpi of the Phryganeina. I come now to speak, though with more diffidence, of its relative position in the Lepidoptera. Mr. Brown presumes its location will be immediately after the genus *Hydrocampa*; Zeller, according to Dr. Hagen, includes it in the Crambidae. Now these families are remarkable for the narrow and elongate abdomen of the males; that of *Acentropus* appears to me more to accord in character with *Cheimabacche fagella*; the thorax, in the manner of its clothing and tippets, is similar to *Epigraphia avellanella*; the form of the wings in the male resembles *Exapate gelatella*, and the veining makes as near an approach to this insect as *E. gelatella* does to *Dasystema salicella*. These characters, then, together with the form of its anal appendages are suggestive of some degree of relationship here.—*Benjamin Cooke*.

Insect Transformations: the Dragonfly.—I have lately been interested in the manner in which the dragonfly enters on its winged life, and I have pleasure in sending you a few notes that may not be unwelcome to your readers. My observations have as yet been confined to a single species, *Agrion Puella*. The larvæ of this, as of other dragonflies, subsist in their subaqueous life on various animal substances, and are veritable little tyrants of the water. In June, or even earlier, they feel their change approach, and pass into the nymph state, which differs from their previous condition in the increasing transparency of the insect and a certain glow of colour that tells so plainly that a further change is at hand. You will need to be an early riser to see the imago emerge. The transformation begins soon after six o'clock. The pupa may then be seen to creep stealthily up the stem of rush or sedge, and, having found a suitable resting-place, it hooks itself fast by its feet, imbedding most firmly its hinder feet in the stem. Here it remains for some minutes, till its case has become perfectly dry. Then the evolutions begin: first there is a cracking of the case above the eyes, and the large lustrous eyes appear; next the part immediately above the rudimentary wing-case cracks, and the crack speedily extends itself towards the head. The head is first liberated, next the thorax is evolved, but lest the helpless creature should overbalance itself, and thus interfere with the delicate evolution of the legs, Nature has provided it with four extremely elastic belts, two being attached behind the neck and two to the region of the thorax: these serve as suspensory bands to support it while disengaging its legs. It then seems exhausted with its efforts, and rests in order to allow the parts already evolved to dry. This done, and the legs having assumed firmness, it clings again to the reed, and very gradually draws forth its body, arching itself so as not to touch the wings, which are limp and tenderly pliable. The wings very slowly and gradually assume their full dimensions, becoming more and more gauze-like as they are developed; the body becomes longer, and in the course of an hour or so the dragonfly rises on its wings and soars away. I brought in several of the pupæ in my botany-case imbedded in

Sphagnum moss, and thus succeeded in retarding their transformation till I had an opportunity of witnessing at my leisure and with a powerful lens the exit of the imago. The pupæ, if put into a basin, and supplied with reeds, will creep up the stems and undergo their change in a room quite as effectually as in the open air.—*Peter Inghald; Storthes Hall, near Huddersfield, June 18, 1862.*

Caaing Whales in the Humber.—During the past week an extraordinary number of caaing whales (*Phocæna melas*) have visited our river; between forty and fifty, having run into shallow water on the Whitton Sands, were left dry on the tide falling. These were soon observed by the people on shore, who, aided by some sloopmen, soon put off with spades, handspikes and other weapons, and despatched the entire shoal. I saw three of them which a sloopman had towed behind his vessel, and which at the time of my visit were laid on the mud previously to flensing for the blubber. They were apparently from fifteen to twenty feet long, and agreed very well with the description and figure given in Bell's 'British Quadrupeds.' A similar shoal went on shore at Cleethorps, near the mouth of the Humber, and the whole were also captured. Although this visitation cannot be compared in point of magnitude with the wonderful shoals which visit the Orkneys and Iceland, still the occurrence so far south struck me as worthy of being recorded. I may mention that in recording the capture the local newspapers mention them as grampusses, and again as bottle-noses, but I feel sure they must be referred to *Phocæna melas*.—*G. Norman; Hull, June 14, 1862.*

Poisoned Grain and Destruction of Small Birds.—Mr. W. H. Duignan, of Rushall, near Walsall, writes:—"I have, or rather had, a rookery adjoining my house, which I established three years ago, and in the welfare of which I took the greatest interest; in fact I loved the rooks like my own children, and fed and protected them. Yesterday evening my servants observed them falling as if shot, and in the course of an hour the field was strewed with their dead bodies. On my return home I examined them, and found their bills and craws filled with poisoned wheat. The destruction is still going on, and nearly the whole of the old birds are dead, leaving their young ones clamouring and starving in the trees. In the course of another day I think there will not be a single bird, young or old, left alive. Mine is not an isolated case: I know several other rookeries which have been devastated by the same cause, and on one estate all the feathered game was destroyed." Another friend writes as follows:—"The effect of the universal tendency to destroy small birds will be yearly more disastrous, unless active measures are taken to check the evil. At present these useful, nay indispensable creatures are at the mercy of every heartless and ignorant vagabond, and even of the half-educated. Men shoot them, entrap them and poison them; boys are allowed by their parents to rob their nests, and thus destroy what, in the great scheme of Nature, is of more value than themselves. In my own neighbourhood, where insects of the most pernicious kinds were never more abundant, a lady has this spring (1862) poisoned, with strychnine, at one dressing of her grounds or gardens, no less than eight hundred birds of various kinds; and she was a few days since preparing for a second *battue*." The annexed is a *verbatim* copy

of measures which are being adopted throughout France, not only by the authorities, but likewise by the chief landowners, to prevent the destruction of small birds. An association formed for that purpose at St. Cesaire, in the Charente-Inférieure, has adopted the following resolutions:—"1. None of us, during the year 1862, will either seek to discover birds' nests or to destroy the young birds, in whatever place soever they may be, and under no matter what pretext. 2. None of us will pursue any birds after quitting their nests. 3. The nests of sparrows, chaffinches and linnets may alone be destroyed, these birds being considered mischievous." It was M. Renon, the parish schoolmaster at St. Cesaire, who drew up these resolutions for his pupils; but it is expected that on consideration he will strike out the third resolution, which declares war against sparrows, chaffinches and linnets, as it is very well known to farmers that they do more service to the crops by destroying the worms than they do injury to fruit trees." I am glad to see that since my first article on this subject appeared in the 'Zoologist' many more have found their way into various leading country journals, and now scarcely a week passes without some interesting statistics appearing. This is what I and all lovers of our feathered races have longed to see. I hope the time is near when these persecuted ones (Nature's intended helpmates) will come and go, and that those who now persecute them will be convinced of their sad mistake, and allow them to rest unmolested. A country walk would then be as in times long past. In the 'Cornhill Magazine' for this month (June) is an interesting article on this subject, and by a long series of useful observations the imputations under which many birds laboured have been entirely disproved, and in many cases a bird which was systematically persecuted and killed by the farmers has been shown to be a positive friend to its ignorant murderer; such birds, for instance, as the rook and crow have been proved to confer immense benefits on the agriculturist, by devouring the subterranean larvæ which stealthily consume the roots of the various crops, and are all the more formidable from the invisible nature of their assaults. The woodpecker, fiercely execrated as a destroyer of trees, has been proved a right good friend to landowners, feeding itself on minute insects that burrow into the bark or decaying wood, and never chipping out its curious tunnel except in a spot where corruption is begun, and is the sure precursor of death. — *S. P. Saville; Dover House, Cambridge, June 13, 1862.*

Protection of Small Birds.—Feeling greatly interested in the preservation of our little birds, and having had occasion some time since to record an instance of their wholesale and indiscriminate slaughter on a property in this neighbourhood, it is with much satisfaction that I observe, in an extract from the 'Norfolk Chronicle' at Zool. 8027, some deservedly severe strictures on the insane practice among agriculturists of poisoning wheat, or rather small birds, and the forcible appeal therein made to their reasoning powers, which it is to be hoped may have the desired effect, or at least make some impression, though long-rooted prejudices are not removed in a day: however the article referred to will now have the advantage of a wider circulation. A few pages further on the arrival and immediate destruction of that most harmless and interesting of migratory birds the hoopoe is announced. Who will venture to say that hoopoes might not breed if allowed to do so? but if not paired ere arrival there is small chance of their becoming so after. They have generally met with a warm reception in this neighbourhood too, where I have known them to be shot for well-nigh fifty years. What number may be shot annually throughout the country it is impossible to say, as probably not half are recorded. I would recommend to all birdstuffers and ornitholo-

gists the reপরusal of the remarks and suggestions on the subject contained in the fifteenth volume of the 'Zoologist,' for unless about to publish a 'History of British Birds,' of which we have enough and to spare, their time would be better employed in studying the habits than in shooting and skinning birds. Had the hoopoe, for instance, been spared, the reason of the raising and depression of the crest might have been more satisfactorily ascertained or accounted for. And, moreover, we should have heard something of its graceful manner of perambulating lawn or gravel-walks, its mode of feeding, buoyant flight, &c.; and had it been duly encouraged or protected, possibly its sonorous "hoopoes" might have attracted its partner; and had nidification ensued, what opportunities then for observation and remark!—*Henry Hadfield; Ventnor, Isle of Wight, June 6, 1862.*

Occurrence of the Honey Buzzard in Cambridgeshire.—A fine example of this rare species, was sent me by a gamekeeper, who shot it near Newmarket, Cambridgeshire, on Thursday, the 30th of May, 1862. This noble bird had been observed for some time prior to its capture haunting the neighbourhood, and was thought by the rustics to be an eagle. The gamekeeper informed me that it had created quite a wonderment, the old women declaring that all their fowls, young ducks and goslings would soon vanish. From the appearance of the tail and other portions of its plumage I have not the slightest doubt that it had a nest, or was busily engaged in labours of incubation. I carefully dissected its craw, and found it contained various limbs and heads of the humble bee (*Bombus lapidarius*), the common lichen, several elytra of a metallic-coloured Coleopteron (these were too far decomposed for me to clearly determine their species), and one small flint. The humble bee appeared to constitute the chief part of its food, at any rate of that day. The bird is a female.—*S. P. Saville; June 12, 1862.*

The Nightingale and its Nest and Song.—The Rev. A. C. Smith has given a graphic account of the ideas of five of our ancient poets on the nest and song of the nightingale; but to my mind the notion that this bird has always a thorn in the interior of the nest is only a vulgar error: nightingales build their nests generally very near the ground, among thorns, brambles and long grass, and their nests a little resemble those of the whitethroat, which arrives in England about the same time as its congener in the way of migration. The idea of the nightingale's singing with its breast against a thorn seems quite a contradiction of my own observations, as I have generally found the majority of these birds, when in full song, in the lower part of a nice bushy-headed oak pollard tree, in nut-bushes, at the corner of underwoods or coppices, and often in thick hedges without thorns. The nightingale, from its many plaintive and minor notes, is called by the poet,—

“ Our mournful Philomel, that rarest tuner;
Henceforth in April I shall wake the sooner,
And to her shall complain from the thick cover,
Redoubling every strain over and over.”

Mr. Smith is of opinion, with many others, that we have two distinct species of nightingales, one smaller and darker in colour than the other. I have on a former occasion mentioned the great difference of their song in the day-time and at night; this does not bear a comparison; and as to the darker colour, birds of three or four years old are always different from those of a year or two. I will instance the plumage of a fine old cock chaffinch with his vermilion breast, and as the Latins say, “*Magna*

componere parvis," a very old hen pheasant, which generally partially assumes the plumage of the cock of that species; lastly, to descend to the bullfinch, which so often turns nearly black in the course of four or five years, even not in a state of confinement. To illustrate "vulgar errors" more strongly; about thirty years ago an acquaintance of mine, aged fifty, addressed me as follows:—"I believe you have studied the history of birds a good deal." My reply was that I had. "We have a small bet depending on a question I mean to put to you: pray is not the wren the real hen of the cock robin?" I told him that the nests of the robin and the wren were made quite differently, and that the birds were of perfectly distinct species. Now the gentleman I allude to was a most intelligent and well-read man in every thing except Natural History, but he had lived in a large city all his life, and was editor of a newspaper. No doubt this gentleman recollected the old hackneyed rhyme of his boyhood,—

"The robin and the wren
Are God Almighty's cock and hen."

Mr. Smith describes a persevering tradesman who has the talent to make artificial food for nightingales, and to keep them alive for a year or two in full song: this man deserves great credit, as I am certain that unceasing attention and great care are required to keep alive, even for six or eight months, such delicate birds as the nightingale and blackcap. Mr. Smith has mentioned one favourable circumstance, that in the county of Wilts our sweet songsters are on the increase: this, I presume, is a good way from "the busy haunts of men," small towns or large and populous villages and hamlets, for I find in the latter the bird-catchers are always on the alert, and we in Gloucestershire may cry out with truth,—

"Hail, beauteous stranger of the grove!
Thou messenger of spring."

The readers of the 'Zoologist' have most likely read the account of an extraordinary appearance of nightingales near Manchester: this, if true, is very uncommon. A neighbour told me he had heard a nightingale in a certain hedge-row studded with young trees: on going to the spot one morning a charming blackcap (*Motacilla atricapilla*) began to pour out his mellifluous notes; my friend instantly exclaimed, "Is not that a nightingale? that is the bird I mean." The poet Milton exclaims,—

"O nightingale! that on yon bloomy spray
Warblest at eve, when all the woods are still."

Milton's notice of the stillness of the woods shows he had a good ear for the music of birds, especially those "liquid notes that close the eye of day."—*H. W. Newman; Hillside, Cheltenham, June 5, 1862.*

Another Shore Lark in Norfolk.—In two recent numbers of the 'Zoologist' (Zool. 7845, 7931) I recorded the unusual appearance of shore larks on our Norfolk coast, in November, 1861, and again in January, of the present year. I have now to add a notice of a sixth specimen, also shot at Yarmouth, about the 25th of April. This bird, which I was fortunate enough to procure, had been sent up to a bird-stuffer in Norwich, with several common species, such as sky larks, wagtails, &c., and being looked upon by the man who shot them as all of equal value, he unfortunately did not enter into any particulars, as to the exact spot, &c., where the shore lark was killed.

This bird, singularly enough, like all the preceding ones, proved to be a male. The plumage, as might be supposed from the time of year, was well advanced towards the full nuptial dress, the gorget on the throat and the patches on the cheeks being large and pure black, and the yellow portions very bright. The band across the upper part of the head was, however, still incomplete, the tips of the feathers being edged with brownish white; the rest of the plumage very perfect. It is not improbable that this bird was a remnant of the ill-fated little flock which passed, on their way southward, down our eastern coast, and possibly reached Brighton, where two are recorded to have been taken alive during the last winter.—*H. Stevenson; Norwich, May 22, 1862.*

Curious Variety? of the Chaffinch's Egg.—Can any of the readers of the 'Zoologist,' give me any information respecting a rather curious circumstance which has come under my observation. Whilst rambling in a sequestered wood in the neighbourhood of Bolton Hall, I happened to observe a chaffinch sitting on her nest. On my approach the bird flew off. Having looked into the nest, my attention was immediately attracted by the appearance of the eggs, five in number, which were exactly like those of the redstart, being of the same shape, size and colour, and bearing not the slightest resemblance to any varieties of the chaffinch which I have ever seen. The nest was that of a chaffinch, placed about ten feet up a plane tree, and during the time I was there both the male and female birds manifested great anxiety. I should be glad to know whether such varieties of the chaffinch are of common occurrence. — *C. Danford; Harnby House, May 20, 1862.*

Note on the Great Black Woodpecker breeding in the New Forest.—I was wandering about the forest last Monday evening (June 9th), picking up whatever came across my path in the way of insects, when, on passing an old (though rather small) oak tree, flash went a large black bird from out of a hole in the trunk, about nine feet up the tree. I thought I perceived some red about its head; and there was no doubt of its being a *Picus*, their flight is so peculiar to them. Visions of the great black woodpecker stole over me; but no, I must be mistaken, one is so apt to fancy every bird or insect one sees to be something very rare, or even a nondescript. However, it made such an impression on me that I thought I would just wait awhile and see if the bird came back again. So down I sat a few yards from the tree, under cover of a friendly bush, and waited—dear me, it seemed an age. An hour gone and no bird. I suppose I must be mistaken, and will see if there are any eggs in the hole. I make a movement to get up, when plump pitches the bird about a yard below the hole; and there, before my eyes, and within ten yards of me, was the first black woodpecker I had ever seen alive,—a fine fellow indeed, and his head, didn't it shine! There was no mistake this time. But what should I do? I must have the bird: if there are eggs, and I do not get the bird too, there are many who will doubt it; but why, said I to myself? "Oh," I thought a voice in my ear said, "you are a collector, a dealer. They won't believe a dealer! You must be a great rogue if you collect for sale; every collector is. Have there not been some one or two or more found out to be rogues? and don't you remember the fable of the robin and sparrow?" But while I sat and stared, and thought how best I could catch my black friend, he had concluded all was right, and had stole into his hole in the tree again, as though he rather thought I was lurking somewhere near. Now for you, thought I. I had my insect net with me (and have done service with it in the way of catching birds in their nests), so, after waiting sufficient time (as I thought) to quiet all fears on the part of my

intended victim, I rose to catch him, trembling as though I had the ague. Ah! that did it. All quiet, and I within a yard of the hole. A flutter and out he goes. It is no use. I must try again. So I waited, watched, and cursed my own folly in being so awkward; but to no purpose: he returned no more. There being several men working about the wood, I was afraid to leave it and try again on the morrow; so I set to work and cut the hole larger, which I very soon accomplished, and had the pleasure of bringing out four beautiful white eggs. Two of them are quite clear, and appear to be addled; the others appeared to have been sat upon for about a week. They were laid upon a few chips and dust, the same as the rest of the woodpeckers. The hole went into the tree for about five or six inches, and thence down to about a foot or not quite so much. The eggs are shaped more like the spotted woodpecker's than those of the green woodpecker, but come off to a finer point than either; in fact they are almost as large and about the same shape as snipe's eggs, and are of course pure white. I cannot give the exact measurements just now, but will do so shortly. I have not yet blown them, as I wish to show them to Mr. Wise first (I expect him here in a day or two), so as to remove, if possible, all doubts as to their authenticity. This, I believe, is the first known instance of the black woodpecker breeding in England.—*W. Farren; Brockenhurst, Hants, June 13, 1862.*

Occurrence of Sclavonian and Eared Grebes in Norfolk in full Summer Plumage.—On the 16th of April three beautiful specimens of the Sclavonian grebe (*Podiceps cornutus*) were killed at the same time on one of our smaller broads. I had fortunately the opportunity of examining them all in the flesh, and found them, by dissection, to be an old male, and a young male and female about the same age. The first, a magnificent bird, with a rich crest of black and orange, resembles exactly the bird figured by Yarrell, from a specimen formerly in his collection, also killed on one of our Norfolk broads, in May, 1826. The colour of the two younger birds are less vivid, and the crests much smaller, with a few white feathers still visible on the chin and throat, being apparently birds of the previous season. In the old male, evidently in full breeding vigour, the testes were large and pure white, the same parts in the immature male being smaller and dark in colour. The female contained a large cluster of eggs, but none larger than good sized pins' heads. On examining the contents of their stomachs, I found them in each instance crammed with a compact green mass, which, on close inspection, proved to be nothing but feathers, mixed with and stained by the green *Conferva* from the surface of the water, the only atom of real food discoverable being a small brown beetle in the stomach of the female. The fact of the grebes thus swallowing their own feathers has been alluded to by Yarrell, Macgillivray, Fleming, and other naturalists; but no satisfactory opinion has, I believe, been arrived at, either as to the cause of their doing so, or the means of disposing of such indigestible materials. As I before observed, with the exception of one minute beetle, I found nothing whatever capable of sustaining life, although the stomachs were in each case greatly distended, the contents being closely matted together and at least half-an-inch in diameter. The stomach of the old male was extremely muscular, indeed a true gizzard, the inner surface rough like a file, and the coats extremely thick. The same parts in the younger birds were also, though in a less degree, indicative of strong digestive powers. Two pairs of the eared grebe, also in full summer plumage, were killed on Horsey Mere, about the 9th of May. One of the females is said to have contained a quantity of eggs. Mr. F. Harmer, of Great Yarmouth, who had heard the particulars from a friend who was present when

they were killed, says ('Field,' May 31st), "Two were shot at the first discharge, one soon afterwards, the fourth four days later. When first shot at, they were diving amongst a small patch of weeds and water lilies, not far from the shore; the fourth bird was shot quite out in the open water, at the other end of the mere. The man who shot them said he could get as near them as he wished,—in fact, quite close to them. A fifth specimen, an adult male, equally rich in plumage, was obtained near Yarmouth, on the 28th (I believe on Rollesby Broad), and this bird, which was sent up to Norwich to be stuffed, I saw in the flesh, and had the chance of comparing the contents and character of its stomach with that of the Slavonian grebes. Besides being far less stout and muscular, I found the stomach of this species differing greatly in the smoothness of its interior surface, the almost file-like roughness observable in that portion of the Slavonian grebe being wholly wanting. The same peculiar habit of swallowing feathers was also plainly discernible in this species; but in this instance these formed only a small portion of the stomach's contents, the great mass consisting of the half-digested fragments of insect-food. Two or three entire feathers were stained brown by contact with the actual food, and many remnants of others, at first sight having exactly the appearance of hairs, were blended with the mass: the appearance of these portions of feathers, thus operated upon by the action of the stomach, would seem to imply that, however innutritious, they are eventually disposed of, through a digestive process. A careful examination of the various fragments of insect-food, consisting mainly of the elytra or wing-cases of Coleoptera, resulted in the identification of claws and scales from the back of the larva of a *Dytiscus*, or great water-beetle; several bodies of some smaller species, probably *Noterus sparsus*, found abundantly in the marshes and stagnant waters; two or three bright metallic-green Coleopterous wing-cases, from a species of *Donacia*, generally found on aquatic plants; and heads of both species of the water-boatmen (*Notonecta*), besides also a minute fragment of bone, probably swallowed unintentionally with other portions of food.—*H. Stevenson.*

Note on the Spotted Redshank, Caspian Tern, Spoonbill, &c., at Yarmouth.—The following birds have been killed on Breydon during the early part of this month on their spring migration. A fine pair of spotted redshanks, male and female, in nearly full summer plumage, a spoonbill, male, and a Caspian tern, also an adult male, several greenshanks, turnstones, and a Temminck's stint, were killed about the same time, and two adult females of Montagu's harrier, in different parts of the county.—*Id.*

Occurrence of Sabine's Gull in Dublin Bay.—In the latter end of last November, I shot an immature example of this gull. I had just killed a blackheaded gull from the coast, when this bird came and hovered over the dead bird. It seemed quite devoid of fear, for, though taking feathers from it with the first shot, it still continued over the dead gull, till I killed it with the second barrel. There was a strong easterly gale blowing at the time, which prevented me from reaching it with a boat for some time, by which the waves had done their work, injuring the head and neck considerably. I have been trying since to find out its name, but without success, till the other day, when turning over Thompson's 'Birds of Ireland' for distinctions between the blackheaded and laughing gulls, I saw, contrary to the usual tenour of the work, a full description of an immature bird of this species, corresponding in all points but two with my bird. The breast of mine is white, not ash-coloured; the sixth primary, which is subject to variation, is dark on the outer web, except the tip, which is white

to the depth of three lines; there is also on this web a small oval spot three-quarters of an inch from the tip; the greater web white, a dark semilunar spot resting against the shaft, four and a half lines from tip; half an inch below this spot a continuation of black extends for thirty-nine lines down the shaft. Thompson records four Irish captures, the first and third in Belfast Lough, the second and fourth in Dublin Bay. These occurred before December, 1838: no others were recorded up to 1850. The same author mentions two English captures up to 1845,—one in Milford Haven, another in Cambridgeshire.—*H. Blake-Knox; Bartragh, Dalkey, Co. Dublin.*

On the Opportunities of advancing Science enjoyed by the Mercantile Marine. By C. COLLINGWOOD, Esq., M.B., F.L.S., &c.*

AT a late meeting of the British Association the importance of the vast trade of Liverpool, in its bearing upon the arts and sciences, was recognized by the appointment of a committee to draw up statistics of the vegetable, animal and mineral products brought annually by the immense mercantile marine of that great port. The productions of Nature, collected from every part of the world, as *profitable cargo*, for the purpose of being used in the arts and manufactures, were the subject of that report; and, indeed, to no one spot in the civilized world are brought such a vast variety of substances—raw material and worked fabrics—as to Liverpool. The mercantile marine of the port of Liverpool, engaged in foreign and colonial trade—amounting to 4500 sail, measuring $2\frac{1}{2}$ millions of tons, and employing many thousands of men—exhibits an amount of enterprise such as probably no other age, and no other place, has ever before shown. The whole globe is scoured by these men and ships in search of whatever may conduce to civilization, and to the wealth of the country which is the centre of this vast and important combination.

The following table shows the number of ships making Liverpool from foreign ports in a given year:—

OFFICIAL RETURN OF FOREIGN AND COLONIAL TRADE FOR 1857.†

	Vessels.		Vessels.
From the United States	934	From East Indies, Hong Kong and Australia	331
(Averaging more than 1000 tons each.)		„ China (exclusive of Hong Kong)	17
From British America	493		
„ Central and S. America.....	505		

* Read before Section D of the British Association, at Manchester, 1861. Communicated by the Author.

† Baines' 'Liverpool,' 1860.

	Vessels.		Vessels.
From France	317	From South Ports of Russia	31
„ Spain	295	„ Channel Islands	36
„ Portugal	169	„ Norway	13
„ Italian States	174	„ Wallachia and Moldavia ...	13
„ Belgium	123	„ Syria.....	13
„ Holland	116	„ Fernando Po	3
„ Germany.....	101	„ Ionian Islands	11
„ Turkey	101	„ Gibraltar and Malta	10
„ Egypt	98	„ Philippine Islands	11
„ Cuba, and foreign West In-		„ Morocco	10
dies	96	„ Sweden	7
„ Prussia	75	„ Java	2
„ Denmark.....	74	„ Greece	7
„ West Coast of Africa—		„ Tunis	1
Foreign ports	74	„ Burman Empire	1
„ Ditto, British possessions ...	37		
„ North Ports of Russia.....	71		
			————
			Total... 4528

The above, it must be borne in mind, represents only the ships *arriving at* a single port in a given year, and the numbers are annually increasing.

Nor is the port of Liverpool, although the largest, representing one-third of the commerce of England, the only one to which similar remarks are applicable; and it therefore becomes a question worthy of consideration, How is it that such a vast staff of enterprising men, constantly sailing to all parts of the globe, do so little to add to our knowledge of the natural productions which they, of all men, are in the very best position to explore, and best able to provide for the investigations of scientific naturalists at home? Why do these men, confining their attention to the immediately useful results of the trade in which they are engaged, altogether pass by natural objects, the collection and contemplation of which could not fail to be a source of interest, and which, to men with a moderate degree of education, would, it might be imagined, afford the stimulus of a rational pride?

One thing is certain, viz., that no accessions of importance are derived to our museums and collections from the labours of sea-faring men. A piece of coral, a parrot, a shell or two, or something which has received attention from its oddity, is occasionally brought by the sailor from the rich and interesting regions which he has visited; but, as a general rule, anything of value or importance is not even to be looked for. No system of any kind marks the seaman's gatherings, and when they have been distributed among his friends

and patrons in England, the contents are generally regarded as lumber, and after remaining for a time where they were first placed, they are laid aside or thrown away to make room for something more useful. It is this utter want of system, this absence of rudimentary information, which renders the ordinary collections of seamen so entirely valueless.

There are, however, a few, a very few, honourable exceptions, in men whose intelligence leads them to see the value of the opportunities they enjoy, and to make use of them, as far as in them lies, for the improvement and advancement of knowledge. The interest of the objects brought home by them can only be appreciated by those who are so fortunate as to have them brought under their immediate attention, and is a strong stimulus to the natural desire for further and more abundant accessions. The willingness of these gentlemen to render their assistance in any direction in which their scientific friends ashore point out that they can be useful, only serves to place in the strongest possible light the immense value which would accrue to Science were a large body of such men, instead of only one or two, constantly employing themselves in a similar manner. We cannot expect all captains of vessels, or indeed perhaps any, to use in this direction the intelligence of a Darwin or a Huxley; but it is not, perhaps, too much to look for that they should exercise a moderate degree of interest in the acquisition of rudimentary information, and a certain amount of capacity in the selection and collection of the multifarious objects which daily come under their notice.

The difficulties which are uniformly brought forward against the idea of seamen turning their attention to Natural History are chiefly on the score of want of time to attend to anything except their own immediate business. But those who are best competent to judge give a different account. They tell us, indeed, that the seaman, during his passage through subordinate grades, has his hands full, and his attention entirely occupied by his ship duties; but when he is entrusted with a command the case is different: he is no longer a servant on board his vessel, but a master; his life of active employment is changed for one of comparative idleness; and it is well if the time thus left on his hands is not put to an evil use. Sailors have not the advantages which the mechanic enjoys upon shore; none of the ordinary rational modes of spending his hours of leisure are open to him; he is dependent upon himself for amusement, and this is more particularly the case with the captain. How often, unfortunately, do we hear of captains of merchant vessels being charged with intem-

perance, cruelty, and the long train of evils resulting from an unoccupied mind, and the absence of sufficient employment for the mental and bodily energies. The ship is not always in a gale: she does not always require the close supervision which is doubtless often necessary. There are numerous seasons of repose, and ample time which might be employed in the pursuit of those rational amusements or studies which would yield a vast benefit to Science. This is an important point, and one on which I should speak with diffidence, were I not assured by men of the most practical knowledge, and in command of the most important vessels, that there are abundant opportunities for such investigations; whereas the time which might be so employed is too often consumed, for want of such resources, in idleness at sea and intoxication ashore.

Again, a captain naturally feels that should he devote attention to Natural History, he might lay himself open to the charge of neglecting his ship's duties. His owner might possibly be narrow-minded enough to condemn him for allowing anything to occupy his mind beyond the routine of ship-work; or he might even be short-sighted enough to imagine that a man with an object in his moments of leisure is less fitted to occupy a position of trust than a mere machine, who has no idea beyond the mechanical duties of his profession. And not without reason is this fear,—a fear which I know weighs considerably with conscientious captains, who would, if they received the sanction of their owners, do great service to Science, without abating one jot of their vigilance in their primary duties.

The main point, then, to be considered is, how shipowners generally can be induced to sanction in their captains the cultivation of those tastes which they often possess, and which cannot but have a beneficial influence upon their character; and to encourage the improvement of those opportunities which they so abundantly enjoy. This is the great desideratum, and until this is done no great good can be effected. The merchant captain of intelligence must know that his attention to Natural History, or any other branch of Science, not immediately connected with his ship's duties, is not only not looked upon with suspicion by his owner, but is encouraged by him. He must feel that his master regards his scientific studies and attainments not as unfitting him for command, and full confidence in the management of the important interests entrusted to him, but as absolutely rendering him more trustworthy, on the principle enunciated by a well-known member of the mercantile marine service, that "a man

with a hobby is always safer, both at sea and on shore, than a thoroughly idle man."

My object, therefore, in bringing this subject before this section of the British Association, is to endeavour to point out where the difficulty lies, in order that, that point being clearly understood, this influential and important body may by some means be brought to act in conjunction with shipowners and others connected with shipping, of which interest Liverpool and Manchester form the active centre. And I trust that the matter will not end with the reading of this brief paper, but that a committee may be formed under the auspices of this Association, which shall confer with some body of shipowners as to the best means of carrying out this most important object, and of opening up this wide and fertile field of scientific research.

I need scarcely dwell upon the manifold advantages which would necessarily accrue were this scheme elaborated and brought with care and judgment into a working condition. Many will at once occur to every thinking mind, and others will unfold themselves in the process of time. Museums, such as those of Liverpool and Manchester, should not lack specimens in any department, with such a staff of industrious and intelligent collectors constantly bringing home contributions.

But by no means the least important result would be the elevation of the mercantile marine service, as a body, and their emancipation from the evils too often looked upon as inseparable from their habits of life, by giving them a rational object on which they may expend their energies, when not called upon by pressing duties on board ship. Having few of the resources which those possess whose life is passed on shore, and herding together as they do for months at a time, with scarce any of the amenities of life, it cannot be otherwise than that their minds should degenerate to a dull blank, or even to a worse condition; and it too often happens that in this respect the captain is in no degree superior to his crew.

[I purpose reprinting the remainder of this interesting paper when I can find space.—*E. Newman.*]

Notes on Nests.—I have taken five nests of the missel thrush this spring, four of which I pulled to pieces, and they each contained a thin lining of mud, besides being firmly cemented to the forks of the trees on which they rested. In the truly valuable little work on 'Birdsnesting' I think a slight mistake is made respecting the number of eggs laid by the starling; it there states "Eggs 4." Now I have never found so

few eggs as four in any nest in which the full complement were laid; they generally range from five to seven, in fact I know of several nests at the present time which contain either five, six or seven young birds. Perhaps the following notes may not be uninteresting. On the 10th of May, whilst staying in the neighbourhood of Weymouth, I obtained two nests of the chough, taken from a high cliff called "Whitenose." One nest contained five eggs, the other four; they were all nearly ready to hatch. On the 10th of June I had the good fortune to meet with a nest of the stone curlew, an extremely rare bird in this neighbourhood: it contained two eggs partly incubated. The eggs were laid in a slight hollow made by the bird on a bare fallow field, and the nest had no lining whatever. In the spring of 1861 a robin built its nest under the thatched eaves of the garden summer-house; this year a pied wagtail repaired the nest and deposited five eggs therein, which I took to add to my collection. Nothing daunted the bird again laid four others in the same nest: these I intended to have left, but unfortunately they were destroyed, probably by a mouse.—*Henry Reaks; Thraxton, near Andover, June 24, 1862.*

The Nightingale's Nest.—Dear Sir: Allow me to make a few remarks upon a communication from the Rev. A. C. Smith (Zool. 8027), with regard to the nidification of the nightingale. It is the custom to laud our great poet to the skies, and he is perhaps deserving of it all; he may have been an ornithologist for anything we know to the contrary, but it is a stretch of ingenuity to quote his poetry as evidence that he knew that some blundering builder of a nightingale had so misplaced its nest. There is some difference, too, between sitting against or upon a thorn. Living in the North of England during my chief birdnesting days, I have had but few opportunities of examining nests of the nightingale, but I do not at all doubt the correctness of the instances of ornithological stupidity which Mr. Smith has mentioned, and if he will again do me the favour to refer to the 'Eggs of British Birds,' he will there find that I have mentioned two similar instances with regard to the hedgesparrow. These can only be accounted for by supposing either that the eggs were ready before the nest, or that the birds were simpletons. I have seen many such unfinished nests. As a proof that birds are not always gifted with much intelligence I quote the last anecdote which I have heard, although I could give you many. Mr. John Hancock tells me that a friend of his found the nest of a wood-owl by observing a broken egg at the base of the tree in which it was placed, and ascertained upon examination that the bird was daily dropping one through a hole in the nest. I have this summer been surprised at the number of perfect eggs which I have found dropped upon my lawn, chiefly those of the starling. This opportunity leads me to send you a memorandum which was made last year, and thrown aside because refused a place in that learned publication by the editor of the 'Ibis.' Perhaps your courtesy will afford it a place in the 'Zoo-logist.'—Yours very truly, *W. C. Hewitson.*

Note on the Nightingale.—One morning a nightingale flew against my window and fell to the ground stunned, and for a long time lay gasping as if in death. I feared that its life was passing rapidly away, and felt much grieved when I thought that I should hear its sweet song no more. I took it in my hand, but its legs were paralyzed and the feet had lost their tension. After a long and doubtful struggle for life the use of its legs returned to it; it grasped my finger, looked up into my face with its large and beautiful eyes, seemed as if just awakening from a dream, and sung a few soft sweet notes: they were low and plaintive, and reminded me of the notes which sometimes escape from an instrument when the hands have ceased to play. It

had no wish to leave me. I transferred it to the branch of a tree, where it remained for some time, but on my again attempting to take it on my finger it flew away.—
W. C. Hewitson.

Proceedings of Societies.

ENTOMOLOGICAL SOCIETY.

June 2, 1862.—FREDERICK SMITH, Esq., President, in the chair.

Election of Members of Council.

The Secretary read the notice summoning the members to a Special General Meeting, for the purpose of electing a member of Council in the place of Dr. Knaggs, resigned; and the Meeting having been made a Special General Meeting, the President appointed Messrs. Baly and Wilkinson to act as Scrutineers; a ballot was taken, and H. T. Stainton, Esq., was unanimously elected a member of the Council of the Society.

Election of Members.

The Meeting having resumed as an Ordinary Meeting, W. H. L. Walcott, Esq., and David Sharp, Esq., were severally balloted for and elected Members of the Society.

Donations.

The following donations were announced, and thanks ordered to be given to the donors:—‘Memoir of the Rev. John Stevens Henslow, M.A., F.L.S., F.G.S., F.C.P.S., late Rector of Hitcham, and Professor of Botany in the University of Cambridge,’ by the Rev. Leonard Jenyns, M.A., F.L.S., F.G.S., F.C.P.S.; presented by the Author. ‘Schriften der Königlichen Physikalisch-ökonomischen Gesellschaft zu Königsberg, Zweiter Jahrgang, 1861, Erste und Zweite Abtheilung’; by the Society. ‘The Canadian Naturalist and Geologist, and Proceedings of the Natural-History Society of Montreal, conducted by a Committee of the Natural-History Society,’ Vol. vii. No. 2; by the Society. ‘The Zoologist’ for June; by the Editor. ‘The Journal of the Society of Arts’ for May; by the Society. ‘The London Review’ for May; by the Editor. ‘Journal of the Proceedings of the Linnean Society,’ Vol. vi. No. 23; by the Society.

The addition to the Library, by purchase, of Jacquelin Du Val’s ‘Genera des Coléoptères d’Europe’ was also announced.

Exhibitions, &c.

The Secretary read a letter addressed to him by Charles Barton, Esq., of Rope Hill, Lymington, requesting an explanation of a phenomenon he had observed in his garden on the 21st ult.: the leaves of all the shrubs and plants were covered with dust, which, with a half-inch object-glass, was found to consist of globules of one size, like small pearl-barley; with a quarter-inch object-glass these globules resembled the ova of fish, but were not perfectly globular, being indented on one side. Some laurel leaves, having some of the globular masses upon them, were exhibited to the meeting. It was suggested by Mr. Saunders that most probably the dust consisted of the pollen of some coniferous tree.

Prof. Westwood exhibited a dry collodion plate, on the coating of which—consisting of gelatine, collodion, nitrate of silver and tannin—considerable devastation had been committed by *Blatta orientalis*; and in reference thereto read the following extract from a letter addressed by W. G. Ormerod, Esq., of Chagford, to Mr. Spence Bate:—"The enclosed may possibly interest you as an entomologist, one of the 'ologies' that I have not dabbled with. I find that the black beetles are particularly fond of dry collodion plates, in the progress from wet to dry, when reared in a box in a dark cupboard. Several had suffered before I found out the cause. At last I caught one black beetle in the act. The animal seems to have been particularly fond of the thick collodion; by the way, he has cleared it off at the corner: the alternate action of the mandibles seems very clear."

Prof. Westwood remarked that this was not the first instance he had known of insects exhibiting a partiality for chemical substances, and mentioned the case of a species of *Ptinus* which was found at Knightsbridge, in great numbers, congregated in a bottle full of chemical solution.

Mr. Waterhouse exhibited specimens of *Seraptia nigricans*, *Ste.*, bred from rotten oak wood, in the neighbourhood of London; and of *Trichonyx sulcicollis*, one of the *Pselaphidæ*, taken also in the vicinity of London, by Messrs. Douglas and Scott.

The President exhibited six specimens of *Pentarthrum Huttoni*, *Woll.*, taken by Mr. Reading in the Plymouth district; and read the following extract from a letter received from Mr. Reading:—

"The history of the enclosed specimens is simply this:—I purchased some material used in gardening operations, amongst which was a cask of light construction, made of birch with hazel hoops, in the stems and hoops of which this insect was found. The cask had been stowed away in an out-house, with various kinds of wood used for burning. There were but four examples of this insect known to Science previous to the capture of these, and they, too, were taken in Devonshire; so that this insect is purely Devonian. It was described by Mr. Wollaston in the 'Annals and Magazine of Natural History' for August, 1854, to which I beg to refer all those who feel interested in the history of the species. After you have shown the specimens to the Meeting, will you be pleased to present a pair of them to the Entomological Society, also a pair to the British Museum, and a pair to the collection of the Entomological Club."

Mr. W. F. Kirby exhibited a specimen (the second) of *Brahmæa Hearseyi*, *White*. Mr. White exhibited it at the Zoological Society a few months ago, and said that it confirmed the characters by which he had separated the species from the *Certhia*, *Fab.*: it was found in a collection of insects received direct from India.

Mr. Kirby also exhibited a magnificent female specimen of *Parnassius Clarius*, a rare, species inhabiting various chains of mountains in Asiatic Russia, and coming nearer to *P. Nordmanni* than to any other European species.

Prof. Westwood said that at the close of the Exhibition of 1851 he had drawn up and read a report of the insect products exhibited: he had not yet had an opportunity of going fully through the present International Exhibition, but he thought it might be agreeable to the members of the Society if he pointed out what of an entomological nature had already attracted his attention. Of the collections from foreign countries, he might mention those from Canada and South Australia, the latter, however, not very good; and a collection of insects of all orders from Guiana, the most remarkable of which was a species of *Paussus*, probably a new genus, but unfor-

tunately the antennæ were broken, so that it was impossible to say whether they were 10- or 8-jointed. Of the exhibitions of an economical kind, the best was one in the North Gallery of the French compartment, which had been formed by monks for educational purposes; there were also among the French exhibitions some magnificent Lepidoptera, including the silk-producing species of *Bombyx*, of which Mr. Moore had exhibited the cocoon at the last Meeting of the Society. The silk products from India were very well and fully represented. Among the South-Australian collection was a magnificent *Astacus* in spirits, as large as a good-sized lobster, and with its body covered with spines. Prof. Westwood thought that the bee products were not so well represented as in 1851.

Mr. W. W. Saunders, in addition to the objects of attraction mentioned by Prof. Westwood, directed the attention of members to the Brazilian collection, and also to the exhibition of the ravages of a species of *Botys*, which was peculiarly destructive to hemp.

The President exhibited specimens and magnified drawings of *Myrmecocystus mexicanus*, and read the following notes thereon:—

“I have this evening an opportunity of exhibiting specimens of a very remarkable ant from Mexico—the *Myrmecocystus mexicanus* of Wesmael, described in the fifth volume of ‘*Bulletins de l’Academie de Bruxelles*,’ 1838. The workers of this singular ant are of two very distinct forms, one being of the ordinary description, like our wood ant (*Formica rufa*), active, and performing the necessary duties in the formicarium; the other, which is the larger worker, is inactive, and does not quit the nest, their sole purpose apparently being to elaborate a kind of honey, which they are said to discharge into prepared receptacles; this constitutes the food of the entire population of the community. In the honey-secreting workers the abdomen is distended into a large globose bladder-like form, much too large for the creatures to drag about with them; the head, thorax, and basal segment of the abdomen are extremely like the *Formica sanguinea*. The male and female I have not seen, but they are described as resembling the same sexes of most of our common European ants. The specimens that I now exhibit were sent to me by Dr. Pagenstecher, of Heidelberg: from him I learned that the ants—that is, the honey-secreting individuals—are collected and regularly sold in the markets in Mexico, and that from the honey which is expressed from them a very agreeable liquor or drink is manufactured. In Mexico the ant is called *Hormigas miéleras*, or *moihileras*, that is, honey ants, or pouched ants.

“It will perhaps be in the recollection of members of the Society that I described, in the second volume of the ‘*Proceedings of the Linnean Society*,’ a species of ant which I named *Crematogaster inflatus*, from the fact of its having a remarkable bladder-like receptacle on the hinder part of the thorax: this receptacle is furnished with a minute aperture at the posterior part on each side; on opening one of these bladders it was found to contain a crystallized mass, which to the taste resembled sugar. This ant was from Singapore and Borneo. I consider this a more remarkable insect than the *Myrmecocystus mexicanus*. Many insects are known to elaborate honey or sweet fluids, the Aphides for instance; but in all previous cases the abdomen has formed the receptacle, whereas in *Crematogaster inflatus* it is situated on the metathorax.”

The Secretary read, on behalf of Mr. Newman, the following paper, entitled

Varieties versus Hybrids.

“At the March Meeting of the Society, Mr. Fereday read a paper of extreme interest, on variation in the coloration or ornamentation of certain Lepidoptera which he exhibited, and argued that the discrepancy between the specimens in question, and the insect in its normal or typical phase, probably resulted from the male and female being referable to different species, although we all know that it is generally assumed that the male and female progenitors of a moth are invariably of the same species. To such an assumption Mr. Fereday objects that ‘we ought not to accept as a fact anything which *may be*, but *is not*, established by direct and conclusive evidence.’ Without attempting to deny the *primâ facie* value of this axiom, I may perhaps be allowed to state that we accept, on theoretical grounds only, many conclusions that are not susceptible of proof by direct evidence; and that we shall continue to do so as long as such minds as those of Galileo, Newton and Cuvier are from time to time permitted to enlighten us; indeed, unless we theorize on very slender knowledge, we shall remain in utter ignorance of much that now passes for sound philosophy. Mr. Fereday proceeds further to support his idea of hybridism by objecting to our forming any conclusions about parentage without positive evidence. These are his expressions: — ‘To prove that the so-called “varieties” are varieties and not hybrids, I contend that it is not sufficient to prove their descent from a particular female, but that there must be evidence of the male parent having been an insect of a precisely similar type to that of the female parent; because, if the male varied from the female, the very question upon which I raise an issue is again involved.’ I do not object that Mr. Fereday should lay the *onus probandi* on those who adopt an opposite theory; but if this be fair and logical, then a moment’s reflection will convince any one that the converse is equally fair and logical, and that the *onus probandi* may also be laid fairly and logically on the advocates of the hybrid hypothesis: for the sake of example: — ‘To prove that the so-called “hybrids” are hybrids, I contend that it is not sufficient to prove their descent from a particular female, but there must be evidence of the male parent having been an insect of a species totally distinct from the female parent, &c.’ I will further illustrate this: let Mr. Fereday fix on an abnormal specimen of *Arctia caja*, *Abraxas grossulariata*, or any other, I care not what species, so that it be liable to great variation, and its maternal parentage known, — say a drab *caja* or a white *grossulariata*, — and then let him find a papa for it in some other species; it matters not whether totally discordant or closely allied; thus were he to discover that one of the quakers, as Moses Harris prettily called the *Tæniocampæ*, had been too familiar with the lady tiger, more properly tigress, and that her tell-tale little ones had thus been suffused with drab, or had he detected a *Pontia Rapæ* male, or even a *Scoria dealbata* male, paying delicate attentions to *Abraxas grossulariata* female, we could perhaps believe that those nuptially-adorned specimens of the last-named insect resulted from illicit intercourse; but surely we who believe in varieties, and who call them varieties, are rather hardly treated when we are told that *we* must prove that these — what shall I call them? — these eccentricities of genius do *not* exist. I wish Mr. Fereday to show that they *do* exist. I am quite sure that if I thought so I should try to prove it, and not lay on the shoulders of another the onus of proving a negative. In our domestic animals (the horse, ox, rabbit, guinea pig, dog, cat, &c.) the coloration or ornamentation varies quite as much as in the tiger or currant moth, and exactly in the same way, that is, in the excess or absence of some particular

colour, as black, yellow or white; yet we suspect no hybridism, for in every instance the male parent is known to be specifically the same as the female. Indeed, varieties are scarcely subject to our control at all; for, whatever Mr. Gregson, who may be called the victuals-doctor, may say to the contrary, I don't think he could produce a stock of red Herefordshire cattle out of black Highland stots, were he to feed them for generations on carrots; neither can I believe that the hybrid theory will ever be established by actual experiment. Those who see one tortoiseshell in a litter of tabbies, or one self-coloured example reared from a batch of tiger's eggs, need not, as I conceive, trouble themselves to detect improprieties on the part of the mother, or assume the consumption of unusual or unwholesome food by either parent or offspring. Varieties will occur; and should we seek an explanation of them, we must investigate the subject with much greater care than we have hitherto done."

Mr. Waterhouse read a paper entitled "Observations upon the Nomenclature adopted in the recently-published 'Catalogue of British Coleoptera,' having reference more especially to remarks contained in Dr. Schaum's paper 'On the Restoration of Obsolete Names in Entomology.'"

Mr. W. F. Kirby read a paper "On the Specific Distinctions of *Colias Boothii* and *Hecla*," and a description of *Cœnonympha Mandane*, a new species, from Polish Ukraine.

"During the extensive examination I have had to make lately of the collection of Rhopalocera in the British Museum, I have met with two specimens of a *Cœnonympha* which appears to me to be new. I therefore describe it under the name of

CÆNONYMPHA MANDANE, n. sp.

*Alis anticis fulvis obscurioribus; posticis fuscescentibus, subtus lineâ argenteâ;
fimbriis omnibus aurantiacis.*

This species expands an inch and three or four lines. Fore wings dull fulvous or tawny, shading off into brown towards the hind margins; hind wings brown, with a few small marginal orange eyes in one specimen. A narrow orange line close to the fringe on all the wings. Fringes ashy gray. Under side of the fore wings uniform dull fulvous; hind margin ashy gray, the orange line fading into it towards the tip. Under side of the hind wings brown, greenish at the base; the orange fringe edged internally by a silvery line, within which are three or four small eyes with silvery pupils. In the centre of the wing the pale band usual in the genus *Cœnonympha* is represented by two large spots. Nearer the base, on the costa, is another small eye with a silvery pupil.

Habitat, Polish Ukraine."

Mr. W. Wilson Saunders said the President and Council of the Society had accepted an invitation to spend the day with him in the neighbourhood of Reigate on the 8th of July, and invited every member and subscriber to meet the President and Council on that occasion.

A new Part of the 'Transactions,' Vol. i., 3rd series, Part II., was on the table.
—J. W. D.

On the Opportunities of advancing Science enjoyed by the Mercantile Marine. By C. COLLINGWOOD, Esq., M.B., F.L.S., &c.

(Concluded from p. 8098).

VARIETY of occupation is no less necessary to the sailor than to other men, and any attempt to debar him from so essential an element in a well-regulated mind cannot fail to be productive of evil. Regarded, therefore, from a philanthropic point of view, it is a subject worth inquiring into, whether or not some scheme may be rendered feasible, by means of which this opprobrium may be removed. No shipowner will deny that such an amelioration of the seaman's character would be ultimately followed by advantage to his own personal interest; but that advantage is not to be reaped suddenly. Let us hope that it is not too distant in its prospect to offer the inducement to take some trouble for its accomplishment.

The direction which I have here supposed the ship-captain's energies to take, is, however, by no means the only one which may be followed with usefulness and advantage. I have made it prominent because I believe it would be, in a vast number of instances, adopted with most useful results; but men's tastes, doubtless, differ considerably, and the study of Natural History would not commend itself to all. Various subjects of study might be followed out as advantageously as the one I have enlarged upon as a text, and the sciences of physical geography, of geology,—the investigation of meteorological phenomena, of currents, tides, winds,—the study of hydrography, of ethnology, &c., would all receive important accessions from the intelligence which a higher standard of education would develop among our merchant marine. These subjects, however, should all be considered by the committee I have proposed, and a scheme for instruction *on board ship* elaborated with care, which, in the next generation, would yield ample fruit.

Some stimulus, however, would undoubtedly be needed to carry on this work; and the nature of the rewards which should be offered to induce the co-operation of merchant officers should occupy our careful attention and consideration. Among the commanders of the mercantile marine there are many intelligent men who would gladly embrace the opportunity, if it were afforded them, of distinguishing themselves in the walks of Science, and of raising themselves above the level to which they are at present doomed. Whether this stimulus, then, should be of the nature of honorary certificates, pecuniary or honorary rewards, association with scientific bodies already in existence, or of any other

kind, would be an important matter for after consideration. I have said enough, however, to bring the matter fairly before you, and in your hands I now leave it, hoping it may not be permitted to fall to the ground, but may be taken up by the influential members of the Association, connected either with Science or with commerce, my own humble co-operation being always at their service.

This paper would be very incomplete without some notice of the important steps which have been taken since it was read to the British Association, on the 7th of September last. On that occasion considerable discussion was elicited, in which the President of the Section (Professor Babington, M.A., F.R.S.), Dr. Lankester, F.R.S., Professor Williamson, F.R.S., Mr. John Lubbock, F.R.S., Mr. J. A. Turner, M.P., Rev. H. H. Higgins, M.A., R. Patterson, F.R.S., and others, took part; all agreeing in their estimate of the importance of the subject, and the great and beneficial results likely to accrue from a well-elaborated plan of operation. Subsequently, in the committee room, the subject was again brought forward by Dr. Lankester, and a committee was appointed to report upon the best mode of carrying out the scheme, of which the writer was requested to take the direction. This committee consists of the following gentlemen:—Dr. Collingwood, M.A., F.L.S., Liverpool, R. Patterson, F.R.S., Belfast, John Lubbock, F.R.S., F.L.S., London, James Aspinall Turner, M.P., Manchester, P. P. Carpenter, Ph. D., Warrington, and the Rev. H. H. Higgins, M.A., Liverpool.

It was further recommended that the paper be printed and circulated among those interested in shipping.

Believing that much might be done by associating merchant officers with existing scientific societies in an honorary manner, the writer, as Secretary to the Literary and Philosophical Society of Liverpool, brought the matter before the members. This society was established in 1812, and is about, during the next month (February), to celebrate its fiftieth anniversary. An addition to the laws was duly passed and confirmed to the effect that the society be “empowered to elect as Associates masters of vessels or others engaged in marine pursuits who may have peculiar facilities for adding to the scientific interest of the Society’s proceedings, such Associates to be in every case recommended by the council and to have the same privileges as Honorary Members, their number to be at present limited to twenty-five.” This plan, there is little doubt, may be productive of much good, and it is to be hoped will be adopted by other societies. One very large and popular society

in London, at least, as the writer is aware, is contemplating a similar step.

The next important advance was as follows. It being considered of the last importance that the sanction and co-operation of ship-owners should be obtained, a meeting was convened in the Mayor's parlour, Town-hall, Liverpool, at which some of the most influential shipowners of that port were present, as well as the Chairman and Secretary of the Mercantile Marine Service Association, Mr. T. M. Mackay, of the firm of James Baines and Co. (a gentleman ever ready to co-operate in every scheme for the good of seamen), occupying the chair. The meeting having been informed of the nature and progress of the movement, and the subject having been discussed, the gentlemen present promised their support, both nominal and pecuniary if it were required; and the Mercantile Marine Service Association were requested to draw up some form of certificate as a reward for industry and diligence in any of the departments in which it is anticipated that they can be serviceably employed, this certificate to be signed by persons of influence to be afterwards decided upon. The Association has since then given the matter their attention, and they propose to request the co-operation of such scientific bodies as may wish to avail themselves of the advantages offered in this direction, and to invite them to draw up carefully prepared and lucid statements of the special subjects they may wish to have investigated.

There can be no doubt whatever that it is to the rising generation of seamen that we must chiefly look for the fruits of any scheme of improved education which may be adopted in the present day, and such establishments as the "Conway" training frigate, in the Mersey, are most powerfully useful to that end; still, in order to collect together the elements of scientific industry and laudable ambition which doubtless exist scattered among the present body of merchant officers, it is proposed, as a beginning, to offer a certificate of merit to such commanders as hold the extra certificate of the marine board, or who keep the meteorological log-book supplied by the Observatory, or who show in various other ways a desire to improve their minds and to encourage industry in those under their charge.

Enough has now been said and done to prove that there is a current at work setting in the right direction, and we can only now leave the matter to time, feeling fully assured that it will go on, and bear ultimate fruit both in the advancement of Science, and in the elevation of the character of the merchant seaman.

Abstract of Mr. J. Wolley's Researches in Iceland respecting the Gare-fowl or Great Auk. By ALFRED NEWTON, M.A., F.L.S.*

As, from various causes, some time must pass before I can hope to find leisure to arrange the mass of information respecting the gare-fowl or great auk (*Alca impennis*, Linn.) collected by Mr. John Wolley, and continue the inquiries commenced by him on that subject, so as to publish the details in a fitting manner, several of my friends have urged me not to delay making known more fully than has been done the results of that gentleman's researches when in Iceland, in which researches I had, to some small extent, the pleasure of assisting him. Independently of these recommendations, I am influenced by the consideration that I ought not to withhold from naturalists what is likely to be interesting to some of them; and, still more, that, were I to do so any longer, I should run the risk of losing to my late friend's reputation the credit which, from his labours, of right belongs to it. But I trust it will be understood that, in this paper, I make no pretence of giving anything like a complete history of the bird; for that is a task for which, at the present moment, I am certainly not competent, however much I may hope some day to achieve it. I only wish to place on record certain facts which Mr. Wolley was able to ascertain.

As long ago as the year 1847 Mr. Wolley's attention was directed in an especial manner to the great auk, and during 1851 and 1852 he bestowed much pains in investigating its history from the works of old naturalists and travellers. When I was with him in Lapland, in 1855, we often discussed the chances of its continued existence, finally pledging each other to make a joint expedition to Iceland as soon as it could be conveniently performed. At the same time I have no wish to underrate the impulse given to my friend's enthusiasm, and through him to my own, during his visits to Christiania and Copenhagen the following year, when he first heard of the discoveries of the late Herr Peter Stuvitz and Professor Steenstrup, and besides made

* Reprinted from the 'Ibis' of October, 1861, and kindly communicated to me by the author. I have delayed the publication of this admirable paper from a fear of interfering with the excellent periodical in which it was originally published. My correspondents will please read it in connexion with another masterly contribution, on the same subject, reprinted at p. 6883 of the 'Zoologist,' and one which probably suggested to Mr. Newton the idea of compiling this still more exhaustive summary.

the personal acquaintance of the last-mentioned illustrious naturalist, who soon after published so valuable a contribution to this bird's history.*

In this paper, therefore, I do not mean to refer much to the bird's appearance in other localities, except in one instance to correct a very prevalent misapprehension. But, on the other hand, I do not claim entire novelty for several of the statements I have to make. Some of them have already found their way into one book or another; sometimes rightly reported, sometimes wrongly. Nor do I profess to be sure that the account I have to give is always the true one. It must be remembered that the results here recorded are the main points of evidence deduced from many authorities, and offered by nearly one hundred living witnesses; and though I do not doubt that the greater number of these latter are persons of eminently truthful habit (for such is the natural characteristic of the Icelander), yet some few there are who may have wilfully told falsehoods. Nor should it be forgotten that it is, humanly speaking, impossible for any two persons, however honestly disposed, to give identically the same version of the same events, though most generally in such cases the variations will be unimportant. Add to this that much of the evidence, though written down at the time by Mr. Wolley (whose note-books I have carefully consulted) in a most painstaking manner, had to pass through an interpreter; and as nearly all of it referred to a period of many years ago, it will not be surprising if some inaccuracies have crept in.

The particular misconception to which I wish to draw especial attention is, that the great auk is, or was, a bird of the *far* North; indeed, of the Polar regions. That such an opinion prevails, one has only to refer to authorities generally received by ornithologists of all countries. Professor Steenstrup, in the paper to which I have alluded, has conclusively shown it to be unfounded, without, however, having been able to trace the error satisfactorily to its source. For myself, I imagine it to have originated in the inadvertence of naturalists, which, in the case of northern localities, leads them to speak of Spitzbergen, Greenland and Labrador as if they were synonymous, or at least interchangeable terms. Regarding it in this light, long before we had heard of Professor Steenstrup's conclusions, Mr. Wolley and I had satisfied ourselves that statements like Temminck's, that

* Videnskabelige Meddelelser for Aaret 1855. Kjøbenhavn. 1856—1857. Pp. 33—116.

the great auk "vit et se trouve habituellement sur les glaces flottantes du pôle arctique, dont il ne s'éloigne qu'accidentellement" (Man. d'Orn. ii. 940), were entirely contrary to fact. There is, I believe, but one reliable instance on record of the gare-fowl* having occurred within the limits of the arctic circle. This is the example said to have been killed on Disco in 1821, and which, after changing hands several times, is now in the University Museum at Copenhagen. The fact has been for the first time recorded in the 'Ibis' (1861, p. 15), and my friend Professor Reinhardt there expresses his belief that "the accounts of other instances, in which the bird is said to have been obtained in Greenland, are hardly to be confided in."†

There is, I take it, nothing which should really lead us to infer that the great auk ever visited Spitzbergen. ‡ The first English writer to whom I can trace the report is Mr. Selby (Brit. Orn. ii. p. 433); and that distinguished ornithologist has lately most kindly informed me that the making mention of that locality was a mistake, which would have been rectified had another edition of his work been required. As to Norway, the only supposed instance of its occurring there within the arctic circle is that mentioned by Professor Steenstrup (l. c. p. 95, n.), and is doubtful enough. Herr Laurenz Brodtkorb, of Wardöe, in 1855, told Mr. Wolley, repeating the story afterwards in my presence, that in 1848 he shot a large diving bird, of which he did not know the name, on a flat rocky skerry off Reenöe. He felt very certain that it was not a great northern diver (*Colymbus glacialis*); but he assured us that its beak was like a guillemot's (*Uria*), that is, narrow and pointed, and not like a razorbill's (*Alca*), thick and truncated. He was equally sure that there were still a pair or two of his species to be found among the guillemots which breed on this spot. Mr. Wolley, in a letter I received from him about this time (1855), naïvely remarks, "I could not see one; but some of the birds were off their eggs;" and I feel bound to say that, though Herr Brodtkorb

* It may seem somewhat pedantic to revive this ancient and almost-forgotten name. In using it I am chiefly influenced by the fact that Mr. Wolley had intended to have employed it.

† I have spoken of the above as a "reliable instance" of an arctic great auk; but I am not sure that even this is free from doubt; for in a letter Professor Reinhardt tells me he has "had some suspicion" whether the reported Disco specimen of 1821 has not been confounded with one asserted by the late lamented Governor Holböll (Kröyer's 'Tidsskrift,' iv. p. 457) to have been obtained at Fiskernæs (South Greenland) in 1815. If this suspicion be correct, the gare-fowl has probably never once occurred within the arctic circle.

‡ Cf. 'Ibis,' 1859, pp. 173, 174.

has a practical knowledge on Ornithology, I cannot consent to his opinion that the bird he shot was a great auk.*

Were I about to give a full and detailed account of the gare-fowl, I should think it best to divide the evidence collected into two classes —(I.) that which may be considered documentary, and (II.) that which is merely oral; again separating this latter into (1) what is only traditional, and (2) what has actually come to my informant's personal knowledge. In the present case, however, I believe it will be most convenient to take the various matters as far as possible in the order of the time to which they refer. But I must first enter upon a brief description of the localities to which I shall have to allude.

Any person who will take in hand the beautiful map of Iceland, executed by Herr O. N. Olsen from the surveys of the veteran Björn Gunnlaugsson, and published in 1844, under the auspices of the Icelandic Literary Society, will find the name "Geirfuglasker" (gare-fowl skerry) occurring in three different places. The most eastern is situated some thirty miles from the coast, off the island of Papey, and the entrance of Berufjordr, about lat. $64^{\circ} 35'$ N., and long. 26° W. (of Greenwich), and is commonly known to Danish sailors as Hvalsbak (Whale's-back). The most southern is one of the Vestmannaeyjar (Westman Islands), in about lat. $63^{\circ} 20'$ N., and long. $33^{\circ} 5'$ W. The most western is off Cape Reykjanes, in about lat. $63^{\circ} 40'$ N., and long. $35^{\circ} 50'$ W. It was accordingly our first object to ascertain how far these spots now deserved the name they bore. On making all the inquiries we were able on our arrival at Reykjavik, we could obtain no recent information respecting the eastern skerry, of which we had, at starting, entertained most hopes. It appeared also that, of the travellers who in the last century had published accounts of their journeys in Iceland, Olafsen and Olavius only had alluded to this isolated rock as a station for the bird, † though another of them, the Færøese, Mohr, was in 1781 for no less than two months at Djupivogr, on the mainland opposite, engaged in the pursuit of

* I may add, that near Wardæhuus, between the fortress and the shore of the inlet (Vest-Vaagen), on a raised sea-beach, is a vast bed of bones, chiefly those of birds, but mingled with them a few seals'. We brought away a considerable quantity of specimens; and on some other occasion I may probably give an account of them; but I am sure that they do not include a single fragment which could possibly be a gare-fowl's.

† 'Reise igiennem Island, &c. af Eggert Olafsen.' Sorøe, 1772, p. 750. 'Oeconomisk Reyse igiennem de nordvestlige, nordlige, og nordøstlige Canter af Island ved Olaus Olavius, &c.' Kjöbenhavn, 1780, ii. p. 547.

Natural History.* We therefore decided we would not attempt the journey thither, at the risk of missing what seemed a better chance, that of finding the object of our search in the neighbourhood of the western locality, where examples of the bird were known to have been last obtained. At the same time we thought it highly desirable that this eastern Geirfuglasker should be visited, and through the intervention of several kind friends we at last met with a gentleman who was willing, for a suitable recompense, to undertake the toilsome, not to say dangerous, expedition. To dismiss this part of the subject at once, I may here say that our envoy, Herr Candidatus-Theologiæ Eiríkur Magnússon, a native of that district, reached Berufjordr in the month of June, and then, taking a boat, proceeded to the island, round which he rowed, quite close enough to satisfy himself that there were no gare-fowls on it; but he was prevented by the unfavourable state of the weather from landing. On his return next month to Reykjavik, he informed us that there were no traditions in that part of the country of the bird ever having been there. Respecting the second Geirfuglasker I have mentioned, that which forms one of the Vestmannaeyjar, we heard on all sides that it was yearly visited by people from the neighbouring islands, and, though we were told that some fifteen years before a young bird had been obtained thence, † it was quite certain that no great auks resorted thither now.

Of the third locality I have now to speak. Lying off Cape Reykjanes, the south-western point of Iceland, is a small chain of volcanic islets, commonly known as the Fuglasker, between which and the shore, notwithstanding that the water is deep, there runs a röst (roost), nearly always violent, and under certain conditions of wind and tide such as no boat can live in. That which is nearest the land, being about thirteen English miles distant, is called, by Icelanders, Eldey (Fire Island), and by the Danish sailors Meel-sækken (the Meal-sack), a name, indeed, well applied; for, seen from one direction at least, its

* 'Forsög til en Islandsk Naturhistorie, &c.,' ved N. Mohr. Kjöbenhavn, 1786, p. 383.

† Of course it does not follow, even if the story be true, that this bird was bred there. Faber states ('Prodrömus der isländischen Ornithologie,' Kopenhagen, 1822, p. 49) that he was on the Westman Islands in July and August, 1821, and that a peasant there told him it was twenty years since a great auk (and that the only one of the species he had ever seen) had occurred there. He adds that this bird and its egg, upon which it was taken, remained a long time in a warehouse on one of the islands, but had vanished before his arrival. We may, with Professor Steenstrup (l. c. p. 76, note), infer from this that the gare-fowl, even about the year 1800, was a great rarity in the neighbourhood.

appearance is grotesquely like that of a monstrous half-filled bag of flour, the resemblance, too, being heightened by its prevailing whitish colour. Not very far from Eldey lies a small low rock, over which it seems that the sea sometimes breaks. This is known as *Eldeyjardrángur* (Eldey's Attendant). Some ten or fifteen miles further out are the remains of the rock formerly known to Icelanders as the *Geirfuglasker* proper, and to Danes as *Ladegaarden* (the Barn-building), in former times the most considerable of the chain, but which, after a series of submarine disturbances, beginning on the 6th or 7th of March, 1830, and continuing at intervals for about a twelvemonth, disappeared completely below the surface; so that now no part of it is visible, though it is said that its situation is occasionally revealed by breakers. Further out again, perhaps some six-and-twenty English miles from Reykjanes, rises another tall stack, called, by Icelanders, *Geirfugladrángur*, and by Dutch sailors *Greenadeerhuen* (the Grenadier's Cap). All these rocks have been long remarkable for the furious surf which boils round them, except in the very calmest weather. Still more distant is a rock to which the names *Eldeyjabodi* or *Blinde-fuglasker* have been applied by Icelanders. This is supposed to have risen from the sea in 1783, the year of the disastrous volcanic eruption in *Skaptafellssysla*, and soon after to have sunk beneath the waves.*

Icelandic records show that, at the beginning of the thirteenth century, various changes took place among the islands off Reykjanes just enumerated. It is stated that a rock, then known as *Eldey*, disappeared; but another being thrust up close by, the old name was transferred to the new-comer, and has since been borne by it. No notice is taken, in manuscripts of that remote time, of the birds found on these islands; but doubtless they were even then, weather permitting, visited by the inhabitants of the adjoining coast. Indeed, it is asserted in *Wilchin's 'Máldagabók'* (which dates from 1397, and has not, I believe, been printed), that half the *Geirfuglasker* belonged to *Mary Church* in *Vogr*, now represented by *Kyrkjuvogr*, and one-fourth to *St. Peter's*, *Kyrkjubolu*, of which the church at *Utskála* is the modern equivalent,—claims which were still looked upon as extant until the submergence of the skerry put an end to them. It

* I should have wished to have given, in explanation of the above description, a sketch map of these localities, but I have not the means of doing so accurately. From our own observations, Mr. Wolley and I had reason to doubt whether the bearings of these islands have been correctly laid down either in *Gunlaugsson's* map or the Danish Admiralty chart.

has been suggested that the remaining quarter was shared by the church of Stadr in Grindavík; but most likely it was left to reward the bold adventurers who resorted thither. In 1628 twelve men were drowned at the Geirfuglasker, no doubt in a fowling expedition; and in 1639* four large boats (three from Sudrnes, the district between Skagen and Osar, and one from Grindavík) proceeded thither; two of which, those from Stafnes and Marsbudum, were lost at the skerry, while the other two, from Hvalsnes and Stadr, only returned with difficulty. It might have been some such disaster as this that prompted a metrical effusion composed by Séra Hallkiell Stephansson, the clergyman of Hvalsnes, who flourished between 1655 and 1697, of which it is feared only two lines have been preserved to posterity. In these the poet says that he has never trusted himself to Geirfuglasker, as, on account of the surf, boats were broken by the waves there. In 1694 a French vessel was wrecked on the island, but the crew landed in their boats at Midnes.

Soon after our arrival at Reykjavík we were pleased to learn that the public library there contained a short but beautifully written manuscript account of the Reykjanes Geirfuglasker. For a knowledge of its existence we are indebted to the kindness of Professor Konrad Maurer of Munich, well known as one of the most distinguished Icelandic scholars, and the pleasure of whose company we enjoyed during our voyage to the North, and part of our residence in the capital. The liberality also of the librarian, in allowing us the free use of, and permission to copy, this curious document, must not pass unnoticed here. From the penmanship and the paper on which it is written, it is believed by good judges whom we consulted to be probably a copy. From internal evidence, which need not now be detailed, I venture to express my opinion that the original must have been composed within a few years of 1760. It commences abruptly by giving a somewhat minute description of the rock and its unquestionably volcanic origin; making, however, no reference to its neighbouring islands. It then proceeds to relate the marvellous numbers of birds found upon the rock, adding that the "gare-fowl is there not nearly so much as men suppose;" that the space he occupies "cannot be reckoned at more than a sixteenth part of the skerry," and this only at the two landing-places; "further upwards he does not

* There is an apparent misprint of "1439" for the above date in Professor Steenstrup's reference to this event (l. c., p. 83, note). The particulars mentioned in the text were supplied to us by Séra S. B. Sivertsen, the clergyman at Utskála, to whom we were indebted for many similar acts of kindness.

betake himself, on account of his flightlessness." The writer then goes on to speak of the extreme danger of landing on account of the surf, saying that to go there is to place life and death on an even chance; and after mentioning the report, which is even now current, that a successful expedition to the skerry was equally profitable with a summer's hiring of two hundred fishes' value in the north country, and citing the statement from the Máldága, to which I have before referred, concludes with Sir Hallkiell's couplet mentioned above. Besides this, there are appended two foot-notes. In the first the writer says that in the year 1732, after a lapse of seventy-five years, the skerry was visited, and two huts, three birchen staffs about two ells long, and some withered human bones, were found thereon; adding, by way of comment, that three men had been known to have supported themselves on the rock by eating sun-dried birds, and drinking rotten eggs for half a month before they were taken off. The second note gives a very accurate description of the gare-fowl and its peculiarities, including its eggs, which the writer describes as if he had been an enthusiastic oologist, though he considers it worthy of remark that he has "known Danes give eight to ten fishes* for an empty blown egg," the climax being the apostrophe "Rara avis in terris!" Not the least singular part of the manuscript is an inserted leaf, on which is drawn a very quaint sketch of the skerry. Two boats are seen, anchored with large stones, according to the Icelandic custom still prevalent. In one of these are seated three, and in the other two men, waiting the return of three comrades, who are on the rock, hunting what appear to be gare-fowls, of which upwards of sixty are represented.

Now it has been above stated that in 1732 expeditions to the skerry were resumed after being long discontinued, and, in connexion with this fact it may not be amiss to observe that Anderson, some time Burgomaster of Hamburg, in his account of Iceland,† remarks on the occurrence of many great auks the year before the death of King Frederick IV. of Denmark, which took place in 1730. Hereupon Niels Horrebøw, whose principal object was to contradict all Anderson

* I much regret not being able to give, in explanation of this and the passage mentioned a few lines above, the worth of a *fish* at the period when I suppose this manuscript to have been written. It was, and in the secluded parts of the country still is, the unit of the Icelandic currency, but of course a unit of very variable value.

† 'Herrn Johann Anderson, &c. Nachrichten von Island, Grönland und der Strasse Davis, &c.' Frankfurt u. Leipzig, 1747, p. 52.

had said, with some reason ridicules* his predecessor's notion of that event being thus heralded, and asserts that no more birds were seen in the year mentioned than previously. But it seems to me improbable that Anderson should have no grounds for his statement, though of course I do not admit the portentous inference, and, if so, it is not unlikely that the renewal of visits to the Geirfuglasker, in 1732, may have been prompted by the report the last-named author mentions of the bird's abundance three years before. On the other hand, I am unable to connect this reported abundance with any other physical phenomenon. I do not find that the period just previous to 1729 was marked by any volcanic outbursts or the presence of any extraordinary amount of floating ice, either of which events might be supposed to affect the bird's movements.

In 1755, Eggert Olafsen and Bjarne Povelsen, to whose accurate account of Iceland I have already alluded, explored the Gulbringu Sysla, which comprehends the south-western corner of the island, and they passed the following winter at Videy (*op. cit.* pp. 848, 849), during which time it is mentioned that they saw both the bird and its egg, which had been obtained from the Reykjanes skerry by some Sudnes boats (p. 983). A few years later, Mohr, in his work, which I have also before mentioned, says (*op. cit.* p. 28), that he was assured by the peasants that the bird was blind when on land, a notion not entertained by the Færøese, but which still prevails in Iceland. He was also told that in former days people had filled their boats with its eggs from the Reykjanes station, and though he does not expressly say so, I think we may infer from these authorities that about the middle or towards the end of the last century this Geirfuglasker was constantly visited by fowling expeditions. Local tradition makes the same assertion, assigning the leadership of these adventurous exploits to one Svenbjorn Egilsson, born in 1700, and Hannes Erlendsson, born in 1705; but later their place was taken by one Hreidar Jónsson, whom people now living can remember as a blind pauper some eighty years of age, with a long beard. This hero was born, as it appears, in 1719, and used to go yearly to the skerry on behalf of Kort Jónsson, a rich farmer at Kyrkjuból, who flourished between 1710 and 1760. Hreidar is even reported to have made during one summer three expeditions, in which he acted as foreman. After his time the practice seems to have died out; but one witness informed us that, to the best of his recollection, people had made voyages between 1784 and 1800.

* 'Tilforladelige Efterretninger om Island, &c.' Kjöbenhavn, 1752, pp. 175, 176.

Faber, who was in Iceland in 1821, and then attempted to reach the skerry (of which exploit I shall presently speak), tells us (*op. cit.* p. 48) that for a long period these perilous expeditions had been relinquished—probably because the results from repeated performance fell short of the risk incurred. But the birds were not wholly banished, for Thorwalder Oddsson, born about 1793, told us that when he was a boy, some nine or eleven years old, he found one on the shore at Selvoggr, and a few days later, probably between 1808 and 1810, two were killed at Hellirsknipa, between Skagen and Keblavik. Erlendur Gudmundsson, an old man with a most retentive memory, showed us the gun with which he shot one of them. He was in a boat with his brother-in-law, A'sgrimur Sæmonsson, who died in 1847, and the occurrence happened in the month of September. The gare-fowls were sitting on a rock: A'sgrimur fired first, and killed one; the other took to the water and was shot by Erlendur. They each ate their respective birds, and very good meat they found them. A third is said to have been shot a few years later, near the same spot, by one Jacob Jonsson, now dead; this also was eaten.

The cause, however, of the most wholesale destruction of great auks in modern times must be sought elsewhere. In 1807 hostilities commenced between England and Denmark. The following year, the 'Salamine,' a privateer of twenty-two guns, under British colours, and commanded by one John Gilpin, but probably owned by Baron Hompesch, who was also on board, appeared at Thorshavn, the capital of the Færöes, which her crew almost entirely plundered, ending by carrying off a certain Peter Hansen, whom they forced to pilot them to Iceland. Arrived at Reykjavik, July 24th, 1808, they repeated their outrages, and before they finally quitted the island paid a visit to the Geirfuglasker, where they remained a whole day, killing many birds and treading down their eggs and young. After this they sailed away, August 8th, and deposited Hansen again in the Færöes. On February 7th, 1810, at the solicitation of Sir Joseph Banks, an order in council was set forth by the British Government, exempting the northern possessions of the Danish Crown from any molestation on the part of English cruisers, and permitting the inhabitants of the same to trade with either London or Leith, though not with the mother country. The Court of Copenhagen met this act of common humanity by issuing decrees, strictly prohibiting, on pain of death, all intercourse with the British.* The consequence was that the unfortunate Færöese were

* 'Journal of a Tour in Iceland in the Summer of 1809.' By William Jackson Hooker, F.L.S., &c., 2nd ed., London, 1813, vol. ii. pp. 57 *et seq.*

nearly reduced to a state of starvation, and in 1813, as a last resource, their Governor, Major Löbner, determined to send a vessel to Iceland to obtain some necessaries. This vessel, the schooner "Færøe," of twelve guns, he placed in charge of Hansen, as one already acquainted with the coast. When they came off Cape Reykjanes they were becalmed, and a boat being lowered, a party went off to one of the skerries, on which, as their captain expected, they found abundance of birds, and among them many great auks. They killed all they could, and loading the boat quite full, yet left many dead ones on the rock, intending to return for them; but the wind springing up, Hansen made sail for Reykjavik, where, about a week later, they arrived on the 29th of July, having then on board among their victims no less than twenty-four gare-fowls, besides others which were already salted down. One of these birds is said to have been given to the Bishop (Vidalin), and by him sent to a friend in England. Mr. Wolley conversed with one of the two survivors of this voyage, Daniel Joensen, in 1849,* and on July 25th, 1858, through the kind attention of Herr Sysselmand H. Müller, we had an interview with the other, a clear-headed old man, Paul Medjord by name. The accounts of these two witnesses differ from each other in no material point, but it does not seem quite certain whether the rock on which they landed was the Geirfugladránger or the Geirfuglasker proper. Many of the above particulars, including the exact dates, which I believe have never before been published, were most obligingly furnished us from the official records by Herr Dahlerup, the Governor of the Færøes, and Herr V. Finsen, the By-fogden of Reykjavik; but Faber, in 1822, briefly mentioned this massacre, and in 1839 the late Etatsraad Reinhardt† added some further information, which notices have been copied into various other works.

In 1814, according to Faber (*loc. cit.*), seven great auks were killed on a little skerry at Látrabjarg, on the north shore of Breidifjodr. I do not know any other reported instance of its occurrence there or elsewhere in Iceland so far to the north. Olafsen (*op. cit.* p. 562) gives a lengthened description of the locality and the birds which frequent it, but makes no mention of *Alca impennis*. The only notice of the place I can find besides is in Mr. Metcalfe's amusing little book

* 'Contributions to Ornithology,' 1850, [edited] by Sir William Jardine, Bart, &c. Edinburgh, 1850, p. 116.

† Krøyer's 'Naturhistorisk Tidsskrift,' i. p. 533.

just published.* This gentleman tells a story to show that spiteful spirits dwell in some part of the cliff, but does not suggest that they are the ghosts of departed gare-fowls.

Faber further informs us (*op. cit.* p. 48) that on the 25th of June, 1821, he started on an excursion to the Reykjanes skerries. He was accompanied by a Danish merchant, a Swedish Count, and the latter's servant.† Of the Icelanders who were on board the vessel, the "Villingar, a cutter belonging to one Jón Danielsson, only one survives. He, by name Olafur Pálsson, gave us an account of the voyage, closely agreeing with Faber's, which he had never seen. They came first to the Geirfuglasker, and sailed between it and the "dránger," where the Count, whose name I have been unable to ascertain, landed and gathered some sea-weed. Then the weather became fair, and they proceeded to the skerry itself, where they arrived in the evening. Faber remained on board, but the Count again landed, and presently fell into the water. They picked him up, and his servant shot a good many gannets (*Sula bassana*). Later in the evening they returned, and some of them went on shore, but could find no way up. Jón Danielsson declared he was ready to stop a week; the Count, however, seemed to have had enough of it, and "Fugle Faber thought as the Count did." They were out two days and two nights at the rocks. They did not go near Eldey, saw no gare-fowls, and their opinion was that they must have been all killed by the French sailors, as they had heard a vessel of that nation had been seen there two summers before.‡ Jón Jónsson, son of the owner of the "Villingar," then a lad about twelve years old, who assisted in putting the foreigners on board her, and had often heard his father and elder brother speak of the expedition, also corroborated Olafur Pálsson's narrative.

* 'The Oxonian in Iceland, &c.' By the Rev. Frederick Metcalfe, M.A., &c. London, 1861, p. 260.

† I am not so fortunate as to possess a copy of Faber's other work, 'Ueber das Leben der hochnordischen Vögel,' Leipzig, 1825, nor have I seen the paper in the 'Isis' for 1827 (p. 633), in the latter of which I am informed he gives the fullest particulars of his expedition; I therefore have to content myself with the translated extracts therefrom contained in a paper "On the Great Auk," communicated May 19, 1850, by Dr. Edward Charlton, to the Tyneside Naturalists' Field Club, and published in their 'Transactions,' vol. iv. pp. 113 *et seq.*

‡ It does not seem to me at all impossible that there should be some truth in this report. Mr. Scales has kindly informed me that he obtained the fine great auk's egg now in his possession from M. Dufresne, who had one or two others in his collection, in 1816 or 1817. It was said to have come from the Orkneys, which, however, I think is extremely unlikely.

It is clear, however, that at this very time there were great auks in the neighbourhood, for, a few days later in the season, two birds were seen sitting on a low rock, close to the place where I have before mentioned that two or three were shot, and were killed with a sprit or gaff by another Jón Jónsson (now dead) and his son Sigurdr, who related the circumstance to us. This witness is certain that it was about the beginning of July of the same year as that of Faber's visit. They sold the skins, which our informant himself took off, commencing the operation by making a hole transversely across between the legs, as he would do in the case of a quadruped. They afterwards ate the bodies and sold the skins to the A'sgrimur before mentioned.* The occurrence of so many examples of this bird nearly in the same locality may perhaps be accounted for by the fact that the tide runs in very strongly round Skagen, and sets along Holmsberg.† The auks, after fishing on that side of the promontory, may have found themselves unable to make head against the current, and so have betaken themselves to the shore.

I may here observe that we failed to gather any further information respecting a bird said by Dr. Kjærbølling (Danmark's Fugle, p. 415) to have been killed in 1818 on a place in South Iceland, where many had been observed; but Etatsraad Reinhardt records (*loc. cit.*) the death of one in 1828, and I think the Doctor is altogether mistaken in the assertion that "Apothecary Mechlenburg, of Flensburg, possesses a pair which were killed on the gare-fowl skerries in 1829, where they were courageously defending their two eggs." But of this last supposed capture I shall say more presently.

* The Icelandic skins of foxes (*Canis lagopus*) are all flayed in the way above described. I cannot help suggesting that these may have been the two great auks' skins stated by the late Etatsraad Reinhardt (*loc. cit.*) as being received in 1823 from Oerebakke (Eyrarbakki), though they were said to have been killed there in that year by a boy with a stick. Faber, when in the district, lived for some weeks in A'sgrimur's house, who was probably thus aware that he wanted them. On leaving it he went in the direction of Eyrarbakki; on July 9th he was five miles to the east of Keblavik, and in the end of that month and in the next was on the Westman Islands (*Prodr.* pp. 38 and 49). Some persons we saw declared that he had three specimens, but he himself says somewhere (I think in the 'Isis') that he never procured any of this species. Possibly, therefore, they were sent after him to Eyrarbakki, and thence some two years afterwards to the Museum at Copenhagen.

† We obtained information respecting the tides from a manuscript account of Gulbringe-sysla, written about 1784, by the then Land-foged Skule Magnusen, which was kindly lent to Mr. Wolley, and the account was confirmed by the statements made to us by fishermen.

We now come to the most modern period in the great auk's history. In 1830, as I have before said, the Geirfuglasker off Reykjanes disappeared beneath the waves. Whatever motive prompted him, it is certain that in that year one Brandur Gudmundsson, an inhabitant of Kyrkjuvogr, who died in 1845, bethought him of making an expedition to Eldey, or the Mealsack, the high rock which stands between the sunken island and the Cape. All the dwellers in the district concur in saying that before that time no rumour of the birds breeding there had ever reached them. It seems that in that year he led two voyages to this new-found locality, in one of which twelve or thirteen, and in the other eight examples were captured. Six of these were purchased by Adnor Gunnarsson, and as many more by Holgeir Jacobæus, two merchants living at Keblavik, while the remainder are unaccounted for. On the first occasion the weather was fine, and all the party but two landed. Besides the gare-fowls they took a great many other birds, razorbills and guillemots. The second time the weather was bad, and only four men went up. They had to come away very quickly. These and many other particulars of interest which I could give, were I not afraid of extending these notes to an unreasonable length, were related to us by two men (brothers), Stephan and Jón Gunnarsson, the only survivors of those who were present. The following year another voyage was undertaken by the same foreman, and whether that the birds were more numerous, or that their persecutors had learned experience (for on the previous occasions several had escaped), twenty-four were captured, of which one was brought off alive, and so taken to Keblavik, where, however, it was killed, or at least died. These two dozen gare-fowls were all skinned by one person, a woman, Sigrída Thorlaksdotter, who told us that she performed the operation in her accustomed way, opening them under the right wing, and stuffing the skins with fine hay. The same merchants as before, with the addition of Dethlef Thomsen, shared them. It is not very easy for me to reconcile the various conflicting statements about the captures of the next two years, but in 1833 thirteen birds were probably taken, and in 1834 nine birds, with eight eggs, seem to have been obtained, of which one bird was given to the Crown Prince (the present King of Denmark), who then happened to be in Iceland, and subsequently passed into the possession of the late Herr Mechlenburg. The remaining eight were purchased by Herr Thomsen, just mentioned, whose son most obligingly showed Mr. Wolley an account of the transaction in his father's books. They were skinned by Madame Thomsen and her sister, Jomfrue A. C. Lewer, who informed us that they were opened

under the wing, and the skins stuffed with hay, the bones being wrapped round with hemp. The eggs were quite fresh, and were blown by the two ladies. All these specimens were disposed of to Herr De Liagre, a dealer at Hamburg, and, I may add, I think that one of the eggs now in my possession belonged to this lot. In August, 1840 or 1841, three skins, as many eggs, and the body of a bird in spirit, were bought of Factor Chr. Thæ, now living at Copenhagen, by Herr S. Jacobsen, who told us that he parted with them either to Herr Selning, a naturalist at Hamburg, or to Mr. Jamrach, the well-known dealer. Two of these birds, or else two more some other year, were obtained by one Stephan Sveinsson, of Kalmaustjorn, whom the good people of Kyrkjuvogr seem to look upon as a kind of poacher on what they consider their rightful domain. Certain it is that on one occasion Herr Thæ bought two birds of this Stephan, as the latter informed us, but the exact date is not so clear.

The last gare-fowls known to have occurred in Iceland were two in number, caught and killed in 1844 by a party, of which our excellent host at Kyrkjuvogr, Vilhjálmur Hákonarsson, was the leader. They were bought, singularly enough, by Herr Christian Hansen, son of that Hansen I have before alluded to as having been (though, in the first instance, against his will) so dread a scourge to the race. From him they passed to Herr Müller, then the apothecary at Reykjavik, who, previously to having them skinned, prevailed upon M. Vivien (a French artist) to paint a picture of one of the dead birds, which picture now hangs in the house of his successor, Herr Randrup, the present apothecary in the capital of Iceland. As many persons may regard these birds as the latest survivors of their species, I may perhaps be excused for relating at some length the particulars of their capture, the more so as this will serve to explain the manner followed on former occasions.

The party consisted of fourteen men: two of these are dead, but with all the remaining twelve we conversed. They were commanded, as I have just said, by Vilhjálmur, and started in an eight-oared boat from Kyrkjuvogr, one evening between the 2nd and 5th of June, 1844. The next morning early they arrived off Eldey. In form the island is a precipitous stack, perpendicular nearly all round. The most lofty part has been variously estimated to be from fifty to seventy fathoms in height; but on the opposite side a shelf (generally known as the "Underland") slopes up from the sea to a considerable elevation, until it is terminated abruptly by the steep cliff of the higher portion. At the foot of this inclined plane is the only landing-place; and further

up, out of the reach of the waves, is the spot where the gare-fowls had their home. In this expedition but three men ascended: Jón Brands-son, a son of the former leader, who had several times before visited the rock, with Sigurdr Isleffsson and Ketil Ketilsson. A fourth, who was called upon to assist, refused, so dangerous did the landing seem. As the men I have named clambered up, they saw two gare-fowls sitting among the numberless other rock-birds (*Uria troile* and *Alca torda*), and at once gave chase. The gare-fowls showed not the slightest disposition to repel the invaders, but immediately ran along under the high cliff, their heads erect, their little wings somewhat extended. They uttered no cry of alarm, and moved, with their short steps, about as quickly as a man could walk. Jón with outstretched arms drove one into a corner, where he soon had it fast. Sigurdr and Ketil pursued the second, and the former seized it close to the edge of the rock, here risen to a precipice some fathoms high, the water being directly below it. Ketil then returned to the sloping shelf whence the birds had started, and saw an egg lying on the lava slab, which he knew to be a gare-fowl's. He took it up, but finding it was broken, put it down again. Whether there was not also another egg is uncertain. All this took place in much less time than it takes to tell it. They hurried down again, for the wind was rising. The birds were strangled and cast into the boat, and the two younger men followed. Old Jón, however, hesitated about getting in, until his foreman threatened to lay hold of him with the boat-hook; at last a rope was thrown to him, and he was pulled in through the surf. It was "such Satan's weather," they said, but once clear of the breakers they were all right, and reached home in safety. Next day Vilhjál-mur started with the birds for Reykjavik to take them to Herr Carl F. Siemsen, at whose instance this particular expedition had been undertaken; but on the way he met Hansen, to whom he sold them for eighty Rigsbank-dollars (about £9). According to Professor Steen-strup (*op. cit.* p. 78), the bodies are now preserved in spirit in the Museum of the University of Copenhagen, but respecting the ultimate fate of the skins I am not quite sure.

Several other expeditions besides those to which I have here adverted no doubt took place between the years 1830 and 1844, but I cannot at present give either the dates or the results. Herr Siemsen informed Mr. Wolley that twenty-one birds and nine eggs had passed through his hands; but this account contains other details, which are certainly inaccurate. If all the stories we received can be credited, the whole number would reach eighty-seven. I should imagine sixty

to be about the real number. Of these a large portion went to the Royal Museum at Copenhagen, as is stated by the late Etatsraad Reinhardt (*loc. cit.*); a good many more passed into the hands of Herr Brandt, whose son informed Mr. Wolley that, in or since the year 1835, his father had had nine eggs, and I suppose birds to match. Two eggs were also purchased by a certain Snorri Sæmonasson then living at Keblavik, but what became of them I do not know. I have also learnt, on undoubted authority, that the late Herr Mechlenburg has had in all eight birds and three eggs.* From this naturalist, in April, 1844, Mr. John Hancock, by the intervention of Mr. John Sewell, of Newcastle, received a bird and an egg, which are now in his collection, with the information that they were taken together with another bird and another egg, a year or two previously, on an island "at the *north-east* side of Iceland." A wrong locality was probably furnished on purpose to mislead Herr Mechlenburg; but the fact of his never having had more than three eggs, of which two came into his possession in, or shortly before, the year 1844, entirely disposes of Dr. Kjærbølling's assertion to which I have before alluded.† Thus it is pretty evident that most of the specimens of the great auk and its eggs which now exist in collections were obtained from Eldey between the years 1830 and 1844. ‡

From what has been already stated, it will be seen how great Mr. Wolley's industry in collecting information was; yet I must add a few more words. In former days, the gare-fowls were, in summer time, so constantly observed in the sea by the fishermen, that their appearance was thought but little of. The people from Kyrkjuvogr and Sudrnes used to begin to see them when they arrived off Hafnaberg, and from thence to Reykjanes röst. We were told by many people that they swam with their heads much lifted up, but their necks drawn in; they never tried to flap along the water, but dived as soon as alarmed. On the rocks they sat more upright than

* Herr Pastor W. Pässler has some remarks on these in the 'Journal für Ornithologie,' 1860, p. 59.

† The additions which, in the last edition of his work, Mr. Yarrell made to his account of this bird (B. B. 3rd ed. vol. iii. pp. 482-3), are copied from Mr. Lloyd's 'Scandinavian Adventures' (ii. pp. 496-7), having been originally taken from Dr. Kjærbølling's book, and are very inaccurate.

‡ Lists of these, which are in the main correct, though I know of a few that are omitted, have lately appeared in the 'Zoologist' for the present year (Zool. 7353, 7386), and almost simultaneously in the 'Field' newspaper (Nos. 423 and 424, pp. 93, 114. Further remarks on them will be found in the former journal (Zool. 7387, 7438).

either guillemots or razorbills, and their station was further removed from the sea. They were easily frightened by noise, but not by what they saw. They sometimes uttered a few low croaks. They have never been known to defend their eggs, but would bite fiercely if they had the chance when caught. They walk or run with little, short steps, and go straight like a man. One has been known to drop down some two fathoms off the rock into the water. Finally, I may add that the colour of the inside of their mouths is said to have been yellow, as in the allied species.

In 1846 Eldey was visited by Vilhjálmur and a party, and no garel-fowls could be found. In 1858 Mr. Wolley and I remained at Kyrkjuvogr, with two short intervals, from May 21st to July 14th. Our chief object was to reach not only Eldey, but the still more distant Geirfugladránger, on which probably no man has set foot since the Swedish Count, in 1821, with so much difficulty reached it. Boats and men were engaged, and stores for the trip laid in; but not a single opportunity occurred when a landing would have been practicable. I may say that it was with heavy hearts that we witnessed the season wearing away without giving us the wished-for chance. The following summer was equally tempestuous, and no voyage could be attempted. Last year (1860), on the 13th of June, Vilhjálmur successfully landed on Eldey, but he found no trace of a greak auk, and the weather prevented his proceeding to the outer island. Later in the year a report reached Copenhagen, which was subsequently published in the newspaper 'Flyveposten' (No. 273), to the effect that two eggs of this bird had been taken on one of the skerries and sold in England for fabulous prices. Through the kind interest of several friends, I think I am in a position to assert that the statement is utterly false. The last accounts I have received from Iceland, under date of June 20th, in the present year (1861), make no mention of any expedition this summer. I am not very sanguine of a successful result, but I trust yet to be the means of ascertaining whether, at the sinking of the true Geirfuglasker, some of the colony, deprived of their wonted haunt, may not have shifted their quarters to the Geirfugladránger, as others, we presume, did to Eldey, and to this end I have taken, and shall continue to take, the necessary steps.

But to sum up the account of Mr. Wolley's personal researches. The very day after our arrival at Kyrkjuvogr he picked up from a heap of blown sand two or three birds' wing-bones (*humeri*).* He was at

* They were from the side of a channel blown out by the wind from a heap formerly drifted there, such as in the eastern counties of England would be called a "Sand-gall."

once struck with their likeness to the figure illustrating Prof. Steenstrup's paper,—that valuable paper to which I first of all referred, and which has been constantly at my side while compiling this abstract of Mr. Wolley's notes. A little comparison, not only with the engraving, but with the corresponding bones in other species, a good supply of which there was no difficulty in procuring, soon showed that he had not been mistaken, and accordingly bone-seeking became one of our recognised occupations. Yet I cannot say that even here we were very successful; curiously enough where the chances seemed the best we never found anything. Thus the old Geirfuglasker having formerly been shared by the churches of Kyrkjubol and Mariu-Kyrkja-i-Vogi, we naturally thought that the "Kjökken-möddinger" (Kitchen-middens) at those places would be likely to yield the best supply. Yet at what we were told was the site of the latter not a vestige of a bone could be found. The ground was covered everywhere with great stones—the little soil there was between them seeming as if it had drifted into its present position, while the sea may have completely washed away the rubbish-heaps, if houses ever stood there. At the former place,—Gammall Kyrkjubol,—though there was a very large grass-grown mound entirely composed of ancient refuse, and into which we made a deep excavation, we did not recover a single fragment of a great auk—scarcely, I think, of any bird—from it. Nor was our luck much better at Stafnes, where we dug down through a large heap, coming upon fishes' bones in great abundance, but little of interest excepting a stratum of broken egg-shells, apparently those of guillemots and razorbills, with perhaps a few eider ducks', though I have not yet examined them very closely. It was remarkable that such of the fragments as had any markings retain them still, after so long a burial, quite as brightly as specimens I have often seen in cabinets, when the collector has not been careful to exclude air and light. At Kyrkjuvogr we were more fortunate; in the wall of the church-yard we found two or three great auks' bones sticking in the turf, which is used instead of mortar to keep the stones in their places. On inquiry the turf was found to have been cut from a small hillock close by. This we pretty thoroughly searched, and amongst a vast number of the bones of other *Alcidæ* there were several of the large species.

But our most profitable digging was at Bøjasker. Mr. Wolley one day, as he was riding along, called out to me that he saw two garel-fowls' bones lying on the ground. On getting off his horse he found them to be the distal ends of the humeri, and apparently a pair.

Going to the spot I picked up a radius, also of a gare-fowl, the first we had found anywhere. We carefully examined the locality on two other occasions, and found remains which must have belonged to at least eight individual birds. Many of them bore marks of the knife, and nearly all were in good preservation. They were chiefly lying under stones, which seemed once to have formed an old boundary-wall, and had probably been contained in the turf from some still more ancient rubbish-heap with which the wall had been built up. Just on this spot the sea appears to have encroached, and in this manner laid bare the two bones whose discovery led to the detection of the rest. Among the specimens we collected there are several in which certain differences, probably the result of age or sex, are observable. I do not intend to describe them now. I will merely remark that the great auk is rendered incapable of flight by the modification of the extremities only of its wings. While its humerus is in proportion with the bulk of the body, and fully twice the length that it is in the razorbill, the ulna, radius and metacarpus are nearly the same length in both species, only much thickened in the gare-fowl.*

It will be gathered from what has been above said that I think there is yet a chance of the great auk still existing in Iceland. At all events until it is proved that he is not to be found on the Geirfugladránger, I think he must not be despaired of; but I know of no other locality where he is likely to be. The numerous islets in the Breida-fjörðr which have been suggested as affording him possibly a last station, are, I believe, visited every year by people from the neighbourhood. Those who imagine he may be on the opposite coast of Greenland are, I am sure, doomed to disappointment. That shore is almost always beset with ice, and, dive admirably as the bird may, I have yet to learn that he can remain under water as long as a seal or a walrus. His then would be a poor sort of existence among closely-packed floes and crashing mountains of ice. Along the coast of Labrador nothing has been lately heard of him that I know of, and yet, if I am rightly informed, it is pretty generally every year visited by fishermen of various nations. The formerly known breeding-places in the Gulf of

* Mr. Edward Blyth gives a few interesting particulars about some bones of *Alca impennis* in the 'Proceedings of the Zoological Society' for 1837 (p. 122). I think it is likely enough that the specimens he examined were extracted from the skins prepared in 1834 by Jomfrue Lewer, which I have mentioned. At all events, that lady seems to have left more of the bones in the skins she prepared than is the custom with other performers in Iceland.

St. Lawrence and off the coast of Newfoundland are ascertained to be abandoned, and no wonder when we think of the annual massacres which used to be committed there.* Yet there may be still "some happier island in the watery waste" to which the penguins of the western seas may have escaped; but then, we may rely upon it, there is left a scanty remnant only.

I have been informed by my good friend Colonel Drummond-Hay, that in December, 1852, in passing over the tail of the Newfoundland banks, he saw what he fully believes to have been a great auk. At first he thought it was a northern diver; but he could see the large bill and white patches, which left no doubt on his mind. The bird dived within thirty or forty yards of the steamer. The same gentleman also has sent me a letter received by him in 1854 from the late Mr. J. MacGregor, of St. John's, Newfoundland, in which he encloses a succinct account of the former wanton destruction of these birds by the fishermen,—the heaps of bones and the "pounds" now to be seen on some of their old breeding-places,—and states that in the preceding year (1853) a dead one was picked up in Trinity Bay. My inquiries about this specimen have not yet resulted in obtaining any further information respecting it.†

* I am under the necessity of dissenting from the opinion expressed by Professor Owen, in a lecture delivered at the Royal Institution, April 12, 1859, and repeated in his article on 'Palæontology,' as republished in a separate form from the 'Encyclopædia Britannica' (p. 400). To the destruction which the great auk has experienced at the hands of man, must, I am confident, its gradually increasing scarcity be attributed. Granting that it does require very peculiar breeding-places to be fit and favourable for it, we only know of the disappearance of one such in the whole extent of its range, which in comparatively modern times reached from Cape Cod to Papa Westra, while on every other known breeding-place it has, from the earliest date, been the especial object of search.

† While on the subject of the bird's occurrence in this part of the world, I wish to remark on Mr. Cassin's statement in Professor Baird's 'Birds of America' (p. 901), touching the great auk "figured by Mr. Audubon, and *obtained by him on the banks of Newfoundland,*" &c. Now in 1857 I was assured by Mr. Bell, the well-known taxidermist at New York, who knew Mr. Audubon intimately, that he never possessed but one specimen of this bird; and if we turn to Professor MacGillivray's 'History of British Birds' (vol. v. p. 359), we find him saying that he never saw but two examples of the species, one in the British Museum, and "the other belonging to Mr. Audubon, and *procured by him in London.*" I have also to set right a mistake made on this side of the water. In their Catalogue of Norfolk and Suffolk Birds, printed in the 'Liunean Transactions' (xv. p. 61), Messrs. Shepherd and Whitear say, they had been told by Sir William Hooker that a great auk had been "killed near Southwold" in the latter county. That eminent botanist, however, has most kindly informed me that not only has he no recollection of any such occurrence, but, having taken some

I am well aware that nothing but the extraordinary interest that attaches to this bird warrants me in occupying so much space. It must be remembered that it is not merely a matter with which ornithologists only are concerned, but is one of far higher and more general importance. "A consideration of such instances of modern partial or total extinctions," says Professor Owen (*loc. cit.*), in reference to this very case, "may best throw light on, and suggest the truest notions of, the causes of ancient extinctions." If this be not sufficient excuse for me, I must urge the great difficulty I have had in condensing the numerous particulars of information which Mr. Wolley's labours have placed at my disposal. It would have been far easier to have been more diffuse. In Iceland all, with but one exception, were eager to tell us all they knew, and that in the most careful manner. I have already mentioned several persons from whom we obtained valuable intelligence, and, unjust as it may appear to the rest, I must forbear from naming more. The chief authorities both in church and state afforded us every facility, and all orders and degrees of men and women followed their example. From the Governor, surrounded by the comforts of modern civilization, through every grade to the unhappy leper, dwelling, as his ancestors may have done centuries ago, amid filth and scarcity, we received an amount of attention, of which it is difficult to express the full value without seeming guilty of exaggeration. Alas! that it is left to me only to make this statement! To all those concerned, then, I have to return our acknowledgments, and to no one more than to our honest and intelligent guide and interpreter Geir Zoega, of Reykjavik, who for more than two months was our constant and willing attendant.

Whether the gare-fowl be already extirpated or still existing in some unknown spot, it is clear that its extinction, if not already accomplished, must speedily follow on its rediscovery. I have therefore to beseech all who may be connected with the matter to do their utmost that such rediscovery should be turned to the best account. If in this

trouble to inquire about it, he is satisfied that the statement originated in error. I must add further, that the reported instance of a bird taken near Marlow, in Buckinghamshire, on the estate of Sir William Clayton, first published, I think, by Dr. Fleming (*Brit. Anim.* p. 130), on Mr. Bullock's authority, seems to me very unlikely. On the other hand, I may mention that Sir William Milner tells me that within the last few years he has become possessed of a fine great auk, which he has reason to believe was killed in the Hebrides. This bird, I am informed, was found to have been stuffed with turf.

point we neglect our opportunities, future naturalists will justly reproach us. The mere possession of a few skins or eggs, more or less, is as nothing. Our Science demands something else—that we shall transmit to posterity a less perishable inheritance. I have to urge, in no spirit of partiality, but purely in the cause of knowledge, the claims of our own country in this event. Our metropolis possesses the best-stocked vivarium in the world. An artist residing among us is unquestionably the most skilful animal draughtsman of this or any other period. By common consent the greatest comparative anatomist of the day is the naturalist who superintends the nation's zoological collection. Surely no more fitting repository for the very last of the great auks could be found than the Gardens of the Zoological Society of London, where living they would be immortalized by Mr. Wolf's pencil, and dead be embalmed in a memoir from Professor Owen's pen.

ALLRED NEWTON.

Elvedon, August 8, 1861.

NOTICES OF NEW BOOKS.

'*Memoir of the Rev. John Stevens Henslow, M.A., F.L.S.*' By the Rev. LEONARD JENYNS, M.A., F.L.S., &c. London: Van Voorst. 1862. 278 pp., post 8vo, with photograph portrait.

PROFESSOR HENSLOW was one of those men whose unostentatious zeal in the cause of Science, whose kindness of disposition and whose willingness to assist the learner, have won for him golden opinions from all who enjoyed the advantage of his society. A distinguishing characteristic of this humble-minded man was his entire indifference to scientific renown: with the single exception of Botany, he neither aimed at nor attained a profound knowledge of the Natural-History sciences; but he acquired a very general acquaintance with all of them, and imparted his knowledge with a freedom and a grace that endeared him to every learner. We could have wished the office of biographer of Henslow had fallen into other hands; to the writer of this notice, and we think to the world of naturalists generally, it would have been far more acceptable to have had a *memoir of Henslow* from one who could have understood and appreciated the *mind of Henslow*, than from one who regards as merit his having caught a Camberwell beauty in his own garden, and a snail which bears the name of Henslowiana,—horrid and barbarous appel-

lation: the first was an accident; the second a calamity. Few biographers seem aware that they present us in their works a double portraiture: the first and more striking photograph is of themselves; the second, less carefully executed, is of the subject of their researches. The little volume before us is an apt illustration of this: the capture of a butterfly, or the complimentary naming of a snail, together with similar trivialities, impress the biographer with their importance, but would have been utterly unheeded at the moment, and in a few days totally forgotten, by the individual in whose praise they are now recorded. How many instances of a similar kind occur in Boswell's 'Life of Johnson;' and yet one cannot regret, or regard as useless, the truthful picture that is thus preserved of both.

The chief study of Henslow's earlier years appears to have been Mineralogy, and his proficiency in this science was sufficient to procure for him, in 1823, a Professorship in the University of Cambridge; but two years afterwards a more congenial chair became vacant, that of Botany. For many years he had regarded plants with a very loving eye; he longed for greater opportunities of studying them, and he had learned that in order to teach, it is indispensable to learn: in seeking the botanical chair he was opposed by William Kirby, who in early years had made plants a leading study, and had been led step by step into Entomology, mainly by the connexion of insects with plants. In the contest for Dr. Martyn's vacant chair, Henslow was successful; and thenceforward he became the leading botanist, as Kirby the leading entomologist, of his country. In saying this we do not pretend to assert that he ever rivalled a Borrer, a Watson or a Babington, in the knowledge of British species; but he acquired a comprehensive and intimate knowledge of the entire science, as proved by his 'Principles of Descriptive and Physiological Botany,' published in 1836,—a work which has scarcely an equal for clearness, simplicity and completeness, and which has served as the foundation of that shoal of introductory works which have of late years inundated the science.

But let us turn from his books to the man himself: here is a sketch from the pen of Mr. Darwin, the worthy pupil of a worthy master:—"I went to Cambridge early in the year 1828, and soon became acquainted, through some of my brother entomologists, with Professor Henslow, for all who cared for any branch of Natural History were equally encouraged by him. Nothing could be more simple, cordial and unpretending than the encouragement he afforded to all

young naturalists. I soon became intimate with him, for he had a remarkable power of making the young feel completely at ease with him, though we were all awe-struck by the amount of his knowledge. Before I saw him, I heard one young man sum up his attainments by simply saying that he knew everything. When I reflect how immediately we felt at perfect ease with a man older and in every way so immensely our superior, I think it was as much owing to the transparent sincerity of his character, as to his kindness of heart; and, perhaps, even still more to a highly remarkable absence in him of all self-consciousness. One perceived at once that he never thought of his own varied knowledge or clear intellect, but solely on the subject in hand. Another charm, which must have struck every one, was that his manner to old and distinguished persons and to the youngest student was exactly the same: to all he showed the same winning courtesy. He would receive with interest the most trifling observation in any branch of Natural History; and however absurd a blunder one might make, he pointed it out so clearly and kindly, that one left him no way disheartened, but only determined to be more accurate the next time. In short, no man could be better formed to win the entire confidence of the young, and to encourage them in their pursuits." In allusion to Natural-History rambles with Henslow, Mr. Darwin says:—"These excursions have left a delightful impression on my mind. He was, on such occasions, in as good spirits as a boy, and laughed as heartily as a boy at the misadventures of those who chased the splendid swallow-tail butterflies across the broken and treacherous fens. He used to pause every now and then and lecture on some plant or other object, and something he could tell us of every insect, shell or fossil collected, for he had attended to every branch of Natural History. After our day's work we used to dine at some inn or house, and most jovial we then were. I believe all who joined these excursions will agree with me that they have left an endearing impression of delight on our minds." It was Henslow who recommended Darwin to Captain Fitzroy, of H.M.S. "Beagle," and thus we are indirectly indebted to the Professor for opening the career of one of the greatest naturalists our country has produced; but this subject we must suppress to introduce Mr. Darwin's beautiful summary of the character of his friend. "During the years when I associated so much with Professor Henslow I never once saw his temper ruffled. He never took an ill-natured view of any one's character, though very far from blind to the foibles of others. It always struck me that his mind could not be even touched by any paltry feeling of vanity, envy or

jealousy. With all this equability of temper and remarkable benevolence there was no insipidity of character. A man must have been blind not to have perceived that beneath this placid exterior there was a vigorous and determined will. When principle came into play no power on earth could have turned him one hair's breadth." The following is also very pleasant and very characteristic, although scarcely scientific, a fact we must ask our readers to excuse. "I remember one trifling fact," says Mr. Darwin, "which seems to me highly characteristic of the man. In one of the bad years for the potato I asked him how his crop had fared, but after a little talk I perceived that, in fact, he knew nothing about his own potatoes, but seemed to know exactly what sort of crop there was in the garden of almost every poor man in his parish."

It has little to do with Science, but much to do with the man that Professor Henslow was what is called a liberal in politics; we have seen the biographer of Kirby vaunting the determined toryism, the excessive intolerance which in that worthy old gentleman became almost a religion; we have here a portrait of another kind, a man educated in toryism becoming an extreme liberal, a reformer, a whig, and neither afraid nor ashamed to avow his sentiments. "I would have," said Henslow, "every tory consistent, and every radical consistent, and every whig consistent, until either of them shall have become convinced that he has been in error, and then I would have him change his politics, regardless of every risk, and despising the shame which the world will heap upon him. But what I would have every man strive to possess is moral courage sufficient to declare his own opinion unhesitatingly in the face of the world, and adequate to maintain them unflinchingly against all influence whatever. A man of strict moral courage will hazard everything rather than act against his conscience." These are golden words, but we must pass on.

Professor Henslow possessed in an eminent degree that useful tact of observing only what was worthy of observation: the want of this tact leading to the eternal reiteration of an oft-told tale, induces a waste of time and labour that is rarely afterwards retrieved. How to get rid of the propensity to observe and write about the useless is one of the difficulties of Science. Henslow intuitively escaped the trammels of this error at a very early period of his scientific career. Many instances of such writing came under Professor Henslow's notice, and his kind heart yearned towards those who made such blunders; he longed to diffuse useful information amongst such writers, in fine to teach them what to observe and how to observe. His observations on the

wheat midge are written mainly with this object: he states this paper was not compiled as a scientific communication, but his biographer truthfully adds, "it is written in that masterly style which bespeaks the scientific character of the author." In this, as in almost every inquiry, he seems to have devoted himself to the service of the farmer, not omitting that fruitful source of absurd speculation, the potato disease. He traced the disease to no fabulous origin, invented no *Aphis Vastator*, suggested no nostrums by which it would be effectually eradicated, but he showed how two-thirds of the nutritive portions of sound potatoes existed in those which were diseased. "It seems," says Henslow, "to be a providential arrangement that as yet the really nutritive portion of the potato is very little injured, even in those tubers which become partially decayed and appear to be wholly unfit for food. The nutritious portion of the potato consists of delicate white grains of starch-like matter, which are enclosed in little cells. When the cells are broken the grains fall out, and collecting together form a beautifully white flour. It is very easy to separate this flour from the rest of the substance of the potato, and if a few persons in different villages would undertake to make the method generally known among the poor a vast amount of wholesome food may yet be secured to them, which otherwise they will suffer to perish." He describes with the utmost exactitude the process by which this flour may be obtained, the best method of storing it up for future use, and how it might be used for bread, if mixed with wheat flour in certain proportions, adding what we all now know, "it is well understood that a very high per centage of what is sold in the shops under the name of arrowroot is nothing more than this very flour of potatoes. It is also passed off in London under about a dozen different names as an important and nutritious article of diet."

Henslow carried the benevolent project of converting diseased potatoes into wholesome food wherever he went; he wrote, lectured and experimented: he demonstrated beyond all question the soundness of his views, but public prejudices were against him, and the same suicidal policy which has introduced poisoned wheat induced the farmers in his neighbourhood to neglect his advice, and sacrifice their potatoes, year after year, on the shrine of some new experiment.

But we are allowing ourselves to be carried away by the biography of this delightful man, whose reputation is destined to outlive that of many a more showy philosopher. The last subject he investigated was perhaps the one which really occupied most seriously his thoughts; we allude to the *questio vexata* of the celts: the existence

of these human and preadamite instruments sorely perplexed him; his belief in revealed religion was immovable; his belief in the evidence of his senses was also unquestionable. Fain would he have believed the celts non-existent, but then they were to be seen and handled by every one. He visited Amiens and Abbeville, in the ardent hope of finding some flaw in the history of celts: unsuccessfully he visited the more recently-discovered locality at Herne Bay; and at last is believed, by his estimable son-in-law, to have "convinced himself that these implements belong to a period long antecedent to that usually attributed to man's existence on the earth." Inclination and supposed duty were pulling one way, and stern incontrovertible fact the other. He clearly saw how such a conflict must militate against our accepting the Natural History of the Bible as infallible in its details, and he nobly confesses, "I do assert that I yield to no man in firm belief that 'all Scripture is given by inspiration;' but, then, given only for the purposes specified, viz., for doctrine, for reproof, for correction, for instruction in righteousness." He thus meets the question in a manly spirit, and exhibits a far deeper love of true religion than those have done who invent cunningly-devised fables in order to prove the accordance of geological discovery with the Scripture narrative of Creation.

If an objection can be raised to any part of the scientific character of this most estimable man, it is his love of speculation: many of his views, retained through a long series of years, and constantly uppermost in his mind, never received that confirmation which converts a vague hypothesis into an available theory: such was his inquiry into the colouring of pebbles, a subject at which he worked throughout life, without attaining, and therefore without giving to the world, any available result. He held that if a defined mineral mass—fragmentary, nodular or crystalline—is imbedded under circumstances which admit of its being continuously acted upon by heat or moisture, then any colouring matters introduced or originally included in its substance can rearrange themselves into zoned laminæ, which bear a distinct relation to the surface of the mass. Also that nodular aggregations can be formed within its substance from numerous centres, many of which are seated at or near the surface of the mass. In his endeavour to establish these views, the Professor collected an infinity of pebbles; some rough, some cut, some polished. In 1836 he communicated orally his views on these to the Cambridge Philosophical Society; but, although he continued the inquiry for a quarter

of a century afterwards, no results, we believe, have ever been published.

We close the book, and heartily recommend it to our readers, assuring them that it is impossible to read its pages without receiving abundant instruction and improvement: they also generates a feeling of satisfaction to know that one is a learner in the same school; and as the young painter exclaimed, on contemplating the *chef d'œuvre* of a master, "ed io anche sono pittore," so, in the contemplation of so much goodness and wisdom and modesty, do we feel inclined to say rejoicingly, "and I also am a naturalist."

J. G.

The Great Black Woodpecker in the New Forest.—Assuming Mr. W. Farren's statement (Zool. 8091) of the great black woodpecker's breeding in the New Forest to be correct (although, according to his own showing, it may be open to doubt), I cannot but regret that his business interests so far prevailed over the good feelings which generally belong to professed naturalists, as to induce him to plunder the nest and attempt the capture of the old birds. In this case the loneliness of the situation, and the fact of the birds having been hitherto undisturbed, will be a sufficient answer to the plausible excuse so often put forward for killing every *rara avis* which visits this island, namely, that some other person would have had the prize if he had not taken it. The great black woodpecker has such an extended range in Europe, and the bird has been observed, though rarely, in so many parts of this country, that its visits can hardly be due to such accidents as bring over to us straggling species from America; so that when a pair of these birds take up their quarters in one of the few suitable localities to be found with us, prepare their nest, and commence incubation, I think many readers of the 'Zoologist' will agree with me in wishing them to be protected rather than destroyed. This is the first record of the species having bred in this country, and Mr. W. Farren will now have the satisfaction of knowing that he has done his best to prevent such an occurrence again taking place.—*E. W. H. Holdsworth*; 18, *Osnaburgh Street*, July 4, 1862.

Toad found in digging Clay for Bricks.—In the 'Zoologist' for May, 1859 (Zool. 6537), there is a notice from me of the occurrence of live toads underneath a bed of clay. The short account there given has been adopted by Mr. Gosse, in his lately-published volume of 'The Romance of Natural History,' of which volume a review appears in 'The Friend' for March last. The reviewer is justly cautious of admitting such statements as proof "that toads can exist without food, light or air, immured for thousands of years," and, by citing an instance observed by himself, he intimates the probability of there being, in all such cases, some unobserved communication between the prison of the immured and the external air. He states that he once found a common natterjack, "enjoying himself to his heart's content at the very extremity of a long and tortuous gallery, excavated by a sand marten, in the perpendicular face of an abandoned gravel-pit on Blackheath," and he adds, "had a well been

sunk from the surface, the little animal would certainly have been found fourteen feet below the surface, and the event as certainly chronicled in all our newspapers, as another instance of the longevity of toads." Now it may be inferred by the readers of the review that some such side communication most probably existed in the case of the toads noticed by me, and I therefore wish to show, by a short description of the place where they were found, that there could not be any such communication. The place is a clay-field (now nearly dug out for bricks), of about an acre in extent, of a triangular form, and nearly surrounded by water; that is, it has a canal on one side, a mill-stream on another, and a deep brook on the other side. The surface of the field before it was dug was but little above the surface of the surrounding streams, and the spot where the toads were found is many feet lower than the bottoms of the streams. There could not, therefore, be any side communication in this case; nor is it easy to see how there could be one from the surface, through a bed fourteen feet thick, of close, moist, adhesive clay, as close and moist and adhesive as a cask of butter. I have no opinion to offer on this obscure question; but it seems to me that the records of toads having been found immured, apparently for centuries, are too numerous and too well-authenticated to be lightly passed by, and that, like the various accounts of the sea serpent, they deserve the careful investigation of naturalists and physiologists.—*Thomas Clark; Halesleigh.*

[A great many notices on this subject have appeared during the past three months in the columns of the 'Field' newspaper: these communications were induced by a paragraph in the 'Worcester Herald' of March 15th, stating that a frog had been found in a coal mine imbedded in the solid coal. Of course numerous sceptics came forward to dispute the fact, and numerous advocates of the "toad-in-hole" hypothesis arranged themselves *per contra*, and charged the sceptics with "sheer ignorance and sheer prejudice;" but to a logician the admission of the advocates of the hypothesis will appear rather damaging; the Worcester miracle has appeared with these little alterations,—"the frog was in loose shale;" "it was found in the prickings;" "there were ponds on the surface, in which frogs were plentiful;" "there was nothing to prevent frogs falling into the pit if they had been so foolish as to go near enough;" "there was daily opportunity for a frog going down in the baskets used for coal, but that did not bear on the question." In support of the Worcester frog, the Lichfield frog has been again brought into the witness-box: this frog had been imbedded in solid rock for countless centuries, and at the time of the Restoration that particular cube of stone which he had selected for his domicile was hewn from its native quarry and placed on the summit of one of the spires of Lichfield Cathedral, which it is said that Cromwell's iron cannon-balls had crumbled about the ears of the human canons engaged at their devotions within. Charles II., a monarch of great piety, ordered the restoration of the spire, and restored it was, the frog-honoured stone forming the apex; but, says the historian, "a century afterwards they (the spires) were much dilapidated, and had to be repaired. One of the stones that were thrown down from the top of a spire was broken by the fall, and in the centre was found a living frog. It is very remarkable that the frog could have lived in such a position high and dry for one hundred years." With this profound observation, in which I cordially concur, I must leave the matter with my readers.—*Edward Newman.*]

The Tench found in the Moray Firth.—A beautiful specimen of the tench (*Tinca vulgaris*) was taken in the Moray Firth, near Banff, about the middle of last month (June). From whence it came, or how it had fared, is of course a mystery. The stomach was empty. The specimen is now deposited in the Banff Museum.—*Thomas Edward; Banff, July 9, 1862.*

Eurydice pulchra at Banff.—Van Bunerduin's new species of land-lice, which he calls *Slabberina agata*, but which, unfortunately for our continental friend, Dr. Leach found and described many years ago, under the name of *Eurydice pulchra*, is quite common here. Should any one be passing this way, and wish to see this little Crustacean in its native pool, I can assure him a treat, if the day be quiet and sunny and the tide out.—*Thomas Edward; Banff, July 9, 1862.*

Is Succinea Pfeifferi a Species?—Dr. Gray in p. 180 of 'Turton's British Shells' (1840), when speaking of *Succinea Pfeifferi* says, "It is very doubtful if this is more than a variety of that variable species" (*S. putris*). I have no means of knowing whether this question has been since settled or not, and for the sake of eliciting information I have put down my own observations on the subject, which all lead me to believe they are distinct. Between the North and South Camps, Aldershott, runs the Basingstoke Canal, along the sides of which, both up and down as far as I have been, the *Succinea* abounds; and they are all alike, small, narrow, very oblique, and, while the animal is in the shell, the colour is bluish black. About a mile from Ash the Canal is raised on an embankment nearly thirty feet above the level of the surrounding country, and the land at the foot of the bank is used as an osiery, where among the willows, &c., the yellow Iris grows luxuriantly. Last month (May) nearly every leaf in this spot had a *Succinea* on it, some of the largest I have ever met with, and about four times the size of their neighbours on the canal. The colour of the animal was invariably a dull white, or white with a shade of yellow. The shell much larger, the whorls more convex, the suture not so oblique, and the mouth broader in proportion; it has also a varnished appearance which is wanting in the smaller kind. I kept many of both kinds alive for a considerable time, and watched their habits. Several paired in captivity and deposited eggs, but though kept together they never united, except with their own sort. The large kind I observed rather to avoid the water, whereas the small often took to it of their own accord, and remained in for a length of time, particularly at night. I shall be glad to know what conclusion has been arrived at by any of the correspondents of the 'Zoologist' who may have given attention to the subject. I have this year lost dozens of the smaller *Succinea* through the ravages of a small worm, probably a *Cochleoctonus*. More than once while looking at my captive I have noticed an individual become restless and begin to throw its head from side to side. Shortly after a worm has made its appearance, usually by eating its way through the right side of the neck of the *Succinea* just above and behind the genital orifice. The poor victim seldom lived more than an hour or two after the exodus, and seemed to die in great pain, as the genital organs and "poche buccale" often protruded as if they had been squeezed out by strong convulsions.—*Bruce Hutton; Aldershott.*

Capture of Deilephila lineata at Westbourne, Sussex.—A fine female of *Deilephila lineata* was found at rest in the garden of a cottage in this village, on the 4th of this month (May).—*H. S. R. Matthews; Westbourne, Sussex, May 29, 1862.*

Destruction of Hymenoptera.—The present year has been a most disastrous one for these insects, particularly the Bombinatrices. The lawn near my residence is riddled with mouse holes, and during the month of May I have been amazed with the attempts of the females of *Bombus subterraneus*, *B. terrestris*, *B. lapidarius* and a large black bee, to commence nidification, but the ground seemed so wet a few inches deep that no lodgment was made by any one of these until the 7th of June, when a queen of *B. subterraneus* commenced her nest. She worked most vigorously until the 12th of June, when an inundation of rain washed the poor bee completely out of her nest. I found her a few inches from the entrance almost in a torpid state. She was taken in doors and fed with honey for one day, and I had the satisfaction of seeing her return twice to her domicile, but another torrent of rain fell on the 13th and 14th, and she never again appeared. I believe she was too weak from the cold and wet below to escape the second time. The bees alluded to were nearly every day for five weeks endeavouring to find a place sufficiently dry to form their nests. I discovered some queen wasps also commencing nidification as late as the 1st of June, from the same cause. The continued rains from the first week in March, with little intermission until the 18th of June, has no precedent during the present century, and we may hope that the law of "compensation" will give us drier weather for the next three months, although with a lower temperature. This day the temperature is ten degrees below the usual heat of June, being 56° at 7 A. M., with a cold north-west wind. I found at least a dozen hive bees fall short of their hives from cold at 8 A. M. They were quite chilled, but were revived by me.—*H. W. Newman; Hillside, Cheltenham, June 28, 1862.*

Capture of Boletobia fuliginaria in London.—While passing down one of the lanes in the City leading to Thames Street, I was somewhat startled on seeing at rest, on the side of a door-way, a male specimen of *Boletobia fuliginaria*. Having fortunately a small pill-box in my pocket, I managed to secure it, not, however, without some little damage to one of the under wings; in other respects is in very fine condition.—*F. O. Standish; 2, Alfred Cottages, Warner Road, Camberwell, July 12, 1862.*

Coleoptera found in company with Formica fuliginosa.—I forward you a few notes on the distribution of species of Coleoptera found in company with *Formica fuliginosa*, as far as they have come under my notice. I have found colonies of this ant at Weston in two places, in the one case in an old tree as usual, in the other in a bank of a garden. At Cambridge I have hitherto found only one living colony in an old willow, but the majority of trees by the river-side have been inhabited by them, and in these I find almost all the coleopterous inhabitants among the rotten wood. I will now enumerate the species which I have found in order:—

Falagria thoracica, Curt. Abundant round the base of the tree, Weston.

Thiasophila inquilina, Maerk. Rare. Apparently lives in the interior of the nest, and will only occasionally come down to the rotten wood at the base. I obtained one specimen of this from the bank above alluded to. Weston.

Haploglossa ———, *Maerk.* Of this I have taken about eight specimens, all from damp moss placed at the roots of the trees and in the nest. Weston and Cambridge.

Myrmedonia funesta, M. laticollis, M. lugens. All common in the rotten wood at the base of the trees; also very abundant in moss. Weston and Cambridge.

M. humeralis. Not rare round the nest in the bank at Weston, in moss, &c.

Homalota confusa. Common at Weston, both in the trees and in the bank. Apparently very rare in Cambridgeshire.

H. cæsula. Three specimens taken out of the rotten wood at the base of the tree. Weston.

Quedius truncicola, *Fairm.* Two specimens taken once at Weston, from moss at the roots of the tree. These present all the characters of *M.* Fairmaire's insect, and also agree with Mr. Janson's specimens; but I am very doubtful whether it can be maintained as a species.

Q. scitus. One specimen at Cambridge, from rotten wood at the base of the tree.

Q. chrysurus, *Kiesen.* Rare at Weston, in the rotten wood at the base of the nest; more common at Cambridge, in deserted nests, in the winter. I have also seen specimens recently taken by the Rev. H. Matthews, of Gumley. I am inclined to think this species (the *Q. infuscatus* of Waterhouse's 'Catalogue') is really *Q. chrysurus* of Kiesenwetter; it agrees with Kraatz's description, and also with the series of that insect in the British Museum sent by Dr. Kraatz. The true *Q. infuscatus*, *Er.*, if it indeed be distinct, has the "elytra fusco-testaceous, suture blackish;" whereas my specimens are always unicolorous. In the 'Faune Française,' moreover, the elytra of *Q. infuscatus*, *Er.*, are said to be longer than the thorax, which I do not observe in my series. This species is very active, and feigns death with great readiness.

Xantholinus glaber, *Nordm.* Rare at Cambridge, in old deserted nests, in the winter, with *Quedius chrysurus*.

Batrissus venustus, *Reich.*? I obtained ten specimens of this pretty Pselaphidan from an old nest near Cambridge. They appear to agree with specimens taken by the Rev. H. Matthews at Sherwood, but some doubt seems to exist as to their identity with the true *B. venustus* of Reichenbach.

Abræus globosus. Not rare at Weston, in moss previously damped, but exceedingly abundant in Cambridgeshire. I have found it throughout the country, frequently under flood-refuse, it having been washed out of the trees on the river-side. Though I have no doubt this is truly a myrmecophilous insect, it has a great partiality for Fungi. I obtained as many as sixty specimens in a piece of half-rotten *Polyporus squamosus* placed in a nest of the *Formica*, near Cambridge. I also dug them freely out of the rotten wood of old trees which had been ant-infested. Some of these were recently excluded, showing that they undergo their metamorphoses in the interior of the tree.

A. granulum, *Er.* I obtained two specimens of this rare species in company with *H. globosus*, near Cambridge. The sudden dilation of the tibia well characterises it.

Cryptophagus bicolor. Not uncommon at Weston.

Prionocyphon serricornis. Of this species, which is, I find, quoted by Kiesenwetter as myrmecophilous, I obtained one specimen at Weston, leisurely walking among the ants at the base of the tree.

Omius brunnipes? Very common in rotten wood at Weston and at Cambridge, in company with ants. Two or three allied species are known to frequent ants on the Continent, *e. g.*, *O. pellucidus*, *Schön.*

Myrmecoxinus vaporariorum. I have taken four specimens of this sweeping near ants' nests, but have not yet succeeded in discovering the economy of the species.

The number of species accidentally occurring is very great, and would take up too much room to insert here; I may mention as a few of the more remarkable—*Copris*

lunaris, *Chrysomela goettingensis*, *Trox scaber*, *Dorcus parallelipedus*, &c. ; these have repeatedly occurred. Notwithstanding the length of this list, there are several more species to be found with this ant, some of which, as *Myrmedonia cognata* and *M. limbata*, have been taken in Britain ; but much remains to be done, and I shall be glad if this sketch incites any of our more northern coleopterists to a careful investigation of the nest of this ant. I can assure them that, when accessible, they will find it nearly always prolific. — *G. R. Crotch ; Uphill House, Weston-super-Mare, July, 1862.*

List of Coleoptera taken in the New Forest, Hants.—

Lebia cyanocephala. One, by sweeping.

Necrophorus Mortuorum, *N. Vespillo*, *N. humator.* All common in specimens in the gamekeeper's museum, *i. e.*, dead crows, &c.

Liodes humeralis. In Fungi.

Scaphidium 4-maculatum. In Fungi. I shall be glad to send specimens of this, set or unset, to any one sending box and return postage.

Cryptarchia strigata. Beneath bark.

Ips 4-guttata, *I. 4-punctata.* Beneath bark, chiefly beneath bark of the stumps when the tree has been felled the year previously, and there is a lot of balmy-looking sap running out.

Rhizophagus depressus, *R. ferrugineus*, *R. bipustulatus.* Beneath bark of felled trees. The last common.

Thymalus limbatus. In Fungi and beneath bark. The same remark applies to this as to *Scaphidium 4-maculatum.*

Bitoma crenata. Common beneath bark, chiefly of stumps when the tree has been cut some years.

Cerylon histeroideus. Beneath bark.

C. ferrugineum. Rare. Beneath bark.

Sylvaenus unidentatus. Rare. Beneath bark.

Mycetophagus atomarius. Last year this was common on a beech tree : not one to be seen this year.

Litargus bifasciatus. Beneath bark.

Dermestes murinus. Common in gamekeeper's museum.

Trox sabulosus. Two, flying over dung.

Athous rhombeus. One, bred from a pupa beneath bark of dead oak.

Elater sanguineus, *E. sanguinolentus*, *E. Pomonæ.* Beneath bark, and sunning themselves on dead trees.

Corymbites quercus. Beating.

Diacanthus bipustulatus. Beneath bark.

D. holosericeus. Beating.

Campylus linearis. Beneath bark.

Byturus tomentosus. - Common. Beating whitethorn.

Cis villosulus. In Boleti.

Platydema violaceum. Two, beneath bark.

Helops striatus. Common. Beneath bark.

Mycetocharis bipustulata. Rare. Beneath bark of dead standing oaks.

Eryx atra. One, beneath bark of dead standing oaks.

Orchesia micans. On Boleti. Of this I have bred a good number, and shall be glad to send unset specimens to anyone who wants them.

Phlæotrya rufipes. Rare. On Fungi.

Melandrya caraboides. Common. Beneath bark, also flying.

Pyrochroa coccinea. One, on Umbelliferæ.

Tomoxia biguttata. Rare. On flowers.

Anaspis frontalis, A. Geoffroyi, A. ruficollis, A. subtstacea, A. maculata. Common. In furze, whitethorn and other bloom.

Dryops femorata. One, flying at night.

Rhynchites æquatus. By beating whitethorn.

Tomicus Laricis. Beneath bark of dead fir.

T. villosus. Beneath bark of dead oak.

Callidium variabile. Beneath bark.

Clytus mysticus. By beating whitethorn.

Leiopus nebulosus. One beneath bark.

Tetrops præusta. By beating whitethorn.

Strangalia nigra. On Umbelliferæ. Rare.

Leptura sexguttata. On Umbelliferæ, &c.

Clythra tridentata. One, by sweeping.

C. 4-punctata. One, by sweeping.

Gonioctena 10-punctata. On shallows.

Prasocuris aucta. One, beneath bark.

Calomicrus circumfusa. By sweeping low furze.

Luperus rufipes. Beating whitethorn, &c.

Tritoma bipustulata. On Fungi.

Of course I have not mentioned the host of common species one always meets with, and I have several that I am not quite certain about, so have not mentioned them.—*W. Farren*; 10, *Rose Crescent, Cambridge, July 9, 1862.*

Proceedings of Societies.

ENTOMOLOGICAL SOCIETY.

July 7, 1862.—FREDERICK SMITH, Esq., President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be given to the donors:—‘*Horæ Societatis Entomologicæ Rossicæ variis Sumonibus in Rossi ausitatis editæ,*’ Fasciculus primus; presented by the Entomological Society of Russia. ‘*Tijdschrift voor Entomologie,*’ Vol. iv., Parts V. and VI.; Vol. v., Parts I., II. and III.; by the Entomological Society of the Netherlands. ‘*Memorias de la Real Academia de Ciencias de Madrid,*’ Tomo iii., iv. and v. ‘*Resumen de las Actas de la Real Academia de Ciencias de Madrid,*’ 1852—1859; by the Academy. ‘*Verhandlungen der Kaiserlich-Königlichen zoologisch-botanischen Gesellschaft in Wien,*’ Vol. xi., Parts I., II., III. and IV. ‘*Nachträge zu Maly’s Enumeratio plantarum phanerogamicarum imperii Austriaci universi, von August Neilreich, Herausgegeben von der K. K. zoologisch-botanischen Gesellschaft in Wien,*’ by the Zoological-Botanical Society of Vienna. ‘*Der Aufenthalt auf Manila während der Weltreise der K. K. Fregatte Novara,*’ von G. Ritter v. Frauenfeld; ‘*Ueber die sogenannte Sägspäan-See Vcobachtet während der Weltreise der Novara,*’ von

G. Ritter v. Frauenfeld; 'Eine für Oesterreich neue Trypeta,' von G. Ritter v. Frauenfeld; 'Beitrag zur Kenntniss der Insekten-Metamorphose aus dem Jahre, 1860,' von G. Ritter v. Frauenfeld; 'Dritter Beitrag zur Fauna Dalmatiens, nebst einer Ornithologischen Notiz,' von G. Ritter v. Frauenfeld; 'Weiterer Beitrag zur Fauna Dalmaticus,' von G. Ritter v. Frauenfeld; by the Author. 'Sitzungsberichte der Königl. bayer. Akad. der Wissenschaften zu München, 1861,' ii. Heft III.; by the Academy. 'Monographia Cassidarum, auctore Carolo H. Boheman,' tom. quartus, Supplementum; by the Author. 'The Natural History of the Tineina,' Vol. vii. (Bucculatrix and Nepticula), by H. T. Stainton, assisted by Prof. Zeller, J. W. Douglas and Prof. Frey; by H. T. Stainton, Esq. 'A Treatise on some of the Insects injurious to Vegetation,' by Thaddeus William Harris, M.D., third edition; by the Boston Society of Natural History. 'Proceedings of the Royal Society,' Vol. xii. No. 49; by the Society. 'The Intellectual Observer,' Nos. 5 and 6; by Messrs. Groombridge & Sons. 'Exotic Butterflies,' Part XLIII.; by W. Wilson Saunders, Esq. 'The Zoologist' for July; by the Editor. 'The Athenæum' for May and June; by the Editor. 'The London Review' for June; by the Editor. 'The Journal of the Society of Arts' for June; by the Society.

Donations.

The President exhibited a box of galls, which had been forwarded to him from Germany, together with the makers of many of them, named in accordance with the nomenclature adopted in Hartig's work on gall insects. One of the species was *Cynips Kollari*, hitherto erroneously called in this country *C. Lignicola*. Of this species the President remarked that about three years ago it appeared in the woods near London, especially on the north side, in very large numbers; but in the second year of its appearance the tomtits had discovered that each gall contained a fine fat grub, and the result was that it was now difficult to obtain a perfect gall. Mr. Walker corroborated Mr. Smith's account both of the appearance and the approximate extermination of the species in the woods near Highgate; and Prof. Westwood expressed a hope that the fact would be made known as widely as possible, since it afforded an additional argument to the many already produced in opposition to the indiscriminate slaughter of small birds.

Prof. Westwood exhibited specimens of *Acarus domesticus*, *DeG.* (*A. Siro*, *Linn.*), found by Dr. Maddox, of Woolston, Southampton, in a nitrate of silver bath prepared for photographic purposes; and suggested that Mr. Andrew Crosse's wonderful creation of *Acari* might probably be explained on the hypothesis that, in that case as in this, the insects had been attracted by some of the chemical ingredients employed. He also exhibited some photographs of insects sent to him by Mr. Dale, the execution of which was so good that, notwithstanding a certain haziness, the specific distinctions of even small species were recognizable: many of the insects photographed were gummed on card, which spoiled the effect; but when they were pinned high, and had the wings flat and horizontal, the result was so successful that the Professor thought that for large insects, and especially for Neuroptera, photography might well be employed for the publication of figures; but that for smaller species it would perhaps only be useful in taking representations, from which the draftsman might afterwards make magnified drawings.

Prof. Westwood also exhibited a box of interesting objects recently contributed by Mr. Stone to the Oxford Museum: amongst them were some galls similar to those

exhibited by the President; Tenthredinidæ reared from brambles; specimens of *Trichiosoma* and its parasite; examples of *Raphidia*, and the cast skin of its pupa, remarkable for the possession of mandibles unlike those of either larva or perfect insect, and which enabled it to bite its way through the cocoon; and specimens of leaves of trees, very neatly preserved, so as to show the forms of the mines of various leaf-mining Lepidopterous larvæ.

Mr. Stainton exhibited two species of *Micropteryx*, both bred by Mr. Wilkinson, of Scarborough; *M. Salopiella* from birch, and *M. subpurpurella* from oak. Mr. Wilkinson had unfortunately not observed the pupa, and was consequently unable to corroborate or add to the description given by Mr. Stainton at a former Meeting.

Mr. Pascoe read the following

Note on Stenidea, Muls., and Blabinotus, Woll.

“In the last number of our ‘Transactions’ (Vol. i. third series, p. 178) Mr. Wollaston, following Mr. Thomson, who has also been followed by Dr. Schaum, in his new ‘Catalogue,’ makes the genus *Stenidea*, *Muls.*, synonymous with *Blabinotus* of the first-named author. This is an error which I pointed out some years ago to Mr. Thomson, and I am only surprised that Mr. Wollaston did not see that a Longicorn genus, with a porrect head and securiform palpi, could have nothing to do with the Saperdides. *Stenidea* is very close to *Pogonocherus* among the Lamiidæ, where Mulsant originally placed it. *Blabinotus* is a Callidium form, belonging therefore to the Cerambycidæ, and was placed by Mr. Wollaston, in his ‘*Insecta Maderensia*,’ immediately after *Phymatodes*, which is about its correct position. I scarcely know, however, how the genus is to be distinguished from *Oxypleurus*, except it be by its smaller and less emarginate eyes. I may add that Mr. Janson, at my request, has kindly examined the two genera, and he is satisfied that they are perfectly distinct. The name *Stenidea* is stated to have been preoccupied: there is a *Stenidea** certainly among the Carabidæ, and if this be the one alluded to I think the objection is invalid, as they are not identical, however near they may be in sound. In any case, if there is to be a new name, that of *Ataxia* of Haldeman must be adopted, an American species described by that author being referable, according to Leconte, to Mulsant’s *Stenidea*.”

Papers read.

Mr. Walker read a paper entitled “Notes on Chalcidites, with Characters of undescribed Species.”

The Secretary read, on behalf of the author, a paper by Mr. R. Trimen, entitled “On some new Species of South-African Butterflies collected in British Kaffraria, by W. S. M. D’Urban, Esq., during 1860—61.” In this paper eleven new species of Rhopalocera were described, including one the type of a new genus, named by the author *D’Urbania*, and placed by him (notwithstanding its apparent resemblance to the Satyridæ) among the Lycænidæ.—*J. W. D.*

* Dr. Schaum, in the second edition of his ‘Catalogue,’ writes *Stenidia*; in the first it is *Stenidea*, as Mulsant wrote it.

NOTICES OF NEW BOOKS.

'A Memoir of Thomas Bewick, written by himself; embellished by numerous Wood Engravings, designed and engraved by the Author for a work on British Fishes, and never before published.'

Newcastle-on-Tyne: printed by Robert Ward, Dean Street, for Jane Bewick, Gateshead. London: Longman & Co. 1862.

WHAT sweet visions arise in the eyes of the naturalist at the name of Bewick! "His works indeed are of the smallest dimensions, but this makes it only the more surprising that so much interest could be comprised within such little spaces. The woodcuts that illustrate his books of Natural History may be studied with advantage by the most ambitious votary of the highest classes of Art, filled as they are by the truest feeling for Nature, and though often representing the most ordinary subjects, yet never, in a single instance, degenerating into common-place. The charming vignettes that ornament these books abound in incidents from real life, diversified by genuine humour, as well as by the truest pathos, of which the single figure of a shipwrecked sailor saying his prayers on a rock, with the waves rising round him, is an instance. There is often in these little things a deep meaning that places his art on a level with styles which the world is apt to consider as greatly above it, in proof of which I would mention the party of boys playing at soldiers among graves, and mounted on a row of upright tombstones for horses; while for quaint humour, extracted from a very simple source, may be noticed a procession of geese which have just waddled through a stream, while their line of march is continued by a row of stepping-stones. The student of landscape can never consult the works of Bewick without improvement. The backgrounds to the figures of his quadrupeds and his birds and his vignettes have a charm of Nature quite his own. He gives us in these every season of the year, and his trees, whether in the clothing of summer or in the nakedness of winter, are the trees of an artist bred in the country. It is equally true in his little home scenes, his farm yards and cottages, as in the wild coast scenery, with the flocks of sea birds wheeling round the rocks. In one of these subjects stands a ruined church, towards which the sea has encroached, the rising tide threatening to submerge a tombstone raised 'to perpetuate the memory,' &c. Bewick resembles Hogarth in this, that his illustrations of the stories of others are not to be compared with his own inventions. His feeling for the beauties of Nature as they were impressed on him directly, and not at second-hand, is akin to the feeling of Burns, and

his own designs remind me, therefore, much more of Burns than the few he made from the poet."*

It will be seen that the preceding sentences were penned by one in all respects able to appreciate Bewick as an artist; our business with him in the pages of the 'Zoologist' is both as artist and naturalist, and confining ourselves to this view of the greatest of wood engravers there is much in this volume that we pass by as foreign to our object. It is quite clear that this autobiography was written for the object avowed, to amuse near and dear relations, not to instruct that larger world to whom the works of the writer of right belong. These are his words, "My dear Jane,—It is in compliance with your wish that I have, after much hesitation and delay, made up my mind to give you some account of my life, as it may at a future day amuse you and your brother and sisters in your passage through the crooked as well as the pleasant paths of the world." Thus most truthfully is the object of the work set forth, and in strict accordance with this intention is it performed throughout; and thus there are introduced faithful portraits of Bewick's neighbours, though unconnected with him in any way, but whose history and conduct attracted his notice. Such was Anthony Liddell, a man who formed his character by the Bible, and yet was a vagabond who preferred jail to liberty, because he was better fed by the country than when he fed himself, and who treated all men as equals. Such was Thomas Forster, whose weakness, or strength as some would call it, was in bees. Such was John Chapman, who lived on bread, potatoes and oatmeal for six weeks at a time, that he might enjoy a regular drinking bout at Newcastle with his savings, which periodical treat he called "lowsening his skin."

It is not for me to object to such scraps of biography or with the object for which they were written, but I cannot help feeling and expressing that—as the heroes in question had not the most remote connection with Thomas Bewick—I should greatly have preferred their absence to their presence in this unpretending narrative. I should have liked it all Bewick, and would gladly have been saved the trouble of picking out the scraps of Bewickian lore from a mass of extraneous information. Nevertheless these scraps are well worth the picking, and begin in very early life. Here is the first, when the little boy is condemned to learn Latin. "As I never knew for what purpose I had to learn it, and was rather wearied out in getting off long tasks, I rather flagged in this department of my education, and the margins of my

* Leslie's 'Hand-book for Young Painters.' I am pleased to adopt without alteration such judicious praise.—*E. N.*

books and every space became filled with various kinds of devices and scenes I had met with, and these were accompanied by wretched rhymes explanatory of them. As soon as I had filled all the blank spaces in my books, I had recourse, at all spare times, to the gravestones and the floor of the church porch with a bit of chalk, to give vent to this propensity of mind, of figuring whatever I had seen. At that time I had never heard of drawing, nor did I know of any other paintings besides the King's Arms in the church, and the signs in Ovingham of the 'Black Bull,' the 'White Horse,' the 'Salmon' and the 'Hounds and Hare.' I always thought I could make a far better hunting scene than the latter; the others were beyond my hand." The schoolmaster caught the little lad at his unprofitable labour and called him a conjuror. Like the youth he had never heard of drawing, and seemed to regard the occupation as something uncanny: his father also found a great deal of fault with him for thus misspending his time. Thomas persevered nevertheless, and filled the flagstones of the floor, and especially the hearthstone, with his designs in chalk; but a friend, whose name is not recorded, saw that this propensity was not so entirely evil as the village pedagogue and the boy's father considered it, and instead of trying to exorcise the demon within him, by thrashing and scolding, actually gave him paper on which to execute his designs. "Pen and ink and the juice of the bramble-berry make a great change. These," says the writer, "were succeeded by a camel's hair pencil and shells of colours, and thus supplied I became completely set up. * * * The beasts and the birds which enlivened the beautiful scenery of the woods and wilds surrounding my native hamlet furnished me with an endless supply of subjects. I now, in the estimation of my rustic neighbours, became an eminent painter, and the walls of their houses were ornamented with an abundance of my rude productions at a very cheap rate. These chiefly consisted of particular hunting scenes, in which the portraits of the hunters, the horses, and of every dog in the park, were, in their opinion as well as my own, faithfully delineated."

Even in the church the drawing propensity found its way. "Having got off the service" he held down his head and repeated it with the rest of the congregation, all the while employing himself in drawing figures upon the soft painted book board with a pin. Flogging seems to have been the normal condition of the boy, but was wholly useless; it neither taught him Latin, cured a vagrant taste for hunting and fishing, woods and wilds, nor eradicated the propensity for drawing; so solitary confinement was tried, a system that was very irksome, as the poor boy

had at that time a firm belief "in ghosts and boggles." He says "My life, both at school and at home, might be considered a life of warfare, and punishments have been inflicted upon me apparently with little effect."

On the 1st of October, 1757, Bewick was bound apprentice to Ralph Beilby, an engraver at Newcastle, and here he first saw practised the art of engraving on wood. His master was a great bungler at his craft, but the apprentice immediately excelled him and obtained reputation accordingly. Some of the wood blocks engraved for the 'Story Teller,' 'Gay's Fables,' &c., were so much approved and admired by his master that he sent impressions of them "to be laid before the Society for the Encouragement of Arts," and these obtained a premium. "This I received shortly after I was out of my apprenticeship," writes Bewick, and it was left to my choice whether I would have it in a gold medal or money, seven guineas: I preferred the latter; and I never in my life felt greater pleasure than in presenting it to my mother."

We have a very pleasant picture some years later of Bewick's weekly visits to his parents at Cherryburn, he being then located at Newcastle. These visits were never omitted, and the only difference caused by altered season or altered weather was the enjoyment with which the young naturalist viewed the ever-varying face of the earth. Here is a description of the advent of spring. "As soon as the days began to lengthen, and the sprouting herbage had covered the ground, I often stopped with delight by the sides of woods to admire the dangling woodbine and roses, and the grasses powdered or spangled with pearly drops of dew; and also, week after week, the continued succession of plants and wild flowers. The primrose, the wild hyacinth, the harebell, the daisy, the cowslip, &c.,—these, altogether, I thought no painter ever could imitate. I had not at that time ever heard the name of the great and good Linnæus, and knew plants only by their common English names. While admiring these beautifully enamelled spots on my way, I was also charmed with the equally beautiful little songsters, which were constantly pouring out their various notes to proclaim the spring. While this exhilarating season glided on by imperceptible degrees, unfolding its blossoms till they faded into summer, and as the days lengthened, my hours of rising became more and more early. I have often thought that not one half of mankind knew anything of the beauty, the serenity and the stillness of the summer mornings in the country, nor have ever witnessed the rising sun's shining forth upon the new day."

These visits to his parents were made with the utmost regularity,

and quite irrespective of such trifling incidents as wind and rain. "I had begun betimes," he writes, "and by degrees, to habituate myself to temperance and exercise, which hardened the constitution to such a pitch that neither wet nor cold had any bad effect on me. On setting out on my weekly pedestrian flight up the Tyne, I never looked out to see whether it was a good day or a bad one; the worst that ever fell from the skies never deterred me from undertaking my journey. On setting out I always waded through the first pool I met with, and had sometimes the river to wade at the far end. I never changed my clothes, however they might be soaked with wet or stiffened by the frost, on my returning home at night, till I went to bed. I had inured myself to this hardship by always sleeping with my windows open, by which a thorough air, as well as snow, blew through my room. In this way I lay down rolled in a blanket, upon a mattrass as hard as I could make it." During the whole course of this kind of life he knew not what it was to have cold or cough or rheumatism, or any of those ailments we generally suppose incidental to a life of exposure.

When out of his apprenticeship Bewick became a partner in his master's business, and we must now turn to the history of his appearance before the public. Of the origin of his 'History of Quadrupeds' he writes thus: — "Having, from the time that I was a school-boy, been displeased with most of the figures in children's books, and particularly with those of the 'Three Hundred Animals,' the figures in which, even at that time, I thought I could depicture much better; and having afterwards very often turned the matter over in my mind, of making improvements in that publication, I at last came to the determination of making the attempt. The extreme interest I had always felt in the hope of administering to the pleasure and amusement of youth, and judging, from the feelings I had experienced myself, that they would be affected in the same way I had been, whetted me up and stimulated me to proceed. In this, my only reward besides was the great pleasure I felt in imitating nature. That I should ever do anything to attract the notice of the world, in the manner that has been done, was the farthest thing in my thoughts; and so far as I was concerned myself at that time, I minded little about any self-interested considerations. These intentions I communicated to my partner; and, though he did not doubt of my being able to succeed, yet, being a cautious and thinking man, he wished to be more satisfied as to the probability of such a publication paying for the labour. On this occasion, being little acquainted with the nature of such under-

takings, we consulted Mr. Solomon Hodgson, bookseller and editor of the 'Newcastle Chronicle,' as to the probability of its success, &c., when he warmly encouraged us to proceed. Such animals as I knew, I drew from memory on the wood; others which I did not know were copied from Dr. Smellie's 'Abridgement of Buffon,' and other naturalists, and also from the animals which were from time to time exhibited in itinerant collections. Of these last I made sketches first from memory, and then corrected and finished the drawings upon the wood from a second examination of the different animals. I began this business of cutting the blocks with the figure of the dromedary, on the 15th November, 1785, the day on which my father died. I then proceeded in copying such figures as above named as I did not hope to see alive. While I was busied in drawing and cutting the figures of animals, and also in designing and engraving the vignettes, Mr. Beilby, being of a bookish or reading turn, proposed, in his evenings at home, to write or compile the descriptions. With this I had little more to do than furnishing him, in many conversations and by written memoranda, with what I knew of animals, and blotting out, in his manuscript, what was not truth. In this way we proceeded till the book was published in 1790. The greater part of these wood-cuts were drawn and engraved at night, after the day's work of the shop was over. In these evenings I frequently had the company of my friend the Rev. Richard Oliphant, who took great pleasure in seeing me work, and who occasionally read to me the sermons he had composed for the next Sunday. I was also often attended, from a similar curiosity, by my friend the Rev. Thomas Hornby, Lecturer at St. John's Church. He would not, like my friend Oliphant, adjourn to a public-house and join in a tankard of ale, but he had it sent for to my work-place. We frequently disagreed in our opinions as to religious matters, he being, as I thought, an intolerant high churchman; but notwithstanding this, he was a warm well-wisher and kind friend, and was besides of so charitable a disposition that his purse was ever open to relieve distress, and he would occasionally commission me to dispose of a guinea anonymously to persons in want."—P. 144.

Such is the account of the first publishing speculation of Thomas Bewick,—a speculation that proved eminently successful: we now come to his greatest and most important work, the 'History of British Birds:;' he had long paid great attention to the subject; had learned to distinguish the species from each other; had closely observed their colour and form; had noticed and absolutely loathed the mon-

strous absurdities which bird-stuffers exhibited as the perfection of their art; and had examined all the published figures of birds, and all the histories of birds, to which he could gain access. Notwithstanding this industrious search into the labours of others, Bewick "determined to copy nothing, but to stick to nature as closely as he could." His engravings being at last finished, it became necessary to supply the letter-press; and on this subject we could have rejoiced to have found more particular information, seeing how much and how bitterly its authorship has been discussed. The first volume of the 'History of British Birds,' as well as the whole of the 'History of Quadrupeds,' were written by Mr. Bewick's partner, Mr. Ralph Beilby, assisted by the greater knowledge of fact possessed by Bewick himself: the record of this is brief, but incontrovertible. "After working many a late hour upon the cuts, the first volume of the book was at length finished at press in September, 1797. Mr. Beilby undertook the writing or compilation of this, the first volume, in which I assisted him a great deal more than I had done with the 'Quadrupeds.' After this Mr. Beilby gave up the engraving business."—P. 162. These works, therefore, produced by the two partners in business, the literary department by Beilby, the illustrations by Bewick, were of course partnership property; they became Bewick's sole property by purchase only. "Some disputes happening respecting the printing of the 'Quadrupeds,' Mr. Beilby, who now sought repose, and could not be turmoiled with disputes of any kind, sold me his share of that publication. Some time before the second volume of the 'Birds' was put to press, he also sold me his share of the first volume." This loss of his partner induced Bewick to attempt what had never before occurred to him,—to furnish the letter-press to his own illustrations. "As soon as Mr. Beilby left me," he writes, "I was obliged, from necessity, not choice, to commence author. As soon as each bird was finished on the wood, I set about describing it from my specimen, and at the same time consulted every authority I could meet with, to know what had been said; and these, together with what I knew from my own knowledge, were then compared: and in this way I finished, as truly as I could, the second volume of the 'History of British Birds.'" That Thomas Bewick was really nothing of an author will be admitted by all those who have studied the works which bear his name: his calling was that of an artist, and in his particular department of art he was altogether without a rival: as a draughtsman and engraver of wood blocks no one has ever equalled him. The texture of plumage has never been

rendered so faithfully ; the scraps of country life have never been depicted so truthfully. Nevertheless, it is a great mistake to quote the supposed writings of Bewick with expressions of admiration, or to bestow unmeasured praise on descriptions of the merits and demerits of which he was equally innocent. To Mr. Beilby credit must be given for any excellencies discoverable in these volumes, and to Mr. Beilby must be assigned any blame for their numerous inaccuracies. The present volume, full of the genuine thoughts of a good and noble-minded man, is an evidence of his inability to write English clearly and forcibly ; the construction of the sentences is clumsy, and the meaning not unfrequently obscure : but regarding the “*Memoir*” in its true light, a legacy to please and amuse his children, it is a most valuable contribution to the biography of a most worthy man.

Three chapters are devoted to wood-engraving and book-illustration generally, and are well worth the most attentive perusal ; they abound in valuable instruction and hints which every engraver ought to study : the process of lowering the surface of the wood for the distances is especially deserving of notice, and should be adopted by every one who desires to attain excellence. It is, however, impossible to give these chapters entire within the limits of this Journal, and to divide or abridge them would render them almost useless.

With regard to the illustrations of this “*Memoir*,” veneration for the name of Bewick requires that the truth must be told ; they are altogether unworthy of him, and the conclusion at which every one competent to form an opinion must arrive is, that they were rejected by the artist himself as failures ; many of them are poor and confused in design, most of them feeble in execution, perhaps the feebleness of age or infirmity. Some of the fishes—alas ! a very few of them—must be excepted from this censure ; for instance, the *John Dory*, p. 297, and the *Lump Sucker*, p. 317 ; but there is every reason to rejoice that the projected ‘*History of British Fishes*’ was never completed, but left for the master mind of a Yarrell, under whose guidance the wood engraver has illustrated a work which, like Bewick’s ‘*Birds*,’ is equally a boon to the naturalist and a credit to the country. Nevertheless, though we may doubt the judgment, we must admire the spirit that has dictated the publication of these relics : it is as the payment of a legacy to a public by whom Bewick was beloved and admired. “*Thomas Bewick gently sighed away his last breath at half-past one on the morning of the 8th November, 1828.*” So concludes the editor of this “*Memoir*.” Let us add,—he was possessed of virtue, honour, integrity, perseverance, courage

and talent, that no ill-usage, temptation, difficulty or danger could ever jeopardise: a less courageous mind would have sunk under the brutality of the ignorant pedagogue who ruled the school in which his boyhood was spent: a less persevering spirit would have shrunk from the difficulties that met him at every step of his self-selected path: a less steadfast mind would have yielded to the constantly-besetting temptations to diverge from the paths of virtue, temperance and frugality. To every young man this Memoir will be instructive; to every young naturalist its teachings are invaluable. It is a photograph that represents a Bewick who is not the conventional Bewick of our imagination,—a wiser perhaps, but certainly a different, man.

E. N.

An Essay upon the Dinotherium. By S. P. SAVILLE, Esq.

It would be difficult to name any other department of Science which has undergone such decided improvement, within the last few years, as the very interesting branch of physical investigation termed Geology. Until then the secondary strata of deposits received no attention; for it was never imagined that they contained the records of various and extensive revolutions in the condition of land and water, as well as in the classes of organised beings with which our globe has been successively peopled; still less was it supposed that evidence could be deduced from the same sources illustrative of the original formation and subsequent disturbances of older rocks. When a comparison is made between what is now and has been, whether with reference to the works of external nature or the history of mankind, the desire of explaining what is obscure in the past supplies an additional motive to examine a multitude of facts, within the reach of our own observation, with more minute accuracy, and to generalize them with more comprehensive views. Geology is continually concerned in such comparisons. By prompting us to investigate more in detail both the animate and inanimate kingdoms of nature, it has enlarged these departments of study, and revealed a multitude of new phenomena connected with them: it has even done more than this; it has elevated their rank and dignity, by teaching us the laws of the aggregation and distribution of simple minerals, and by requiring more comprehensive systems for the arrangement of the animal and vegetable productions of the earth. This latter branch of Science has engaged the energies of many powerful minds, from the days of Linneus to our own times.

M. Cuvier, in his Preface to the 'Règne Animal,' justly remarks that "the habit necessarily derived from the study of Natural History, of classing in the mind a great number of ideas, is one of the advantages derived from this science, the least talked of, but which may rank perhaps as the principal, when it shall have been generally introduced into ordinary education. In addition to these advantages derived from the study of Natural History, Geology has the merit of exerting continually the reasoning faculties, in deducing conclusions from numerous data and complicated phenomena, and, although it cannot appeal to demonstrative proof, may often conduct us to moral certainty. It is constantly concerned in weighing a great mass of probable evidence, and is therefore powerfully instrumental in exercising the mind and strengthening the judgment.

In regard to organic fossil remains, we have hitherto been acquainted with very few mammiferous quadrupeds as natives of the British Islands, or as having inhabited them within twenty-three generations. We have now discovered that this part of the earth was once peopled by many other animals of the same class, although we have not yet penetrated beyond the first boundaries of this new region of discovery.

It is admitted by all naturalists that the animals of our own acquaintance are not mere varieties of fossil species gradually changed by climate and other local circumstances; and further, that the probability is extremely remote of discovering even a small proportion of the supposed extinct quadrupeds, in a living state, in regions hitherto unexplored. Surprising as the above facts may appear, there are others, relating to the same department of the animal kingdom, which attest far greater changes in the form of the land and the ancient character of its inhabitants. At a yet earlier epoch that part of the globe where the continent of Europe now extends was peopled with a race of terrestrial quadrupeds' of an entirely different description,—a race of which most of the genera, and all the species known to us as fossil remains, have been since annihilated. Their skeletons are found entombed in strata evidently deposited in the entrances of rivers and at the bottom of fresh-water lakes, in a manner closely analogous to strata at present in the course of formation in our own lakes and rivers. In the same formation are found the bones of birds and crocodiles, fresh-water tortoises and fish; nor are shells wanting. The whole of these are either of extinct genera or of unknown species. The plants on which these large herbivorous animals were supported differed as widely as them-

selves from all known species. Palms, reeds, and many other kinds are met with in these strata, indicating upon the whole a vegetation not exactly of tropical climates, as does the flora of our secondary formations, but rather such as now clothes the countries bordering on the Mediterranean. But what is most important as regards these quadrupeds is the circumstance that in the environs of Paris and in those of Orleans, and in a district not far from the Rhine, near Strasburg, the strata enclosing them are again covered with marine deposits.

After a careful examination of the contents of these, there admits no doubt that the sea returned and covered the land on which these animals had lived, and where the rivers and lakes were situated, in the beds of which their remains had been buried. To such an event the most celebrated geologists of the day have, with great probability, attributed the annihilation of the quadrupeds then inhabiting the ancient continents.

Deluges and earthquakes have operated, at different intervals of time, to destroy the productions of Nature and Art, which modern industry has clearly developed; but geologists have extended their exertions, and have shown how much of the history of extinct races may yet be rescued from oblivion. The Dinotherium, together with the Megatherium, constitute perhaps the most remarkable of all fossil Mammalia in regard to size, and unexampled peculiarities of anatomical construction, with which modern discovery is acquainted. The Dinotherium is the largest of all land creatures belonging to that class of animals which suckle their young, whilst the Megatherium presents greater deviations from ordinary animal forms than occur in any other species, either of recent or fossil quadrupeds.

The second or miocene system of tertiary deposits contains an abundance of the extinct genera of lacustrine (inhabiting lakes) Mammalia, with the earliest forms of genera, which exist at the present time. These admixtures have been found in great abundance at Epplesheim, near Alzey, about twelve leagues south of Mayence; and splendid specimens are preserved in the museum of Darmstadt. Among all these remains of animals, which it is unnecessary here to particularize, further than that they embrace numerous important specimens, no vestiges of the monkey tribe have been discovered, until lately, in the department of Gers, in France, a single jaw-bone of one of these animals was found among other skeletons of extinct quadrupeds.

No traces of man or his works have hitherto been discovered in any of these strata which can distinctly claim a remote antiquity

corresponding to that of the extinct species of quadrupeds. But, however, supposing that man was contemporary with the animals of the older strata, there are several causes which would account for the absence of all trace of him. In his early condition his numbers must have been infinitely small compared to the rest of the animal creation, and therefore the chance of the discovery of his remains is as one to many thousands. Man was, further, long confined to a certain limited spot on the earth's surface, while the animal creation, it is presumed, was universally diffused; so that the extensive forests and wild savannahs swarmed with live existences, although no human eye and intelligence were there to behold their habits and motions.

The regions most minutely examined by geologists—such as England, France, Germany, &c.—were evidently long under the ocean, and many of the animals discovered in this deposit indicate a lacustrine or swampy condition of the regions they inhabit; one of the most remarkable and extraordinary, the *Dinotherium giganteum* (gigantic tapir), it is now our object to describe.

The excellent publications of Professor Kaup, of Hesse Darmstadt, having given it as the opinion of that learned author that the fossil animal holds an intermediate space between the tapir and the mastodon, whilst the eminent Cuvier—from the molar teeth it possesses nearly resembling those of the tapir—seems inclined to refer it to a gigantic species of that genus. The talented geologist, Mr. Bakewell, possesses in his museum a remarkable specimen, exhibiting the crown of the teeth of this animal. It was found with other mammalian remains near Grenoble, and from the hardness and brilliance of the enamel it appears as fresh as if recent. He considers it the most perfect fossil tooth he has ever seen. The form of these molar teeth approaches most nearly to those of tapirs; but there is a marked difference from the character of those animals as well as of every other quadruped, whether living or extinct; it consists in the presence of two enormous tusks placed at the anterior extremity of the lower jaw, and curved downwards similar to the tusks in the upper jaw of the walrus.

The largest species of this genus is estimated, both by Cuvier and Kaup, to have attained the extraordinary length of eighteen feet. The most wonderful bone that has yet been discovered is the shoulder-blade, the form of which more nearly resembles that of a mole than any other animal, and seems to indicate a peculiar adaptation of the fore leg for the purposes of digging—an idea which receives strength on viewing the remarkable structure of the lower jaw: the length of this jaw, including the tusk, has been estimated at nearly four feet: it

belongs to the tribe of the Pachydermata, or thick-skinned animals, and its frequent haunts were marshy grounds or the estuaries of rivers; but its most important peculiarity is in the position of the tusks, which remarkably tends to illustrate the habits of the animal. From the near approximation to the living tapir, we may infer that it was furnished with a proboscis, by means of which it conveyed to its mouth the food it raked from the bottoms of lakes and rivers by its tusks and claws. The bifid unguis bone (the two-railed) discovered with the other remains of the *Dinotherium*, having this remarkable bifurcation, which is found in no living quadrupeds except the pangolins, seems to have possessed a claw like that of these animals, possessing peculiar advantages for the purposes of digging and scraping, and indicating functions concurrent with those of the tusks and scapula.

In reference to this position of the tusks, constituting the great peculiarity of the animal, Dr. Buckland has happily alluded, in closing his account of it. We cite the learned Professor's own language:—"It is mechanically impossible that a lower jaw nearly four feet long, loaded with such heavy tusks at its extremity, could have been otherwise than cumbrous and inconvenient to a quadruped living on dry land. No such disadvantage would have attended this structure in a large animal destined to live in water; and the aquatic habits of tapirs, to which the *Dinotherium* was most nearly allied, render it probable that, like them, it was an inhabitant of fresh-water lakes and rivers. To an animal of such habits the weight of the tusks sustained in water would have been no source of inconvenience, and if we suppose them to have been employed as instruments for raking and grubbing up the roots of large aquatic vegetables from the bottom, they would under such service combine the mechanical powers of the pickaxe with those of the horse-harrow of modern husbandry. The weight of the head, placed above those downward tusks, would add to their efficiency for the service here supposed, as the power of the harrow is increased by being loaded with weights. The tusks of the *Dinotherium* may also have been applied with mechanical advantage to hook on the head of the animal to the banks, with the nostrils sustained above the water, so as to breathe securely during sleep, whilst the body remained floating at perfect ease beneath the surface; the animal might thus repose, moored to the margin of the lake or river, without the slightest muscular exertion, the weight of the head and body tending to fix and keep the tusks fast anchored in the substance of the bank, as the weight of the body of a sleeping bird keeps the claws firmly round the perch. These tusks might have been further

used, like those in the upper jaw of the walrus, to assist in dragging the body out of the water, and also as formidable instruments of defence. The structure of the scapula, already noticed, seems to show that the fore leg was adapted to co-operate with the tusks and teeth in digging and separating large vegetables from the bottom. The great length attributed to the body would have been no way inconvenient to an animal living in the water, but attended with mechanical disadvantages to so weighty a quadruped upon land. In all these characters of gigantic herbivorous aquatic quadrupeds we recognise adaptation to the lacustrine condition of the earth during that portion of the tertiary periods to which the existence of these seemingly anomalous creatures appear to have been limited."

It would hence appear that successive races of distinct plants and animals have inhabited the earth—a phenomenon perhaps not more unaccountable than one with which we are familiar, that successive generations of living species perish, some after a brief existence of a few hours, others after a protracted life of many centuries. None of these fossil plants or animals appear referable to species now in being, with the exception of a few imbedded in the most recent strata, yet they all belong to genera, families or orders, established for the classification of living organic productions; they even supply links in the chain, without which our knowledge of the existing systems would be comparatively imperfect. It is therefore clear to demonstration that all, at whatever distance of time created, are parts of one concentrated plan. They have all proceeded from the same author, and bear indelibly impressed upon them the marks of having been designed by one mind. There is a gradation of animated beings, from those of the most complicated organization,—from the invertebrated to the vertebrated; and, ascending in the scale, from the lowest of the vertebrated class to the most perfect, we find at length in the *Mammalia* all the most striking characters of osteological structure, and all the leading physiology of the human frame fully displayed. When we have ascertained that animals of that class in which the type of our physical organization is so unequivocally developed, existed at distant, though not the most remote, periods in the history of this planet, and that a scheme, of which man forms an inseparable part, is of such high antiquity, the remarks of Bishop Butler on the connexion of the course of things which came within our view, with the past, the present and the future, are forcibly recalled to our recollection. "We are placed," he observes, "in the middle of a scheme,—not a fixed, but a progressive one,—every way incomprehensible, in a manner

equally with respect to what has been, what now is, and what shall be hereafter.

Dover House, Cambridge,
July 14, 1862.

S. P. SAVILLE.

Note on the Breeding of the Honey Buzzard in the New Forest.—I took a nest of two eggs of this rare bird on the 21st of June, 1859, and the female bird was shot as she rose from the nest. The nest was placed in a fork of an oak tree, not more than twenty-five or thirty feet from the ground. I was informed by the gamekeeper that, two or three years before, the nest was a crow's, but on his shooting the rightful owner a pair of buzzards took to the nest, and had repaired it from year to year since. At the time I took the eggs the bottom part appeared very old, but had been repaired and lined with fresh green leaves of oak and beech. The old bird, on leaving the nest, went off very much in the style of a heron, and with the same heavy flapping sort of flight. On the hen bird being shot, the male, who was flying over the trees in the immediate neighbourhood, rose to a great height in the air, and kept hovering and flying round in circles, uttering a loud note similar to the common buzzard, but somewhat hoarser. I obtained another pair of eggs in the same month and year. Last year I obtained another pair, and this year I have five eggs, three from one nest, and two from the other. The three eggs were taken at intervals of three days between each; the first, a large and fine coloured, though rather pale egg, was taken on the 7th of June; the next, a smaller and darker egg, on the 10th; and the third, a very small and peculiarly coloured egg, on the 13th. The nest of two eggs were taken on the 17th of June, and are very dark and similar in shape to those of the peregrine; and since my return home Mr. J. R. Wise has obtained two pairs of eggs, which he has sent me, together with an egg of the merlin, to blow for him.—*W. Farren; Cambridge.*

Note on the Breeding of the Merlin in the New Forest.—In 1859 I obtained a nest of three eggs, which I supposed to be the merlin's. From their size and colour, and from their being taken on the top of a low pollard holly, Mr. F. Bond, to whom I showed them, agreed with me in believing them to be the eggs of the merlin. In 1861 I obtained three or four nests of the same kind of eggs, and from similar situations, but could get no proof till the present year, when, on the 19th of May, I got a nest of three eggs, and shot the old male bird as he rose from the nest; thus not only obtaining proof of the breeding of the merlin in the New Forest, but also that the male bird takes his turn in sitting on the eggs. The eggs are very similar to some small varieties of the kestrel's, but are not so highly coloured and are nearly round: the nest was placed in a hole in a dead yew tree, and was composed of dead sticks with some sprigs of heath. All the nests I have met with were placed on low isolated trees, such as pollard hollies and hawthorns, and never in the thick-wooded part. I may mention that from but one nest have I obtained more than three eggs, and in that instance four eggs. This, I believe, is the first authentic instance of the merlin breeding in the New Forest. That the merlin should build in holes of trees has excited some surprise, as I believe it nests only on the ground in the North.—*W. Farren.*

Note on the Breeding of the Dartford Warbler in the New Forest.—I had a nest of four eggs of this bird brought to me, which were taken at the bottom of a furze bush, on the 29th of April, on Lyndhurst Heath. The eggs are similar to those of the whitethroat, but are easily distinguishable by the general appearance: the ground colour is a light gray, neatly covered with bluish and stone-coloured specks. The egg is, moreover, smaller than those of the whitethroat. The nest is very compact, and is composed of moss, fragments of heath and furze, with a few bents, lined with a little horse-hair and very fine grass; the outside of the nest is bound round with a very broad flag-like grass, which gives it somewhat the appearance, externally, of the nest of Savi's warbler. The Dartford warbler was much more plentiful in the New Forest in 1858 and 1859 than in 1861 and this year; in fact, I did not see half-a-dozen birds this year where there were dozens in the two first-named years. I believe the diminution of numbers is owing to the wet and cold summer of 1860 and the severe winter of 1860-61. I was unable to blow more than two of the above-named eggs, as they were very hard-set.—*W. Farren.*

Dates of Arrival and Nesting of Birds.—In the 'Zoologist' for June (Zool. 8026) is given the dates of arrival of the swallow, &c., in the South; the following are a few memoranda I have made down here:—

March 1. Saw first wheatear; also a tawny bunting, nearly all white; it was very tame.

April 8. Heard chiffchaff.

April 10. Saw last woodcock, and got the eggs of common wood owl.

April 13. Found the nest of missel thrush with eggs, also that of the longeared owl; the young well feathered and almost able to fly.

April 18. Found the nests of peewit and common snipe, both with four eggs; also saw a flock of fieldfares, thirty-three in number,—the latest I have seen them here was in 1855, on the 29th of April.

April 20. Saw first wood wren.

April 22. Saw first house martins.

April 26. Saw first chimney swallow, whinchat and cuckoo, and heard landrail.

April 27. Found yellow bunting's nest with three eggs.

May 4. Found curlew with four eggs, also longeared owl with two eggs, and wheatear with six.

May 17. Found a red grouse with six eggs, also a brood of young ones, running strong; same day, found a curlew with four eggs; the old bird sat on the nest till a friend and I walked within two yards of it: I never heard of a curlew sitting so close before.

May 28. Found a teal with nine eggs.

Landrails have been very plentiful this season: an old bird was killed on its nest, and two eggs broken with a scythe, on the 2nd of July. I received the remaining eight eggs, which were far from hatching. In 1854 and 1858 I saw house swallows and martins earlier than usual,—*viz.* on the 14th of April.—*Thomas Thompson; Winton.*

The Nest of the Nighthingale.—Living in a neighbourhood abounding in these birds, I have had considerable opportunities of observing their habits. This year I have known nine of their nests, last year six: they were placed in all sorts of situations; in the bottoms of hedges, among nettles, the remains of last year's brambles, on and at the sides of ivied stumps, amongst grass and dead leaves in a wood, dense

tangles of bramble, and, in one instance *only*, at more than a foot from the ground, in a wild rose. Besides its being a very unusual thing to find the nest high up in a hedge (where thorns are most numerous), the bottom is, as a rule, nearly an inch thick, and very closely packed with dead leaves, bass and the dried stems of leguminous plants, through all which it would require a very long thorn to reach. I am afraid Shakspeare is not much of an authority in Ornithology; take, for example, the following lines on the cuckoo, where the fool in King Lear says:—

“The hedgesparrow fed the cuckoo so long,
That it had its head bit off by its young.”

There is a similar allusion in the play of Henry IV. As also it is the cock bird that sings and the hen that sits, the various lines quoted by your correspondent can be no argument for the thorn *in the nest itself*. I see the birds singing almost daily throughout May, and it is a very exceptional thing, even when there may be very tall overgrown hedges, to find them there; they will choose in preference a hazel, birch or other low-spreading bush or young tree. I once found a nest every egg in which was different, beginning with very dark blue with black spots, and going through slighter and slighter varieties till the one last laid was of the usual olive-brown colour.—*John W. Ford; Enfield Old Park, July 21, 1862.*

The Nightingale at Manchester.—“The readers of the ‘Zoologist’ have most likely read the account of an extraordinary appearance of nightingales near Manchester: this, if true, is very uncommon,” says your talented correspondent H. W. Newman (Zool. 8090). I should say so too; but I question its truth. In 1852 there was a nightingale heard in the Vale of Crumpsall, near Manchester, and great numbers of persons went to hear it. The little songster sang without intermission during the summer nights, and its song could be heard in any part of the Harpurhey Cemetery, and upon the hill sides both on the Harpurhey and Crumpsall side of the river Esk. I and a Manchester naturalist were at some trouble to ascertain what the songster was, and several times followed the sound to the edge of a large reservoir, belonging to a paper-mill, and amongst the reeds and flags which grew in it the songster, without a doubt, was singing, and we both were convinced that the bird was a reed warbler (*Salicaria arundinacea*). The inhabitants of a village near Hull once were possessed of a nightingale, and many people went to hear it; but, in this case, a naturalist from Hull succeeded in finding the nest of a reed warbler, and the bird having lost its nest, and being disturbed by the rude assemblies, forsook the place. I have no doubt but the Manchester nightingales are either reed warblers or sedge warblers, both of which will sing through the long summer nights. The reed warbler is a very fine songster, and the stillness of the summer nights renders its song doubly sweet. The sedge warbler is very common on some parts of the Ouse, and in this neighbourhood, amongst the willows that skirt the banks of the many brooks and rivulets.—*John Ranson; York.*

[I very much incline to concur in this opinion, having been often astonished at the great mistakes made as to the song of the nightingale.—*E. Newman.*]

Singular Variety of the Chaffinch's Eggs.—A correspondent (Zool. 8391) describes a variety of the chaffinch's egg, and wishes to know if such a variety is of common occurrence. For his information I beg to state that on the 29th of April, 1861, I took a nest of the chaffinch containing three eggs, which exactly agree with the description he gives, being pale blue without spots; the blue, however, not so bright as in the

redstart's egg, to which he compares his own specimens, but about the same tint as those of the wheatear. The nest, placed in a thorn bush, was much the same as usual, except that, instead of the usual dark-coloured horse-hair for lining, in this case it was white, and there was perhaps rather more white wool used in the nest than is generally seen. This induces me to ask whether the colour of the substance on which the eggs are deposited can in any way affect the colour of the eggs? On the 12th of May this year I had two more eggs of the chaffinch brought to me, exactly the same as regards the ground colour, but differing in having a few minute specks at the larger end: and I recollect taking a nest in Somersetshire, about four years ago, which contained very light-coloured eggs without spots. In addition to these instances of the variety, my friend and neighbour, Mr. Bond, has some eggs of the same description in his collection, so that I think your correspondent, Mr. Danford, must not think them of "rare occurrence."—*J. E. Harting; Kingsbury, Middlesex, July 23, 1862.*

Nesting of the Tree Creeper.—I found a nest of this bird in a wood hen-house on the 13th of June: it was about five feet from the ground, placed between the corner post and the boards, the nest very much compressed, but containing four young birds. I saw the parent birds feed them six times within five minutes; they flew to the bottom of the house, then crept up to an aperture in the boards to feed their young, and made their exit at another aperture.—*Thomas Brunton; Methven Castle, Perth, N.B.; June 30, 1862.*

Occurrence of the Hoopoe at Keynsham.—A fine specimen of a male hoopoe was shot, a few weeks ago, by Mr. Harford Syne, of the Mauor House, in this parish. It was seen feeding on a heap of mixed manure near his residence. As it appears to be a rare bird in this part of the country I thought it might be worthy of notice in the 'Zoologist.'—*John Rutter; Keynsham, July 17, 1862.*

Migration of Swallows, &c.—First swallow (*Hirundo rustica*) observed on the 4th of April: I saw two or three more a few days later. I noticed a yellow wood wren in my garden on the 30th of March, and a redstart (*Sylvia phœnicurus*) and a wheatear on the 20th of April; however, the latter, I find, had been seen on the sea-cliffs about a week earlier. On the 8th of April brown linnets were still flying in flocks.—*Henry Hadfield; Ventnor, Isle of Wight, April 23, 1862.*

Notes about Magpies.—During the last two years I have kept several magpies, a rook, a Royston crow, a jackdaw, a raven, and a pair of the common gull, running about my garden, which is walled all round. Their wings have of course been kept cut. The magpies, originally three,—called Faith, Hope and Charity,—were increased to seven by the addition of Scrub, Snob, Snap and Snip. Of these, however, three have come to untimely ends; so that my present number is only four. Perhaps one or two notes about the habits of this family may be interesting. Faith, the first which came, was in many respects a very interesting bird. She was quite tame, and would whistle, bark and talk to perfection. In order to excite these performances perfect quietude and solitude were necessary: if any one was in sight the talking ceased. Early in the morning, perched in a holly tree near our bed-room window, many strange conversations were carried on; these were generally imitations of words she had frequently heard used, but were spoken with perfect distinctness. The whistle was varied in its tone and rhythm almost *ad libitum*, and very curious notes were sometimes heard. The bark is a loud, sudden expletive, generally expressive of anger, and, being something similar to the bark of a dog, we always called it barking. I have said that Faith was very tame. To those whom she knew she was very

accessible, permitting herself to be stroked on the head, which pleased her vastly, and generally elicited a low muttering vote of thanks. She would jump on to my knee or shoulder when sitting in the garden, but was easily alarmed, and, once having been caught when so doing, for the purpose of having her wing cut, it was a long time before she came again. The presence of strangers excited her greatest curiosity. After barking for some time she would gradually try to get on better terms, and was at once subdued by the jingling of a bunch of keys or the exhibition of anything shining. The presence of children, however, excited her utmost indignation, and, having enlisted Hope (the next bird to be described) into her service, she would fly at their feet, and if naked get hold of the skin, exciting the utmost terror among very young "bairns." It was this singular propensity which made the gentleman who formerly owned her transfer her to my care. Faith remained in my possession a year and a half. To my horror and vexation she was one day found dead on the garden wall, with a hole in her body, entering behind and passing right through the heart. No bullet was discovered, but I have no doubt she fell a victim to the cruel brutality of those who think it a great feat of skill to shoot down even tame and innocent birds. Hope, also now numbered with the dead, was a remarkable bird. He had evidently been brought up in the neighbourhood of or in company with the common peewit plover, whose whistle he imitated exactly, and which performance gave him in my household the *soubriquet* of Whistler. Among his other qualities Hope had a remarkable propensity to wander out of the garden. Although his wing was cut, he would make extraordinary jumps from shrubs, or get on the top of the wall by the fruit trees. When there he chose to wander about the next garden, also walled in, and commit all sorts of depredations among newly-planted things, exciting the ire and wrath of my neighbour's gardener. There is a Scotch fir tree at the corner of one of the walks, in which Mr. Hope would quietly ensconce himself, knowing full well that his wandering would soon be looked to. At the bottom of this tree was a stack of faggots, among which, when pursued, he would creep, and thus avoid capture for the time. When missed from the garden, a search was of course immediately instituted, and Mr. Hope's whereabouts was generally announced by a long whistle of defiance, from the thick part of the fir tree, the moment he saw the well-known gauze net which was usually the means of catching him. Nothing could be more provoking. Pursuit was useless so long as his means of retreat were not cut off. If, however, my servant could get round unobserved, so as to get between the tree and the faggots, capture was certain. Whistler knew this as well as we did, and generally kept a sharp, close watch, announcing, wherever we were, his discovery of the enemy by his defiant whistle. When his retreat, however, was intercepted, he knew resistance was useless, and generally hopped down on to the stubble and thence into the garden. Hope was (alas! I speak in the past tense) a very amusing bird. He had the same dislike to children as Faith, and joined with her, as before stated, in determined raids against them whenever they appeared. Mr. Hope had his likes and dislikes. The latter he always evinced most unmistakably against the footman, who caught him in his wanderings. The former were equally shown, in the opposite direction, by the affection he evinced towards the housemaid. He would almost scream with delight when she went into the garden, and would strut about, with his crest and tail erect, in a most ludicrous manner. He would permit any amount of liberty to be taken with him in this direction. He would let her stroke his head or take him up in her arms without a struggle, and if he heard her voice in the room above sure enough he would be found

on the top of a lilac tree which commands one of the rooms, looking out for recognition. Poor Hope! he is also gone, and his death was doubly grievous, inasmuch as it was the dark deed of a young puppy which, on the point of being entirely broken in to magpies, committed the deed. Brownie was of course well flogged every day, with the dead bird before his eyes, for a week; and I will be bound to say he will never again, to the day of his death, injure another feather. Scrub is the next of my pets that deserves notice, inasmuch as I am inditing obituaries, and this is the last I have to record. Scrub came to me in a vile condition of feather and flesh, from neglect and confinement. He was turned out among the rest, and very soon picked up meat and plumage. As he grew in strength and stature, so did he increase in power over the others. He was the bully of the family, and very soon evinced his power by lording it over them all. He was withal a shy, cunning fellow, and had always an eye to his own interest. His vocal powers, however, consisted principally in imitating to perfection the cackling of a hen: so earnestly would he do this that I have listened to him with doubting ears myself; I never heard any imitation so perfect. He was deficient, however, in social qualities, and never became very tame. His death was in this wise:—A patient and kind officer in the Highlands of Scotland was good enough to send me a pinioned peregrine falcon which he had brought down when shooting grouse. I kept him at first in an out-house, which I suppose was damp, for one morning, to my horror, I discovered the poor falcon unable to stand, and paralysed in both legs. I brought him into the garden and placed him in the sun, going immediately in search of a coop. I returned just in time to save his life, for I found Scrub mounted on his back, and hammering away at his head with his beak. The poor peregrine was quite helpless, and would have been brained in no time had I not returned. Of course I expressed my indignation, and Snob was glad enough to escape with a whole skin to the top of a *lignum vite* tree, where he remained barking and scolding while I secured the falcon under the coop. Exposed to the sun and air, and well supplied with bird-food, the falcon gradually recovered; but to my surprise I found that Snob had upon more than one occasion got through the bars of the coop to steal the remains of peregrine's dinner. It did not, however, again venture to attack the latter, and the day of retribution for its own temerity was at hand. The falcon got quite well and strong upon its legs, a fact Scrub did not fully estimate, for one day, hearing a great chatter in that part of the garden, I went down just in time to see the end of a meal which peregrine was then making, the subject being the unhappy and unfortunate Scrub.—*C. R. Bree; Colchester, August 10, 1862.*

Deposition of Eggs by the Cuckoo. By H. L. SAXBY, Esq.

THE observations made by Mr. Hogan (Zool. 7935) upon this highly interesting question, together with the passage quoted by him in support of his views, are so conclusive that, but for his invitation to other ornithologists, further remark might be considered almost unnecessary. However, as I have devoted much time, during the past fifteen years, to the study of the habits of the cuckoo, and have upon the whole been somewhat fortunate in the opportunities of

observing it which have fallen to my lot, it may not be considered out of place for me here to record some of the results of my experience; and first I will relate two incidents which appear to bear strongly upon the contested point.

One morning early in June, 1855, as I was "birdsnesting" at Tan-y-Bwlch, in North Wales, I was accosted by a lad belonging to a neighbouring village, who greatly excited my curiosity by the announcement that he had just shot a hawk carrying a lark's egg in its throat, and thereupon he produced—not a hawk, but a fine specimen of a female cuckoo. He stated that the egg had dropped from the throat of the bird as he laid it upon the ground, after having carried it for some distance; and at my request he led me to a spot beside a footpath, where, after a slight search, we found a broken cuckoo's egg, and where, in still further corroboration of his story, I noticed the disturbed appearance of the grass upon which he had been resting. Now, although it must be confessed that the lad was by no means celebrated for his adherence to the truth when a falsehood would better serve his purpose, yet it would be unreasonable to suppose that in the present instance the main facts were incorrectly stated; however, as a still further test, I concealed my knowledge of the species of the bird, and then, after having conversed for some time upon other subjects, carelessly inquired what a cuckoo was like, and whether he had ever shot one. His reply convinced me that, however accurate his knowledge of game birds might be, he was utterly unaware of the fact that he was at that moment carrying a cuckoo in his hand. As nearly as could be ascertained, the bird was killed at about eleven o'clock in the morning. In the stomach were a few caterpillars and small beetles, and the ovary contained several eggs in various stages of advancement towards maturity, but none were perfect.

The second instance referred to took place in the summer of 1860, near Falkirk. I was walking beside a thick hedge about five o'clock in the afternoon, when a female cuckoo flew out of some brambles and tangled weeds at the bottom, but immediately fell to the walking-stick gun of a friend of mine who accompanied me, but who, I am desired to observe, was at the moment ignorant of the species to which the poor bird belonged. We hastened up, and within an inch of the bird's bill we found its egg, uninjured and perfectly fresh. I at once expressed my joy at having at length detected a cuckoo in the very act of carrying its egg in its bill; but here my friend very reasonably observed, that although the evidence was strongly in

favour of this supposition, yet it should be borne in mind that the bird had remained tumbling about upon the ground for some seconds after it fell, and therefore that the egg might possibly have been laid during the struggle. After having searched the hedge without finding a nest of any description, we held a *post mortem* upon the body of our unfortunate victim, which resulted in the discovery of a *perfect egg* in the oviduct; but to this remarkable circumstance I shall presently have occasion to revert.

One striking peculiarity in the history of the cuckoo appears to have met with but little attention, *viz.*, that it differs from other birds as to the *time* at which it deposits its egg in the nest: of course I do not refer to birds in a state of domestication. Careful observation of twenty different species of our insessorial birds has enabled me to ascertain the fact that, as a general rule, they lay their eggs between the hours of seven and twelve P.M., whereas those of the cuckoo are usually, perhaps invariably, placed in the nest during the daytime. Now, although it is perfectly justifiable to suppose that the cuckoo, like other birds, possesses the power of retaining an egg for a considerable time after it is ready for exclusion, and therefore that, instead of laying at night, it postpones the process until a suitable repository is found, yet that period must have its limit. And here it may well be asked, What is the consequence when no such opportunity occurs, and Nature will no longer permit the delay? Any other bird thus circumstanced would lay in its unfinished nest; but it would be difficult to imagine that the cuckoo, which is so pre-eminently subject to the inconvenience in question, should be the only bird whose requirements in this respect are unprovided for; therefore it is far from unreasonable to infer that some special provision is made to meet the emergency. The numerous observations which have from time to time appeared in the pages of the 'Zoologist' and elsewhere, go very far to substantiate the theory that when the cuckoo can no longer retain its egg the latter is laid in some convenient place, and there remains until the parent removes it, having at length found a nest for its reception; and that this is not merely a conjectural view of the case the following will, I think, pretty clearly prove.

Several years ago, about four o'clock one afternoon in June, my brother Gordon came in haste to inform me that he had just driven from a meadow pipit's nest a cuckoo, which had turned out an egg and two newly-hatched young birds, one egg only remaining undisturbed; but upon accompanying him to the spot, I was not a little

astonished to find a cuckoo's egg also in the nest. As my brother could not have been absent more than two or three minutes at the very outside, we of course immediately remarked the rapidity with which the process of laying had taken place; but our suspicions as to the mode in which the egg had been conveyed gave way to certainty upon the discovery being made that *it was nearly cold*, while that of the pipit was still quite warm. Now, even supposing that the cuckoo returned to the nest immediately after my brother left, is it at all probable that a newly-laid egg could have fallen to such a low temperature in so short a time, and if so, how was it that the pipit's egg did not also cool? I was at first rather inclined to give attention to the fact that the latter contained a living bird, and in order to satisfy myself upon the subject I that very evening procured a newly-laid hen's egg, and one that was within a few days of hatching, and placed them side by side in the open air: the result convinced me that the difference between the temperature of the pipit's egg and that of the cuckoo could not be thus accounted for.

Repeated inquiry among my friends, and also among many scores of birdsnesting boys, have furnished me with several instances of a somewhat similar nature, the tendency of them all being to prove that in most cases a remarkably short interval elapses between the arrival of the cuckoo at the nest and the deposition of the egg. Upon an average this interval may be roughly said to range between half a minute and three minutes; and any one who would assert that during so short a space of time the egg is "laid," in the ordinary acceptance of the term, would be compelled to admit, though obviously upon very unsubstantial grounds, that the cuckoo is endowed with a power of which other birds are destitute; for we must remember that even a barn-door hen, no matter how anxious she may be to lay, is seldom in the nest for less than ten minutes or a quarter of an hour before the egg is produced. I once thought to solve the difficulty by comparing the relative sizes of the eggs and of the parent birds, but herein I failed; for in the cuckoo, although the egg is remarkably small, the reproductive organs are proportionately contracted in their dimensions. Even were the contrary the case, it would be an ingenious cuckoo indeed that could lay a cold egg.

With regard to the instance previously mentioned, in which a female cuckoo, on being shot, dropped an egg upon the ground, another one equally well developed being at the same time within the oviduct, the truth appears self-evident. The egg which fell upon the ground must have been laid some hours previously, and the undigested

state of the food in the stomach afforded ample proof that the bird had recently been feeding, of course without so serious an impediment to deglutition as an egg would have been; it therefore only remains to be decided where the egg was in the meantime. Cases of this kind are usually met by the argument that the bird was not the parent of the egg, but that the latter was in the act of being devoured. Truly it would require a most accommodating imagination on the part of any naturalist who would attribute to this interesting species such a marvellous power of oological discrimination, for how can it be even for one instant supposed that the bird is in the habit of seeking out nests for the purpose of abstracting such eggs as have been laid by its own species? If such really were the case, the habit must belong to the female alone, for I believe I am correct in stating that no instance has yet been recorded of a male cuckoo carrying an egg. Even if all this be admitted, one grave question still remains, *viz.*, by what means does the bird invariably select *fresh* eggs?

It is to be regretted that the shy habits of the cuckoo render the task of becoming acquainted with its history one of such extreme difficulty, and it is only to my good fortune in having resided in neighbourhoods where cuckoos abounded, and perhaps also in no small degree to mere accident, that I attribute my success, comparatively trifling though it has been. Still, I trust that the few facts which I have advanced speak sufficiently for themselves, and that other and more competent observers will ere long be enabled to remove all further doubt upon this much-vexed question.

HENRY L. SAXBY.

H.M.S. 'Devonshire,' Sheerness,
August 1, 1862.

Occurrence of the Norfolk Plover in Cambridgeshire, with a few Remarks upon its Habits.—This species, which, to my knowledge, has never before occurred in any numbers, has this year been very plentiful, as many as two or three dozen eggs having been exposed for sale at one fishmonger's shop in Cambridge, and I have also seen a good number of old birds. A man brought me a nearly full-grown young bird, and had another, which got accidentally killed. I kept my bird alive, and apparently in the enjoyment of good health, for several days, and I think I dare venture to say it would have been easily tamed, or, in other words, quite reconciled to roam about in a moderate-sized enclosure, had it not unfortunately partaken of something in the way of salt meat. It devoured worms, slugs, caterpillars and blowflies; it had a peculiar dexterity in detaching a snail from its outer covering, a shake of its plumage after this feat evidently portraying its satisfaction at its success. To watch its movements, which were of the most active and sprightly kind, afforded me the greatest pleasure:

it was constantly on the move, now and again stopping to pick up a worm or a slug which had incautiously placed itself in its way. Its movements were graceful and quick; it used to run with the neck comparatively short, its eyes ever actively on the alert for some dainty morsel: as the shades of evening drew near, it appeared to move more actively than during the day, if possible searching with renewed vigour: while standing the legs and thighs were very forward; in feeding it only slightly inclined the body forward, and, lowering the neck in a curve, it would make a determined dart at its food; while at rest (which appeared to be only during the hottest part of the day) it squatted flat upon the ground, with head and neck brought close to the shoulders; in running it took long and rapid strides; in walking the feet were carried rather wide, not as in the *Tringa* family, which while walking or running place one foot over the other; the tail, which it kept constantly on the move, was carried rather high; the knees were very swollen (naturally so): it must have been the young of this bird that first led naturalists to apply the appellation of "thick-kneed" plover, as adult birds of this species never present a puffy appearance in their knee-joints.—*S. P. Saville; Dover House, Cambridge, July 13, 1862.*

Snipes' Nests in Oxfordshire.—Several nests of the snipe have been mown out in Mr. Richard Lord's common near Stanton Harcourt, Oxfordshire, and the head of one old bird cut off with the scythe: this is an unusual occurrence, as the snipe was never known to breed in that locality before. I have some of the eggs, sent me by Mr. G. Arnatt, of Stanton Harcourt, a friend of Mr. Lord's.—*W. Hollis; 8, Canonbury Cottages, Lower Road, Islington.*

Unusual Situation of a Sandpiper's Nest.—Some weeks ago, as I was walking by the side of a rough stone wall, about half-a-dozen yards from a small pool of fresh water, a common sandpiper flew out close to my feet; and on stooping down I was surprised to find its nest, containing four eggs, placed upon the ground, and so far back in a crevice that my hand, when inserted up to the wrist, was only just able to reach the eggs. The hollow in which the nest was situated was about an inch and a half deep in the centre, and had probably been excavated by the bird, as the soil was very loose and dry. The lining of the nest consisted of fine dry grass and about thirty white feathers; beneath was a somewhat thick bed of moss and half-dried pond-weed, a considerable mass of which filled up a crevice behind. I have found many nests of the common sandpiper, but never knew one to contain so large a quantity of material, or to be so neatly and compactly made. The very unusual addition of feathers was readily accounted for when I observed the quantity of them lying at the margin of the pool, which was much resorted to by geese. It may be just possible that, the nest having been disturbed by these birds upon former occasions, the poor sandpipers, in the unconscious fulfilment of a well-known adage, "went to the wall" forthwith. It has no doubt been frequently remarked that the common sandpiper, when unmolested, will return to the same spot, year after year, for the purpose of incubation. I remember an old gardener in North Wales showing me a hollow at the foot of a thick bush of yellow broom, and assuring me that a pair of these birds had for many years been in the habit of bringing out their young there; in the following spring I had the satisfaction of seeing the pair return to that very spot, and of watching them from the time they collected the first few dry broom-pods, as the commencement of their nest, until long after the young birds accompanied their parents to the river-side.—*Henry L. Saxby; H.M.S. 'Devonshire,' Sheerness, July 31, 1862.*

Natural History Notes from Norway. — These notes have been kindly forwarded to me by my esteemed friend Mr. Charles Doughty, of Hiberton Hall; Suffolk, who has just returned from Norway. He has been on a tour of geological research, and has devoted some portion of his time in penning these interesting notes. He commences thus:—"The cuckoo I heard in full call at midnight was at Tromsøe, 2° north of the Arctic Circle; it sang at intervals throughout the night. The night hour in these regions, at this season, is merely an arbitrary division of time, as the sun shines throughout the twenty-four hours, diffusing a sensible warmth at midnight at an elevation of rather more than 4° above the horizon. I spent the night upon the Sound shooting, and most beautiful it was, surrounded by snow-peaks, the full globe of the sun shining above them, and the water so clear that I could plainly see shells and other marine productions thirty or forty feet below the surface. Everything was perfectly still, except the occasional notes of the solitary cuckoo from a stunted wood above the town. It was here I shot most of my eiders and the rednecked diver: they are quieter at night, when the sun has less power, and can consequently be more easily approached. The Norwegians call the red and blacknecked divers 'looms.' I saw several altogether, but they are singularly wild and shy, being seldom shot on that account. They fly very high up in the air when going from place to place, making a loud cackling noise not unlike a duck: they rise from the water very awkwardly, running and splashing for at least fifty yards before they are fairly on the wing; then, however, they fly with amazing rapidity. They are very tough birds, and unless struck on the head or wing are seldom brought down. The skua gull I shot at Bodo, a little north of the Arctic Circle. There is a vast morass behind the town, and about six of these birds were coursing and screaming over it; they were very shy, and after many attempts I gave up all hopes of getting within range of any of them. At last I quite lost my way, the town being hidden behind hills, and when wandering hopelessly about I suddenly looked up and saw two sailing over my head. I immediately brought down one of the birds, but the other was too quick for me, and was out of range in a moment. The one I shot was only wounded, and bit at me fiercely as I went to pick it up. By holding it up, when dead, at arm's length, I managed to entice its mate and two or three others nearly within shot: they made great circles round me, uttering, if I remember right, loud cries. Its gizzard was nearly empty; it contained a few minute fish-bones and a small quantity of decomposed or digested matter. Of the eiders which I shot the gizzards of most were comparatively empty, containing the merest traces of shelly matter; whilst the others contained broken fragments of shell-fish in considerable abundance. One I shot apparently in the act of swallowing, as no less than three small mussels were in its throat: its gizzard was swollen to a prodigious size and perfectly hard; on opening it I found an immense mass of shells, for the most part broken up, but many nearly and others quite entire, with the animal still unchanged in them: the shells were almost entirely mussels, with a few like periwinkles; the mussels are of a very small species. In the throat of another I found a crab, about an inch and a half long and one in width; it is not the common British species, but allied to the 'spider crab.' The thing that struck me so much in this was the sagacity of the bird in biting off all the legs before swallowing it! The razorbill I shot a few miles from N. Cape. They congregate about Stappen Island in thousands: when the sound of my gun disturbed them they rose up in ten thousands, screaming and shrieking at a great height above my head, but occasionally darting past almost within arm's reach. I fired about twelve times, and, though each time I

could distinctly see the effects of the shot in staggering and knocking them a little out of their course, I only brought down two. My friend then took the gun, and, though an old sportsman, killed none: it must be a wonderfully tough bird. The parrot-beak bird was there in almost the same abundance, associating and swimming about with the razorbill, but they were much more shy. The wild animals of Norway are the lynx, the glutton, wolf, foxes (red, silver and black), the bear, the elk, rein-deer and red deer, ermine, lemming, otter, beaver (?), &c. The lynx is somewhat rare, and inhabits, I believe, the extreme North. The glutton is not often seen. The wolf is commoner, and much sought for on account of its valuable fur, which is sold to the Russian traders. The following way of capturing them is somewhat amusing:— In the winter they sometimes tie a young pig to the back of their sledge, and then set off across the snow at full gallop; the pig begins to squeal, and the wolves rush out and are easily shot down. But the most tempting bait for these animals is a dog: for dog's flesh they have an irresistible desire, and have been known to snatch a dog from between the knees of travellers when driving in their carriages. Silver and black foxes are rare, and their skins very valuable; the latter is, I believe, chiefly found in the Leyfodens. The Norwegian bear is a small animal; he never hugs, but kills his enemy by ripping him up with one stroke of his paw: the most vital part is a few inches behind the fore shoulder; some sportsmen, however, aim at the neck, to break the vertebræ I suppose. The elk is rare, and found in a rather limited area. The red deer is also uncommon; it inhabits the islands of the west coast. The rein-deer, though shy and difficult of approach, abounds in the mountains in the south part of Norway; in the north they are tame. Ermines are comparatively abundant in the Leyfodens. Lemmings only appear at definite intervals, and then in the most prodigious abundance, swarming in every field. Otters are rare and expensive. Beavers it is thought are extinct, except in one part of Norway, where a gentleman has carefully preserved them on his property. Ptarmigans are prodigiously abundant in some parts; blackcock and capercally are moderately so." I sincerely hope that the insertion of these notes will stimulate tourists to make the valuable acquisition of a notebook to their kit, and communicate their researches to the 'Zoologist.' Funds of interesting and hitherto-undiscovered facts relative to the habits, retreats, &c., of objects of Natural History, would thus be permanently recorded, and present to the future tourist a chart not to be despised. — *S. P. Saville; Dover House, Cambridge, August 14, 1862.*

Unnoticed Character in Succinea Pfeifferi. — Will you allow me to add a postscript to my query about *Succinea Pfeifferi* (Zool. 8138)? After dissecting and examining many specimens under a microscope, I have found that what I must, for want of a better name, call the "upper jaw" (though it seems to be jaw and palate combined), is, in *S. putris*, divided into three teeth, one large projection in the centre and two small ones, one on each side; whereas in *S. Pfeifferi* there is only one tooth-like projection in the centre of the jaw. I have found this to be invariable in very many specimens of both kinds that I have examined this summer; and the fact goes far to convince me that *S. putris* and *S. Pfeifferi* are more distantly connected than some conchologists seem to think. I send you a drawing of each, which will show you my meaning more clearly than words can. They are two out of many I have done under a *camera lucida*. — *Bruce Hutton; Aldershot, August 7, 1862.*

Occurrence of Cyclas pallida in Lancashire.—For the information of conchologists I am happy to record the occurrence of *Cyclas pallida* (of Dr. Gray) in Lancashire. In September, 1861, I unexpectedly turned it up in the Leeds and Liverpool Canal, while dredging for *Pisidium amnicum*, but as yet have been able to get them only very sparingly. The shell is easily recognized, and widely distinct from any of its congeners, and is truly a beautiful addition to the British Cycladidæ.—*R. Wigglesworth; Maudsley Street, Accrington, August 11, 1862.*

A new British Mygale.—I beg to record the discovery of a *Mygale* new to the British Fauna. The *Atypus Sulzeri*, recorded by Leach, has hitherto been the only representative of the *Mygalidæ* in the British Fauna; and the new species is the *Dysdera erythrina* of Latreille. I took it on the 19th of July last, from a steep sunny clay-bank ill-famed for adders, near Brighton. It is a male, and is still alive and active. I took it in a lump of crumbling clay containing the tube and an egg-bag, the mouth of which is stopped with the carapace of a spider of the same species. The falces act horizontally; the eyes are six, placed on a tubercle and arranged horse-shoe fashion, with the opening in front. This *Mygale* climbs up the side of the bottle when he pleases, and rests for hours, back downwards, on the linen rag covering the mouth of it; and *Dysdera erythrina* is evidently a *Mygale* built for crawling and struggling through the cracks and crevices of loose and dry clay-banks, and for seizing and killing his prey with fangs acting horizontally.—*John Robertson.*

Capture of Charocampa Nerii at Hastings.—A very fine female of this rare *Sphinx* was taken at rest by a labouring man in this town on Saturday, the 2nd instant. It measures 4 inches 4 lines, and is now in my possession.—*Robert Kent; St. Leonard's-at-Sea, Sussex, August 8, 1862.*

Capture of Sesia Scoliaformis.—Referring to my advertisement which appeared on the wrapper of the 'Zoologist' for this month, I now add that, besides the specimens there named, I took five more of this species in July, in the pupa state, one of which emerged at 8 o'clock A.M. on the 13th, and the last on the 20th, at 6 o'clock P.M.; another was also taken by my son on the 14th, making eight in all. The only one I saw in the act of stretching on the tree was at 10 o'clock A.M. The larva feeds in the trunks of rough-barked birch trees, and before making up eats its way through the thick bark to the surface, and then spins a tough cocoon. I did not find a trace of one in any smooth-barked tree.—*Nicholas Cooke; Spring View, Liscard, Cheshire, August 7, 1862.*

Larva of Orgyia fascelina.—With regard to your paper describing the larva of *Orgyia fascelina* (Zool. 8078), I fear your informant must have paid but little attention to its habits. Instead of the insect laying her eggs on the dwarf willow in August, she deposits them about the end of June or beginning of July; and instead of the young larva hibernating amongst the roots of the plant (which, if they did, would be fatal to their existence), they may be found snugly made up in the forks and branches of the willow, in a thin silken web, with from eight to a dozen dried leaves of the same drawn together around them. I have found in several of these little

snuggeries, during the winter months, as many as three and four larvæ huddled together. I have never succeeded in saving them through the winter, the cause of which I presume is their removal from their native salt air; nor do they do well unless taken when nearly full-grown. I have sent larvæ to gentlemen in most parts of the country, and have afterwards been informed that they did not thrive. I have paid much attention to this larva, having bred it for the last five years.—*Thomas Galliers*; 9, *Brenton Street, Liverpool, July 18, 1862.*

[Another and far more important error on my part appears to have escaped my correspondent's notice: the eggs are not deposited on the *leaves* but on the *stems* of the willow, and in a very singular manner, which I shall have to describe when printing my collected observations. The laying of the eggs on the leaves was a deviation from normal habit, and probably the result of confinement.—*Edward Newman.*]

Description of the Larva of Ennomos erosaria.—The eggs were laid on the 29th of August, and hatched about the 12th of May. The young larva is almost smooth, but begins to assume the lumps I have to describe after the second ecdysis. The posture in which it rests is varied; I have not unfrequently observed it attached to the twigs of the beech, both by its legs and claspers, the middle of the body being then elevated in an almost semicircular arch; again, not unfrequently it will release the hold of its legs, and adhere only by the claspers; if touched, breathed on or annoyed when in this position, it invariably oscillates the fore part of its body; but no annoyance that I have tried induces this larva to fall off its food-plant or feign death. The head is nearly of the same width as the anterior part of the body, semiporrected, and wider at the mouth than on the crown. The body is narrower anteriorly than posteriorly, and bears a number of wart-like protuberances—one on each side of the 3rd segment; one on each side of the 6th segment, and an elevated ridge on the back between them; a double or compound lump on each side of the 7th segment, extending to the ventral surface of the segment; a large transverse lump on the back of the 9th segment; on the back of the 10th segment are two small warts; on the back of the 12th segment is a transversely-placed lump, and on this lump are two conspicuous warts, also placed transversely; on the 13th segment, below the anal flap, are two parallel approximate points directed backwards: in addition to these lumps, there are a great number of small warts on different parts of the back, and every wart emits a short black bristle. Head pale brown, a crescent-shaped white mark on each lobe of the crown, and a continuous white line across the face just above the mouth; colour of the body dingy brown, in some specimens very pale, approaching to putty-colour; the lumps are darker, and the ventral surface is paler, in some specimens greenish white. There are many shades and variations of colour in different specimens, but they do not appear to me sufficiently constant to demand notice. This larva has a great propensity to spin, constantly drawing the leaves of its food-plant together, as if about to undergo its transformation. Feeds on *Fagus sylvestris* (beech), and is full fed the beginning of July, when it ascends to the top of the cage, and spins a few threads among the leaves, like strong spiders' webs; among these it changes to a pupa: the pupæ are of a pale brown-colour, mottled and reticulated with still paler, and exhibiting darker lines at the junction of the segments and at the margins of the antennæ and wing-cases: they appear remarkably active, and wriggled out of their insecure dwellings on being touched. The moths appeared from the 24th to the 28th of July. I am indebted to Mr. Wright for the opportunity of describing this species, and can only notice its habits and food in confinement.—*Edward Newman.*

Description of the Larva of Eupithecia viminata.—Rather short, but tapering very considerably towards the head. Ground colour bright green, very translucent. Central, dorsal and subdorsal lines dark green, but varying considerably in breadth and intensity of colour. Segmental divisions yellow. Belly generally destitute of markings, but occasionally traversed longitudinally by two slender faint subventral lines, rather darker than the ground colour. Spiracular line whitish green. When young the ground colour is greenish white. Feeds on flowers and seeds of *Valeriana officinalis*, in woods, osier-beds, &c. Full fed from the middle of July to the middle of August. Pupa yellowish olive, enclosed in a slight earthen cocoon. Perfect insect appears in May and June. In July, 1861, I found a number of larvæ feeding upon valerian in one of our Buckinghamshire woods, which I took to be *E. plumbeolata*. The greater part of them were ichneumonated; but in May I bred a small set of *E. viminata*, *Doubl.* I have this summer again met with the larva in an osier-bed in Herefordshire, and in woods in Dorsetshire and Bucks; and my friends Messrs. Hellins and Greene have taken it in Derbyshire and Devonshire. Mr. Doubleday is of opinion—and I have no doubt whatever that he is correct—that this species is *E. valerianata* of Hübner. His figure of the larva of this latter species agrees with those I have taken. The name “*viminata*” must therefore, I suppose, sink, and be replaced by the older and more appropriate title of “*valerianata*.”—*H. Harpur Crewe; The Rectory, Drayton-Beauchamp, Tring, August 12, 1862.*

Description of the Larva of Eupithecia indigata.—Long, slender, and tapering considerably towards the head. Ground colour pale greenish yellow or yellowish red. Central dorsal line dusky reddish brown or olive, frequently very indistinct or wholly evanescent, except on the capital segments. Subdorsal lines pale yellow. Segmental divisions reddish. Head reddish. Collar reddish brown. Spiracular line pale yellow. Belly greenish yellow. Central ventral line yellow. Subventral line reddish brown. The eggs from which the larvæ above detailed were reared were laid by females obligingly sent me by Mr. Greening, of Warrington. They fed upon wild juniper and cypress, and were full fed from the middle to the end of July. I regret to say that just as they were ready to spin up I was obliged to leave home, and the journey killed them all. I was, however, able to take descriptions, and to secure an accurate drawing from the pencil of Mr. Buckler.—*Id.*

Description of the Larva of Petasia nubeculosa.—The egg is laid about the middle of April, either on the slender twigs or young leaves of the birch, and is hatched on or about the 1st of May. The larva rests in the form of a horse-shoe, the head thrown back until it nearly touches the elevation on the 12th segment; when in this position it often adheres by three pairs of claspers, only the 1st and 5th pairs being raised: it does not fall off its food, feign death, or roll itself in a ring when touched or disturbed. The head is of slightly less diameter than the body, and is susceptible of being partially withdrawn into the 2nd segment: the body is of uniform diameter throughout, the 12th segment being elevated on the back into an obtuse angle; the divisions of the segments are marked by conspicuous incisions. Head shining, glaucous or blue: body delicate apple-green, with a narrow, transverse, oblique, yellow stripe on each side of the 4th segment; on the back of each segment from the 5th to the 10th, both inclusive, is a whitish cloud, and on each side of each segment is a faint indication of a similar whitish cloud; on the summit of the elevation on the 12th segment is a narrow transverse line, bright yellow at both extremities, but paler in the middle; on each side of each segment are ten raised dots; the two that most nearly approach the

median line of the back are yellow, and each emits a single black bristle; then follows a longitudinal series of three white dots, and then a single yellow dot emitting a black bristle, and below this yellow dot is a spiracle, oblong, white, and black-margined; anterior to the spiracle and in a line therewith are two white dots, and posterior to these one yellow dot emitting a black bristle and one white dot; behind the last spiracle, and extending along the edge of the anal flap, is a bent white line, in which are two conspicuous yellow dots, larger than either of those previously mentioned: the legs are rather long, green tinged with red-brown; the claspers apple-green, with a shield-shaped mark in black outline on each. Feeds on *Betula alba* (birch), and is full fed rather before the middle of June, when it measures rather more than two inches in length; it then goes into the earth, concealing itself just beneath the surface: the perfect insect appears at the end of March or the beginning of April, and, as far as the British Isles are concerned, has hitherto been found only in Scotland. I am indebted to Mr. Greening, of Warrington, for the opportunity of describing the larva of this species: in confinement it rarely attains the perfect state, most commonly dying as soon as full fed.—*Edward Newman.*

Capture of Heliothis peltigera. — Perhaps it may be interesting to your readers to hear that I have captured, during the last three weeks, three beautiful specimens of *Heliothis peltigera*. Mr. Terry has also captured others in first-rate condition. Among my other best captures this year I may mention—one *Deilephila Livornica*, several *Agrotis lunigera*, and about a dozen *Dianthecia coupersa*. I have also taken two beautiful *Heliothis marginata*.—*R. M. Steward.*

Life-Histories of Sawflies. Translated from the Dutch of M. SNELLEN VAN VOLLENHOVEN, by J. W. MAY, Esq.

(Continued from p. 8083.)

NEMATUS SEPTENTRIONALIS, *Linn.* *Linn. Faun. Suec.* ed. 2, No. 1558. *Fabr. Syst. Piez.* p. 42, No. 63. *Panzer, Fauna Germ.* 64, f. 11. *Schæffer, Icon.* tab. 167, f. 5, 6. *DeGeer, Mém.* ii. 2, p. 262 (*Goetze*), tab. 37, fig. 24—28. *Ratzeburg, Forstins.* iii. p. 118, tab. 3, fig. 3. *Lepeletier, Monogr.* p. 63, No. 184. *Curtis, British Ent.* i. pl. 17.

Nematus niger, ore pedibusque anticis partim luteo-rufis, abdominis fascia lata rufa, tarsorum posticorum articulo primo latissimo compressoque.

After the careful researches of Ratzeburg, there remains but little new or unknown to record concerning this insect; but as this author does not mention the points in which the young larvæ differ from the full-grown, we hope our descriptions and figure will not be looked upon as wholly uncalled for.

The imagos are found in May and June (fig. 6 represents a female,

magnified). As Ratzeburg justly remarks, Dr. Hartig, in his *Aderfl. Deutschl.* i. p. 184 and following pages, has not described the true *N. septentrionalis*, *Linn.*, as according to him, the female has red femora. The imago is from 9 to 10 mm. long, expanding to from 12 to 13 mm. In the female the head and antennæ, together with the breast and base and apex of the abdomen, are black; the mouth is brownish and the cenchri white. Coxæ black, but the ends of those of the third pair and the apophyses are obscure white; femora black, those of the first pair inclining to brown; the tibiæ and tarsi of the first and second pairs reddish brown, the tibiæ with white rings at the base; the femora of the posterior pair are black, the tibiæ white, the end, which is black, being flattened and expanded, spines red, tarsi black, the first joint being also broad and expanded. The second and succeeding segments of the abdomen up to the sixth are red; the first has usually a narrow, red, transverse line on the anterior margin. The wings are transparent, with a brown stigma; costal nervures brown, with a smoke-coloured band extending downwards from the stigma, and faintly continued to the apical margin. The posterior wings are also clouded between the anterior and apical margins (fig. 6).

The male is distinguished by a more elongated form of abdomen; the mouth is obscure brown, as are also the tegulæ and the antennæ (the latter sometimes only on the under side, or for half their length). In this sex the legs are almost entirely reddish brown, as only the coxæ for four-fifths of their length, the trochanters and apophyses of the anterior and intermediate pairs of legs, as also the ends of the femora, the apices of the tibiæ, and the tarsi of the posterior pair of legs are black.

These insects saw an opening in the veins of the leaves of the alder, and deposit as many as 150 eggs in rows. According to Ratzeburg the larvæ are also found on the birch, the broad-leaved willow, the wild cherry, the hazel, and the balsam-poplar; like DeGeer, I have only found them in this country on the alder, sometimes in such numbers that the whole tree was stripped of its leaves; thus in 1841 solitary alders growing between Bodegraven and Sluipwijk, and rows of the same tree thickly planted along the banks of the canal near the Hague, were completely stripped of their leaves.

At the time of quitting the egg the larva is white, with a brown head, but by the following day has acquired a green colour. They begin by eating out holes in the middle of the leaves. After the second moult they are obscure green or pale brown, both extremities being somewhat yellow, with two black stripes on either side; the

posterior extremity is somewhat attenuated, the head shining black (fig. 1).

When fully grown the larva is about 14 mm. long (see fig. 2); it has 20 legs, colour greenish or bluish green, the first and last segments, together with the abdominal claspers, inclining to orange; head shining, deep black; the under lip and maxillary palpi obscure gray and black-ringed. The head is provided with some extremely minute hairs. The first segment is orange-yellow, with a very small black spot on each side; the second is yellowish gray, the third to the eleventh greenish gray, the twelfth and thirteenth yellow. There is an irregular black spot on each side above the scarcely visible white spiracles; below the spiracles one larger and two smaller vertical black shining spots; below these, again, at the origin of the legs, a single black shining spot. On the first segment below the spiracle are some irregular black lines or spots; on the third and fourth, just above the legs, are a square spot and some little lines. On the last segment, above the anus, is a triangular black spot, branching out on either side into a sharp point, as represented, magnified, at fig. 4. The thoracic legs are shining gray, with a brown point on the last joint, and brown claws. The middle and hinder legs are deep yellow. On the under side, between each pair of these legs, is a triangular black spot, and before it, in the direction of the head, a small line. There is a large gland behind the first spot on the fifth, sixth, seventh, eighth and ninth segments, represented at fig. 3, *a* and *b*; on the fourth and tenth is a very small gland. These glands seem to be covered with little wart-like protuberances, in the same manner as the first toes of the fore feet of the male frog in the pairing season; they are drawn back into themselves like the finger of a glove or the horns of a snail. I have not been able to perceive any opening at the end, not even when I had expanded the gland to its utmost by compression. As in this operation the skin falls into transverse wrinkles, one may readily, at first sight, imagine that a transverse opening exists.

After the second moult the larvæ consume the leaf, beginning at the edge and usually leaving nothing but the larger veins. At the slightest touch, either from others or from their companions, they raise the abdomen, and bend it over sometimes as far as the head, thereby causing the opening of the abdominal ducts. These probably emit a fluid which is hurtful or obnoxious to the enemies of the larva, particularly the parasitic ichneumons. When the time for pupizing has arrived, usually four weeks after the larva has quitted the egg, it

lets itself fall to the ground, and, after having crawled about for some time, spins itself an oval cocoon, covered on the outside with little grains of earth, being black and smooth on the inside. The larva generally remains one year in the cocoon before changing to the pupa; some individuals, however, assume the pupa state within eight months, and emerge in May. From this we should be led to suppose there are two generations in the year; however, I have never found the larva earlier than August, and find no record of larvæ in May and June. The pupa is represented at fig. 5. The imago gnaws its way out by an oblique irregular opening in the cocoon.

The National Museum of Natural History has two specimens of the female, from my collection, both of which have only three submarginal cells in the right fore wing, the second submarginal being united to the third, in consequence of the absence of the middle transverse nervure. *Nematus latipes*, described as a distinct species by Foulques de Villaret in the 'Annales de la Société Entomologique de France,' is only a variety of this species. Probably his *Nematus varus* and *N. laticrus* are also only varieties of *N. septentrionalis*. We must, however, not omit to mention that Ratzeburg considers *Nematus varus* to be distinct, for the two following reasons:— first, there is a difference between the imagos, not only in colour but also in structure; for example, in the form of the hinder tibiæ, which are not so suddenly nor so much expanded towards the end: and secondly, there is a great difference in the colour of the larva, which appears to want the orange tinge, and seems to be entirely green, with black spots on the sides. He also includes the sawfly described by DeGeer; but in this he is certainly in error, for DeGeer distinctly states that his larvæ had the first and last segments of the body yellow, inclining to orange. So far as we know there seems to be no reason why we should not regard the four species as one.*

I have not reared any parasitic wasps from the larvæ of this species. Ratzeburg, in his 'Ichneumonien der Forst-Insecten,' records no less than nine species of Ichneumonidæ and Braconidæ, which were reared in Germany from *Nematus septentrionalis*.

* Since the above was published in the original, the following has been received from the author:—

"I have lately discovered that Ratzeburg was quite right in his assertion that *Nematus varus* is a distinct species. I have reared this latter insect from the larva, which is in fact entirely green, with black spots."

Capture of Toxocampa Craccæ in Devonshire. — I took four specimens of *Toxocampa Craccæ* in the perfect state, on the north coast of Devon, July 24—28, 1861. This spring I wrote to a friend of mine, whose family are fond of Natural History, to get them to search for the larva on *Vicia sylvatica*, which grows abundantly in the locality. I received in due time a box with a broken lid, containing only food, the three larvæ which had been put in having found their way out. Afterwards I received another box containing two larvæ, one lively and nearly full-grown, the other smaller and quite dead, and one pupa. The following is an accurate description of the larva, taken from my journal: — “Date when received, June 7th. Food-plant, *Vicia sylvatica*. Legs 16, half-looper, long, rather attenuated towards extremities. Dorsal band broad, dark olive, intersected by a thin dorsal line, and containing on each segment four indistinct blackish spots, two on each side of the line. The lateral spaces, from the dorsal band to below the spiracles, are yellowish olive, containing, first, a very narrow dark line from head to tail; secondly, a cloudy broader line or band enclosing the spiracles (blackish rings indistinct), and two small black spots on each segment, placed obliquely on each side the spiracles, the upper one towards the head. The whole of the under side is dark olive, as dark as the dorsal band, darkest next to the lighter lateral spaces, streaked with lighter olive and intersected by a dark ventral line. Head pale olive, with the darker lines of the body going through it.” My larva fed on *Vicia sylvatica* as long as the supply sent with it lasted; when this failed, and I was expecting every day to see it change to a pupa, I tried it with every kind of leguminous plant that I could obtain from a neighbouring nursery, but in vain; and as I could not procure its proper food in time, it died. My Devonshire friend had before tried them on *Vicia Cracca*, but they would not touch it. My only hope now was in the pupa which I received in the same box with the larva, and which was alive when it arrived. As it was not in a cocoon, I thought it best to put it on earth in a pot and cover it with moss. The result I have already stated; but from my having taken the imago in fine condition on July 24th, and received a pupa on June 7th, it appears that the pupa state lasts about six weeks. There is no doubt in my mind of the larva being that of *T. Craccæ*; it is not that of *T. pastinum*, as it is a half-looper, and as it was taken feeding where the imago was taken the year before. I will here give an extract from my friend's daughter's letter who found the larvæ, partly because it throws light on the habits of the insect, and partly because it proves that the pupa sent me was that of the same kind of larva: — “I am very glad you think it the right caterpillar, and I shall be very glad to give you any information I can about it. The first boxful I sent you were very small, smaller than the little one (the dead one) you had last time: they were exactly the same colour as the larger, only perhaps a little lighter. I found them all on the stalk of the plant, and generally crawling up it. I have seen two or three since, besides the ones I sent you; but they are very difficult to get. The moment you touch them they wriggle up and fall off, and unless you have something underneath to catch them in they are lost in the grass. The chrysalis turned after I picked up the caterpillar. One morning when I looked at it, it seemed stupid and sleepy, and I thought it was going to change its skin. Next time I looked it was a chrysalis: it had no cocoon. I found all of them close to where we used to catch the moth, never higher up nor lower down, though the plant was more plentiful then.” I could have got more larvæ I have no doubt; but I told my friend not to take any more, for fear of destroying the species. Mr. Stainton exhibited a specimen of the perfect insect at a meeting of the London

Entomological Society (Zool. 7981), but I here add a description of it, for the benefit of those who were not at the meeting, as well as a description of the pupa:—

Imago. Expanse of wings rather greater than in *T. pastinum*. Body much stouter. Ground colour the same. Collar jet-black. Transverse streaks nearly or quite absent. Reniform stigma a regular crescent, brown, edged towards the base with black; whereas in *T. pastinum* it comes to an angle, and the brown filling up is wanting. Four brown-black spots on the costa, preceding the brown triangular cloud, the one close to the base the smallest. The veins of the upper wings are all whitish, while in *T. pastinum* they are not distinguished from the ground colour.

Pupa. Entirely dark brown, inclining to black; wing-cases not produced to a point. Anal segment terminated by a bunch of short spines, with fine recurved points.—*E. Horton; Lower Wick, Worcester, August 23, 1862.*

Larvæ of the Glowworm.—Last spring I took three larvæ of the glowworm (*Lampyrus noctiluca*) in the Isle of Wight. In course of time they turned to pupæ, and I could not help noticing how prominent the distinction of sex was in this stage. One was evidently destined to produce a male, and the rudiments of the wings were very visible; the other two were larger, and without the smallest trace of wings: these, as was expected, turned out females. All three pupæ were luminous, the light being similar in character to that of the perfect male, namely, two small round spots of greenish light on the under side of the abdomen near the extremity: the light was only shown when the pupæ were disturbed. When the perfect insects appeared, a pair were placed in a phial with damp moss. Union lasted more than four hours, but less than eight; and the next day the female commenced laying eggs, and in two or three days they amounted to about 120. They seemed fragile and of a yellowish colour, not much unlike the seeds in the pulp of a grocer's fig. When magnified about a hundred diameters the surface was seen to be obscurely and minutely granulated. On taking the phial into a dark room the eggs were found to be distinctly luminous, the minute globes of light pointing out the position of each individual egg among the moss. The light of the eggs was of course persistent, not requiring the stimulus of irritation. One that happened to get crushed smeared its luminous matter on the finger. On the eighth day after the laying commenced both seemed to be dead, but the male revived on being disturbed, and made some efforts to crawl, showing the usual two points of light when touched. The female could not be made to show any sign of life, but the body was quite flaccid, and when examined in the dark the penultimate segment was plainly luminous, and the antepenultimate very obscurely so; not the slightest movement could be detected with a lens, though disturbed. After another day or so the whole abdomen was faintly luminous from end to end, the divisions of the segments being visible in the dark. The body was then limp from incipient decomposition; so perhaps the light might be analogous to the gleam of a decaying lobster. These observations satisfied me that the glowworm is luminous in all the stages of both sexes—egg, larva, pupa and imago. The separated female, like the male, lived but a short time longer.—*George Guyon.*

Cicada hematodes.—In 1859 I took a specimen of the above (now in the collection of Prof. Babington) in the New Forest; it was sitting on the stem of the common brake (*Pteris aquilina*), and on my endeavouring to catch it it flew off with a loud buzzing noise. On the 29th of last month (June) I took two more; both were sitting on the stems of the brake, and flew off in the same manner as the one referred to, only to become victims of the net and pin. At the same time I heard two more,—

“ Drunk with the dewdrop, perched on twig so lofty,
 Noisy Cicada, o'er the wild waste sounding,
 Sawlike the feet which to thy side thou presseth,
 Drawing sweet music,”—

but did not succeed in getting either of them. On several succeeding days I heard some singing, but they were still

“ Perched on lofty branches,
 Deep in the forest,” &c.

—*W. Farren.*

Proceedings of Societies.

ENTOMOLOGICAL SOCIETY.

August 4, 1862.—FREDERICK SMITH, Esq., President, in the chair.

On the motion of the Rev. Hamlet Clark, seconded by Prof. Westwood, it was unanimously resolved, “ That the thanks of the Society be tendered to W. Wilson Saunders, Esq., for his constant liberality towards the Society, and in particular for the hospitality exhibited by him on the occasion of the Society's visit to Reigate on the 8th ult.”

Donations.

The following donations were announced, and thanks ordered to be given to the respective donors: — ‘ Proceedings of the Royal Society,’ Vol. xii. No. 50; presented by the Society. ‘ The Zoologist’ for August; by the Editor. ‘ The Intellectual Observer’ for August; by the Publishers, Messrs. Groombridge & Sons. ‘ Saggio di Ditterologia Messicana di Luigi Bellardi, Professore di Storia Naturale,’ Parte II., ed Appendice; by the Author. ‘ Journal of the Society of Arts’ for July; by the Society. ‘ The London Review’ for July; by the Editor. ‘ The Athenæum’ for July; by the Editor. ‘ On the opportunities of advancing Science enjoyed by the Mercantile Marine,’ by Cuthbert Collingwood, M.B., F.L.S., &c.; by the Author. ‘ Stettiner Entomologische Zeitung,’ 1862, Nos. 4—6; by the Entomological Society of Stettin.

Exhibitions, &c.

Mr. Stevens exhibited a magnificent collection of Coleoptera, made by the late M. Moubot among the mountains of Lao, in the interior of Cochin-China; it included some splendid Buprestidæ, about 150 species of Longicorns, &c., and a very large number of novelties. He regretted to have to state that M. Moubot's exertions in the cause of Science had brought on a fever which resulted in his death.

Mr. Stainton exhibited specimens of *Gracilaria semifascia*, bred from maple-leaves obtained near Mickleham, on which the larvæ raised small, blunt, conical excrescences. Mr. Stainton having remarked upon the tendency of this insect to produce verdigris on the pin, the President suggested the use of a pin dipped into varnish, and allowed to dry before it was used.

Mr. Wallace exhibited photographic figures of Coleoptera: plates of *Lucani*, of the natural size, were conspicuously successful; other insects of smaller size, but magnified twice in linear dimensions, were not so successful. Mr. Wallace called

attention to the mode of mounting these smaller species on pieces of gelatine instead of cardboard: this rendered the use of gum unnecessary, since all that was requisite to fix the insect was to moisten the under side; moreover, the gelatine was so transparent that the under side of the insect was available for examination.

The President exhibited two rare Staphylinidæ, — *Myrmedonia Haworthii* and *Heliobates propinqua*, — both captured by his son, Mr. Edward Smith, on Reigate Common, on the occasion of the Society's excursion on the 8th ultimo.

The President also exhibited an imperfect hermaphrodite of *Apis mellifica*, which had been sent from Scotland, and read the following description thereof:—

“Size and general appearance of the insect that of a worker. Head male; the eyes large, and meeting on the vertex; both the antennæ female, 12-jointed. Mandibles worker, not toothed at the apex as in both male and female. Wing on the right side, male; that on the left, worker. Legs male, or, rather, partly male on the right side; the anterior and intermediate legs perfect male; the posterior leg male, but fringed with hair, and the basal joint of the tarsus male exteriorly, that is, smooth and convex, but within transversely ridged and clothed with hair; the following joints male; the left posterior leg is perfect worker. The abdomen furnished with a sting; the sting female, straight.”

Prof. Westwood said that during June last he had noticed a couple of hive-bees near the mouth of the hive, apparently fighting; and on capturing them he found that one, which seemed to have been attacked by the other, had attached to its head a tuft of filamentous matter, which turned out to be composed of the pollen-matter of *Orchis maculata*. The Professor was desirous of sending the specimen to Mr. Darwin, as bearing on the subject treated in the most recent of that gentleman's works, but unfortunately it had been placed in spirit, by which the tuft of pollen-matter had been dissolved.

The Secretary read, on behalf of Dr. Alexander Wallace, the following

Note on the Ravages of the (Currant) Sawfly.

“In the ‘Zoologist’ for July, 1862 (Zool. 8079), an interesting account is given of the sawfly, *Nematus ventricosus*, *Klug*, translated from the Dutch of M. Snellen van Vollenhoven, by J. W. May, Esq. This insect is familiarly known by the name of the ‘gooseberry grub,’ whose ravages this year, extending all over the kingdom, have deprived us of many tons of fruit. By studying the natural history of this and other insects, we shall doubtless find a clue to the prevention of their ravages, and I wish now to throw out some hints which may prove useful for that purpose. After giving a description of the larvæ, &c., our author goes on to state, ‘They feed both day and night, and, beginning in company on a leaf, they eat on until there is nothing left but the stalk and some of the thickest veins. Before quitting the bush they moult, once more assuming a pale yellowish green colour, the first and terminal segments being orange; but they are now without the black spots and hairs which they had in their earlier state. After this they drop from the tree, and construct a cocoon at the foot: this cocoon is made at no great depth in the ground, and is externally covered with little grains of earth. They assume the pupa state, in the summer, in the space of three weeks, in the winter only after an interval of eight months. The pupæ are yellowish white, and display all the parts of the imago. They very soon change their colour, and in eight or ten days, having moulted for the last time,

the perfect insect gnaws open the cocoon and escapes.' Our author then gives a description of the perfect insect, and further adds, 'There was an incredible number of these larvæ in 1860. From observations made at Utrecht and at Leyden, there seems no doubt that the first brood in May attacked exclusively the leaves of the gooseberry, some of the bushes being quite stripped; and that the second generation, appearing in July, principally confined itself to the currant, but small numbers having been seen on the gooseberry. I observed this myself in a garden where the two plants were growing intermixed. Both larvæ and imagos were decidedly of but one species.' The truth of this latter observation, that the larvæ attack both gooseberry and currant trees (the former at an earlier period of the year), is quite borne out by my own observation this summer. The second brood having now just made their appearance, I will detail a mode by which their ravages may be greatly lessened.

"The eggs—white, elliptical—are laid on the under surface, along the ribs of the leaf, to the number sometimes of 120 on a single leaf; the larvæ, when hatched, during the first twenty-four hours, make each one a little round hole. The leaf then presents the appearance of having been riddled by No. 7 shot. The second day the holes are larger, less regular, and soon coalescing; the larger veins only at the tip of the leaf remain undemolished. This is the critical time to destroy the brood. By gathering these leaves daily as the caterpillars are hatched (for they keep coming out during a fortnight or three weeks, according to the period at which the eggs were laid) the whole of the brood will be easily destroyed. The peculiar appearance of the leaf renders the gathering of the brood remarkably easy; while the fact that at this early period they are all together on one leaf, and that a week later they will be more scattered over the tree, as also that their destruction of the foliage is then at the minimum, peculiarly points out this period as the one most suitable to their destruction. I should say that on the 19th of July, from about ten trees in my own garden, I picked off fifty to seventy leaves, each containing from five to seventy eggs, and young larvæ just hatched. Since then I have daily picked off about ten leaves similarly attacked. If each possessor of a garden would thus destroy the young brood, we should have no more sawflies next year to trouble us. Other methods are advantageously used at a later period for their destruction; such are hand-picking, shaking the stems, when the larvæ drop down and can be killed; syringing the under surface of the leaves with alum and water, or watering the larvæ when shaken down with the same mixture: but all these methods are put in force when the damage is half done and when the larvæ are widely distributed over the trees, and are insignificant when compared with that which I now advocate for nipping the evil in the bud. Let us now look to our currant trees and next spring to our gooseberry trees, and we shall get rid of the enemy."

Paper read.

The President read a paper entitled "A List of the Genera and Species belonging to the Family Cryptoceridæ, with Descriptions of New Species."—*J. W. D.*

A Visit to Pratas Island.—In the 'Zoologist' for 1860 (Zool. 7236) I contributed a list of animals observed on Pratas Island, situated at one side of the Pratas Reef, a coral formation in the China Sea. Since then I have come across a short account of

my visit to the Pratas Shoal, which possibly may interest some of your readers, as conveying some notion of what these isolated coral islands are like. During our trip to the Reef, in the 'Dove,' April 20th, 1858, about one hundred miles from Hong Kong, a padi-bird is observed on the wing, making futile attempts to get on board. This is so far interesting, as tending to confirm the idea that, after the web-footed aquatic birds, like the albatrosses, gulls and gannets, the wading birds form the earliest colonists of oceanic atolls and other islets. When I land on the island, through the surf, like Robinson Crusoe, I light a fire and make a tent of the boat's sail, choosing for my bivouac a little sheltered glen, with bushes of *Scaviola* on one side and stunted *Tournefortia* trees on the other. Having arranged the house to my satisfaction, I walk round the island. Near the sea I observe a carpet of creeping grass, the flowers with large white anthers, and bearing a delicate feathery stigma, and gemmed all over with *Convolvulus* flowers—red, white and pink. At the first blush nothing was visible inland but dense masses of green glaucous shrubs, mostly *Scaviola*, with here and there traces of *Tournefortia*. As I advance, however, I see open spaces, with heaps of fine coral sand, white as the driven snow. The bones of shipwrecked men, mingled with those of the turtle on which they had fed, are bleaching in the sun. The heat is intense, and, with dozens of gannets hovering over my head, I bathe in the view of the shoreless ocean. So bold grow the gannets as to threaten my eyes, and I leave the water to pelt them with fragments of coral, for stones there are none. The fin of a shark looks rather ominous of evil, so I dress and proceed with my exploration. I capture a white heron, with a crest of two long feathers; I then rob a gannet's nest of two light green eggs, about as large as those of a duck; I come to a little jos-house filled with offerings to the Chinese goddess of the sea; looking for beetles in the undergrowth, I am stung by a little scorpion: I observe, moreover, that *Ocypode*, or horsemen crabs, run about the sand; that a huge locust everywhere leaps about, and that a splendid humming-bird hawk-moth hovers incessantly about the white, fissured flowers of the *Scaviola lobelia*. On the outskirts of the liliputian jungle are carpets of crassulaceous plants, in which the land-crabs, *Thelphusa* and *Ocypode*, form large, deep burrows. I now come to a double lagoon, divided by a tongue of land, and near the end of which *Pandanus* and other trees form quite a miniature picture of a tropical forest. Madrepore masses, left high and dry, fringe one margin of the lagoon; hermit-crabs abound; and among the herbage I notice rounded masses of pumice-stone, which must have been floated hither by currents from Formosa, for I cannot discover any traces of a volcanic origin for my little island. In fact it appears to be merely one end of the horse-shoe coral reef the 'Dove' is now surveying, elevated above the level of the sea and covered with vegetation. Wading birds are seen fishing in the waters of the shallow lagoon, sandpipers on the yielding sands, snipes on the soft, oozy ground of the margin, and herons standing in the water. The number of gannets on the island is astounding; the ground in some parts is strewn with their eggs, two in each shallow nest of sticks, and often, instead of eggs, two callow unfledged young ones. The contents of their pelican pouch I observe to be chiefly flying fish, the flavour of which the infant gannets appear to fully appreciate.

Arthur Adams.

NOTICES OF NEW BOOKS.

'*On the Zoology of Ancient Europe.*' By ALFRED NEWTON, M.A.,
Fellow of Magdalene College, Cambridge, F.L.S., &c. Mac-
millan & Co., London and Cambridge. 1862.

An essay of great interest: it contains a considerable amount of reliable information, arranged with some judgment, but not methodically. The author seems perfectly aware of this: he assures us he "well knows that his remarks are too discursive:" they certainly would have been more useful to the closet naturalist had they been somewhat more carefully arranged: in fact there seems to be no arrangement, either chronological, geographical or zoological. I think perhaps in a popular lecture this discursive manner may have its advantages; the touch-and-go style is often used to prevent the attention from flagging: but we have here an essay filled with abbreviated references, and assuming, to say the least of it, to be a scientific production; and in such we are apt to expect something in the way of method. Again, I should have preferred a somewhat deeper research into reputed facts; for instance, in the case of the lion, which Mr. Newton claims as a native of Europe, it would have been most delightful to have found conclusive evidence of his former sojourn amongst us; but Mr. Newton's researches, *in the first place*, show that in Asia the *tiger* ascends northward to latitude 52°, and that hence we may conclude the *lion* would bear the climate of Europe; and, *in the second place*, we are referred back to our school-books, and there we shall find that the skin of the lion was a trophy of Hercules, and that Herodotus tells us there were lions in Thrace in the days of Xerxes: here is the passage entire; the conclusion therefrom, that lions were indigenous to Europe, appears to me very like a *non sequitur*:—

"I claim without hesitation for the king of beasts a place in the Fauna of Ancient Europe. We are disposed at first sight to consider the presence of the larger Carnivora as confined to the tropical or quasi-tropical regions of the globe. Allow me to say that this is a very great error. I pass over extinct species, such as the *Machærodus* or the *Felis spelæa*, whose relics the unwearied researches of the late Dr. Buckland unequivocally detected in Kent's Hole and the Kirkdale Caverns; for we know not the climatic conditions under which those formidable creatures once existed in this country. But

at the present day it is incontestible that the tiger (*Felis Tigris*)—specifically identical with the treacherous inhabitant of the jungles of Bengal—not only crosses the snows of the Himalayah Mountains, as, in truth, has long been known, but even extends its range throughout China, to that district—the valley of the river Amoor—by which the boundaries of the Russian Empire have recently been ‘rectified.’ The labours of Von Middendorff, Von Schrenck and others, have shown that it is an ordinary resident at all seasons of the year, and frequently destructive to men and cattle, about the mouth of the river Ussuri, in north latitude 48° (nearly that of Vienna); and also that it even passes over the ice in latitude 52° (almost as far north as our present place of meeting), to devastate the island of Saghalien, where, according to Keith Johnstone’s ‘Physical Atlas,’ the mean temperature is that of Iceland, while the winters are as severe as those of St. Petersburg. I therefore do not question that the legends of ancient Greece may have had a strictly local origin, when they assert that the first settlers in Argolis met with lions there. The early trophy of Hercules—the hide of the Nemæan monster—seems to me far less mythical than most of that hero’s attributes. Again, too, I need scarcely remind my audience of the numerous allusions to this animal which are to be found in Homer, nor of the statement of Herodotus respecting the existence of lions in Thrace, and the ravages they committed there on the camels of Xerxes. I hope I shall not be supposed to affect a classical knowledge I can only admire in others, but, speaking merely as a zoologist, I see no objection to the story.”

The essay, however, is not generally of this apocryphal character. As a novelty in science, however, or at any rate a recent and most interesting discovery, the occurrence of bones of the water tortoise in Norfolk may be cited: they were found at a place called West Mere, a few miles from Thetford, and consequently very near to Mr. Newton’s residence, and belonging to Mr. Birch, of Wretham Hall:—

“In this mere there was ordinarily about four feet of water, and beneath it about eight feet of soft black mud, partly held in suspension and requiring to be removed in scoops. When the mud was being cleared out a great number of bones were discovered, chiefly deposited, as from its semi-liquid nature might have been expected, at the bottom. They were nearly all those of the red deer (*Cervus Elaphus*) and the now extinct *Bos longifrons*; but among them also was the upper part of a goat’s skull, with the horn-cores and the skull of a boar or pig of some sort. Near the centre of the mere, lying below

the black mud, was found a ring or circular bank of fine white earth, sufficiently solid to allow Mr. Birch to ride upon it without yielding to the weight of his pony; indeed it seems to have been about as firm as average sea-sand when damp. Outside this ring the bottom of the mere was so soft and deep as to be almost impassable until the mud was cleared away. The ring or bank was some twenty or thirty feet across, a foot wide, and about four feet in height. Not far from its inner circumference was a circular hole, about four feet and a half in diameter, some six feet deeper than the bottom of the mere, and, as my informant states, almost like a well to look at. The mud it contained was even softer than that elsewhere. This was marked out by a circle of stout stakes, or small piles, apparently of alder (*Alnus glutinosa*), and it bore traces of having been wattled. It was not in the centre of the ring, and between the two circles were the remains of a wall, composed of flints packed together with marl or soft chalk. In the same place was some earth of a bright blue colour, which, when dried, crumbled to powder, and was not preserved, though there are traces of it on some of the bones. In this interspace a still greater number of bones were found, and also the remains of a rude ladder, but in such a state of decay it could only be pulled out piecemeal. Still enough of it was seen by Mr. Birch *in situ* for him to have no doubt as to its original form. Its sides were about fifteen inches apart, and its rounds about the same distance from one another. The stakes appear to have been riven from trees some four inches in diameter. They were very hard, as heavy as stone, and of a dark gray colour. The fragments of the ladder, on the contrary, were very rotten and light, but the remains of both, after being kept some time, exfoliated and crumbled entirely to dust. In and around this ring there lay, as I have said, a vast number of bones, of which no small portion were the upper parts of the skulls of *Bos longifrons*, with the horn-cores attached, and many antlers of the red deer, either entire or in fragments. All the former, excepting one unusually large example, had a fracture in the forehead. I believe that hitherto no decisive evidence has been adduced to prove that in England the long-fronted ox was contemporary with man, but the appearance of these skulls removes all further doubt on that subject, and corroborates the conjecture put forth several years ago by Professor Owen, that this species was probably domesticated by the aborigines of Britain before the Roman invasion. Of the deers antlers some have certainly been shed in the due course of nature; others, on the contrary, have been separated from the head by sawing, as is conclusively shown by a speci-

men in the possession of Mr. Birch. In this case the operator, probably through inadvertence—for the corresponding portion of the fellow antler bears no such trace—first set to work at this bone above the ‘burr’ or junction with the skull, but after a few strokes with his tool, he seems to have thought better of it, and finished the job by cutting off a portion of the skull with it. To what use these bones have been put I do not take on myself to suggest, nor is that in accordance with my present object. It may not be uninteresting to compare the excellent handiwork of this early British sawyer with a much more recent though still ancient bit of a reindeer’s antler, brought by me from Lapland, where it formed one of a large collection of similar offerings, now I believe scattered at an old Lapp Altar at Jerisjärwi. In this the marks of some six or seven blows of a hatchet are plainly visible, and testify either to the clumsiness or bad tools of the operator, who probably at last effected his purpose by breaking off the half-severed bone by main force, as the appearance of the surface leads one to suppose. Of the other bones found in West Mere, and I am told there were hundreds of them, most of the larger ones have been fractured at one or either extremity, doubtless in order to extract the marrow they contained. But they have not been split longitudinally, as is the case with the marrow-bones found in the Danish Kitchen-Middens; and we may perhaps infer from this fact that something like the long-horn spoons which we now have for that purpose were in use amongst the ancient *gourmets*. Another bone, and, as far as I can make out, the only one found which presents this peculiarity, has been polished on one side, but the reason why is not very obvious, unless it has served, as I before suggested in the case of a similar specimen, for a skait. It appears to have belonged to the long-fronted ox, and my motive for referring to it, as well as dwelling upon these other circumstances, is only to strengthen the truth of Professor Owen’s conjecture, to which I have already referred, as to the probability of that species having been domesticated by former races of men in this country, and hence the possibility of its being the progenitor of some of our modern breeds of cattle. I must add that no weapons or implements of metal, which can be referred to a period at all remote, were brought to light in this or any of the adjoining meres, but a great number of flint disks were found, which, according to the description I have received (for unfortunately none of them seem to have been preserved), must closely have resembled those known to the Danish antiquarians as ‘sling-stones,’ from the probable use made of them.”

But I must quote the particular passage to which I have alluded, touching the water tortoise. This pretty and hardy chelonian might without difficulty be introduced into our ornamental waters in England, as it endures the rigours of a continental winter without any apparent injury, being firmly established not only in the South of France, Italy, Hungary, Greece and Turkey, but extending its range northwards to Austria, Silesia and Poland. In company with *Emys caspica* it frequents Dalmatia and the shores of the Caspian, and is found in friendly relations with the minute *Emys Sigriz* in some of the table-lands of Spain.

“Some weeks since, when examining the large collection of ancient remains in Mr. Birch’s possession, all of which were, I believe, found on his estate in Norfolk, I found, to my surprise, some specimens far more interesting than any I had expected to meet with. They consist of some limb-bones and a considerable portion of the dorsal and sternal shields of two individuals of the European fresh-water tortoise (*Emys lutaria*), a species the existence of which at any time in the British Islands has never before been suspected. These were found, as a label upon them in Mr. Birch’s handwriting testifies, so long ago as June, 1836, in a peat-bog, by the side of a spring-pit, at East Wretham, about seven feet below the surface, and beneath some fifteen hundred laminations of a species of *Hypnum*, specimens of which were, I understand, submitted by Mr. Birch to Sir William Hooker, who declared the species to be *Hypnum filicinum*. I immediately communicated these facts to Professor Owen and Professor Bell, as being respectively the highest authorities on the fossil and recent reptiles of this country; and subsequently sent the remains to the first-named gentleman, who kindly determined the species for me, thereby confirming the view I had taken of them, but adding that they were somewhat larger than modern examples from Germany, now in the British Museum. Now, I am told that no trace of testudinate remains has been previously observed in England, in any formation of a later date than the London clay, certainly not in any post-tertiary deposit. I therefore think I am justified in presenting them to your notice, as being especially worthy of attention. But this is not my only motive for so doing. I am anxious to point out, in this instance, another of the many coincidences which existed in days of yore between the fauna of Ancient Britain and the faunas of the continental countries nearest to our island.”

The concluding words of this passage are scarcely to the point,

this pretty tortoise never having been found in the North of France, Holland, Belgium, Denmark, Sweden or Norway.

On the subject of the northern penguin, the great auk of our British lists, Mr. Newton cites from Steenstrup's admirable 'Monograph' several passages of great interest; and these, in continuation of the delightful paper I have already reprinted in the 'Zoologist,' will form a very complete history of this truly extraordinary and now probably extinct bird.

"But the species which is supposed by many ornithologists to be now extinct was formerly very plentiful on both sides of the Atlantic, and even on some islands suited to its necessarily peculiar habits around our coast. The statement of its breeding on St. Kilda, which has been often quoted, is very circumstantial; and in Orkney there are still persons living who remember it as a native bird, a fact by no means extraordinary, when it is known that the last example observed there was killed in 1812, and its skin sent to Mr. Bullock, at the sale of whose collection it was bought by Dr. Leach for the British Museum, where it may now be seen in very fair preservation. A few of its bones have been discovered in the Danish 'Kitchen-Middens,' and this circumstance has led Professor Steenstrup to publish an excellent little monograph on the species. Herein he has most carefully collected the notices concerning it which exist in the narratives of old voyages to Newfoundland and the Gulf of St. Lawrence. And notwithstanding that it may be perhaps somewhat departing from the scope of a paper professedly on European Zoology, I hope it will be permitted me to mention a few of these here. For though most of them are drawn from sources originally published in England, they have never been collated by English naturalists, and they represent a state of things similar in all probability to that which once existed in many localities along the western shores of Europe.

"In 'The voyage of M. Hore and diuers other gentlemen to Newfoundland and Cape Briton in the yeere 1536,' &c., it is stated:—

"'From the time of their setting out from Grauesend, they were very long at sea, to witte, aboue two moneths, and neuer touched any land vntill they came to part of the West Indies about Cape Briton, shaping their course thence Northeastwardes, vntill they came to the Island of Penguin, which is very full of rocks and stones, whereon they went and found it full of great foules white and gray, as big as geese, and they saw infinite numbers of their egges. They draue a great number of the foules into their boates vpon the sayles, and tooke up many of their egges, the foules they flead and their skiinnes

were very like hony combes full of holes being flead off: they dressed and eate them and found them to be very good and nourishing meat.'

"In a letter written to M. Richard Hakluyt, of the Middle Temple, containing a report of the true state and commodities of Newfoundland, by 'M. Anthonie Parkhurst Gentleman,' dated 'From Bristow, the 13th of Nouember 1578,' is this passage:—

"'There are Sea Guls, Murres, Duckes, wild Geese, and many other kind of birdes store, too long to write, especially at one Island named Penguin, where wee may driue them on a planke into our ship as many as shall lade her. These birdes are also called Penguins, and cannot flie, there is more meate in one of these than in a goose: the Frenchmen that fish neere the grand Baie, doe bring small store of flesh with them, but victuall themselues alwayes with these birdes.'

"Again, in 'A report of the voyage and successe thereof, attempted in the yeere of our Lord 1583 by Sir Humfrey Gilbert knight, &c., written by M. Edward Haies gentleman, &c.:'—

"'We had sight of an Iland named Penguin, of a foule there breeding in abundance almost incredible, which cannot flie, their wings not being able to carry their body, being very large (not much lesse than a goose) and exceeding fat: which the French men vse to take without difficulty vpon that Iland, and to barrell them vp with salt. But for lingering of time we had made vs there the like prouision.'

"The passage just quoted is no libel on the French sailors of those days. It is entirely confirmed by the narrative of Jacques Carthier's third voyage. I have not been able to obtain a sight of the original work, and must content myself with the extract as given by Professor Steenstrup. After speaking of the incredible abundance of birds at the so-called 'Ile des Oyseaux,' near Cape Bona-vista, the writer goes on to observe:—

"'Neantmoins il-y-a cent fois plus à l'entour d'icelle, et en l'air que dedans, desquels les vns sont grands, comme Pies noirs & blancs, ayans le bec de Corbeau: ilz sont tousiours en mer, et ne peuvent voler haut, d'autant que leurs ailes sont petites, point plus grandes que la moitié de la main, avec lesquelles toutefois ilz volent de telle vitesse à fleur d'eau, que les autres oyseaux en l'air. Ilz sont excessivement gras, et estoient appelez par c'eux du païs *Apponath*, desquelz noz deux barques se chargerent en moins de demi heure, comme l'on auroit peu faire de cailloux, de sorte qu'en chèque navire nous en fimes saler quatre ou cinq tonneaux, sans ceux que nous mangeames frais.'

It would be idle and untruthful in me to say that Mr. Newton has

exhausted this subject, which is one of the highest possible interest ; indeed the essay may be designated as suggestive rather than conclusive, appetising rather than satisfying : nevertheless it is a valuable work, as showing the resources of a scientific region hitherto unexplored, the riches of a mine hitherto unworked ; and I have great pleasure in most cordially recommending it to the notice of my readers.

EDWARD NEWMAN.

Curious Habit of the Shrew.—A friend of mine, when shooting by the Ouse-burn, saw some object apparently struggling on the rocky and shallow bed of the burn. At this he fired, and on picking up his game was considerably astonished to find that he had killed a black shrew and a small fish. Probably the fish had been too strong for its captor, as they were apparently rolling over and over in the water, and doing battle with all their energy.—*T. J. Bold, in 'Transactions of the Tyneside Naturalists' Field Club,' April, 1862.*

Occurrence of the Orangelegged Hobby near Hythe.—An adult female of the orange-legged hobby (*Falco rustipes*) was killed at Sandling Park, near Hythe, in the early part of this summer. I saw the bird soon after, but as I believe its occurrence in this instance has not been recorded, I have asked permission to notify it.—*W. Oxenden Hammond ; St. Alban's Court, near Wingham, September 15, 1862.*

Curious Capture of a Hobby.—One day last week a labourer brought me a fine adult male hobby (*Falco subbuteo*), and curious enough was his story of its capture. The man (an invalid) was taking a stroll in the church-yard of Chesterton, Cambridgeshire, accompanied by his little boy, who all at once said, "Oh, father, look ! what curious bird is that drinking at the pond ?" The man made no reply, but crept gently up to the hedge, this side of the pond, and by some manœuvre or other managed to put a walking-stick over its back, and in this manner captured the bird, which turned out to be a hobby. When brought to me it was lively, and, to all appearance, in good health : the man informed me that it ate meat freely. I have since had it preserved, and no appearance of any injury, either externally or internally, was apparent : its plumage was also nicely clean, and in all respects, as far as I could see, a healthy bird. I will vouch for the honesty of the man who captured it. The hobby is with us not by any means a frequent visitant, only a pair or a single bird occasionally occurring. The hobby is a good sportsman, generally making his appearance some time in September, and again retiring about October or November. On reference to my note-book I find I have a note of the capture of the hobby as early as the 12th of August, but these instances are not general. In the field the hobby is a bold and daring falcon, pursuing his prey with astonishing avidity and fierceness. The partridge is his particular favourite : I have always noticed that when seen or captured, it has invariably been in the vicinity of an abundance of that bird.—*S. P. Saville ; Dover House, Cambridge, September 15, 1862.*

The Song Thrush singing later than usual.—That beautiful songster, which has been lauded by at least half-a-dozen of our poets, and by Robert Burns particularly, as the

"mavis," was heard by me on the 6th and 15th of August,—a most rare occurrence; as the thrush generally ceases about the end of July for three months, it may be attributed to our extraordinary dull weather in June and July making the summer appear late to the bird, the temperature being so cold with the continued rain: the birds were perched on a high elm tree in the vicinity of Cheltenham. I mentioned the reverse in the 'Zoologist' for 1859; in a burning July the same species of birds ceased singing in the middle of that month, every thing being prematurely advanced. The only writer that ever underrated the song of the thrush was my old neighbour and acquaintance the author of 'The Journal of a Naturalist,' and being fond of singing birds it seems singular for him to have done so. Mr. Knapp seemed to think that thrushes had no particular notes, and that every bird had a set of notes of its own; but he did not make allowance for young and old birds, and singing birds are often interrupted in the midst of their tunes, and commence where they left off. He goes on to say, "Harsh, strained and tense as the notes of this bird are, * * * yet they are pleasing from variety." The blackbird he praises for his mellowness of voice, but omits his greatest beauty, plaintiveness: evidently this writer had not a nice musical ear. He mentions one thrush which sang a whole season near his house, which used to repeat "Lady bird, lady bird," but this must have been an old bird with his nest near: the three notes which are mentioned are notes used by every old song thrush, and may as well be sounded "Ti, ti, ne" or "Ti, ti, to," as the fanciful sound of the author in his 'Journal.' Notwithstanding the eccentricity of his opinions, now and then his style of writing is easy and elegant, and his book is a great favourite, having passed through four editions. Thrushes, as I have mentioned once before, sing much louder while nesting—are perched much lower and nearer to their nests in April, May and June—than at other times. When they sing in the third week in October and in December, they may be observed always at a greater distance; but in the breeding season four or five of these birds will frequently sing in opposition to each other close to a dwelling house.—*H. W. Newman, Hillside, Cheltenham; August 26, 1862.*

Number and Eggs of the Dartford Warbler.—As regards the diminution of numbers of the Dartford warbler, I can fully confirm the statement of your correspondent (Zool. 8160), for having met with them somewhat plentifully, as well as their nests and eggs, in 1859 and 1860, I have these last two seasons only had a very few specimens. There is no doubt that the cold winter of 1860-61 nearly destroyed them. I have an interesting series of their eggs, and have seen many more, but cannot agree with your correspondent that they are similar to those of the whitethroat. Mine vary a good deal, but approach more nearly to those of some varieties of the reed warbler; they have, however, I think, always a distinctive character about them which pretty readily distinguishes them from the eggs of any other bird. I think the ground colour being very light, sometimes almost approaching white, and a distinctness of spot, chiefly give this; whereas the reed warbler often has the ground colour more approaching green, and the spots more suffused. I find the spots in the Dartford warbler's egg, moreover, often tending towards a well-defined zone at the larger end, though not by any means universally so.—*Alfred Crowley; Croydon, September 16, 1862.*

Blue Variety of the Chaffinch's Eggs.—Noticing some remarks in your last number about the blue variety of the eggs of the chaffinch (Zool. 8161) I can confirm the view of your correspondent, that they are not of very rare occurrence. I have seen such in several collections, and have them myself of that colour, but with spots.—*Id.*

Nesting of Martins and Sparrows.—Since my residence near Colchester, nearly nineteen years, each spring till the present, successive pairs of martins have built a nest under the broad eaves of the house at the east end, of which, however, when completed, they have not unfrequently been dispossessed by sparrows: on such occasions I have served an ejection on the dishonest intruders by poking down their usurped dwelling. Last season they constructed their habitation as usual, and, not being disturbed by bad neighbours, hatched three young ones. Either by accident or design the nest was struck by a ball, which demolished it, and the birds, well fledged, descended gently to the ground. The visitor who had caused the disaster carefully collected and placed them on some hay in a bird-cage with a wooden back, and having a door in it, and covered the top and sides with double coarse paper, as a protection from the weather, and hung it up as near as possible to the place where the nest had been. The parent martins immediately commenced feeding the nestlings, which did not appear to be discomposed in their new abode, but often sat in a row on their own door-sill to receive their food. The old birds soon seemed to fancy the opening was too large, for they presently began to plaster it up in a convex form, but did not, in the first instance, close it to the top of the door-way till the young ones took their flight, when they finished the work, leaving only the usual small aperture. They continued to frequent this novel habitation, carrying materials into it, we supposed as a preparation for a second brood, but of this we have no decisive proof, as we all left home soon after, and, being absent several weeks, on our return the hirundine tribes had migrated. On taking down the cage, we perceived an indentation in the centre of the hay neatly lined with feathers, and in several parts of the interior, where air could be admitted between the wires or elsewhere, the crevices were found to be carefully plastered. This spring, in order to ascertain whether the martins would again resort to the cage, it was hung up in the former position, but they did not appear to notice it, and although they were seen to fly once or twice to the old spot, they made no attempt to build as heretofore. In the course of the summer, however, a pair of sparrows, seeing vacant lodgings, viewed them at first with a coy timidity, perhaps suspecting a trick to ensnare them; but, becoming assured, they took possession, probably for a second brood, enlarged the entrance, and filled the cage with the heterogeneous mass of which their nests are ordinarily composed. In due time they reared their progeny, and the house is again to let.—*Joseph Shewell; Lexden Road, near Colchester, August 27, 1862.*

Nest of the Twite.—In Shetland I have repeatedly met with the nest of the twite in walls, both of stone and of turf, in peat stacks, among heaps of stones, in rugged banks of streams, in cavities beneath large stones lying singly upon the ground; less frequently upon ledges or in crevices of sea cliffs; twice in low elders, at the height of about four feet from the ground; once in a rabbit-burrow, once in a hay-stack, and once in the wall of a stable, considerably above my reach. I mention these facts, because the twite is usually described as only building among grass or heath.—*Henry L. Saxby; H.M.S. "Devonshire," Sheerness, September 1, 1822.*

Further Notes on the Oviposition of the Cuckoo.—According to Mr. Saxby's account of the hen cuckoo (Zool. 8164) she lays her egg sometimes after the "foster parent bird" has hatched her own brood, so that, according to this new theory, the poor deluded bird last alluded to has to sit her time over again to hatch the stranger's egg. I certainly cannot reconcile this unnatural mode at all, everything in creation being so regular, consistent and beautiful in all its curious ways; the cruelty also

committed on the unfledged young of the foster mother seems unlikely: my own notion is that the cuckoo seldom or never selects any nest except one where the hedgesparrow, titlark, wagtail, or other bird she finds has nearly finished laying the proper number of eggs, and then the cuckoo, from that wonderful instinct implanted in all God's creatures, lays her single egg only in each nest she visits on different days, and probably ejects the whole of the eggs except her own, sucking each of the foster-parent's eggs, if hungry, or getting rid of them with her bill. I can only authenticate one case: when a schoolboy I was on a visit to a near relation in Northamptonshire, when, in company with another boy birdsnesting in May, we found a hedgesparrow's nest, which is the nest most frequently chosen by the cuckoo; the nest contained three eggs, but on visiting the nest again the hedgesparrow was found sitting very closely; a fortnight or rather more afterwards the bird was driven off her nest, and only one egg was there, which was hatched the next day, and turned out to be a cuckoo. I have given a minute account of the rearing of this bird, and placing it in an osier-twig cage, where it lived near the nest until it was six weeks' old; the history of this bird is recorded in the 'Zoologist' for 1852 (Zool. 3424). That the cuckoo is fond of the eggs of singing birds there is little doubt. I once found the nest of a bullfinch with eggs; this nest I intended to take when the young were old enough: I visited the nest every morning, but at the very time when the old bird finished laying, on visiting about 10 A. M. I found a cuckoo sitting almost upon the nest, moving her head downwards: she was driven away, and on examining the nest the whole of the eggs had disappeared, except a few broken fragments of the shells, and although the shells were moist there was no mess made in the nest. It has been often said that as soon as the laying of the singing birds, at the end of June, is over, the cuckoo becomes hoarse for want of suction: how far this is correct it is impossible for me to say; it is probably a vulgar error, but I have heard many times that the voice of a public singer is best cleared by the white of a raw egg. To return to Mr. Saxby's theory of depositing its eggs from the mouth by the cuckoo, I am certainly inclined to agree to that theory, and it agrees with the account given by me this year in the 'Zoologist' of a young cuckoo having been discovered in a robin's nest in a stone wall, and the inhabitants of Norton Court, Gloucestershire, where the occurrence took place, were puzzled to think how so large a bird as the cuckoo could have had access to the nest, the aperture being only big enough for the robins, the foster parents, to enter. The Creator has so willed it that the love of offspring shall be wanting in some of his creatures, and we may say of that extraordinary bird, the cuckoo, what, in the beautiful language of Job, is said of the ostrich:—"Gavest thou wings and feathers unto the ostrich, which leaveth her eggs in the earth and warmeth them in the dust. She is hardened against her young ones as though they were not her's; her labour is in vain without fear: because God has deprived her of wisdom, neither hath he imparted to her understanding." Mr. Saxby says truly that the shy habits of the cuckoo are a great bar to the discovery of its exact history, and I fear that different accounts may verify the old story of the chameleon,—all nearly right. May not the hen cuckoo, after all, employ different modes of depositing her egg according to the exigency of her case, and the situation of the selected nest?—*H. W. Newman; September 6, 1862.*

The Common Sandpiper a Diver.—Some days back I happened to wound a sandpiper (*Totanus hypoleucos*), which, on flying some distance from the rock on which it had been feeding, fell into the water. When my boat approached it, it dived in a

most expert manner, perpendicularly, to the depth of five or six feet, then horizontally under water for a long distance and with great celerity, using both wings and feet. It repeated this several times till it reached the rock from which it had flown. I landed, expecting to pick it up, when I was surprised to see it walk down the slanting side of the rock for three feet under water, and then strike out again. When it rose I shot it, and thus ascertained its species. I think it very probable these birds, like the dipper, have a certain power of diving in search of food. Not knowing that these birds dived, I inquired of Mr. Newman for information, and finding the fact entirely unknown to him, I insert this.—*H. Blake-Knox; Bartragh, Dalkey, Co. Dublin, September 4, 1862.*

Woodcock breeding near Keswick, Cumberland.—My brother, J. S. Mawson, when out in search of insects on the 24th of June, nearly stepped upon the nest of a woodcock, containing four eggs: the old bird was rising from the nest at the time. My brother continued to visit the nest daily up to the time she hatched, which was on the 7th of July: the old bird allowed him to go within a couple of yards of the nest without being in the least annoyed. The nest is merely a slight hollow in the ground, with a few dry leaves round the sides. The old bird, when sitting upon the nest, always rests the point of its beak upon the ground, with its dumpty tail almost erect, giving it a curious appearance. The nest is upon a dry bank facing the North, which I believe is nearly always the case with the woodcock, the bird preferring the shady to the sunny side of a bank. The eggs are very similar to those of the corn crake, being rather larger and in colour much the same. After hatching, the young birds left the nest almost immediately.—*George Mawson; Gill House, August 18, 1862.*

Occurrence of the Great Snipe near Malham, in Yorkshire.—Two very fine specimens of the solitary snipe (*Scolopax major*) were killed on Saturday last, September 6, by Mr. W. Braysley, at Malham, in this county. The birds were both found on high ground, and almost a mile and a half apart. Mr. Braysley has very kindly given me one of the birds for my collection; it weighed over eight ounces, and was, I believe, a female; the other weighed rather less: both were in very good plumage.—*W. Christy Horsfall; Horsforth Low Hall, near Leeds, September 8, 1862.*

Occurrence of the Black Stork near Hartlepool.—I have just added to my collection a fine specimen of the black stork (*Ciconia nigra*), which was obtained near Hartlepool, within the last few weeks.—*Id.*

How they fatten Ducks in China. By ARTHUR ADAMS, Esq., F.L.S.

A STROLL through the straggling villages on the banks of the Great River is pleasant enough in the spring. Along the level bund Coolies are carrying burdens at the end of bamboos, rich men are riding in couples on wheelbarrows, a little-footed woman is toddling awkwardly along, and there is a shaven priest in a dingy robe.

Inland is seen a vast, green, cultivated plain, with scattered farms and hamlets, and their attendant white goats and hungry yelping curs. An aged crone is usually spinning at the open door, the ducks are in the dykes which always encircle the houses, and in the elm and willow trees are the familiar magpies and mina-birds.

The fields are now dry ; rice, padi-birds and frogs are gone ; not even a land-crab sidles along the muddy banks. All around the yellow blossoms and snowy pods of the cotton are mingled with the foxglove-flowers of *Sesamum*, from the seeds of which an oil is expressed ; wheat and barley form undulating fields, together with purple tares and sweet-scented flowering beans. A granite arch, dedicated to filial virtue, often rears its quaint form above the cotton, and everywhere wooden coffins are seen exposed in the open air ; the grassy grave-mounds are yellow with *Chrysanthemum Chinense*, from which you note the sibilant song of the grasshopper-lark ; the pheasant crows in the young corn, and the pretty ring dove flies across the path to join her mate in the bamboo thicket.

The banks are covered with violets and dandelions, mixed with patches of yellow *Thaumatopsis*, and, what is rare in these southern latitudes, with the blue flowers of a little gentian.

In this scene of smiling plenty the people are calmly industrious, tending their goats, weeding the crops, or threshing out the last year's padi ; the women are busy among the cotton plants ; the men are turning the sod and crushing the clods with their heavy four-pronged hoes, and the children are gathering esculent leaves.

On what, however, is he intent who, basket on arm, surveys the willows with inquiring eye ? By means of a little sickle at the end of a long bamboo, he ever and anon detaches brown swinging cradles from the slender boughs, and deposits them in his basket. This is a pupa gatherer, and those tiny mummy-like objects of his solicitude are the pupa-cases of a species of *Oiketicus*. When I blandly desire to know the use these accumulated larvæ are to be put to, the face of the old man relaxes into a smile, and he transforms himself suddenly into a duck, gobbling up imaginary *Oiketicus* larvæ with impatient greediness and noise.

This is one way in which they fatten ducks in China, but there are several others. In the beginning of summer, when the *Principia utilis*, which in winter time is nothing but a tangled mass of green thorns, teems with milk-white flowers and swarms with bees ; when the edges of the narrow paths are gay with the white and pink coronals of *Anthyllis*, about which wasps are vigilant and bustling ; when in all waste places the blue flowers of *Veronica* mingle with the milk-white stars of *Stellaria*, and in the far distance a puce-coloured mass of peach-blossoms contrasts with the green willows ; when those long-beaked hairy flies, the *Bombylii*, hover over the hot narrow paths, like so many liliputian humming birds, and yellow-legged bees settle on the

sun-bright spots,—then you are startled in your walks by strange guttural noises, which seem to come from beneath your feet, but which proceed in reality from the Iris leaves which margin the river's brink.

There, moored in some secluded shallow spot, is seen a long roofed boat, shaped like Noah's Ark, with a sloping board leading into the reeds and sedges. A little boy watches all day long his greedy charges, keeping them in order by means of a slender wand with a bit of rag at the end. At daybreak down swarm the ducks into the frog-peopled swamp, and at sunset they are driven back, and waddle up the ladder to their house to roost.

There is a wide marshy plain at the junction of the Woosung and Yang-tsze rivers, with mud flats stretching away for miles. Here the uncouth buffaloes delight to wallow in the ooze; the white padi-birds stand in a row at the edge of the water; and far in the distance, like a sentry at his outpost, watches the gray solitary heron. A flock of teal settles down in the water, and the sparkling surface of the river is dotted with brown-sailed junks. A vole or a field mouse sometimes runs across your path, or the gliding form of a snake is seen vanishing in the grass. Towards evening frogs are demonstrative, and assert themselves; they croak loudly and without cessation, and leap by hundreds down the banks of the dykes and streams. Now these merry Batrachians are good for ducks, and Chinamen are particularly fond of *fat* ducks. The natural result is that at this "witching hour of night" silent boys and old patient men are seen in these frog-haunted precincts, a long bamboo rod in their hand and a string baited with a worm, angling for frogs! In my homeward walks, when the brown owl swoops down and settles on the cotton fields, and the huge black Copris flies across my face, I often fall in with an old man bending under the weight of a hamper of frogs, the produce of his evening's fishing.

ARTHUR ADAMS.

Shanghai.

Occurrence of rare Birds near Worcester.—At the commencement of the present shooting season a fine specimen of the hoopoe was shot by Mr. Pardoe, of the Yew-tree Farm, near Ombersley, in this county: it was stuffed by Mr. Brooks, of this city, in whose care it is at the present time: I was informed that another was seen in the same neighbourhood, and is being sharply looked after. About twenty-five years ago I saw one that had been shot near the Trench Woods, about seven miles from Worcester, and between that period and the present another was killed, I have ascertained, at another place about the same distance from this city, and is in the possession of Mr. J. Freeman, of Gaines, near Bromyard. But few rare species have been

met with latterly in this county. Three or four years ago a fine specimen of the pied flycatcher was killed at Ombersley, and also a beautiful gray phalarope was shot upon a pond near Martley, in this county, both of which fell to my lot and were added to my collection. During the last winter upwards of a dozen hawfinches were shot near and about this city,—a very unusual circumstance: one was killed in the garden of Sir Charles Hastings, a very central part of the city. Two years ago three tippet grebes were shot upon the lake at Westwood Park, the seat of the Right Hon. Sir John Pakington, Bart. Several large spotted woodpeckers have been killed in Worcestershire during the last three years, two of which came into my possession: I saw one that was a very beautiful and remarkable variety, having the scapular feathers and a portion of the back feathers of an intensely rich brown colour: I am sorry to say that my endeavours to obtain it were quite unsuccessful.—*Abraham Edmunds; The Tything, Worcester, September 15, 1862.*

The Lizard Snake in the Zoological Gardens.—In the last number of the 'Field,' under date of September 13, 1862, is a notice by Mr. F. T. Buckland of the capture of a specimen of the lizard snake (*Coronella austriaca*) in Hampshire, by Mr. Fenton, of the Royal Military College, at Sandhurst. The specimen was presented to the Zoological Society, and is to be seen, enjoying life and health, in the reptile-house in Regent's Park, where it occupies the fourth division from the end on the right side of the house. The most interesting part of Mr. Buckland's communication is the following letter from Dr. Gunther, confirming so entirely as it does what has been so repeatedly stated of the food of this reptile:—"A large male specimen of *Coronella lævis*, which I kept for a long time on account of its tameness, fed exclusively on lizards, never on mice or frogs. After having fed it for some time with ordinary-sized lizards proportionate to the size of the snake, I brought a very large specimen of *Lacerta agilis* to its cage, in order to try the strength of the snake. The lizard was immediately seized, but after a long fight, during which the lizard several times appeared to be entangled in the writhings of the snake, always managing, however, to free its head, which had been seized by the snake, the latter changed the point of attack, and got hold of the tail of the lizard. This of course broke off, and was devoured by the snake. From this time the snake always seized the tails of the lizards given him for food, without further attacking them, nor, if tailless lizards were put to him, would he attempt to devour them." Dr. Gunther adds that the lizard snake is a local species all over Germany and France, and in some places is by no means scarce; it frequents only dry places where lizards are found: it abhors marshy ground: it is a ferocious brute, but easily tamed." Mr. Buckland introduces his notice by announcing that "a new kind of British snake has been discovered," and repeats that it is "an entirely new British snake:" this is a manifest mistake: for the last three years the snake has been universally admitted as British, the earliest notices of its occurring in Britain being by Dr. Gray (Zool. 6730) and Mr. Bond (Zool. 6787).—*Edward Newman.*

Variety of the Turbot.—I saw in Truro fish-market, on Saturday last, a curious variety of the turbot, as to colour: the whole surface of the upper and lower parts

were of an uniform dark grayish brown, the under parts in no respect differing in tone of colouring from the dorsal surface. It was a two-thirds sized fish, and in very fine condition.—*Edward Hearle Rodd; Penzance, September 8, 1862.*

Characters of a supposed new Cyclas.—Having found a form of *Cyclas* in Battersea Fields, with which I was unacquainted, I showed it to several friends, to whom it seemed equally new, and as it does not entirely answer to any description that I have had the opportunity of seeing, I have endeavoured to give such an analysis of it as my inexperience enables me to do. The shell is small, very tumid, almost spherical, edges blunt, hinge ligaments not external, umbo produced, finely, deeply and regularly sulcated, occasionally iridescent, the colour also occasionally interrupted, as may be often seen in *C. rivicola*. The hinge-margins are not at all winged as in the typical form *C. cornea*. Colour, when young, yellowish horn, but becoming darker with age until it assumes a greenish olive with a yellow margin. Animal:—foot extremely long and narrow, perfectly white, no appearance of flesh-colour in any part; siphonal tubes rather short, dark yellowish brown; oral tube darkest and longest, not fimbriated, but jagged irregularly. In comparison with its allies it is dull and inactive in its motions, and in confinement appears to be exceedingly shy and nervous, withdrawing into its shell upon the slightest motion of the containing vessel, and I have even thought at times that those I had in confinement were aware of the approach of an opaque object toward the side of the small glass globe in which I kept them. The fry, both when expelled and in the matrix, were as large as from a large example of *C. cornea*. It differs from *C. cornea var. nuclea* in being more spherical and the umbos more produced. *C. cornea var. flavescens* I have not at present by me, but my recollection seems to be that the shape was more rhomboidal. Habitat:—ditches or field drains, black and somewhat foetid mud. The accompanying shells were *Planorbis cornea*, *P. contorta*, *P. complanata*, *P. vortex*, *Limnæus periger*, and a single example of *Cyclas calyculata*, but without the umbonal appendage. It may be nothing new; if so I have only to offer my apologies, and plead my inexperience to yourself and your readers.—*John E. Daniel; 10, Taigon Terrace, Clapham Road, London, S., September 5, 1862.*

Capture of a Recent Belerophina in the Indian Ocean.—The capture of a recent species of *Belerophina*, a genus imagined to be only found in a fossil state, and the representative of those great extinct Cephalopods which formerly disported themselves on the surface of primeval seas, must be an event worthy of record in the 'Zoologist.' During the monotony of long tedious voyages trivial objects are often invested with a strange fictitious interest. The otherwise unoccupied mind finds a dreamy pleasure in contemplating the few organic phenomena which present themselves. The vigorous leap of the Bonitoes, and the glittering bodies of the flying-fish as they drop exhausted one after the other into the water; the huge rolling bodies of unwieldy slack-fish, their dark skins rough with barnacles, moving through the water; the pretty white boatswain-bird, with his marline-spike of a tail, hovering round the glittering vane at the main-mast head; the azure glint of the dolphins shining through the deep pellucid water; a passing ship; the capture of a shark; a patch of floating gulf-weed, with its colony of sailor-crabs and little fishes; the spar of some lost ship, white with clustering barnacles; the clouds, the water-spouts, the changes of the wind, are all so many

incidents which are viewed and watched with absorbing interest. About one hundred miles from Java Head it is nearly a calm. A huge tree, torn by some tempest from its native forest, comes drifting by the ship, hoary with clustering *Lepades* and with swimming-crabs clinging to it, as shipwrecked mariners to a raft. Anxious about the barnacles, short-banded trunk-fish keep close alongside, making sudden onslaughts upon the helpless *Cirrhipedes*; a shoal of bright green parrot-fish hover in the rear; more lustrous still, three blue sharks dart about and around. In the distance a school of brown *Cetaceans*, round-backed and long-nosed, comes coursing along,—vaulting head downwards they wantonly pursue each other. On they go by fifties and by hundreds, leaping, tumbling and dashing the spray about, so as to cause the mast-headman to sing out from aloft, “Something like breakers on the starboard-bow.” The whole surface of the water is alive with those fragile lesser forms of being which constitute of themselves a peculiar pelagian faunula. You see the blue vesicle of *Physalia* and the indigo disk of *Porpita*; the pellucid bells and globes and mushroom bodies of the *Acalephæ*, and the glassy shrimps, *Erichtbus* and *Alima*. When, by means of a towing-net, these are assembled together in a vessel of sea-water the interest is doubled, for now we begin to discern the erratic evolutions of the *Entomostraca*, the steady progress of the small cerulean *Pontia*, and the skeleton-form of long-eyed *Leucifer*. These move almost invisible among the equally pellucid *Sagittæ*, true arrows darting, as their name implies, with rigid bodies through the water. And now uprise with flapping wings the globose *Cavolinæ*, and *Styliola* in her tube-like shell. But what, amid these varied examples of oceanic life, is that tiny floating bubble? It is nautiloid and yet no *Nautilus*, nor is there any keel to constitute it an *Atlanta*. It is a recent *Belerophina*!—*Arthur Adams*.

Temperature of Snails.—M. J. B. Schnetzler has been experimenting on the temperature of the terrestrial mollusks, and has arrived at some interesting results, which are recorded in the ‘*Bulletin Scientifique*.’ He began with the *Helix pomatia*, the large pale fawn-coloured snail, not uncommon in our lanes and woods, and which is considered fine eating by epicures abroad. In April, 1861, when the air was 12°.1 cent., a snail of this kind was a little warmer, 12°.5. In June, when the air was 23°.7, the thermometer, when covered with the snail’s foot, rose to 24°.7. A few days later, when the thermometer stood at 18°.7, it rose on being introduced into the snail-shell, and brought as near to the respiratory cavity as possible, to 20°. Irritating the muscles of the animal gave a further rise of .75. In July a lively *Helix pomatia*, by mere contact of its foot, raised the thermometer 2½ centigrade degrees.* Half an hour later the air rose one degree, but the snail remained the same. In September, after some snails had closed their shells for a month, a shower of rain came, and although they were kept in a room they woke up, but their temperature did not exceed that of the surrounding air. In January he placed two snails in the open air, having removed their operculum. During the night the temperature fell to 2° cent., but they were not injured; on a subsequent night at 8° they froze and died. Slugs have a lower temperature than snails. M. Schnetzler proposes to call these creatures “animals of variable temperature,” in contradistinction to mammals and birds, whose temperature is generally more equal, if we except the changes which hibernating *Mammalia* undergo. Mollusks may become colder than the air by evaporation from

* A degree of Fahrenheit is equal to five-ninths of a degree of the centigrade-scale.

their skin, and Dutrochet found that frogs became noticeably warmer in air saturated with aqueous vapour, and, consequently, suspending their evaporation. — ‘*Intellectual Observer*’ for September, 1862, p. 146.

Note on the supposed Discovery of a New British Mygale (Zool. 8172).— Mr. Robertson is evidently in error in recording the discovery of *Dysdera erythrina*, as a species new to Britain. If Mr. R. will refer to Zool. 6501 and 7563 he will see that it is there recorded by myself as “common under stones and rocks at Portland,” and “rare on Bloxworth Heath, Dorsetshire.” I have, since thus recording it, received a specimen from a London cellar, where it was captured, and kindly sent me by Mr. Edwin Shepherd, of 176, Fleet Street, and also from Mr. F. Bond, of Kingsbury, where he meets with it occasionally in his greenhouse. Moreover, these records by myself are by no means the earliest of its having been noticed as a British species, for Mr. Blackwall notices it (Linn. Trans. vol. xix. p. 128) as having been found in Manchester before the year 1835, and in that year at Cambridge. Subsequently also, in the ‘Annals and Magazine of Natural History,’ Mr. Blackwall says he has received it from Oxford, and that “Mr. Walker has met with it on the south coast near the sea-shore.” Supposing that Mr. Robertson’s spider is *Dysdera erythrina*, he is again in error in calling it a Mygale; Walckenaër, in his ‘*Insectes Aptères*,’ places it directly following the Mygalidæ, and, in my opinion, rightly so; Mr. Blackwall, however, conceiving that its normal number of eyes (six, instead of eight as in the Mygalidæ) should have greater weight than Walckenaër gives it, places this species at the head of his second great division of the Araneidea, based exclusively on the number of the eyes, and called “Tribe Senoculina;” so that in his arrangement the family Mygalidæ is the first, and that of the Dysderidæ nearly the last on the list (see Linn. Trans. vol. xviii. p. 601, where Mr. Blackwall gives his reasons for this, his primary division of the Araneidea). Is Mr. Robertson’s species *Dysdera erythrina*?—*O. Pickard-Cambridge; Bloxworth, September, 1862.*

Jumping Spiders.— Has it been ascertained by what means the jumping spiders are enabled to regain their hold when springing at a fly on a perpendicular surface? The direction of the spring must be more or less away from the face of the wall or window pane; gravitation would draw the creature downwards, and the attraction of matter for matter (which has been suggested) is not found, in practice, to influence light bodies dropped close to the face of a wall. May it be that a thread is attached to the holding-ground at the moment of the spring, which, by tightening, brings the spider back to the surface?—*George Guyon.*

New Group of Parasitic Crustacea.—Dr. Fritz Müller describes parasites of crabs, to which he gives the name of Rhizocephala (root-headed). He says, “The head of these apparent worms, which is inserted in the body of the host, emits roots like those of plants—hollow tubes, which, being much ramified, cling round its intestines, and their brood holds a middle place between that of the Lernææ and the Cirripedes.” The parasite of the Porcellana he calls Lernæodiscus Porcellanæ, and that of the hermit crab Sacculina purpurea. Further details will be found in ‘Wiegmann’s

Archiv,' 1862, or 'Annals of Natural History' for June. — 'Intellectual Observer' for August, 1862, p. 67.

Lepidoptera captured in 1862. — I have captured the following Lepidoptera during the present summer. The universally common species are of course omitted; of those marked * I have duplicates. In spite of the absence of sunshine many of the day-flying species were extremely abundant, especially in Ireland. Sugar I have found generally unproductive, contrary to my experience of former wet summers.

**Leucophasia Sinapis*, **Chortobius Davus*, **Thecla Betulæ*, **Zygæna Minos*. All abundant in the West of Ireland.

**Lithosia aureola*.

**L. caniola*. I have again had the pleasure of taking this novelty on the Irish coast. It flies softly soon after sunset, and again at dawn; it also comes sparingly to sugar. The larva is probably not exclusively lichenivorous: there is very little either of lichen or moss on the ground where the moth occurs; and Dr. Knaggs, who has succeeded in rearing it from the egg, informs me that in confinement it feeds freely on clover.

**Orgyia fascelina*. Larvæ abundant in May and June, on sallows on the sand hills at the mouth of the Mersey. The perfect insect appears to have very retired habits: I have never met with it at large.

**Lasiocampa Trifolii*, **Nyssia zonaria*, **Leucania littoralis*, **Eubolia lineolata*, *Rhodaria sanguinalis*, **Agrotis corticea*. All abundantly on the Lancashire and Cheshire coast.

**Mamestra albicolon*, **Agrotis cursoria*, *A. præcox*. Same localities, but much rarer than in former years.

**Agrotis Ashworthii*. At sugar, Llangollen.

A. lunigera, **A. Lucerneæ*, **A. porphyrea*, **Mamestra furva*. At light and sugar, on the Irish coast, occurred freely.

Cucullia Chamomillæ. At light, same locality. An addition to the Irish list.

Dianthæcia Nisus. On the Irish coast: occurred in June and again in August; whether a second brood, or only stragglers of the June brood, I am uncertain.

**Xylophasia scolopacina*, **Apamea connexa*, **Euperia fulvago*, **Amphipyra pyramidea*, **Erastria fuscula*, **Bankia argentula*, **Hydrelia unca*. At Killarney (the three last-named in profusion), in June.

Cymatophora fluctuosa. One specimen floating in a ditch at Killarney, June 20th. New to the Irish list.

Macroglossa Stellatarum. A specimen taken at midnight, June 18th; attracted to the lantern of a lighthouse elevated 130 feet. This seems a novel habit, and an unusual hour for this insect to be on the wing.

**Fidonia conspicuata*. Bred from eggs kindly sent by Captain Russell, from Suffolk.

**F. brunneata*.

Botys terrealis. At Llangollen, sitting on rocks.

**Sericoris littorana*. Irish coast, June and August.

**Spilonota amœnana*. Abundant on Cheshire sand hills, July.

Eupœcilia albicapitana. (See 'Annual,' 1862). Irish coast, June.

Scopula ferrugalis, *Ephestia elutella*, *Semasia rufillana*, *Cochylis Francillana*. Not uncommon on the coast near Dublin, August.

Among my captures in Ireland, during June, is a *Noctua* which does not appear to be referable to any known British species: it belongs to *Dianthæcia*, or some closely allied genus. Mr. Barrett has also a specimen of the same insect, captured by him in 1861, in the same locality.—*Edwin Birchall*; *Birkenhead, August 25, 1862*.

Occurrence of Argynnis Lathonia at Swanage.—A lady in this village kindly allowed me to examine a few specimens of British Lepidoptera taken at Swanage, in the summer of 1852, by her nephew, Mr. R. W. Barlow, then a boy twelve years of age. Amongst them I immediately recognized a pair of that rare butterfly *Argynnis Lathonia*, and of which, in your 'Natural History of British Butterflies,' you only record two captures. That these are genuine British specimens there cannot be the slightest doubt, but unfortunately one has lost a hind wing; the other is, however, a fair specimen. If you would like to see the perfect specimen, and could suggest a means of sending it safely, I would forward it to you for examination.—*Henry Reeks*; *Thrupton, Andover, August 30, 1862*.

[In answer to my correspondent's kind offer of sending a specimen, I replied that I should like to have an opportunity of examining it: it was therefore most promptly transmitted to me, and is most certainly an example of *Argynnis Lathonia*.—*Edward Newman*.]

Singular Variety of Pamphila Comma.—On Monday last I captured a beautiful variety of *Pamphila Comma*, an insect which has occurred here more plentifully this year than I ever remember it to have occurred before. My specimen has its fore wings milk-white, while the under wings are of a delicate green colour; the silver spots shine through on the upper side like gold. I should feel most happy to show this beautiful specimen to any entomologist who takes an interest in varieties.—*W. E. Parsons*; *New Road, Aylesbury, Buckinghamshire, September 6, 1862*.

Occurrence of Deilephila Lineata at Herne Hill.—I met with a very beautiful specimen of this insect on the 29th of April last, in our garden here: it was at rest near the edge of one of the beds, and looked as fresh as though it had just come out.—*W. J. Wild*; *Herne Hill, September 16, 1862*.

Occurrence of Sphinx Convolvuli at Cambridge.—This species has this year again made its appearance at Cambridge. I have heard of several specimens having been seen and one or two captured. An old woman brought me a fine male which she said she caught sitting on the palings of the houses at Park Side, Parker's Piece: when brought to me it was carefully wrapped up in a great piece of paper, so that when exposed to view it was in a rather dilapidated condition. At uncertain intervals this locality is rather prolific in this species, generally making its appearance some time in September, and again retiring about October or November.—*S. P. Saville*; *Dover House, Cambridge, September 15, 1862*.

Occurrence of Sphinx Convolvuli near Bury.—A fine specimen of the above species was brought me on the 8th inst., having been found by two little boys on the pavement in Peel Street, Bolton Street, Bury, Lancashire. The insect was in excellent condition, but has since been spoiled by an unfortunate accident.—*T. Pollitt*; *Gigg, near Bury, September 24, 1862*.

Occurrence of Charocampa Celerio at St. Leonard's-on-Sea.—A fine fresh specimen of the above insect flew into the workshop of a shoemaker in this town on Friday afternoon, the 12th inst., and was captured by one of the workmen, and brought to me alive and uninjured.—*Robert Kent*; *St. Leonard's-on-Sea, September 14, 1862*.

Zygæna Minos in Ireland: the Extermination Question.—*Zygæna Minos* was in great profusion in Ireland this summer, but did not appear until the first week in July, being fully a fortnight later than in the hot summers of 1858 and 1859. I hear it has also occurred on the west coast of Scotland, but not having seen any of the specimens I cannot speak as to their identity with the Irish insect. It is gregarious in its habits to a singular degree: you may examine twenty of the stony fields so characteristic of the west of Ireland, all apparently alike in vegetation and aspect, and not see a specimen except in one, but that one field will be positively crimson with this beautiful moth. Much has been said about the extermination of insects, from their wholesale capture by collectors,—more, I believe, than the facts warrant,—and though I sincerely join in reprobating any needless taking of life, I am inclined to doubt whether it is in our power seriously to diminish the number of many insects by the mere capture of specimens. As some evidence of this, in the case of *Zygæna Minos*, I may state that I have taken from one rocky field, of perhaps fifty acres in extent, upwards of 2000 specimens during the last five years, and that the insect was this summer more numerous than ever on the same ground. A female *Z. Minos* will lay about 200 eggs, so that after all my captures only amount to the produce of ten moths for one season, and has probably had no appreciable effect on the numbers of the insect. The destruction of woods, the alteration of the character of the soil and its vegetation by drainage, and the encroachments of human habitations, are far more fertile sources of destruction to insect life than the ravages of the collector; but I do not think that man, either directly or indirectly, is by any means one of the most powerful agents in the extermination of species, though no doubt his sword weighs when thrown into the scale. There seem to be not unfrequently causes at work which determine the scarcity of one species and the abundance of another closely allied in habit, which are quite inappreciable by us; for instance, the common Burnet moth (*Zygæna Filipendulæ*) occurs on the same ground as *Z. Minos*, but in vastly smaller numbers, probably not one *Z. Filipendulæ* for fifty *Z. Minos*. Who can say why an insect of such hardy habits and universal occurrence has not been able to get a stronghold in that locality, or what special enemy has put so effectual a check on its increase? I can honestly say I have not hurt a hair of its head. The difference of habit in *Z. Minos* and *Z. Filipendulæ* would seem to favour the latter insect, *Z. Filipendulæ* forming its cocoon on the stem of a plant safely elevated above the effect of the almost perpetual rain of the west of Ireland, whilst the cocoon of *Z. Minos*, placed at the roots on the surface of the ground, must frequently be under water, and would seem to be more exposed to the attacks of prowling beetles. Can it be that some insects are like some opinions,—more apt to thrive under a little wholesome persecution than when quietly let alone?—*Edwin Birchall; Birkenhead, September 16, 1862.*

[I very much agree with my correspondent's remarks on the extermination of species by the hand of man: as instances I may cite *Nematus ventricosus* (the goose-berry grub) and *Pieris Brassicæ* (the large white butterfly), to destroy which man's ingenuity and industry have been taxed in vain: it is a different thing when man destroys the habitat, drains a bog, empties a pond or converts the heath into a corn-field; then the pabulum of life is gone, and life goes also.—*Edward Newman.*]

Description of the Larva of Melanippe procellata.—A number of eggs of this species were kindly sent to me by a friend at Brighton, about the end of July last. They hatched almost immediately, and the following is a description of the full-grown larva:—Head flat, buffish brown and slightly hairy; on the head are two reddish lines,

which unite, forming, with the apex of the head, a distinct triangle; these are bordered by two other lines of the same colour, which approximate, but do not join at the second segment; commencing at this point are two lines of a burnt umber colour, which continue, more or less distinctly, down the back to the anus; within these is a finer line, as far as the fourth segment, of the same colour; this is followed by a distinct and intensely black spot; there are five of these spots, and the line uniting them is also black; the remainder of the line is a rich ochreous-brown, very clearly defined. In addition to the spots already named are others, very minute, deep black and surrounded by a white ring. The ground colour is dull whitish clay, more or less mottled, but the four posterior segments are much paler, almost white. The caterpillar, which is about an inch and three-quarters in length, tapers towards the head, and lies pressed close to the stalk, gauze, &c.: it feeds on the common clematis, and grows rapidly.—*Joseph Greene; Cubley Rectory, Doveridge, Derbyshire, September 1, 1862.*

[The reader is referred to my description of the same larva (Zool. 7252).—*Edward Newman.*]

Description of the Larva of Angerona prunaria.—The larvæ, from which the following description is taken, were beaten from clematis last autumn, at Woodbridge, in Suffolk; they consequently hibernate. Lead-colour. On the third segment a black dorsal line, which, on the fourth and fifth segments, dilates into a black blotch; in the centre of this and the next segment are two raised black spots; on the eighth a dark triangular mark; on the ninth a dark double-pointed protuberance: this is followed by two more raised black spots, and on the twelfth two more. The sides are mottled with dark shades and lines. Length two inches. During the autumn they fed on clematis as long as it lasted; they then fortunately ceased feeding, and in the following spring set to work on honeysuckle. It is a slow eater. The pupa, which is black and enclosed between two leaves, much resembles that of *Ennomos illunaria*.—*Id.*

Description of the Larva of Ourapteryx sambucaria.—The larvæ were taken at the same time and place as the above, and, like them, hibernated. It is difficult to give anything like a comprehensible description of them. General appearance long, slender and rigid, the ground colour being clay-brown. Head an exact representation in miniature of a "pork-pie" hat. On the sixth segment are two lateral protuberances; on the tenth a small dorsal one. The last pair of legs (or whatever they ought to be called) are very broad and flat; in fact, it may be gently insinuated that they are decidedly "splay," and extend to a considerable distance from the body. Two sharp points protrude from the anus. The position when at rest is very peculiar: it lies rigidly extended from the anus up to the fourth segment, when it suddenly becomes elbowed, forming an angle of about 90°. It is upwards of two inches in length. When full grown the larva (from which this description is taken) gnawed off some of the gauze, and, mixing it with bits of leaves, formed a tubular case, which hung downwards, resembling very much the pictures I have seen of the nest of, I believe, the tailor-bird; within this case the pupa hangs suspended by the tail, like a butterfly. The pupa itself is very long, like *Ennomos angularia*, and of a spotted gray colour.—*Id.*

Corrections in Mr. Newman's Description of the Larva of Ennomos erosaria.—In Mr. Newman's elaborate description of this larva (Zool. 8173), he observes that he can only notice its habits and food in confinement: this will probably account for some considerable discrepancies in his experience and mine. I have taken the larva, by beating, in Bucks, Suffolk and Hampshire, but invariably on oak: I have no doubt that, in its natural state, it feeds exclusively on that tree. What struck me, however,

in Mr. Newman's account, as quite opposed to my experience, was the period given by him for the full growth of the caterpillar, *viz.* the beginning of July: on no single occasion have I ever found the larva full fed before the *end* of that month; in fact, just about the period when Mr. Newman's moths emerged. The perfect insect itself I have frequently beaten out of oak, and, upon referring to my note-book, I find the earliest date to be the 14th of August. Mr. Newman, I am sure, will not regard these remarks as in any way reflecting upon his accuracy, but simply as a contribution to the history of the insect when in a "state of nature."—*Joseph Greene.*

[This is exactly the kind of correction that I desire. The larvæ being only known to me in a state of captivity, I saw the almost inevitable necessity for some emendations both as to food and date. I shall be extremely obliged for specimens of *Ennomos erosaria* in the perfect state for the cabinet of the Entomological Club: I have not one tolerable specimen.—*Edward Newman.*]

Description of the Larva of Tephrosia crepuscularia.—Eggs laid in July, and hatched the beginning of August. Larva rests in a nearly straight posture, the middle segments sometimes arched, and the head porrected. Head narrower than the body, having a deeply impressed triangle on the face. Body almost uniformly cylindrical, but having the 3rd segment swollen all round, and the 4th segment swollen below, the swelling bearing the third pair of legs; there are two small warts on the back of the 12th segment, and the 13th segment has three short mamillary points below the anal flap and directed backwards: skin of the body much folded transversely. Colour of the head brown mottled: colour of the body wainscot-brown, with six very narrow and very indistinct darker rivulet stripes extending the entire length of the back; these are associated in three pairs, the stripes in each pair being closely approximate and in some parts scarcely separable; on the 6th segment the lateral stripe ascends obliquely towards the median line of the back; between each pair of stripes are several black dots; the sides of the larva exterior to these stripes are paler, especially on the 7th, 8th and 9th segments, and the back of the larva is manifestly darker on the 8th segment; there is a triple yellow spot on each side of the 10th segment close to the ventral claspers. The legs are brown, the claspers paler. Feeds on *Pinus Larix* (larch), *Betula alba* (birch), and *Quercus Robur* (oak), and is double-brooded; the larva of the second, which is now described, is full fed at the end of September, when it descends to the ground and spins a slight web, generally among fallen leaves, where it changes to a pupa, in which state it remains all the winter. The first brood of this species used to swarm in the larch plantation nearly opposite the Inn at Birch Wood Corner in March and April, but since these trees have been cut down the species has disappeared. Eggs laid by the spring females produce moths, in confinement, in July and August; but I have never seen the summer brood at large, and Mr. F. O. Standish has made the same remark to Mr. Doubleday, who has bred the early brood in February; but it may be remarked, as a general rule, that insects appear earlier in confinement than at large. I am indebted to Mr. Thomas Hockett for the opportunity of describing this insect.—*Edward Newman.*

Description of the Larva of Boarmia biundularia.—Egg laid by a captured female from the 21st to the 27th of May; larvæ hatched on the 4th and 5th of June. Rests in a nearly straight posture. Sometimes the middle segments form an arch, as in walking. Head semiporrect, narrower than the body, with a deeply impressed triangular mark on the face. Body almost uniformly cylindrical, but with the 3rd segment swollen above and at the sides, and the 4th segment swollen beneath, and

having the 3rd pair of legs seated on the swelling; the 12th segment has two very small warts on the back; and the 13th segment beneath the anal flap has three short mamillary points directed backwards, the middle one acute, the lateral ones obtuse: the skin of the body is a good deal folded transversely, so as to give the segments the appearance of being subdivided into rings. The colour of the head is brown and mottled; in some specimens the darker tints form two conspicuous patches on the upper part of the face, nearly on the crown. Body particoloured; there is a very broad stripe down the middle of the body, and this contains and includes a number of darker longitudinal markings, especially conspicuous on the 2nd and 3rd segments, where they form two approximate parallel lines almost black; the dorsal surface of the 8th segment is darker, and the dorsal surface of the 7th and 9th segments lighter than the remainder of the back, and each of these three segments, that is, the 7th, 8th and 9th has a median dark spot transversely elongate and enclosed in oblique lines that seem faintly to indicate the lozenge-shaped markings, so usual in *Melanippe* and other genera of *Geometræ*: there are, moreover, several minute black dots in pairs on the back: on each side of the broad median stripe is a narrow black stripe, which is double throughout its length, but its two component parts are so close together on most of the segments that they appear united, while on the 9th and 11th segments they are separate and quite distinct, and they terminate in the anal warts on the 12th segment; this black stripe bends obliquely towards the back of the 6th and 7th segments; beneath this double black stripe is a yellow stripe on each side, which includes the spiracles; this yellow stripe is rather obscure on the 2nd, 3rd and 5th segments, but very distinct in the 6th, 7th, 8th and 9th segments, and on the 10th it descends into the ventral claspers: there is a rosy or reddish tinge on the anterior margin of the 2nd, 3rd and 4th segments, on the sides of the 6th, 7th and 9th segments, and on the anterior margin of the 10th, 11th and 12th segments; the ventral surface below the yellow stripe is very dark, in some specimens quite black, with a median pale stripe extending throughout its length; in some few specimens, however, this paler median stripe is obliterated: the under surface between the ventral and anal claspers is pale; the legs are brown mottled, and the claspers pale brown. These larvæ vary exceedingly, but more in the colour than the disposition of the markings. The usual food-plant is *Quercus Robur* (oak), but it feeds freely on the leaves of the plum in confinement; the larvæ were full fed on the 9th of July. Mr. Doubleday thinks this species is partially double-brooded, and Mr. F. O. Standish also every year takes specimens of the second brood. I am indebted to Mr. Wright for a most liberal supply of these larvæ. In this and the preceding description I have endeavoured to bring together all the information at hand respecting two insects which many entomologists, especially on the Continent, seem to regard as constituting but a single species; this, however, is not the opinion of our greatest English Lepidopterist, Mr. Doubleday; and it would ill become me to say a single word on a subject which our highest authorities are unable to settle: I may, however, state that the larvæ appear to me almost as difficult to distinguish as the perfect insects; that of *B. crepuscularia* has a yellowish tinge, that of *B. biundularia* a grayish tinge; the latter is a more variegated and ornamented looking larva.—*Edward Newman.*

Food-plant of Eupithecia virgaureata. — I have been breeding *Eupithecia virgaureata* from larvæ I found in Devonshire last year. The greater part came out in May or June, but a second batch are coming out now (from larvæ found at the same time as the former). I figured the larva, and have found a few here, all on *Senecio*

Jacobæa : of the number I took in Devon I only found one on *Solidago virgaurea*. — *Henry Moore ; Albury, Surrey, September 6, 1862.*

Eupithecia debiliata — I have great pleasure in adding to the testimony of the Rev. E. Horton (Zool. 7969) concerning the food-plant of the larva of this insect; for although I have taken a good number of the insect this season, yet in no single instance did I take one where *Vaccinium Myrtillus* did not grow. I have also taken the insect on Chat Moss, on a spot where *Vaccinium Myrtillus* was growing. — *Charles Campbell ; 325, Rochdale Road, Manchester, August 25, 1862.*

Larva of Eupithecia debiliata. — I am told that a number of specimens of *Eupithecia debiliata* have been taken this summer in Burnt Wood, Staffordshire. The larva of this pretty and local species is at present undescribed and unknown. It should now be full fed. If this should meet the eye of any entomologist residing in the neighbourhood of Burnt Wood, might I ask him to spend a spare hour in beating all the tall-growing flowers in the wood, and sweeping all the low-growing ones? I think he would be almost certain to get the larva of *E. debiliata*. If he is disinclined to try his own hand at pug-breeding, and will send the produce of his labours to me, I shall be most happy to do my best to rear the larvæ and share the results. I imagine *Vaccinium Vitis-Idæa* or some species of *Melampyrum* will prove to be the food-plant, but it is mere conjecture, for I was never fortunate enough to meet with the insect, and only possess one specimen. — *H. Harpur Crewe, August 21, 1862, in the 'Weekly Entomologist,' p. 19.*

Double-broodedness of Eupithecia virgaureata. — During the month of May, Mr. D'Orville, of Alphington, kindly sent me a number of impregnated eggs of *Eupithecia virgaureata*, laid by females bred in confinement: these hatched in the course of a few days. I supplied the young larvæ with flowers of *Anthriscus sylvestris* (common parsley): upon this they fed, and had all spun up and turned by the end of June. They were in colour and general appearance almost precisely the same as the ordinary autumnal larvæ which I have been in the habit, for some years past, of taking upon *Solidago virgaurea* (golden-rod), in September and October. The perfect insects began to emerge during the last week in July, and had all come out by the end of the second week in August. They were rather smaller and darker in colour than the spring brood. I obtained impregnated eggs by putting a sprig of golden-rod in a bottle in the breeding-box. They hatched in a few days, and the young autumnal brood are now feeding upon flowers of *Senecio Jacobæa*. — *Id.*, p. 18.

Larva of Eupithecia pulchellata. — The larva of this beautiful species is at present quite unknown. It is taken in some localities pretty freely, flying over the unexpanded buds of *Epilobium angustifolium* (the large narrow-leaved willow-herb) in woods. It is possible that the larva may feed afterwards upon the flowers and seeds. It is at any rate worth going to try and find it out. A [bred] set of *E. pulchellata* would be a splendid addition to the cabinet. If any of your readers live in or near a locality where this plant abounds, will they kindly take a stick or umbrella, and beat the flowers and seeds well? If they get any larvæ let them take all the pains in their power to rear them. If they will send me one or two to look at, so much the better. — *Id.*, p. 19.

Is Eupithecia tripunctata double-brooded? — The larva of this insect appears upon the flowers of *Angelica sylvestris*, during the month of September and the beginning of October. It is not usually full fed till towards the end of the month. The perfect insect, in confinement, invariably appears early in May, sometimes at the end of April.

It seems scarcely possible that this spring brood of moths can be the parents of the autumnal larvæ; and I cannot help strongly suspecting that, like *E. virgaureata*, there is an intermediate summer brood, the larvæ of which feed upon some other plant. I have never yet been able to obtain eggs of this insect in confinement, and I never took the perfect insect till the day before yesterday (August 19), when I found a fine female sitting upon the wall of a wooden house near a wood, where I am in the habit of taking the larva in September. I conceive this to be an individual of the summer brood. Upon going into the wood, and examining the unexpanded flower-buds of the Angelica, I found eggs of either this species or *E. trisignata*.—*H. Harpur Crewe*, in the 'Weekly Entomologist,' p. 19.

Cidaria immanata.—About the end of July my friend Mr. D'Orville bred a very fine specimen of *Cidaria immanata*, from a larva which he had taken on the 29th of April, feeding on *Fragaria vesca* (wild strawberry). It was then very small indeed, but fed up well, and became very like the variety of the larva of *Cidaria russata*, which has no red spiracular line, being, according to Mr. D'Orville's description, of a yellowish green colour, with darker green dorsal line and yellow segmental divisions, and furnished with two anal points. That there might be no doubt about the species, the moth has been sent to Mr. Doubleday, and he pronounces it to be undoubtedly *C. immanata*, and tells us it is the only bred specimen of that species he has ever seen. I see by my note-book that I had several larvæ of *C. russata* brought me this spring—that is, from the middle of March to the middle of April—which had been found feeding on dock and other low plants; but these were then nearly full-grown, and many of them were changed to pupæ by the time Mr. D'Orville found his little larva; and the moths from them all appeared during the second fortnight of May, *C. immanata* of course at that time still continuing to feed in the larva state. I should not be surprised if it is found that the eggs of *C. immanata*, though laid in the autumn, do not hatch till next spring, and that in this respect it resembles its congeners, *C. prunata*, *C. testata* and *C. populata*, which, as far as my experience goes, remain in the egg till March or April. Any how, I think Mr. D'Orville has given us a clew which may lead, next spring, to this species becoming better known in its earlier stages than it seems to be at present. As to its food, it can scarcely be confined to one plant: probably, like *C. russata*, this species is polyphagous; but the chief thing to be noted is the *time* of its appearance as a larva, and this would seem to be the end of April and the greater part of May, the very time when the first brood of *C. russata* is on the wing in the perfect state. May I be allowed to append to this note an appeal for eggs or larvæ (wanted for figuring) of *Cidaria psittacata*, *C. corylata* and *C. sagittata*? If any one will kindly supply me with any of these species, I will gladly pay all expenses of postage, and make him the best return in my power.—*J. Hellins, Exeter, August 18, 1862, id.*, p. 20.

Occurrence of Lobophora polycommata at Albury.—Two days ago I took a torn specimen of *Lobophora polycommata*. Are not both the time and place somewhat unusual?—*Henry Moore; Albury, Surrey, September 6, 1862*.

Is Thyatira Batis double-brooded?—Last September I took three very fine specimens in perfect condition, and at the beginning of August this year I found two larvæ, which I was obliged to leave, having no opportunity then of feeding them.—*Id.*

Acronycta Alni at Tavistock.—On the 8th inst. I was at Tavistock, on the occasion of the field-day of the Devon and Cornwall Natural History Society, and, having lost the rest of the party, I and Mr. Reading strolled along the banks of the Tovey,

and after we had been among the bushes for a short time I found a larva of *Acronycta Alni* on his coat. This I tried with various kinds of food, but it refused all, and died apparently of inanition.—*R. McLachlan*; *Forest Hill, September 18, 1862.*

Economy of Acronycta Alni.—Going along a sandy lane here on September 1st, I observed what appeared to be sawdust sprinkled on some bramble-leaves. I thought it probably the work of a larva, and so looked for some stem whence it might have fallen. I now found an old dead bramble-stick, one end of which was hollowed. I split this down about a couple of inches, and disclosed a full-fed larva of *Acronycta Alni*. On looking at it two or three days later I found it had changed. The pupa is a rich deep chestnut colour, and its head uppermost in the stem. There is no appearance of silk or cocoon, and the thin layer of pith above the pupa is very slightly stuck together.—*Henry Moore.*

Xylophasia scolopacina near Hythe.—I beat out a specimen of this northern species at Saltwood Castle, near Hythe, Kent, in the last week in July. Probably it has never before been taken in this country so far south. Contrary to rule, it was very much darker than the northern examples.—*R. McLachlan.*

Description of the Larva of Epunda lichenea.—Head obviously narrower than the body, extremely shining, but emitting several slender hairs; body uniformly cylindrical, obese, smooth, but emitting a very few, very distant, short and fine hairs; these are only discernable under a lens. Head olive-brown, tessellated with paler markings: body dull olive-brown on the back, pale transparent olive-green on the belly, and having a paler stripe dividing the two colours, and including the spiracles; the back has a series of somewhat lozenge-shaped marks down the middle, and on each side of each of these is a shorter oblique paler mark, the whole of these markings being obscure and indistinct, yet viewed together constituting a dark median stripe, with a paler and intercepted stripe on each side: the legs are shining, the claspers opaque; both pellucid, and of an orange-green colour. The egg is laid on *Senecio Jacobæa* (ragwort) in August, and hatches in September, and the larva hibernates while very small: in confinement it feeds freely on *Senecio vulgaris*, and is full fed in May. Mr. Lynch kindly handed me two of these larvæ, which he had received from Mr. Fereday; one of them of the colour described above; the other of an uniform green tint, the markings scarcely distinguishable.—*Edward Newman.*

Remarks and Observations on the Red Ant.

By Captain HENRY HADFIELD.

ON the 4th of July, about noon, I observed a number of ants foraging; they quartered the ground as pointers might do in hunting for game, and, like that animal, are, I am inclined to believe, guided or attracted by scent; moreover, they appear to follow in the track of others by the same means, for I frequently noticed, after the passing of one or more over or along the path, others—though several seconds might have elapsed—taking exactly the same course, and not unfrequently pausing or halting at precisely the same spots as their predecessors. I also remarked that in carrying off their prey

they would occasionally halt, as if bewildered or uncertain which way to proceed, and then often double back in the opposite direction. I was at a loss to account for this, unless, as I have suggested, they are guided by scent, which might be overpowered by that arising from the object in hand. This reminds me that though they neither shake hands nor rub noses, they have a somewhat similar practice, seldom meeting without a friendly salute or recognition, at which time the quivering antennæ are momentarily crossed, whether receiving or imparting information I will not venture to say, but doubtless there must be some object in it. When an ant discovers some prey or victim it is astonishing how quickly others congregate, though they soon disperse on finding their services are not needed. One I saw go up to another and quietly relieve it of its burden, the latter apparently satisfied of its being in safe hands. Another I saw attempting to kill a small slender dusky caterpillar of about a third of an inch in length, having three longitudinal light stripes on the anterior part of the back and sides; it resisted, endeavouring to shake its assailant off, but all to no purpose; the ant, holding on with the tenacity of a bull-dog or blood-hound, was carried off by the caterpillar till another ant joined in the attack. I then came to the rescue, and with a blade of grass endeavoured to rid it of its tormentors, but it was not till I had taken up another, stronger and stiffer, that I succeeded in doing so; but by this time the caterpillar's strength was failing. Many insects were passed by unnoticed or unheeded, worms or caterpillars never. One of the latter had a very narrow escape: descending from a privet by its web it alighted on a walk where there were but few ants prowling; it was seized on at once by the tail, but before they could get a firm hold the caterpillar, suddenly bowing its back, jerked itself backwards, throwing its assailant a considerable distance to the rear; then redoubling its speed, it succeeded after many narrow escapes in gaining the shelter of a neighbouring bank, on to which it climbed, assisted by a sloping blade of grass. On revisiting the spot at intervals during the afternoon I found them employed as before, and even as late as 8 P.M., though decreased in number, they were as active and busy as ever, and I continued to watch them as long as the failing light admitted of my doing so. On returning, at a quarter past 10, I observed by candle-light a few running up and down as before, though a slight drizzling rain was falling at the time: at half-past 11 there were still a few remaining; one I stopped carrying a load, which it dropped at once; on taking a last look, a little after midnight, they had not all retired, notwithstanding the rain had increased.

July 5th, 8 A.M. Found a small party of ants at work; one I found carrying a large burden, which it let fall on being touched; it was a white, semitransparent mass, about the size of the egg, and not unlike a grub of some kind, there being at the extremity a small curved head-like projection of a brownish colour: another carrying off a dead soldier I likewise stopped, but instead of dropping its victim it struggled hard to retain it, hurrying on faster than ever, but I finally succeeded with a stem of grass in drawing the dead body from its grasp, but not until one of the antennæ had been broken off at the head or angle and the near hind leg injured, causing it to go limping away, though it soon recovered of this, and, notwithstanding the loss of the antenna, seemed little the worse for the encounter: it had been dragging the body with and by the antennæ, but, on meeting with any obstacle or impediment, one of the fore legs was frequently raised to assist in getting over it. One fine-looking soldier, of a lighter chesnut-brown, though of the same size as the rest, I observed polishing itself off: beginning at the head, which was held down for the purpose, it frequently passed the hand-like antennæ over it, then squatting down and thrusting the posterior forward, so that it could readily be laid hold of by the antennæ, it was seemingly pressed, as if for the purpose of extracting oily matter wherewith to anoint itself. I observed it do this two or three times in the course of as many minutes.

July 6th. Watched, for half an hour or more, a party of ants taking their morning repast off a worm but recently killed, for the blood was oozing from it; it was partially coiled up, forming a half-circle, within which the ants had chiefly collected, though some were on the body, mostly towards the anterior part, which was discoloured and swollen. Here they had already managed to make some incisions; in fact, deep cavities, into which the head was thrust, apparently to suck the blood, for during this operation there was no discernible motion, whereas when feeding on the flesh there was a constant lateral motion of the head, giving each side of the jaw alternate play. One had managed to cut out and almost sever a solid lump of flesh, but the tenacity and elasticity of the skin was such that its efforts to gnaw through it were in vain; it then tugged at it, but with no better success, for though greatly distended it did not snap: a comrade, seeing this, went to its assistance, and began gnawing away at the part nearest the body, while the other pulled with all its might, assisted by the antennæ and occasionally by its fore legs, the centre ones being thrust out at a right angle with the body, the hind legs thrown back to their greatest stretch and wide apart. After

feeding I observed that the antennæ, mandibles and fore legs were successively cleansed; they are seemingly most careful in doing this, and in brushing off any dirt or dust. The repast was a most orderly and peaceful one; though occasionally walked over and trodden on they did not appear to resent it, and if noticed at all it was by a mere raising of the antennæ. One I saw dragging off a dead ant, but being frequently impeded by the inequality and roughness of the road, it relaxed its hold, and stepping back the body was poised and raised on high with the greatest ease imaginable, though about twice its own size. Dr. Carpenter says that the soldiers of this species are "nearly three times the size of the workers," and "rather differently formed from the rest."

It is astonishing how few are killed or even injured by pedestrians; however, it is but a small portion of the foot that comes in contact with the ground, owing to the projection of the heel, ball of foot, nails, &c.; besides ants are so strong and tenacious of life: their muscular organization is truly wonderful, enabling them to carry, with the greatest ease, objects many times their own size and weight, and that, too, up-hill and down-hill, and for any distance. Not having devoted much time to the study of ants, I was not aware of their being so nocturnal in their habits as to be foraging at midnight, and of a dark, wet night, too. Even supposing them to be but eighteen hours on the run the distance traversed must be very considerable, for, allowing but two feet a minute (a moderate calculation) it would in the time specified amount to nearly half a mile.

A worm having strayed on to a path was attacked by ants; one, though mounted on its back, was seemingly unnoticed at first, as the creature went wriggling on as before, till, being wounded, it sprung or jerked itself up, tossing its assailant well to the rear, but it soon renewed the attack, and, with the aid of a glass, I could see its huge curved mandible laterally opened to its greatest stretch, and then brought down on the back of the worm, causing it to writhe with pain. This was repeated with great regularity, not unlike the measured strokes of a machine. Other ants having joined in the assault I put an end to it by removing the worm to a place of safety. Some ants I observed endeavouring to carry off a dead worm, and though an inch or more in length three of the number sufficed to move it, but it was not until the party had been increased to ten or a dozen that they succeeded in dragging it off, on account of the obstructions, the chief of which being two lumps of hard earth adhering to its side and tail. Seeing this, one seized hold of the latter or smaller fragment, which

not giving way readily the ant was dragged on with it. The larger piece two or three ants were most perseveringly endeavouring to detach, but, like the former, were drawn along, though exerting their utmost powers to keep a footing; this of course was a great hindrance, but ultimately it gave way, too, when the advance was greatly facilitated. During this operation I observed one ant go up to another and drag it along by the antennæ; there was no resistance offered, nor, when released, was the liberty resented: what the object of it was I could not discover; possibly a lazy or refractory member of the community was being thus forcibly recalled to a sense of duty. A lame or sick ant that went halting along was noticed by all comers, some going up to it and feeling it carefully, passing the antennæ over every part; others would accompany it for some distance: all seemed ready to aid or comfort it. I saw two soldiers carrying off a warrior of the yellow species; one had seized it by the base of the antennæ, the other had laid hold of the body, the prisoner resisting stoutly, and clinging with the greatest tenacity to any inequality in the road, causing frequent halts; the force with which it was dragged along doubled the body, which seemingly was in danger of snapping: having obliged its assailants to desist and remove it to another spot, it endeavoured to escape, but was again captured, this time by a single soldier of the red species, which, turning it over on its back and raising it up, would have walked off with it had it been allowed to do so, but, thinking it sufficiently persecuted, it was placed in security, apparently uninjured, except having one of the antennæ bent or distorted.

HENRY HADFIELD.

Ventnor, Isle of Wight.

Coleoptera in Coombe Wood. — The strict preservation of this old hunting-ground has so increased the number of pheasants, that insects may reasonably be expected to be not so plentiful as they used to be. Lepidopterous larvæ are so easily picked up by birds that few arrive at their perfect state, and butterflies and moths appear very scarce; but beetles are so inconspicuous, and protected by position in their earlier stages; that they do not seem to have become any rarer. I have taken the following species during the past season, among many others:—*Notiophilus rufipes* (not uncommon under dead leaves where large stones are underneath them), *Myrmedonia limbata* (47), *Atemeles emarginatus*, *Aleochara mycetophaga*, *Bolitochara bella*, *Haploglossa nidicola*, *Callicerus rigidicornis* (8), *Gyrophæna pulchella*, *Mycetoporus clavicornis*, *Philonthus carbonarius*, *P. punctiventris* (in profusion under cut grass), *P. Puella*, *P. decorus*, *Stenus fuscicornis*, *Oxyporus rufus*, *Choleva spadicea*, *C. nigrita*, *Leiodes humeralis*, *Amphicyllis globus*, *Scaphidium quadrimaculatum*, *Dendrophilus punctatus*, *Meligethes memnonius*, *M. erythropus*, *Læmophæus duplicatus*, *Cercus bipustulatus* (not uncommon on *Epilobium*), *Dermestes vulpinus*, *Byrrhus dorsalis*,

Melasis hyprestoides, *Diacanthus holosericeus* (very abundant on oak-shoots, and especially where oak-galls are rotten), *Malthinus frontalis*, *Ochina Hederæ*, *Mordellistena abdominalis*, *Conopalpus testaceus* (both sexes out of oak-boughs), *Abdera quadrifasciata* (ditto), *Rhynchites megacephalus*, *Apion minimum*, *A. Spencii*, *A. ebeninum*, *A. rubens*, *Balaninus turbatus*, *Orobitis cyaneus*, *Cænopsis Waltoni*, *Nanophyes Lythri* (swarming on *Salicaria*), *Acalles ptinoides*, *Pachyrinus quadrituberculatus*, *Orchestes avellanæ*, *O. ilicis*, *Coccinella hieroglyphica*, *Tritoma bipustulatum*, *Scymnus capitatus*, *Aspidophorus orbiculatus*. On the Thames bank near Hammer-smith Bridge (Surrey side), *Anchomenus scitulus*, *Trogophlæus arcuatus*, *Stenus nitidiusculus*, *Lesteva punctata*, *Errirhinus Festucæ* and *Tachyerges Saliceti* have been very abundant; and I also took the following:—*Bembidium gilvipes*, *Stenolophus exiguus*, *Clivina collaris*, *Gallicerus obscurus*, *Ilyobates forticornis*, *Achenium humile*, *Ooalea rivularis*, *Baridius picicornis*.—*E. C. Rye*; 284, *King's Road, Chelsea, S.W.*

Bradycellus collaris.—Any coleopterous readers of the 'Zoologist' will do well to examine their specimens of this insect; all that I have seen are nothing but small *B. harpalinus*. Dawson notices the great similarity of *B. collaris* and small examples of *B. fulvus*, and, as he has confounded *B. harpalinus* with the latter species, it is no wonder that he found this resemblance. It seems doubtful whether we have *B. collaris* at all (if indeed it be a distinct species).—*Id.*

A curious Habit of Agabus uliginosus.—I was one morning last week searching along a pond-bank, after a heavy shower of rain, for some Chrysomelidæ which I found frequenting the flowers of the common buttercup, when my attention was drawn to a dark creature attached to the stems of some high grass which grew near. Thinking it was one of the genus *Carabus*, I picked it off, when, to my astonishment, it proved to be *Agabus uliginosus*. Making further search, I soon found several others in a similar position. They had all climbed the grass-stems as high as they would bear (some eight inches), in fact till they began to bend with the weight; and these *Agabi* appeared to be holding on tight by their fore legs, and, with their heads drawn inwards, to be revelling in the hot sun. That such an apparently clumsy beetle as the *Agabus* should perform such a feat as this is a circumstance I think worth recording; and it also explains the mystery of this insect being sometimes found in the bottom of the net when sweeping long grass and herbage by the side of ditches. The *Agabi* appear to be fond of sunning themselves, for I have often found *A. maculatus* on the top of a stone wall, evidently enjoying the blaze of a July sun, and where it could only have got by using its wings; but attached to the uttermost part of a blade of grass is the last place I should ever have thought of for searching for any of this family.—*V. R. Perkins*, in 'Transactions of the Tyneside Naturalists' Field Club.'

Acentropus niveus: its Characters and Affinities.—Having been myself one of those who ventured a rash guess that this insect was lepidopterous, and this guess having possibly influenced the opinion of some subsequent writers on the subject, I beg to retract, withdraw and cancel this or any other guess I may have ventured, and to admit that I never ought, with such very insufficient knowledge, to have published them. My attention has been again called to the subject by Mr. Cooke's observations (Zool. 8085), which I have read with the most careful attention, but which seem to me to leave the question as far off a solution as ever. Various guesses are adduced in support of the lepidopterous hypothesis. Mr. Westwood has discovered scales, but there are no such scales on the wings of any lepidopteron; scales far more like those of *Lepidoptera* occur on the elytra of a thousand beetles: moreover, the character of

“wings clothed with scales” applies only to a portion of the Lepidoptera, the large and heterogeneous family at present called Psychidæ having both wings and bodies clothed with hairs exactly after the manner of the Phryganidæ. The thorax in Acentropus is furnished with tippets, and certainly this is the case in the most conspicuous groups of Lepidoptera; but does it obtain throughout? are the Psychidæ thus provided? Again, the hind wings are said to have a bristle, but this will tend as much to unite Acentropus with the Hymenoptera as with the Lepidoptera. Lastly, Mr. Brown is quoted as stating “The pupa-case puts the relationship of the Acentropus beyond a doubt; it is clearly the chrysalis of a moth” (Zool. 5919); but neither Mr. Brown nor Mr. Cooke state in what characters the pupa of a moth differs from that of a Phryganea. In fine, viewing the question under the cross lights thrown on it by the various guesses hitherto published, we are compelled to admit that no progress whatever has been made towards settling the question; and I fear I cannot concede that Mr. Cooke has taken a single step in the right direction. The proper mode of proceeding in such a case as this is the following:—

1st. Give a life-history of Acentropus: describe its egg, larva, pupa: define economy, food and metamorphosis.

2nd. Describe the imago: its mouth, wing-rays, thorax and legs should have especial care bestowed on them.

3rd. Define the difference in economy, metamorphosis and structure between a lepidopterous and phryganidous insect, taking universally-acknowledged types, as *Sphinx Ligustri* and *Phryganea grandis*.

4th. Institute the most rigid comparison between Acentropus and these two insects, and give the result of the comparison.

Above all things, come to the task quite unprejudiced: throw overboard all the guesses of others and all the leanings of your own mind, and give your verdict solely on the evidence before you.—*Edward Newman*.

Proceedings of Societies.

ENTOMOLOGICAL SOCIETY.

September 1, 1862.—JOHN LUBBOCK, Esq., V.P., in the chair.

Donations.

The following donations were announced, and thanks ordered to be given to the respective donors:—‘The Zoologist’ for September; presented by the Editor. ‘The London Review’ for August; by the Editor. ‘Journal of the Society of Arts’ for August; by the Society. ‘Sitzungsberichte der Königl. bayer. Akad der Wissenschaften zu München,’ 1862, Part 1; by the Academy. ‘Reise nach Mossambique,’ von Dr. Peters (5ter Band, Insekten und Myriapoden); by J. W. Dunning.

Election of Members.

Beriah Botfield, Esq., M.P., F.R.S., &c., of Norton Hall, Daventry; Edmund Walcott, Esq., of the Oriental Club, Hanover Square; and Peter Inchbald, Esq., of Storthes Hall, Huddersfield, were elected Members of the Society; and Wm. Philipps, Esq., of Reigate Lodge, was elected a Subscriber.

Exhibitions, &c.

Mr. Bond exhibited a female specimen of *Sphinx Nerii*, taken at rest in a garden at Hastings on the 2nd of August last; and specimens of a *Tinea* which he considered to be *T. confusella*, now for the first time taken in England, though it had previously occurred in Ireland. Mr. Stainton, however, was of opinion that the species was *T. nigripunctella*.

Mr. Bond, on behalf of Mr. Piffard, exhibited specimens of a *Tortrix*, apparently of the genus *Spilonota*, taken on the trunks of poplars near London, in June: the perfect insect concealed itself in the chinks of the bark, and was very sluggish. A description of the insect, by Dr. Knaggs, under the name of *Spilonota Doubledayana*, *n. sp.*, was read.*

Mr. Stainton exhibited a living specimen of *Zelleria hepariella*, and called attention to its position when in repose, resting on the four anterior legs, the hind legs being elevated by the side of the abdomen, and with the head downwards, like an *Argyresthia*. Mr. Stainton remarked that the pertinacity with which this species had been referred to the genus *Gracilaria* was rather singular; it formerly did duty in all British collections as *Gracilaria rufipennella*, and since that error had been pointed out, and a new genus, *Zelleria*, created for it in the family *Argyresthidae*, the insect had actually been twice described as a *Gracilaria*—by Gregson as *G. Haighii* (*Zool.* 5295), and by Herrich-Schäffer as *G. taxella*, in his 'Schmetterlinge von Europa.' The specimen exhibited had been obtained by beating yew trees on Mickleham Downs, during the previous week.

Mr. Stainton also mentioned, as showing the progress that Entomology was making in other countries, that he held in his hand a list of the entomologists of Canada, who were thirty-six in number.

The Secretary read a letter addressed to him by Miss Farington, of Woodin Hall, Preston, Lancashire, requesting information as to the name, habits, and best mode of extirpation of a small beetle which occurred in prodigious numbers in an old house occupied as a grocer's shop; it had been observed for the first time in that neighbourhood during the present year, infested the furniture and beds, and (the writer stated) ate holes through the clothes of the inhabitants. Specimens of the insect were exhibited, which proved to be *Ptinus hololeucus*.

Sir John Hearsey exhibited various insects from India and China, including an enormous gad-fly, two fine species of *Cimex*, a *Cetonia*, the cotton-insect (*Aphis*), and other objects of interest.

Mr. Waterhouse exhibited seven British species of *Homalota* not recorded in his 'Catalogue,' and with which he had but recently become acquainted, and read the following notes respecting them:—

"1. *H. autumnalis*, *Erichson*. One specimen found by myself in beating dead sticks in a damp wood at Hawkhurst, in Kent. I have likewise seen specimens in the collections of Dr. Power and Mr. Rye.

* This insect has since been recognized as *Pædisca oppressana*, described in 1835 by Treitschke, in the tenth volume of his 'Schmetterlinge von Europa.' The species is included among the British *Tortrices* in the Museum 'Catalogue' of the late J. F. Stephens, and in the 'Catalogue' of Mr. Doubleday (ed. 1859).

2. *H. luteipes*, *Erichson*. The specimens exhibited were presented to me by Mr. Wollaston, and were obtained at Whittelesa Mere. I have seen other specimens found by Dr. Power in the London district.

3. *H. intermedia*, *Thoms.*, *Kraatz*. The two specimens laid before the Society were found at Purley Down, by Dr. Power. I have seen no other British examples of the species.

4. *H. paralella*, *Mannerh.* This appears to be a northern species. I have seen a series of specimens forwarded to Mr. Douglas by Mr. Gregson, of Liverpool, and since specimens taken by Mr. Hislop in Scotland.

5. *H. subterranea*, *Mulsant*. The only specimen which I possess is from Paisley, and was given me by Mr. Morris Young.

6. *H. lepida*, *Kraatz*. This also appears to be a northern species. I possess a specimen from Scotland, for which I am indebted to Mr. Andrew Murray.

7. *H. palliola*, *Erichson*. I exhibit two specimens of this insect, which were sent me (with the above name attached) by Mr. Linnell, who finds the insect, I am informed, in the neighbourhood of Reigate. The species, I have no doubt, is correctly determined."

The Rev. Hamlet Clark exhibited specimens of four species of *Hydroporus* hitherto undescribed, and stated that descriptions would be given in the forthcoming number of the 'Journal of Entomology'; one of them was taken in Spain, the other three in Great Britain: they were—

1. *Hydroporus Andalusæ*, very nearly allied to *H. Clarkii*, *Woll.* (which was taken in the Canaries); captured by Mr. Gray and Mr. Clark near Malaga, in May, 1856.

2. *H. severus*, allied to *H. assimilis*, *Payk.*, and more closely to *H. fuscitarsis*, *Aubé*; taken by Dr. Ernest Adams in a small river near Stowmarket, and by Mr. Clark in a running stream near Horning Fen, in May, 1855.

3. *H. derelictus*, allied to *H. planus*, *F.*, and *H. erythrocephalus*, *L.*; received from the Orkneys in August, 1855.

4. *H. celatus*, closely resembling *H. vittula*, *Er.*, and *H. incertus*, *Aubé*; taken by Dr. Power in a stream in Bradgate Park, Leicestershire, in August, 1855, and in a stream at Black Park, Uxbridge, in August, 1856, and by Mr. Brewer in a stream in Tilgate Forest.

Mr. Clark also exhibited *Hydroporus 5-lineatus*, *Zett.*, hitherto unrecorded as British, but which had been taken several years ago by Mr. Waterhouse, probably in the London district.

Mr. Lubbock exhibited specimens of a small Hymenopterous insect swimming in water by means of their wings; the specimens were taken with a net in a pond near Mr. Lubbock's residence in Kent, and had been recognized by Mr. Walker as *Polynema fuscipes*, of the family Proctotrupidæ. The fore wings were large, and profusely fringed all round; the hind wings small and very narrow: in the general appearance of the insect there was nothing to suggest the probability of an aquatic habit: the motion through the water did not appear to be in any way assisted by the legs, but was due to the sharp jerking action of the wings. The insects were able to remain three or four hours beneath the water, but required occasionally to swim to the surface, or crawl thither up the stem of an aquatic plant, in order to breathe; so, at least, it was to be inferred from the fact that specimens which had been confined for a whole night, in such a manner as to be unable to reach the surface, were all found dead in the morning. Mr. Lubbock had never seen the insect fly, but of the other species of

the genus one was known to feed on the eggs of *Pontia brassicæ*, and consequently was of terrestrial habits. With reference to what he termed the geological aspect of the question, Mr. Lubbock remarked that, if this insect had been found in a fossil state, no geologist would ever have imagined that it was an inhabitant of the water,—a circumstance which showed the necessity of some degree of caution in deducing from the structure of animals conclusions as to their habits.

Paper read.

Professor Dr. Schaum, of Berlin, communicated the following description of and remarks on *Scaritarchus Midas*, a new genus and species of the Coleopterous group *Scaritidæ*:—

SCARITARCHUS.

“*Labrum* antice submarginatum. *Mandibulæ* intus unidentatæ, supra rugoso-striatæ. *Maxillæ* apice rotundatæ. *Mentum* dente medio simplici, profunde canaliculato, lobis lateralibus rotundatis breviori. *Palpi* maxillares articulo ultimo triangulari, lato, fere subsecuriformi, præcedentis longitudine; labiales articulo ultimo fortiter securiformi. *Prothorax* breviter cordatus, angulis posticis distinctis, basi submarginatus. *Coleoptera* ovalia, striato-punctata. *Tibiæ* anticæ supra canaliculatæ, extus tridentatæ, dentibus inferioribus approximatis obtusis, tibiæ intermediæ fortiter unidentatæ. *Trochanteres* postici breves, validi, apice rotundato.

SCARITARCHUS MIDAS. Niger, prothoracis margine laterali basaliq̄ue et elytrorum margine laterali late aureo, his crebre striato-punctatis, interstitiis subconvexis, carinula humerali in interstitium continuata. Long. $1\frac{1}{2}$ poll. et ultra.

The splendid insect here described constitutes a new genus of *Scaritidæ*, and belongs to the first section of that group (Lacord. Gen. i. 192), which embraces *Pasi-machus*, *Emydopterus*, *Carenum* and *Scaraphites*. It stands nearest *Carenum*, resembling it in the securiform last joint of the labial palpi, differing from it, however, in the broad, triangular and almost securiform last joint of the maxillary palpi, in the simply and feebly emarginated labrum, in the cordate prothorax with distinct angles, and in its strongly unidentate intermediate tibiæ. A few specimens, collected in Laos by the late M. Henri Mouhot, have recently been received by Mr. Stevens. A figure of it will be shortly given.”

Special General Meeting.

The Secretary announced that a requisition, signed by six members of the Society, had been presented to the President and Council, requesting that a Special General Meeting be called, for the consideration of certain specified alterations in the Bye-Laws: a copy of the Bye-Laws with the proposed alterations was laid on the table, and was taken as read to the Meeting; and notice was given that a Special General Meeting of the Society would be held for the above purpose on Monday, the 1st day of December next, at 7 P. M.—*J. W. D.*

Errata.—Page 8163, line 11 from bottom, for “stubble” read “stable:” 8164, line 15 from top, for “earnestly” read “exactly;” line 18, dele “patient and:” 8164, third line from top, for “it was the dark deed” read “it was the dark doing.”

Has the Giraffe Two Horns or Three?

“Who shall decide when doctors disagree?”

THIS question does not appear fraught with great difficulty, and yet it has agitated the scientific world for some time past, and appears as far from a solution as ever: it is brought prominently before a more extended public in the seventh number of the ‘Intellectual Observer,’ by Dr. Cobbold, who appears to have thoroughly investigated the subject, and who states the *pros* and *cons* with great clearness as well as fairness. The theory that the giraffe is possessed of three horns originated, as I believe, with that illustrious traveller, Dr. Rüppell, who declared in the most emphatic manner that a third horn existed in the adult male: these are his words:—“The horns constitute the principal generic character, they being formed by distinct bones united to the frontals and parietals by a very obvious suture, and exhibiting throughout, the same structure as the other bones. In both sexes one of these abnormal bones is situated on each branch of the coronal suture, and the male possesses an additional one, placed more anteriorly, and occupying the middle of the frontal suture.” Cuvier entirely corroborates this view of the case, and says without any hesitation, “In the middle of the forehead is a tubercle or third horn, broader and much shorter than the others, but articulated in the same manner.” Professor Owen, to whose judgment almost every zoologist will be predisposed to bow, refuses entirely to adopt this view: writing of the giraffe, in ‘Brandé’s Dictionary of Sciences,’ he says that until lately we find it described as having callosities on the knees and sternum, and “as a kind of *lusus* with three horns, of which one, being articulated over a suture in the middle line of the forehead, seemed to take away the chimerical nature of the unicorn, by indicating a transition to that heraldic monster. *The truth is, however, that the giraffe possesses neither those callosities nor this median articulated horn.*” I have italicised those passages which express in the strongest manner the discrepancy of opinion on this moot question.

Dr. Cobbold, after citing the authorities above noticed, expresses his own opinion in favour of what may be called the Ruppellian theory, assigning his reasons for doing so in the paragraphs which follow:—

“1. In the young male giraffe which died last year at the Zoological Society’s Gardens, Regent’s Park, there was only a slight thickening of the subdermal periosteal tissues immediately above the central frontal eminence; but it was sufficiently thickened to allow of detach-

ment by dissection, and I have preserved the separated portion in a dried state. This young male giraffe was only about six weeks old.

“2. In another young male giraffe, which died at the Zoological Society’s Gardens on the 2nd of December, 1859, the fibrous sub-integumentary aponeurosis was still more markedly thickened, but there was as yet no development of a gristly cartilagenous tissue within its substance. This giraffe was born on the 6th of July, 1859, and was therefore about five months old. I have given an account of the accidental circumstances which led to its death, together with the anatomical peculiarities it presented, in a paper entitled ‘Contributions to the Anatomy of the Giraffe,’ published in the Zoological Society’s ‘Proceedings’ for February 14th, 1860.

“3. In an immature male giraffe, which died at Edinburgh during the severe winter of 1854, I found the frontal aponeurotic thickening much more marked, forming on the dried skull a distinct fibrous mass. I subsequently detached this fibro-cartilagenous matrix for separate preservation and examination, but it was, I believe, swept away with other museum *débris* by an assistant who had no knowledge of its value. After removal it was perfectly transparent and free from osseous deposit. The giraffe in question belonged to Wombwell’s travelling menagerie, and was represented to me as being about eighteen months old. Having, at the outset, devoted three weeks to its dissection, and renewed my examinations of the various organs at subsequent intervals, I may, for further particulars respecting its anatomy, death, &c., refer to my several memoirs in the ‘Edinburgh Physiological Society’s Reports’ for 1854, the ‘Edinburgh New Philosophical Journal’ for 1856, and more particularly to the June number of the ‘Annals of Natural History’ for 1854.

“4. When engaged, during the autumn of 1856, in writing the article ‘Ruminantia’ for the ‘Supplement’ to Dr. Todd’s ‘Cyclopaedia of Anatomy and Physiology,’ I took occasion to visit the Museum of Trinity College, Dublin, expressly with the view of examining the adult cranium of a fine male giraffe, which I understood to be preserved there. As a result of this inspection I subsequently wrote as follows:—‘Through the kindness of Dr. Ball we have examined the skeleton of a male giraffe, which died at the Dublin Zoological Society’s Gardens, and which is now preserved in Dr. Harrison’s anatomical museum. In this individual the central cranial eminence is not smooth as in our specimen (above referred to); on the contrary it is particularly rough, owing to the deposition of osseous nodules, which bear a marked resemblance to the irregular bony laminæ prolonged from the attenuated margins of the bases of the true horns. If these

rough prominences could be shown to be separable by maceration, we might with good reason infer the rudimentary existence of a third horn.' This fine male formerly belonged to the London Zoological Society, and was bred in the Society's Gardens, Regent's Park. I have noted the peculiar cause of its death in the paper already referred to, in the paper, already referred to, in the Zoological Society's 'Proceedings' for 1860.

"5. After completing the article above mentioned, I visited the Museum of the Royal College of Surgeons, Lincoln's Inn, and having, through the ever-ready kindness of the late Prof. Quekett, had an opportunity of inspecting the giraffine crania there preserved, I was in time to append a foot-note to 'Ruminantia' to this effect:—'The osseous nodules noticed in the Dublin specimen not only exist in one of these crania, but they could be partly raised from the subjacent bone by the easy insertion of the finger-nail under the margin.' Since the year 1856 I have repeatedly examined these crania, and have no shadow of doubt as to the existence of an ossified synchondrosis which has united the third horn to the frontal eminence.

"6. The distinctness between the third horn and the frontal eminence was still more significant in the skull of an adult giraffe which died at the Zoological Society's Gardens several years back; but in this case also there was union by synchondrosial ossification. I examined the cranium in 1857, before the skeleton was finally cleaned and sent away, and have since been informed that it is preserved in a museum at Bristol.

"7. The most cogent evidence, however, which I can adduce is that derivable from the skull of a young male, whose entire skeleton may now be seen set up and preserved in the Derby Museum at Liverpool. This skeleton was formerly in the possession of Mr. Gerrard, the accomplished taxidermist at the British Museum, and I am indebted to his son for the loan of a carefully executed drawing. In this instance, as I am distinctly and unequivocally informed by several gentlemen connected with the British Museum, who have examined the skull, the third horn became readily detached by maceration; it was for a considerable time separately preserved, and presented all the ordinary characteristics of the two posterior horns, of whose epiphysial character no one entertains the slightest doubt. The third horn, or central pseudoceratophorous epiphysis, has since been glued on to its original position, and may now be seen *in situ*, as a standing proof of the correctness of Rüppell's original persuasion.

"8. In the Museum of the University of Tübingen there is also preserved a similar skeleton of a young male giraffe, in which—

according to verbal information kindly communicated to me by Dr. Gunther, of the British Museum, who is familiar with the specimens,—the third horn was equally well marked and separated by maceration.

“9. Lastly, I adduce additional conclusive evidence from Dr. George Jæger’s ‘Bemerkungen uber die Hörner und Epiphysen,’ &c., as recorded in the twenty-sixth volume of the ‘Acta,’ already referred to, and I beg to call particular attention to this extract, which I translate from a foot-note appended to the memoir in question; the *italics* are mine. The author says:—‘In the skull of a young male in the collection at Munich, whose horns are scarcely two inches long, and likewise separated, there is, in the place of the third central horn, a rather strongly marked elevation of the frontal bone, but no trace of an epiphysis. In the skull (nineteen inches long) of a male received a short time ago from the North of Africa, through Dr. Heuglin, which skull we believe to be mature, the suture of the hind horns is still perceptible, but the serrated borders are almost firmly united to the frontal and parietal bones. *The mesial horn, however, is still quite separated by the epiphysial cartilage from the frontal and nasal bones, whose sutures are not yet obliterated, as also obtains in the other cranial bones. The anterior margin of the central horn-bone projects about one inch over the posterior limit of the nasal bone. From thence the anterior part of the horn rises to the tip, forming a very gradual slope, while the posterior inclination is comparatively steep and short. It results from this that the central horn unites with the bones much later than the hinder horns, which are common to both sexes.*’”

A few questions that are not mooted by Dr. Cobbold appear to me deserving of attention: *First.* Is the female giraffe invariably without the frontal process here denominated a third horn? *Secondly.* Supposing this frontal process not to be a horn, what is it? is it the homologue of any other bone or process among suckling animals? Is there any reason to suppose that at any period of the life of the male giraffe the horns, or either of them, are denuded of hair? In conclusion, I desire to state that I am quite ready, from an attentive perusal of Dr. Cobbold’s paper, to give in my adhesion to the tricorn theory: the question seems to have been removed, by careful investigation, from the region of conjecture, and must henceforward cease to be regarded as the fallacious hypothesis which Professor Owen appears to have considered it.

EDWARD NEWMAN.

NOTICES OF NEW BOOKS.

‘*The Natural History of the Tineina.*’ Vol. vii. (containing *Bucculatrix*, Part i., and *Nepticula*, Part ii). By H. T. STANTON, assisted by Professor ZELLER, J. W. DOUGLAS and Professor FREY. London: Van Voorst. 1862. 252 pp. letterpress; 11 coloured plates.

THIS is one of the very few works which began well, and which have nevertheless improved as they proceeded. I prefer this seventh volume to either of its predecessors: it is more entomological. At the commencement both author and artists were eminently truthful: they copied and described what they believed they saw, and copied and described with a Chinese fidelity that at the same moment proclaimed their conscientious love of truth and their ignorance of the laws of homology. The descriptions at pp. 2 and 172 in vol. i., and the figures of larvæ on plate iv., exhibit confused ideas of those absolute natural laws for the position of legs and claspers, without the guidance of which we must infallibly go astray. In descriptions of the imago this conscientious method has its advantages,—hence the great value of Mr. Stainton’s volume of the ‘*Insecta Britannica*,’ which, despite apparent pedantry in the use of italics and some other trifling defects, will long be justly considered an invaluable contribution to the science of Entomology. All this is amended now, and the figures of larvæ, alike artistic and scientifically truthful, leave nothing to be desired. The life-histories of the species are equally excellent with the figures, but the arrangement is still susceptible of improvement. For instance, the “description of the larva” and “its mode of life” are inconveniently separated by the interposition of the description of the imago: there is also a want felt in the frequent absence of all notice of the pupa, a state which in these *Micros* may be supposed to present very interesting characters; indeed, where observed, as in *Micropteryx* and other genera, their structure has been found strikingly different from that in the more familiar *Macro-Lepidoptera*, and equally different one from another, thus furnishing me with an additional argument in favour of the opinion I expressed long ago that these *Micros* are allied or rather associated by the single character of their diminutive size. But this is enough of generalizing. I will now select for quotation a few of the life-histories which I have characterized as being so excellent, the title of this work having already explained that the

contents of the volume comprise only portions of the genera *Bucculatrix* and *Nepticula*.

“*Bucculatrix cidariella*. The larva feeds on the leaves of the alder in August and September. At first it mines the leaf, making very slender galleries; these are rather long for larvæ of this genus and slightly curved: immediately it quits the mine it spins a flat, pale ochreous cocoonet on the under surface of the leaf, beneath which it then reposes in a horse-shoe form till it has cast its skin; it then becomes an external-feeding larva, feeding principally on the under surface of the leaf, which it gnaws half through. When mining, the colour is greenish, with the head blackish, and with a conspicuous black spot on the back of the second segment. When become an external feeder its length is three lines, its colour yellowish green, the three first segments orange, the dorsal vessel darker; along each side are two rows of minute white dots, and two other rows on each side of the back. When full fed the larva generally descends to the ground, and, seeking a secure retreat, it spins its ochreous-ribbed cocoon from which the perfect insect emerges in the month of May or June of the following year.”—(Pp. 40—42).

I ought to observe that I have brought together the component parts of the foregoing paragraph in order to show how I think they ought to have been arranged. I proceed to descriptions in which I have followed the author's arrangement.

“*Bucculatrix ulmella: Mode of Life*.—The larva feeds on oak leaves (according to Mann also on elm leaves, but here I had strongly suspected some mistake, as in various localities I have constantly observed the insect amongst oaks, but never amongst elms; but Professor Frey assures me that he has repeatedly bred *B. ulmella* from *Ulmus campestris*, and that the best locality for the larva at Frankfort in September is a row of elm trees). The young larva makes small contorted mines in the oak leaves, and these are almost invariably placed close to a rib; these mines are filled with brown excrement; they may be always readily distinguished from any of the mines which are made in the oak leaves by the larvæ of the genus *Nepticula* by their extreme shortness, as at an early age these larvæ quit the mine to feed on the external surface of the leaf. Before commencing, however, this latter operation it spins a white cocoonet under which to moult; it leaves its cast skin in a coiled position beneath this shelter; the larva then feeds for some time on the surface of the leaf, which it eats half through; when full fed it descends to the ground and seeks some convenient corner wherein to spin its small yellowish ribbed cocoon. There are

two broods in the year; the larvæ which feed in July produce moths in August; the eggs laid by these furnish the caterpillars which we find in September and October; these remain the whole winter in the pupa state, and produce moths from the middle of May to the middle of June."—(P. 49).

Here follows a minute description of the imago.

"*Description of the Larva.*—Length $2\frac{1}{2}$ lines. Pale olive greenish gray, with a darker stripe along each side; spots whitish; head pale brown; second segment brownish gray, with two rows of small black dots. The above is the description of the external-feeding larva; before it quits the mine it is very different; it is then entirely yellowish, with a brown black band and a T-shaped mark on the back of the second segment."—(P. 52).

The following passages cited from the writings of the immortal Lyonnet are still more interesting. I do not hesitate to transcribe them, since the posthumous volume of Lyonnet's works published by Dr. Hann, in which they occur, is very little known, and I may almost say *never* read in this country.

"This industrious larva is little more than two lines long. It has sixteen legs; under a lens its body appears covered with tubercles the colour of parchment; along the back is a broad grayish streak; the rest of the body is brown; the seventh and eighth segments appeared to me darker than the others, and on the first segment instead of tubercles we see eight black dots.

"These caterpillars keep on the under side of the leaves of the oak, which they gnaw without covering themselves up, and there also they construct their cocoons, which mine did during the month of August.

"These cocoons are whitish and ribbed; one counts between the grooves seven ribs, which run the whole length of the cocoon, but which appear to have been broken and patched again a little beyond the middle; the very singular form of these cocoons made me anxious to see how the insect set to work to construct them, and on the 20th of August, 1744, I had an opportunity of satisfying my curiosity.

"I then saw that the larva first commenced by surrounding itself by twenty posts (so to speak), which it ranged in an ellipse around it: these imitation posts were constructed of silk; they were stiff, elastic and thicker towards the base than towards the top; they form no part of the cocoon itself, and I can conceive no other use for them than that of protecting the larva, whilst at work, from coming in contact with leaves or other substances, which, agitated by the wind, might otherwise inconvenience it.

“Having prepared this sort of enclosure it commenced to spin its cocoon in the interior, beginning near one of the extremities of the major axis of the ellipse; having agitated its head for two or three moments with very great activity, I saw that one end of the cocoon began to appear and already displayed its grooves. I observed the construction attentively through a powerful glass, and I found that the relief of the grooves arose from a row of angular meshes which advanced one beyond the other and were fastened down by the threads, which passing over these meshes were fastened on both sides to the body of the cocoon; between the intervals of each of these rows of meshes I saw a very regular network of simple threads, which in crossing formed a series of lozenges. The caterpillar continued this work with surprising quickness, which prevented me from being well able to follow its movements, and had spun in a few moments nearly a third of the length of its cocoon.

“Up to this time it remained entirely outside its cocoon, working backwards like a ropemaker, but then it entered it head first, and having turned round it protruded the anterior part of its body from the open end of its cocoon, and having extended its head sufficiently far, it commenced the other extremity of its cocoon, adopting a proceeding precisely similar to that which it had put into execution at the opposite end. It continued to work thus till the space which was left open between the two portions of the cocoon became so contracted that the larva could no longer move its head; then it withdrew entirely within its cocoon, turned itself on its back, and, spinning from below, so caused the two portions of the cocoon to approach each other that at length they met; but since the ribs of the second portion of the cocoon do not meet precisely in the same line with the ribs of the other end, a break in their continuity is caused, as we have already remarked.

“All the work which I have just described was finished in about half an hour, but it was not sufficient to shelter the larva from atmospheric influences, nor from extraneous injury. The larva was then only enclosed as in a pretty cage, through which it might be easily perceived; however, it soon set this to rights by spinning against the interior of its cocoon till it was completely enclosed; this occupied it for some hours, and as I was then no longer able to see it, I know not whether it continued to spin for a greater length of time.

“When these cocoons are finished they have much consistence; they are able to resist a moderate pressure, and one can no longer per-

ceive that regular arrangement of the threads of which the framework is composed.

“The chrysalis of this larva is one of that class which serve as useful instruments to the moths within them in order to escape from the cocoon when the time for that attempt arrives; that is to say, this chrysalis is one of those which have the back armed with spikes, directed obliquely towards the tail, by means of which, when the moth should escape, it presses forward against the end of the cocoon, and, leaning on these points, which prevent it from slipping backwards, presses so strongly that at length the cocoon breaks and affords a passage to the chrysalis, which, after protruding its anterior segments, itself yields to the efforts of the moth, which opens it, disengages itself from it, and thus finds itself liberated both from the chrysalis and the cocoon.”

The only other descriptions I shall cite are selected from the genus *Nepticula*, and these, equally with those which have preceded, will abundantly support my observations as to the care which the author has bestowed on every branch of the subject. With regard to the limits of species opinions will and must differ. Mr. Stainton does not view this question under the light thrown on it by the still imperfect theories of isomorphous pairs and dimorphism: this may yet be hoped for; but let us accept with gratitude what is placed at our disposal: no other entomologist living has ever sacrificed so much time and money for what can only be appreciated by the instructed few.

“*Nepticula argentipedella*: *Mode of Life*.—The egg is laid on the under surface of the birch leaf, and very frequently close to one of the lateral ribs. The larva mines a blotch of irregular form, but the commencement is always of a peculiar dark brown, and remains conspicuous, the remainder of the blotch being only a pale greenish brown; the excrement is scattered quite irregularly in the mine, and never forms a definite track. When the larva is full fed it comes out on the upper surface of the leaf, and descends to the ground, where it constructs its dark green cocoon. There seems to be only one brood in the year, the larva occurring at the end of September and in October; in some localities it is excessively abundant. The perfect insect appears at the end of May and beginning of June.

“*Description of the Larva*.—Length $2\frac{1}{2}$ lines. Pale greenish, dorsal vessel bright green; head and second segment light brown, the mouth and two lines receding from it reddish brown; beneath is a row of dark reddish oblong spots down the middle.”—(Pp. 212 and 216).

“*Nepticula atricollis* : *Mode of Life*.—The egg is deposited on the under surface of a leaf of hawthorn or wild apple. The young larva mines an extremely slender mine close to the edge of the leaf, going in and out of each serrature; this slender mine is about an inch in length, and is almost filled up with the brown excrement; the larva then commences mining on a different plan, making a broader mine, and eventually a large blotch, of which the brown excrement occupies only a very small space; this blotch assumes rather a peculiar brownish green tinge, especially on the leaves of the hawthorn: when the larva is full fed it comes out on the leaf, and seeking some convenient corner constructs its blackish green cocoon. There are two broods of this insect in the year, the larva occurring in October and more sparingly in July. The perfect insects appear in May and at the beginning of August.

“*Description of the Larva*.—Length 2 lines. Pale greenish, with dark green dorsal vessel; the eleventh and twelfth segments with a reddish tinge; the head and second segment blackish brown; beneath is a central row of dark spots.”—(Pp. 228 and 230).

In conclusion I can only add that this work has my most cordial recommendation. It is quite immaterial whether I think with the author on all points; no one can possibly deny him the credit of having produced a work of great beauty and accuracy, and one the utility of which is even now only beginning to be appreciated.

EDWARD NEWMAN.

Among the Ainos. By ARTHUR ADAMS, Esq., F.L.S., &c.

WE have been driven by the fury of a gale through La Perouse Strait into the Sea of Okhotsk, and are now quietly at anchor in Aniwa Bay.

This grand Bay, forty miles deep, is on the south end of Saghaleen, as the Ainos call their island. These aborigines also term it “Isoka;” in fact, I find that Geographers as well as Naturalists may sometimes be embarrassed by a multiplicity of synonyms. The Japanese call the island “Oku-Yesso,” the Russians “Sachalien;” it is named by old writers “Karafto,” and in ancient maps it is “Sahalien,” “Ula-hata,” “Auga-hata,” “Island of the Black River” and “Amur.” By Siebold, followed by Keith Johnson, it is called “Tarakai,” but the name by

which it is generally known is "Saghaleen," derived from "Sagarün," one of the names of the Amur River.

The general features of the island are very similar to those of the opposite coast of Manchuria. Primary formations compose hills and rocks of varying heights, and wild tracks of country covered with high rank grass, scrub and masses of fine trees. The most conspicuous trees are conifers, pines, yews and junipers. A dogwood is common, and I observe a beech, an oak, and a species of *Euonymus*. The aster and pink, a small gentian, the flower-of-yarrow and St. John's wort, a species of *Ribes*, and the pretty white-flowered grass of Parnassus, are among the common plants. A dark *Marchantia* covers the ground in damp places; a *Lycopodium* is conspicuous in similar localities, and of ferns I gather a species of *Pteris* and a *Polystichium*.

As we land in a shallow bight of the splendid Bay we observe the duck family in full feather. The pretty golden-eye is swimming and diving near the shore, or indulging in little playful flights on and off the land; flying wildly and uttering loud cries are the elegant long-tailed ducks; the whistling widgeons pass by in twos and threes; and, conspicuous in the bustling noisy crowd, are the beautiful shieldrake and the solitary shoveller. These, with the mallards and the teal, make the shallow waters of the little sandy bays vocal with their quackings and screamings, and highly amusing with their loves and quarrels, their flutterings, alarms and greedy gobblings. The little guillemot turns gaily about in the water, and the long necks and pointed heads of the divers are seen at intervals above the surface.

At the water's edge the golden plovers and the sandpipers come trooping along the mud-flats, while the shrill whistle of the oyster-catcher and the cry of the curlew are heard in the distance. Half buried in the shingly beach is the huge skull of some hapless whale, stranded in the shallows after having sought shelter in the Bay, and just before we land a black bear is seen trotting along the beach. Before he has climbed the red cliff behind him he is saluted with a rifle ball, which causes him to turn his head and cast an angry glance upon the intruders of his solitude. We find the sea-weed scratched up by Bruin, who has been down foraging for shell-fish, dead crabs and mollusks being numerous on the strand after the recent gale.

The captain and myself land and discover the abodes of the Ainos in precisely the same manner as did M. de Langle and his companions in the time of La Perouse. "They saw a litter of blind puppies, the mother of which barking in the woods led them to suppose that the owners were not far off." A half-scared woman, seeing us approach,

endeavours to conceal herself in the tall grass. She is, however, detected, and good-humouredly hunted down, when she makes for the door of a little smoke-dried hovel. Pushing gently aside the sliding board which serves the purpose of a door, we enter smiling, and lo! the entire family is before us. The countenance of the frightened damsel is shrouded by a veil of loose black hair, and all are silent, solemn, squatting on their hams around the fire; Gipsy-fashion an iron cauldron, with its seething mess of fish, hangs suspended in the midst. No sign of welcome is made, no peace-offering accepted. We therefore quietly withdraw, and enter another and a larger hut.

Four men are seated around the smouldering wood fire solemnly smoking, while two young women are clearing away the fish-bones and fragments that remain from the recent meal. The interior of the dingy abode is lined with matting, and on a raised platform on one side are an old woman and some children. The captain and myself seat ourselves among these strange people, and endeavour to win the hearts of the women by pictures from the 'Illustrated London News,' which they accept timidly and contemplate upside-down; the absurd little brown monkey-like imps are regaled with sweet biscuits, which they shyly munch with silent gusto, and the stolid hairy men are propitiated with tobacco, which they slice up and smoke instanter. It is a pleasing thing to note the skilful way in which one little savage lights his grandmother's pipe, and wonderful to observe that ancient dame with a black mane, crouching on all fours, like some hideous Sphinx, smoking the soothing weed.

The dress of the men is composed of coarse canvass or the skins of dogs and seals; their legs are protected by laced buskins, and their feet by clumsy straw sandals. Every man carries a knife in a wooden sheath, and a carved tobacco pouch. The lips of the women are tattooed of a pale black colour, and their coarse straight hair is neither gathered up in a becoming knot, nor confined by coquettish net or other feminine device, but is simply parted down the middle, and very much resembles a huge black mop. These "unlovely" women have enormous metal ear-rings depending from the lobes of their ears, and necklaces of coloured beads adorn their necks. They are clothed in silver-gray or spotted seal skins, with long boots of the same material reaching above the knee; a black leathern girdle, or "cestum Veneris," encircles their waist, the which is covered with brass ornaments, and to which is invariably suspended the all-useful knife. Oysters, mussels and scallops, mingled with the bones of salmon, seal and porpoise, are thrown in heaps around their houses, showing their piscivorous

propensities, and giving evidence of the debt these poor people owe to the sea. The one idea of their existence seems to be the capture of salmon. These noble fish they sell to the Japanese, "reserving," says La Perouse, "for themselves only the stench, which adheres to their houses, furniture, clothes, and even the very grass surrounding their villages."

As they come striding through the tall grass, with their bows and spears, and their long hair streaming in the wind, they give one the idea of being formidable savages, but this ferocious exterior resembles the ass in the lion's skin, and only serves as a cloak to hide a harmless timid nature. On suddenly meeting a party in the woods the men crouch down and the women and children "hide their diminished heads." Their hirsute limbs, long tangled hair and bushy beards have earned for them the soubriquet of "Hairy Kuriles," but on close inspection the general expression of their faces is good nature and stupidity, which is fully borne out by their large heads and clumsy figures.

The Ainos are certainly not the original stock from which the Japanese have sprung, as they have little in common either physically or morally. Their language even is different, being similar to that spoken by the Kuriles. This is the opinion of M. de Rosney, who observes, in his 'Introduction to the Study of the Japanese Language,' "it was considered very probable that the natives of the islands situated in the seas to the north of Japan might speak an idiom approaching to that of the Japanese, and consequently might belong to the same linguistic family. The study of the Aino language and of the different dialects used in the island of Yesso and the Kuriles, oblige us to consider this opinion as completely inadmissible."

In two respects I observe these Aino tribes resemble the aborigines of Formosa, who are called by the Chinese "Tai-lo-kok." Mr. Swinhoe, who saw a few of them, observes that "their hair was short and fringed on the forehead, behind it hung loose." The second peculiarity is the circumstance of their arrows having no feathered shaft, which appears very strange, as birds are abundant and feathered shafts would seem to be in vogue among all who habitually use the bow. I do not know if there is any linguistic affinity between these two tribes of wild men. M. de Rosney says, "The Formosan language, or that of Formosa or Tai-wan, appears itself to be a branch of the Oceanic family."

ARTHUR ADAMS.

Effigy of an Eagle in copper. — At Fortnum and Mason's, No. 191, Piccadilly, there is now being exhibited a life-size figure of an eagle which has excited the admiration of all who have seen it, so wonderfully accurate is the imitation of Nature, so exquisite the workmanship. "It stands," says a writer in the 'Times,' "on the summit of a rugged and precipitous rock, in a bold and threatening attitude. With wings outspread ready for a dash at his quarry, or to withstand a human foe, the bird, with one claw advanced, firmly grasps with his talons the rocky ledge, while, with head protruding and open beak, he absolutely seems to scream warning and defiance. The keen eye peering from under the shadowing ridge of the skull, the rising feathers of the crest, the swell and ruffling of the muscular neck, form a picture of savage anger as true to nature as it is admirably conceived and executed. * * * Every one of the minute feathers which cluster round the neck, the fine hair-like down which runs from the beak to the eye, the soft cushion of plumage at the junction of the wings and body, are here separate, and can be each separately raised by the finger. The half-hairy, half-feathery legs of the bird are wonderful in the fineness of the down which overspreads them. The most extraordinary triumph of Mr. Phillips's skill, however, is shown in the extremely minute feathers which cover the frame of the pinions, and which conceal the fastenings of the large feathers forming the tips of the wings. It would be impossible to overrate this portion of the work, so numerous and so thick are the feathers, and so soft and deep is the effect produced." The entire work is in copper, and Mr. Phillips, the artist and owner, has thus explained its manufacture to Mr. Buckland, who has published, in the 'Field' newspaper of October 11, the following account of this new process: — "Mr. Phillips explained to me that all before me (rock and bird) was made of copper. He set to work some six years ago in this way: — He first made the body of hollow copper, and the bird then resembled a plucked fowl; he then proceeded to put the feathers *on*, instead of taking them *off*: what a difference in the facility with which these operations are performed! He obtained some slips of the finest copper from Japan (it is only allowed to be sent over from that country in slips), and he began to cover the bird feather by feather; each feather is, indeed, a study by itself, and he showed me the process of making them. A real feather is placed on the table, a slip of copper is cut out its size and dimensions; it is then hammered into shape, and with peculiar graving tools is graved on the surface, and cut at the edges, till it is the exact model of the feather itself, each feather having to pass some twenty-six or twenty-seven times under the hammer and the graver, and having frequently to submit to great heat. Some of the feathers—their name is legion—are huge things, above eighteen inches long, such as we see in the bonnets of Scotchmen; the quills of these are hollow, as in the natural state; others are as minute as the down upon a young chicken, or as fine as human hair: witness the feathers about the legs and over the eyes and nostrils of the bird. I could not make out," continues Mr. Buckland, "how it was possible for human hands to put all these feathers on to the copper body of the bird, and this in such beautiful and regular order. Mr. Phillips, however, informed me that every one was soldered on, and that he began at the feet, and soldered the feathers on one over the other. Now, unless some colouring process had been adopted, the copper eagle would have had a dull, and possibly a verdigris, appearance. Mr. Phillips has, however, managed to overcome this difficulty. The mode of colouring which he has employed is a secret of his own; but whatever the process may be, the result is most beautiful: there is a glitter and gloss upon the bird only to be equalled by the plumage of a wild bird who

is in the highest condition of health. Mr. Phillips has taken for his model—a lesson to thousands of modellers—Nature herself. He has plucked the dead bird feather by feather; he has studied the living bird in its most striking attitude and its most lustrous plumage; and he has produced a work which no naturalist, however sceptical, can find a fault in, and which is perfection itself." I strongly recommend my readers to visit this extraordinary work of art: it is a model of laborious painstaking which contrasts very favourably with those frightful productions generally exhibited in taxidermists' windows under the name of "stuffed birds."—*Edward Newman.*

Blue Eggs of Chaffinch.—Lately I have seen several notices of blue eggs of the chaffinch. I have seen several, and have two eggs which I took last May, both of them unspotted and of a bluish colour; one, however, has a pink tinge over the thick end.—*Robert W. Leven, Windygates, Fifeshire, October 4, 1862.*

Deposition of Eggs by the Cuckoo.—It appears that my remarks upon the cuckoo (Zool. 8164) have been slightly misunderstood; but this I can scarcely regret, seeing that this very circumstance has called forth some highly interesting observations from Colonel Newman, which might otherwise have remained unrecorded. In my statement, that "in most cases a remarkably short interval elapses between the arrival of the cuckoo at the nest and the deposition of the egg," I lost sight of the fact that the truth of my assertion had been established in a great measure by means of observations upon the habits of the bird, made during the hours of broad daylight, the very period at which, as I have endeavoured to prove, the egg is most likely to be carried in the bill of the parent; therefore I now freely allow that the egg may be placed in the nest after the usual manner among birds more frequently than I formerly supposed; for it does not follow that because the bird has never been seen in the act late in the evening, while there was yet sufficient light for the discovery of a suitable nest, that such an act is therefore improbable. Nor is it my belief that it is by any means a common occurrence for the cuckoo either to turn out and destroy young birds, or to deposit her egg in the nest after incubation by the foster-parent has commenced; indeed the contrary may be accepted as the rule; but that such does occasionally occur there is not the smallest doubt. And in addition to my former statement I would call attention to the following extract from my note-book:—"June 11th. On looking into No. 11 chaffinch's nest this morning, I saw the young ones alive and well; but upon my return, some hours afterwards, a cuckoo flew out from the nest. Two of the young ones were still there, but the remaining three were struggling upon the ground. These I replaced, and it was probably owing to my interference that the cuckoo did not again make her appearance at the nest." Some of the numerous readers of the 'Zoologist' have doubtless met with instances of a similar nature. In an exceptional case—such as that in which the cuckoo deposited her egg in the nest of the meadow pipit, the latter having already hatched some of her young—the probability is that the foster-parent would, after the lapse of a few days, remove the egg of the intruder, just as she would do with an addled one of her own; and it is not impossible that, in the event of her own brood being destroyed, she might even bestow her care upon the cuckoo's egg, and recommence the task of incubation, although her case would certainly be a hard one. We cannot blind ourselves to the fact that instances of cruelty and oppression are not confined to mankind alone, and that the Creator, for the fulfilment of some wise purpose which it is not for us to investigate, suffers them also to occur among lower animals; therefore the objection to my views by the question of *cruelty* can scarcely hold good; for might we not upon the

same ground deny that the young cuckoo casts out of the nest a number of helpless beings, consigning them to unmerited death in order to promote its own well-being? It would ill become me to contradict any statement advanced by a naturalist of such ability as Colonel Newman; but, lest he may imagine that I have been misled by the accounts of others, I will merely remark, with all deference, that, however unskilfully I may have handled my theory, the main facts which have been adduced in its support have occurred beneath my own observation, and are therefore beyond dispute. — Henry L. Saxby; *H.M.S. 'Devonshire,' Sheerness, October 2, 1862.*

*Remarks on Pallas's Sand-grouse (Syrhaptus paradoxus).** — Our Secretary having entrusted to my charge an example of *Syrhaptus paradoxus* which died at the Gardens, I am desirous of recording the results of my examination of it. I must apologize for the imperfection of the observations I am about to offer. I have not been able to compare the skeleton of this bird with that of other sand-grouse, except from memory; and I prefer to confine my remarks to the structure of the sternal apparatus. This, as is the case in other species of the peculiar group to which *Syrhaptus* belongs, offers at first sight an unquestionable resemblance to that of many of the *Columbidæ*, particularly of those members of the family which possess terrestrial habits. The similarity seems principally to arise from the form of the lateral processes of the sternum, which in *Syrhaptus* are widened and partially united to the main portion, as in *Chamæpelis* and *Geopelia*, instead of being singularly prolonged and acuminate as in the more typical *Gallinæ*. The resemblance is also increased by the exceedingly deep keel, which is of similar conformation to that of the *Columbidæ* generally. But here the likeness ends. The coracoid bones, which I am inclined to regard as the most characteristic in, as they are the most peculiar to, the ornithic skeleton, are plainly framed on the true Gallinaceous model. The furculum is very different from that of any other group of birds which I happen to remember, and bears no resemblance to the same bone in the *Phasianidæ* or *Tetraonidæ*. Still less, however, does it indicate any approximation to the same part in the *Grallæ*, or I may say of the *Columbidæ*, with both of which groups the sand-grouse have been supposed to have affinity. From the peculiarities, therefore, of the sternal apparatus I am fully of opinion that Bonaparte, and those authors who have followed him, are quite right in elevating it to the dignity of a family (*Pteroclidæ*), though I imagine they were chiefly led to that conclusion by an examination of the external characters only. I should have felt it incumbent upon me to have made some remarks on the information possessed by naturalists respecting this rare and curious bird; but almost all that can be said on the subject has recently been admirably recapitulated in a paper by my friend Mr. T. J. Moore, in the '*Ibis*' for last year.† I would, however, observe that although the illustrious Pallas has the credit of first giving a *description* of this bird, he does not appear to have seen more than a single example of it, which was obtained in the Kirghis steppes by Nicolas Rytchkof, and mentioned by him in his *Journal*.‡

* Read before the Zoological Society of London. Communicated by the author, Alfred Newton, Esq., M.A., F.Z.S.

† The '*Ibis*,' 1860, p. 105.

‡ '*Kirghis-Kaisazkoi Stepie, &c. St. Petersburg, 1772, p. 40.*' I have not been able to see this work, and only quote the reference at second hand. — A. N.

And of this example, judging from the figure given of it, not only, as Pallas himself says, "*Caudu in specimine deerat,*" but it also appears to have lost the elongated portion of the shafts of the outer remiges, which form so singular a feature in the species, and which, as we see by the state of the birds in our Gardens, are no doubt easily broken off. I must be allowed to add that I think this circumstance greatly favours the supposition that the specimens which were obtained in Western Europe in July and August, 1859, were not indebted to any human interference for their transport; for I have had the good fortune to examine all four of them, and each possessed these extraordinary appendages in nearly perfect preservation.

The Sandpiper a Diver. — In the 'Zoologist' for this month (Zool. 8195) there is a communication concerning the fact of the common sandpiper being a diver. I remember having taken a note some time back of an occurrence somewhat similar. I had wounded a sandpiper, and it fell into the river. On wading in to secure it, to my surprise it disappeared beneath the surface, and reappeared again at a considerable distance from me. I again waded towards it, and this time came much nearer, when again it repeated the manœuvre, and I distinctly saw it, at about a foot below the surface, making off as hard as it could by the united aid of two legs and one uninjured wing. I never observed one doing the same either before or since, though I have wounded several much in the same way. — *John A. Harvie Brown; Dumpace House, Falkirk, October 6, 1862.*

The Sandpiper a Diver. — I notice in the 'Zoologist' for this month (Zool. 8195) an article on 'The Sandpiper a Diver,' which it would appear is not generally known. I have noticed it often when wounded, and on one or two occasions while the birds were amusing themselves on the shore or bank of a stream: whether they were after food or not I cannot say. The first time was in 1855, on the banks of the Jed, near Jedburgh: I wounded a sandpiper which alighted on a stone in the middle of the stream, and on my wading in for it, it jumped into the water and swam underneath to the bank, where I secured it. I have seen them dive four or five feet deep, and that not by plunging in, but from the surface. They swim well, carrying the head a little back, and the legs rather higher than the breast: they use both wings and legs, are quick in their motions, and appear to swim with great ease and comparatively swift. The sandpiper is an elegant little bird in the water. I never saw one swimming on the surface, unless wounded. — *Robert W. Leven; Kennaway Burns, Windygates, Fifeshire, October 4, 1862.*

Occurrence of the Curlew Sandpiper at Rochester.—About a week ago I saw a fine example of this species in the possession of a boy who had just before killed it with a stick a little above Rochester Bridge. It was extremely fat, and the stomach was full of sand and small worms. I afterwards observed eight more upon some marshy ground near the same spot.—*Henry L. Saxby; H.M.S. 'Devonshire,' Sheerness, September 24, 1862.*

Occurrence of the Common Skua near the Land's End. — The large skua (*Lestris catarractes*) seldom makes its appearance on our coasts, but I have to record one that was obtained a few days since near the "Wolf" Rock, off the Land's End.—*Edward Hearle Rodd; Penzance, September 22, 1862.*

On the Geographical Distribution of the European Fresh-water Tortoise (Emys lutaria).—In the notice of my lately-published paper ‘On the Zoology of Ancient Europe,’ which you did me the honour to insert in the last number of the ‘Zoologist,’ there occurs a statement likely to mislead some of your readers. You speak of the European fresh-water tortoise (*Emys lutaria*) as “never having been found in the North of France, Holland, Belgium, Denmark, Sweden or Norway” (Zool. 8190). Now in my pamphlet (pp. 22, 23) I cited the cases of the remains of no less than four individuals of this species which are recorded by Professors Dalman and Nilsson as having been found in Sweden under circumstances very similar to those discovered by Mr. Birch in this neighbourhood. I besides mentioned the curious fact of the capture of a living specimen, many years ago, in that country, adding, however, that Professor Nilsson supposed at the time that it must have been an imported animal. I also showed, on Professor Steenstrup’s authority, that bones of three different examples had been found in Denmark, under conditions substantially the same as the Norfolk specimens.—*Alfred Newton; Elveden Hall, Thetford, October 10, 1862.*

[I should have perhaps expressed my meaning more clearly had I written “never having been found living and indigenous in the North,” &c. The occurrence of fossil tortoises and tortoise remains, both on the Continent and in Britain, is very familiar to geologists: I never intended to call in question statements universally accredited; but, in justice to Mr. Newton, I have much pleasure in extracting entire, the passages to which he refers.—*E. Newman.*]

“The first notice of the discovery of a fossil tortoise in Sweden seems to be by Professor Dalman, who gives an account (Vetensk. Acad. Handl. 1820, II. p. 286, tabb. vi., vii.) of some remains found in digging the Götha canal, near Norsholm, in Östergötland. They appear to have been in peat earth, over which a bed of gravel had been super-imposed. About twenty years later Professor Nilsson (Vetensk. Acad. Handl., 1839, pp. 194, 210) noticed a like discovery made in two places—Gräfve in the pastorate of Bragarps, and Fuglie in that of Hvällinge—both in Scania, and then pointed out what seemed to him to be some differences between the well-known *Emys lutaria* and the Swedish examples, which he separated as ‘var. borealis.’ In 1842, the same naturalist states (Skandinavisk Herpetologi, p. 11, note) that more than twenty years previously he had received, through a student, a living specimen of the European water-tortoise, captured near Falsterbo, the extreme south of Sweden, which, at the time, he thought must be an imported animal, accidentally escaped, and so neglected to make further enquiries respecting it. He likewise added that he had recently obtained from another source fragments of a fossil water-tortoise found in a moss in Öland. This he identifies with the modern *Emys lutaria*, and appears content to allow his own variety ‘borealis’ to sink into oblivion, as if doubtful of its validity even as a local race. For the occurrence of tortoise-remains in Danish bogs, I can only refer to a statement made by Professor Steenstrup (Overs. Vid. Selsk. Forhandl. 1848, p. 74) respecting an imperfect example of the ‘*Emys lutaria*, var. borealis, Nilsson,’ found in a moss at Overdraaby, in Zealand; while, a few years later, he announced (Overs. &c., 1855, p. 1) the discovery of the dorsal and sternal shields of another individual in a moss at Egholm, not far from the last-mentioned locality, and it is also stated (*op. cit.*, p. 184) that the remains of a third—but smaller and younger example—had since been obtained at the same spot.”

The Fresh-water Tortoise an Inhabitant of Great Britain.—I was exceedingly startled to read, in the last number of the ‘Zoologist’ (Zool. 8190), an extract from

Mr. Newton's essay 'On the Zoology of Ancient Europe,' in which he says the remains of a fresh-water tortoise have been discovered in recent peat in Norfolk. The following has been in print some months in a supplement prepared by myself to a forthcoming work, by Sir Oswald Mosley, on the Zoology of this district:— "Cistudo europæa, Cuv. (The Spotted Marsh Tortoise). This species is introduced, owing to an example having been captured, in the early part of the summer of 1857, on the banks of the canal near Burton. It is not a species that can be kept long in captivity; but it is probable it may have lived for a long period in the canal, or even have bred there, if accident had provided it with a mate. This animal is said not to take food excepting in the water. The individual in question died very soon after coming into my possession." When I penned the above remarks, I had no other idea than that my specimen, improbable though the supposition was, had been kept in an aquarium, and had escaped accidentally from captivity. With the evidence, however, adduced by Mr. Newton, of the recent occupancy of this country by a fresh-water tortoise, it appears to me to be the less improbable supposition, to view my specimen as a truly British-born and indigenous individual. The names *Cistudo europæa* and *Emys lutaria* are treated as synonyms by some authors, but even should not that be quite correct, it is very probable a mistake may have been committed in naming the imperfect Norfolk remains *Emys lutaria* of Gray. The spotted fresh-water tortoise lives in lakes and marshes, some of which are situated in the extreme South of Europe, others as far North as Prussia; and it is said to bury itself in the mud during the greater part of the summer, and to hide in some hole on land in winter. A few remaining individuals of this hiding species may thus have hitherto escaped the attention of British naturalists; whilst the very recent discovery of a new British snake renders the discovery of a new Chelonian less improbable than it would otherwise be.—*Edwin Brown; Burton-on-Trent, October 10, 1862.*

Capture of another Specimen of the Lizard Snake: Birth of Young Ones.—Mr. Buckland has procured from the New Forest a fine female specimen of the lizard snake (*Coronella austriaca*), in addition to the one already mentioned as in the possession of the Zoological Society. On Tuesday morning she produced six young ones, two of which were drowned in the water provided for their mother, and of the four survivors Mr. Buckland thus writes in the 'Field' newspaper:—"I really wish my good friends who read the naturalist columns of 'The Field' were by my side now, and I would show them one of the prettiest sights they ever beheld; the old mother snake is coiled up in a graceful combination of circles; her little family are nestled together on her back; they have twisted their tiny bodies together into a shape somewhat resembling a double figure of 8, and there they lay basking at their ease in the mid-day sun. The old mother snake is vibrating her forked tongue at me, the little ones are imitating their mother's actions, and are vibrating their tiny tongues also; the mamma's head is most beautifully iridescent in the sun, and her babies are in this respect nearly as pretty as their mother. They are about five inches long, about as thick as a small goose-quill, and smoother than the finest velvet. Their eyes are like their mother's; their tails are unlike their mother's; she has lost the tip of her tail—her young ones have not, they are tapered off to a point as sharp as a pin. Their skins are of a brownish black colour, and marked like their mother, only that these markings are not yet well developed. The scales on the under parts of their bodies are a beautiful pale glittering blue; altogether they are real little beauties." This interesting occurrence proves that the lizard snake is viviparous, in this respect

assimilating to the viper (*Pelias berus*) rather than the common snake, *Coluber Natrix*.—*Edward Newman.*

Singular Capture of an Octopus.—The ship's company are fishing from the main-deck ports, when some excitement is occasioned by one of their hooks being seized apparently by a large fish. The imaginary prize is heavy and is rapidly hauled up, when it appears to the amused bystanders in the form of an old iron tea-kettle without a spout! Curiosity induces a sailor to peer into the interior, when he observes two eyes of some strange animal undreamed of in his philosophy gazing up at him, but the occupant cannot be dislodged. Here is a pretty kettle of fish! As persuasion is of no avail a bold hand is introduced, when it is immediately seized by a fleshy coil and retained by a hundred suckers. The hand is forcibly withdrawn in terror, while the great eyes continue to stare upwards from the profundity of the kettle. The kettle, with its mysterious lodger, are now submitted to the Doctor, who is expected to solve the question of this questionable shape. While pondering on the best means of dislodging the creature, he unexpectedly relieves us from the dilemma by suddenly making his exit and shuffling rapidly along the deck in a grotesque and startling manner, revealing at the same time the form and action of a great warty Octopus. Alas! poor Octopus rugosus. He very soon becomes a specimen in spirits.—*Arthur Adams; Ascension, May, 1862.*

Notes on some peculiarities of Insect Life in 1861.—Never, perhaps, were insects generally so scarce as in 1861; the effects, no doubt, of the cold wet summer of the previous year. Some remarkable exceptions to this, and one or two other peculiarities, I have thought worthy of record. Thus, while bees, Fossores and sawflies were so scarce that they were said not to be in existence at all, yet wasps were in such abundance in some places as to become a perfect pest. Everywhere in our own district more than plenty of them were astir, and these were principally the ground wasps, *Vespa vulgaris* and *V. rufa*. In the vicinity of Wigton, Cumberland, the wasps were abundant enough to dispute possession of the cherry crops with their owners; these also were the ground species. Near Brampton and eastward by Lannercost, towards our own district, one of the tree wasps, *Vespa norvegica*, was the predominant species. By the roadsides leading from the railway station to Naworth Castle their nests might be noticed in especial abundance. Near Lannercost and up to the village of Banks the same species has colonized the gardens, using the branches of the gooseberry bushes on which to suspend their nests. I was often asked to catch the hordes of "tartars" with my "fly-catcher," a task, however, which I most respectfully declined. One of the ground wasps would appear to have tenanted a fallow field at Walton-wood-head, and were so desperate in their attacks on horses and men that the farmer had to cease work until the nests were sought out and their inmates destroyed. Also very extraordinary was the occurrence of the common species of *Apathus* (*A. campestris* and *A. Barbutellus*), in very nearly their usual numbers, while the species of *Bombus* of which they are parasites were in such diminished numbers that certainly not more than one-fiftieth part of the usual number of individuals of our commoner species (*B. Muscorum*, *B. Pratorum*, *B. Lucorum*, *B. lapidarius* and *B. Hortorum*) were noticed; of the rarer species

(*B. senilis*, *B. fragrans*, *B. Sylvarum*, *B. Derhamellus* or *B. Scrimshiranus*) not a single specimen was seen during the whole season. The species of solitary bee taken was *Megachile circumcinctus*, of which I caught a pair on the sands near South Shields, and these were only about one-half the size of the specimens from the same colony which I took the previous year. During the whole season I only saw one fossorial insect, *Crabro dimidiatus*, although I kept a sharp look-out for them, the tribe being a great favourite of mine. Ants, I think, also were tolerably numerous: Mr. Perkins and I observed *Formica rufa* in great plenty in the woods near Bothal, and I noticed *Formica nigra* in much of its usual numbers when in Cumberland in June. The commoner yellow ants were plentiful also near the ballast heaps at South Shields. Earwigs were neither common nor destructive in gardens, and they were very few in numbers on the sea-coast, where they swarm in ordinary seasons. In Coleoptera some good things were taken, which will be noticed elsewhere. I never recollect a season in which so few sawflies were astir; the only species noticed was the one which infests the gooseberries. Hemipterous insects were exceedingly scarce, and although the water species were plentiful enough, yet many of them wanted wings, most likely from the deficiency of heat. Of many thousands of *Gerris paludum*, seen in the Ouse-burn in October, not one had wings or even wing-cases. I took some small bugs *in copulâ* early in March, which appears rather remarkable, as these insects are in the perfect state only in summer or autumn. Another peculiarity of this remarkable year was the abundance of winged Aphides in May, which were flying in great numbers in the lanes on the few warm still days we had towards the end of the month. I beat a grown species (apparently the *Callipterus Betulæ*; *Koch's Aphiden*, fig. 289), in great numbers out of birch, on the 18th of May, of which fully one-half had wings. I need scarcely observe that Aphides are produced in spring from eggs laid the previous autumn: these young are all without wings, and females; they in their turn produce other wingless females alive, and so on through many generations, until towards autumn, when winged males and females appear, and it is this brood which provides for the continuation of the species, and which, taking wing, are often forced upon our notice by their numbers on warm still days. Midges were also not wanting, as I found to my cost when beating the hedges in Cumberland. Neither were "elegs" wanting, and I noticed a rare *Tabanus (T. austriacus)* much too abundant for the comfort of a farmer's horses near Lannercost.—*Thomas John Bold*, in 'Transactions of Tyneside Naturalists Field Club,' vol. v. p. 219.

Entomological Notes for the year 1861.—Not only in our own district, but throughout Europe, have entomologists been complaining that there are no insects; from the beginning of the spring to the commencement of the winter there has been a very great scarcity of insect life. Cold and wet as last year was, larvæ of all kinds seemed abundant; and it was thought that this season, if fine, would have been an unusually good one for insect hunters: these predictions have not been verified; the prophets prophesied falsely, and, contrary to all expectations, insects never were scarcer. Bees, beetles, butterflies and bugs, as our cabinets can testify, have made a sorry show. Some usually common have not put in an appearance, of others perhaps one or two solitary specimens have been seen, but nothing has been abundant, save and except wasps; these certainly have proved the rule: they have had it all their own way, not only here but in the south as well; "from John o'Groat's to Land's End" everybody says we have plenty of wasps. There was an abundance of them in the spring: at Gibside, when we went to seek *Andrenidæ*, we found nothing but *Vespidæ*; when we

went out, later on in the summer, for beetles, butterflies and bugs, nothing was noticed but wasps; and in the autumn their numbers had not diminished. How are we to account for this superabundance of wasps, when even the common house-fly was not found as usual in the cream-jug at breakfast, nor on the sugar at tea? Such, however, was the case, and such also was the case in the year 1853—the same superabundance of wasps, the same scarcity of other insects.

Lepidoptera:—Butterflies it was no use looking after. The Orange-tip I saw but once; the Tortoise-shell, one on Good Friday and one since; one Red Admiral, no large Whites and but few small ones; the Meadow Browns, where were they? did anybody see them? The Blues held their ground for a few days in extremely limited numbers, and then they disappeared. But I must not omit mentioning, in order to keep up the spirits of our younger brethren of the net and pin, the occurrence of three of our rarer Sphingidæ in the district—*Acherontia Atropos* (Death's Head) was captured at Wylam, *Sphinx Convolvuli* at Newcastle, and *Deilephila Galii* at South Shields. Moths were few, and in many instances of smaller size than usual; this was the case also in the South, probably the effect of cold and damp upon the larvæ.

Coleoptera:—Land beetles of all kinds were scarce, and water beetles it was particularly remarked were in greatly diminished numbers; some of common occurrence were rare; others, local, have not been found. The common cockchafer I only saw three times all the summer, and the coastchafer (*Anomala Frischii*), though sought for particularly in its usual haunts (the links beyond South Shields), where it was abundant last year, has not been seen.

Hymenoptera:—Bombi few, but their parasites, the Apathi, one kind particularly (*Apathus campestris*) was common in the autumn: this is another problem which wants elucidation. Other bees rare, exceedingly so. Ichneumons and sawflies the same.

Diptera:—From the daddy-longlegs to the smallest black dung-fly, in greatly restricted quantities.

Such has been the state of the insect world during the season in this part of the country, and, though want of success may have damped the ardour of some young beginners, I hope in no instance that the fire has been quite extinguished, but trust that the sight of their empty boxes and blank spaces will, when the spring returns, give them a new impetus to pursue this very interesting branch of Natural History—Entomology.—*V. R. Perkins*, in 'Transactions of Tyne-side Naturalist's Field Club.

Captures near York.—I have taken eleven specimens of *Agrotis agathina* off the flowers of the heath, together with *Noctua neglecta*, of which latter I have also bred fourteen fine specimens, varying in colour from deep red to pale drab. I found the larvæ in the spring feeding on the dwarf sallow. *Nonagria fulva*, *Apamea fibrosa*, *Miana arcuosa*, *Noctua umbrosa* and *Toxocampa Pastinum* I have taken pretty freely.—*J. H. Dossor*; East Parade, Heworth Road, York.

Occurrence of *Argynnis Lathonia* in Britain.—I observe that the occurrence of *A. Lathonia* so long ago as the year 1852 has been noticed in the last number of the 'Zoologist' (Zool. 8204). I was not before aware that any doubt existed as to its having occurred many times. Eight localities are named for it in Mr. Stainton's 'Manual.' In either 1858 or 1859 (I cannot distinctly remember in which of these years) seventeen specimens were reported to have been taken in this neighbourhood. I cannot in any way vouch for the truth of this, but I think it probable that some were taken. I can, however, speak with certainty as to one instance in which this insect

was taken by a friend of my own in one of the above-named years, and this specimen is now in my cabinet. It is an unusually large female in fine condition. It was seen flitting several times up and down a broad walk in a kitchen garden, and settled at last on a leaf, expanding its wings in the sun, when it was taken.—*W. Oxenden Hammond; St. Alban's Court, near Wingham, Kent, October 5, 1862.*

Occurrence of Sphinx Convolvuli near Sheerness.—Yesterday a seaman belonging to H.M.S. "Cumberland" brought me a specimen of the above, but it was perfectly useless, the body having been transfixed by a large copper nail, and the wings confined to the slip of wood upon which it was placed by means of glue! It was stated to have been caught upon a telegraph post near Sheerness, about three weeks previously.—*Henry L. Saaby; H.M.S. "Devonshire," Sheerness, September 23, 1862.*

Larva of Ourapteryx sambucaria.—I lately took a larva of *Ourapteryx sambucaria* feeding on ivy. Two days since I hastily removed some of the ivy leaves, intending to replace them with fresher ones, and in so doing I disturbed and broke through the silken thread, with which it had tied itself down to the stem, preparatory to transformation, which I had not observed to be approaching. The following day, on looking to see if the larva had again secured itself, it was not visible, but on turning over the earth at the bottom of the cage I found it buried rather deeply. Thus, the disturbance I had accidentally caused to the insect appears to have caused it to change its ordinary habit, and to adopt a totally altered arrangement for its transformation.—*W. Oxenden Hammond; St. Alban's Court, near Wingham, October 14, 1862.*

Larva of Ennomos erosaria var. canaria.—At the end of August of the present year I took a larva feeding on *Alnus glutinosa* (alder), of a dark red colour, but in other respects it does not well agree with Mr. Newman's description of the larva of *Ennomos erosaria* (Zool. 8173), as the crescentic white mark on the lobe of the crown and the continuous white line across the face were both wanting. There was also a great discrepancy in the time of feeding, time of appearance, &c. My moth came out on the 4th of September, a fine specimen of *Ennomos erosaria var. canaria.*—*H. J. Harding, Deal, September 29, 1862.*

Occurrence of Ennomos alniaria near Deal.—The other evening as I was returning from collecting *Aporophila australis*, &c., when nearly at my own door, I saw a large moth flying about a gas lamp, which at first I thought looked very like *Ennomos tiliaria*. I was not long before I had it in my box, and when I got it home I found it was a fine female of that rare insect *Ennomos alniaria.*—*Id.*

Description of the Larva of Abraxas ulmata.—Robust. When disturbed drops immediately and suspends itself by a thread. Head and legs deep black. Back creamy yellow, forming a broad stripe. Down the middle runs a slender uninterrupted black line; this is succeeded by a broader, uneven, subdorsal stripe, also black; then follows a white line, another black, another white, and another black. Lateral stripe chrome-yellow, having two black spots in each segment. Anal legs black, bordered with yellow. Claspers dirty yellow. A yellow stripe also runs down the belly. The black markings are very intense, and the different stripes clearly defined. Length an inch and a quarter. Feeds on the wych elm in woods and plantations throughout September and beginning of October. Like the perfect insect, it is a heavy, sluggish creature, and does not seem to thrive in confinement. It appears to have the power of producing an almost unlimited quantity of silk. Wherever I have met with this insect it has been in boundless profusion. Give the tree a tap with your stick, and down comes a whole shower of larvæ.—*J. Greene; Cubley Rectory, Doveridge, Derby, October 3, 1862.*

Acronycta Alni at Worcester.—On the 31st of August I took a larva of *Acronycta Alni* on some palings round a shrubbery in the village of Powick, about a mile from my house. The previous night had been very stormy, and I concluded it had been blown from some tree or shrub overhanging the palings. No alder was near, but I offered it *Seringa*, lime and elm being the only trees near the paling, and afterwards alder and other things, but all in vain. As it seemed about full fed, I hoped from day to day that it would make its cocoon, and, to enable it to do so, I supplied it with various kinds of rotten wood, as well as earth and moss, in a most convenient wooden box, where other larvæ had made themselves perfectly happy. But no, it would neither eat nor work, and, after some days of alternate restlessness and sulks, it retired into a corner of the box, where it gradually dried up, without any sign of disease or ichneumon; in short, it was a case just like that of Mr. M'Lachlan's larva (Zool. 8210). Had Mr. Moore's observations been published in time I should certainly have tried hollow sticks in my breeding-cage. Rotten wood was recommended to me by a distinguished northern entomologist, who also spoke from experience of the value of alder as food. A Worcester entomologist, however, bred a moth this spring from a larva that fed on lime. This is the second time that I have taken this larva in this neighbourhood; my first served me exactly the same, but I did not then know of the rotten wood. The restlessness in that case was very remarkable, and I believe it died as much from over-walking as from want of food. Could the nervous system of this larva be investigated by some modern Lyonnet, the difficulty of rearing it might be accounted for; but as *A. Alni* is so scarce, and Lyonnets are probably extinct, we must content ourselves with observing the habits and consulting the tastes of this fastidious creature whenever we have the opportunity. It is the duty of every one who takes the larva to publish his observations. If I should be fortunate enough to take another I shall certainly try the hollow sticks.—*E. Horton; Lower Wick, Worcester, October 2, 1862.*

Micro-Lepidoptera at Mickleham.—In the course of the past few weeks I have taken the following not generally common species of *Tineina* on Mickleham Downs:—

Zelleria insignipennella and *Z. hepariella*. Both these insects have been, as far as I can judge, far more common than usual. They are almost invariably beaten from yew trees. There appear to be some doubts as to whether they are really distinct, and at first I felt strongly inclined to share these doubts, but further experience of the insects induces me to think that they are really two good species,—a point that can only be settled by the discovery of the larvæ. When *Z. hepariella* first appears, *Z. insignipennella* is scarce, but later in the season the reverse appears to be the case, and on my last two visits I saw no sign of *Z. hepariella*; besides the latter insect is always smaller and generally darker and more obscure, but the head is much paler.

Gracilaria semifascia is not at all uncommon; beaten both from yew and juniper.

Coriscium cuculipennellum. A few specimens beaten from yew.

C. sulphurellum. I have taken about fifty specimens of this insect. The first two or three were beaten from yew, but I afterwards came upon their head-quarters in this wise: happening to beat an old lichen-covered sloe-bush, several specimens flew out, and this set me to work systematically at the few bushes I could find of this character, and I found that the amount of thrashing they stood before they would apparently yield up all their occupants, was most astonishing. Mr. E. Shepherd informs me that he has observed the creature to have similar habits in the New Forest. I can scarcely suppose that the larva feeds on lichen, a habit that would be so much at

variance with that of the rest of the family, but cannot help thinking that it may have some connection with the sloe.

Sarothripa Revayana and *Peronea cristana* also appeared singly.—*R. M. Lachlan*; *Forest Hill, October 10, 1862.*

Occurrence of Pædisca oppressana near Willesden.—On the 20th of June last I captured a single specimen of this insect on a fence near Willesden, Middlesex. There were three or four large poplar trees close by.—*Percy C. Wormald*; *Kilburn, N.W., October 1, 1862.*

An Insect Gravedigger.—As I was sitting, this morning, on the lower step of my verandah, my gaze fixed listlessly, during the noontide heat, upon the gravel-walk before me. "Thinking," I verily believe, "of nothing," or, at most, entertaining a dreamy impression that I was becoming a focus for the concentration of the sun's rays, my eyes were suddenly attracted to an insect whose motions very soon rivetted my attention. The little creature, when I first caught sight of it, had already commenced, within four feet of the spot on which I was seated, its work of excavation; for as I looked it disappeared, and shortly afterwards returned to the surface of the ground, tail first, and, running backwards over a tiny mound it had previously made, deposited a grain of gravel, fully as large as its own head, *outside* the mound, with the evident intention that it should not roll back again into the cave it was in process of forming. This operation was continued with great rapidity, and ever as it re-entered the orifice I saw minute particles of sand fly upward, impelled purposely by its descending feet. The care with which the insect distinguished between the larger and the smaller grains was wonderful; those only whose gravity might have caused them to roll down again, had they been placed below the apex of the mound on the side on which the work was being carried on, were conveyed *beyond* the mound; the smaller grains were added to the mound itself without much apparent discrimination. After a time the work was evidently completed to the satisfaction of the labourer, for it flew away to the grass edging of a flower-border, distant about six feet from the cave, and immediately emerged from thence, dragging after it—for it was running backward—the body of a large spider, not long dead,—a spider whose bulk was at least three times as great as that of its intending sexton. On arriving within twelve inches of the sepulchre the insect left the corpse, and hastened thither, to ascertain, as I cannot doubt, whether or not the orifice was large enough for its admission: it was not so, and the grave-digger resumed his work, enlarging, though but very slightly—showing thus how true his eye was—the opening he had made. Returning to the spider, he dragged it onward, and, still running backwards, pulled it after him within the hole; and I noticed that, so nice had been the calculation, there was exactly sufficient space for the passage of the body,—sufficient, but not a hair's breadth to spare. The insect soon once more emerged, and immediately commenced filling in the grave,—a work he speedily, though carefully, accomplished; and when that work was completed he ran round and round with great celerity upon the surface, scattering the gravel in all directions with his feet, with the undoubted object of obliterating even the faintest mark by which his *cache* might be discovered; and so effectually was this portion of his operation executed that half-an-hour subsequently I was unable (though I searched diligently and anxiously, assisted too by eyes far keener than my own,—eyes that had also watched the whole transaction), to find it out myself. Meantime, having sent for my net, I, not without some feelings of compunction, captured the little workman, and, putting him to death by the shortest possible method, made a sketch of him for future

reference. A reflection, and I conclude. How slender is the line of demarcation separating instinct from reason! and how marvellous is the creative power that could have imparted, to an insect so insignificant, faculties such as I have attempted, however feebly, to describe!—*Vincent Clementi*; *Peterboro, Canada West, July 26, 1862.*—*Communicated by the Rev. J. F. Dawson, M.A.*

Description of the Larva of Phytonomus Pollux.—I have this season bred several specimens of *Phytonomus Pollux* and the variety *alternatus*, from larvæ found feeding on *Œnanthe pimpinelloides*, in the vicinity of Exeter, and not having ever seen a description of these larvæ in any work, I beg to append one for the use of others. It is of a pale yellowish green colour, with the head black and rather small, the three anterior segments somewhat suffused with blackish green; this is continued along the sides of the larvæ above the spiracular line to the penultimate segment of the tail. There are lappet-like projections from the third anterior segment to the penultimate one of the tail, forming eight bright pale yellow spots; the spiracles themselves black, each of the yellow lappets have two black dots placed horizontally; each segment, which is much wrinkled, has eight minute brownish dots, placed on an elevated ridge, each surmounted by a bristle. Legs very rudimentary, the anterior indicated only by black points. Length of the body 2—2½ lines. These larvæ went into pupæ on the 28th of June, and came out on the 10th of July. They spin a beautiful open net-work cocoon, the meshes of which are nearly round, the angles being obliterated by the adhesion of the transverse lines forming the net-work. The pupæ do not lay at the bottom of the cocoon, but are elevated to a considerable angle at the head, so that the cocoon in reality is shorter than the pupa, but very wide in proportion. These cocoons are not made of silk, but of a gelatinous substance, semitransparent and tough; they are not soluble in nitric acid, which is very remarkable: whatever this substance may be its power of resistance of this powerful solvent is something very strange. I immersed a cocoon in this acid for three hours, and it came out as perfect as it went in. The larvæ of this species feed in the flowers and unopened buds of the *Œnanthe* in May and June, and when feeding, to compensate for the want of legs, they turn themselves half round the umbellules, and so hang on by pressure of their bodies against the stem. The varieties of the imago of this species are very striking and very decided, and might easily be mistaken for distinct species if colour and markings were only considered, but form and sculpture stamp the species.—*Edward Parfitt*; *Devon and Exeter Institution, October 2, 1862.*

Description of the Larva of Phytonomus Rumicis.—The larva of this species is very much like the preceding, the principal difference being that the three anterior segments are more suffused with blackish green, and this colour is continued beneath to the end of the third segment from the apex of the head, the rest of the under side being yellow. This colour penetrates the other in a narrow stripe to the head. The habits and every other particular the same as *P. Pollux*. I have two pupæ of a parasite which spin up in the cocoons of this species which have not yet come out; they are probably *Ichneumons*, as they have all the appearance of such: these will not I suppose come out before the spring?—*Id.*

Notes on Phryganidæ from South Devon.—Having lately made a short stay in South Devon, chiefly with the object of collecting *Phryganidæ*, I thought that a few words on the success met with might be acceptable to the readers of the 'Zoologist,' and perhaps induce some to turn their attention to these much neglected but highly interesting insects. Had the weather been finer it is possible that more might have been

done, but at Plymouth, where I stayed nearly a week, "west country" weather prevailed to such an extent that one is almost inclined to believe the saying current in the more easterly parts of the county, that "it always rains at Plymouth," an accusation, however, which is indignantly denied by the inhabitants. For those species of Phryganidæ that require the highly aerated water of running streams for their successful development the boulder rivers of South Devon are particularly adapted. My attention as a Londoner was especially turned to these rivers, and from that reason the species of Limnephilidæ, most of which breed in standing waters, are poorly represented in the list which follows. It is possible from the comparative absence of suitable breeding places that these are really not plentiful. The localities visited extend from Exeter to Plymouth, and so of course include the various streams that have their origin on Dartmoor. The spot that I found most productive was Shaugh Bridge, about a mile from the Bickleigh station on the Tavistock Railway. Here two rushing torrents, known as the Rivers Meavy and Cadworthy, unite amidst scenery of the most romantic nature. For the knowledge of this and many other interesting localities I am indebted to the courtesy of my friend Mr. Reading. The following is a list of the species taken:—

Limnephilus Auricula, *Curtis*. Dawlish.

L. costalis, *Curtis*. Abundant in a marshy spot on Dawlish Warren.

Stenophylax striatus, *Pictet*. One specimen at Cornwood (River Yealm). Apparently a scarce species everywhere.

S. stellatus, *Curtis*. Dawlish.

Halesus digitatus, *Schranck*. Dawlish and Shaugh Bridge.

H. flavipennis, *Pictet*? *Stephens*. Moderately common by most streams.

Sericostoma Spencii, *Kirby*. A few specimens.

Mormonia hirta, *Fabr*. Common.

M. irrorata, *Curtis*. Of this little species, which has hitherto been a great rarity (not more than half-a-dozen specimens being in collections both here and on the Continent), I captured eight or nine. It evidently prefers spots where the water is very shallow, and in two localities I found it among the damp moss about the sides of quarries, where there were merely slight dripping springs.

Hydroptila ——— ? Very abundant at Dawlish, coming into the open windows in swarms.

Odontocerus albicornis, *Scopoli*. Single specimens at Exmouth, Dawlish and Ivybridge (River Erme).

Leptocerus bifasciatus, *Olivier*, *Pictet*. This beautiful black, white-spotted species was not uncommon at Dawlish, dancing about in small swarms over the surface at mid-day.

L. (Setodes) bicolor, *Stephens*. Bickleigh.

Rhyacophila dorsalis, *Curtis*. Abundant by all running streams. At Tavistock, where the waters of the Tavy are much polluted by mine water, this was the only species that frequented the river side, though by a small stream that runs into it other species were as common as elsewhere.

R. munda, *M'Lachlan*. This species, which I first discovered last year at Shaugh Bridge, was common at the same locality, and I also found it at Ivybridge and Cornwood. It probably frequents all the Dartmoor streams. All my specimens are males. Possibly the female is so like that of *R. dorsalis* that they are confounded.

Glossosoma fimbriata, *Stephens*. Generally common.

Berœa ——— ? Dawlish. The small black insects in this genus are little understood.

Chimarra marginata, Linn. One specimen only at Shaugh Bridge. Mr. Reading informs me that earlier in the year this is very abundant on the mossy boulders in the middle of the stream.

Plectrocnemia conspersa, Curtis. Dawlish.

Polycentropus irroratus and *P. multiguttatus*, Curtis. Of each several specimens.

Philopotamus variegatus, Scopoli. Abundant by all streams; possibly *scopulorum* is also present, but I am as yet not able to separate them satisfactorily.

Philopotamus? *occipitalis*, Pictet (*Aphelocheira subaurata*, Stephens). A few specimens. Those from Shaugh Bridge seem darker, and are perhaps distinct.

Aphelocheira flavomaculata, Stephens. Mr. Reading sent me a specimen of this from Cornwood early in the summer, and I met with two examples in the same locality.

Tinodes pusillus, Curtis. Dawlish.

Hydropsche ———? Several specimens at most of the localities visited. I dare not at present even hazard a conjecture as to the name.

I also brought home many specimens of Ephemeriðæ, Perlidæ, &c., the determination of which remains for some future time. In conclusion I again say that I shall be very glad to see any specimens that entomologists may have collected, especially from Scotland, Ireland and Isle of Man.—R. M'Lachlan; Forest Hill, September 23, 1862.

Proceedings of Societies.

NORTHERN ENTOMOLOGICAL SOCIETY.

July 28, 1862.—The Meeting took place at the residence of Mr. Thomas Hague, Stalybridge. Mr. N. COOKE, President, in the chair.

Exhibitions.

Mr. Birchall exhibited upwards of six hundred specimens of Lepidoptera, captured in Ireland during the last week in June; among them were fine series of *Chortobius Davus*, *Zygæna Minos*, *Lithosia aureola*, *Aspilates strigillaria* (variety), *Dianthœcia Nisus*, *D. Cucubali*, *Cucullia Chamomillæ*, *Erastria fuscula*, *Banksia argentula*, *Hydrelia unca*, *Melanippe hastata*, *Serricoria littorana*, *Eupœcilia albicapitana* (see 'Entomologist's Annual' for 1862); also a single specimen of a *Noctua*, apparently allied to the *Dianthœciæ*, and new to the British list; its name has not yet been ascertained. Mr. Birchall brought for distribution among the members a number of *Cossonas Jardia*, captured at Killarney.

Mr. B. Cooke exhibited *Coccyx finitimana*, a new species of *Glyphipteryx*, bred from leaves of *Vaccinium*, sent from Rannoch; a new species of *Tinea*, bred from larvæ which fed on Stilton cheese; three species of *Campoplex*, bred from cocoons of *Cimbex Betuleti*? sent from Rannoch; and *Leptocerus bifasciatus*, captured at Bramhall.

Mr. N. Greening sent the following insects for exhibition:—

1. Eleven specimens of *Biston betularia*, bred from a male of the ordinary colour and a black female; five of these were of the ordinary colour and six perfectly black. Mr. Greening has now a large brood feeding reared from the eggs of a pair of totally black ones.

2. *Eupithecia trisignata*, reared from the larva.
3. A pair of *Noctua ditrapezium*, also reared; these were very large, expanding an inch and three-quarters.
4. *Sesia Sphægiformis*, believed to be the first ever bred in England.
5. *Sesia Scoliaformis*.
6. *Cæcophora grandis*, from Llangollen.
7. *Pterophorus lithodactylus* and *P. osteodactylus*, from Llanferris.
8. A bunch of cocoons of *Ennychia cingulalis*.
9. A series of a new species of *Tinea*.
10. Ten varieties of *Abraxas grossulariata*, bred this year, the larvæ having been fed on black currant and radish tops; there was not one of the normal colouring, and three of them are splendid varieties.

Mr. C. S. Gregson sent for exhibition *Pterophorus osteodactylus*, discovered by himself when on the rocks at Llanferris, on the 22nd of July, 1862.

A note from Mr. Gregson was read, in which he mentions having reared *Cimbex Lucorum*, male and female, and its parasite, from pupæ sent from Scotland by Mr. John Stafford: it is a true birch-feeder, and new to Britain.

A pupa of *Petasia nubeculosa* was exhibited to show the large hook or forked-tail appendage.

Mr. N. Cooke exhibited seven specimens of *Sesia Scoliaformis*, four bred and the other three captured by himself and son at Llangollen, on the 13th of July, 1862.

The Secretary read the following note by Mr. Gregson:—

Note on Mr. Newman's Description of the Larva of Orgyia fascelina (Zool. 8078).

“One error in Natural History is well known to be the father of a whole race of errors, but it is especially likely to be so when made by a man of Mr. Newman's standing, for all book-makers will claim to be excusable if they copy his works. I therefore wish to call the attention of naturalists to one or two mistakes he has evidently been led into by some one who knows nothing whatever about the habits of this species. Mr. Newman says the eggs are laid in August on the leaves of *Salix fusca*. Here are two mistakes in the length of one line; the first is impossible, unless the insect lives two or three months in the perfect state, for, as a rule, it appears in May or June on the banks of the Mersey, and any boy knows that this species lays its eggs round a rush, stick or twig of any sort, just as does *Saturnia Carpini*, and some of the collectors in this neighbourhood would prefer searching for its eggs or larvæ on a thorn hedge if they wanted a supply for their friends, not but what it will and does eat willow where no thorns are, just as it eats heath where there is neither thorn nor willow. The larvæ are abundant in this district on both thorn and willow, but I doubt if my practical friends here ever knew it to lay its eggs otherwise than round a twig or grass stem, where it forms a beautiful symmetrical object.”

The Secretary then read the following paper by Mr. Edwin Brown, of Burton-on-Trent:—

On the Mutability of Specific or Race Forms.

“The question how did species originate has suddenly become the most absorbing scientific topic of the day, but it is doubtful whether we are ever likely to arrive at more than the barest inferential evidence touching the origin (properly so speaking) of species, or, in other words, at a knowledge of the earliest differentiation of forms when

first inanimate matter became animate. If, however, the phrase 'origin of species' be considered to relate only to the assumption by animals and plants of those exact forms which they now present to our observation, it is tolerably certain that careful reasoning from exact data will lead ultimately to correct notions as to the relationship by descent of races, and consequently to the origin of existing so-called species. Many years before Darwin promulgated his doctrine of 'selection of races' I had formed my own conclusions relative to the now fixedness of species, and being unable to find any support in nature to the theory of uniform 'progressive development,' I framed the hypothesis that species or forms are, and ever were, mutable, sometimes advancing in the scale of organization, sometimes retrograding, but always varying,—the sons from their sires, and the sires from the patriarchs of their respective races. I termed the theory 'The Mutability of Species, or the Mutation of Generations.'

"Mr. Darwin has dwelt ingeniously and satisfactorily upon one cause for the alteration of forms of life, *viz.* that of the greater fitness to surrounding circumstances in the struggle for existence of certain slight modifications of structure. He has dwelt so exclusively upon this branch of the great subject as almost to lose sight of other agencies; for example, the direct influences of climate and food, and the accumulative effects of those apparently causeless individual variations that take place at every generation. It is to the latter law that I am myself disposed to attribute the greater portion of the mutation of forms or of so-called species. Let us suppose a separation by an intervening ocean of the two portions of a large tract of land that were previously united, and let us further suppose the whole of this land to have been inhabited at the time of the cataclysm by some race, say of geodephagous insects. We will distinguish these two now separated portions of land as the eastern and the western. The generations of the insect in question that came into existence after the separation of the land would succeed each other as their ancestors had previously done, each individual differing somewhat from the parents and each pair handing down to its progeny a structure embracing what may, for the sake of explanation, be termed the hereditary typical form, together with a portion of the joint peculiarities of the parents themselves, and combined with that certain degree of individual peculiarity by which peculiar facies or appearance the new-born individual would be known to the critical eye from all other individuals of the same race. The conjoint effect of hereditary transmission of form and individual peculiarity will have taken in the eastern tract one direction, in the western probably another: food, climatic conditions of heat and moisture, and natural selection, will have acted directly and indirectly in giving some bias in respect of form, size, colour and appetites, which, in the individuals of either one of the restricted districts, will have assumed a degree of uniformity owing to the interbreeding. In the meanwhile, different influences have been operating in the other isolated district, and the mutable tendency of the race, on the ordinary doctrine of chances, will, almost as a matter of inevitable certainty, have set up a bias differing in some respects from that of the generations in the opposite district. It thus results that the longer the period of time during which separation has existed the greater the chance of divergence, and if the races in the two separated tracts of land have been kept apart for a long period of time, say for some thousands of years, we may reasonably look to find a very sensible divergence of forms, sufficiently so to set naturalists disagreeing as to whether they ought to call the forms by two different specific names, or whether the two should be considered varieties merely of each other. This is the view I took in reference to mutation of forms or transmutability of species,

and I now propose to lay before you the insects which, to my thinking, as nearly demonstrate the truth of that theory as demonstration can be arrived at. In the first place, I lay before you a series of North-American Lepidoptera, collected chiefly by the late Mr. E. Doubleday, and putting, as far as I am able, the European analogues side by side, you will see a striking illustration of the common phrase, 'the same with a difference.' Several years before the death of the late Mr. J. F. Stephens, I was talking with him on the subject of these very specimens, when he told me a friend had one day brought to him, by way of a joke, a box of United States Lepidoptera, they being the analogues of British species, when, on opening the box, believing them to be British, his involuntary exclamation was, 'What a wonderful assemblage of varieties.'

"It must be very far back in point of time, although perhaps, geologically speaking, of recent date, that the Atlantic was so far bridged over, as that the individuals of any race of insect could interbreed, and thus render the bias of mutation, to a certain extent, uniform throughout the larger area. We have, in the difference between the parallel forms now exhibited, a measure of the effects of separation through a very long period of time, and when we see, however decided the difference in minor characteristics, how slight is still the separation of form from form, we need not wonder that no appreciable difference can be found between the figures of the ostrich on ancient Eastern monuments and the bird itself still living, under the same circumstances of climate and food that surrounded it three thousand years ago, and of which fact Mr. Westwood makes so strong a point in favour of the permanency of species.

"The other specimens exhibited are *Nebria* and *Calathus* from the Shetland Isles. They will all be found to differ, to an appreciable extent, from specimens captured on the mainland of Britain. It is probable that the separation of these areas took place at a much later date than the epoch of the separation of North America from Europe. It would therefore have been interesting to have compared the Lepidoptera of Shetland and Britain, only that the distance to which the islands are removed from each other is so small as to vitiate the conditions of the experiment by individuals occasionally flying over from one area to the other. I regret I have intermingled in my collection specimens of several other species of Shetland *Geodephaga* with British-caught specimens, as nearly all the *Geodephaga* from those islands exhibited characteristic differences in the shape of the thorax, or of some other portion of the structure, distinguishing them at once from mainland specimens, and affording characters sufficiently definite for a manufacturer of species to found new specific names upon. To the naturalist who busies himself with nomenclature there appears to arise a great practical difficulty from the disbelief in the permanency of species; but does not also the naturalist who has full faith in the lastingness of specific forms, spend much of his time in trying to ascertain which forms are properly designated as species and which as varieties merely? I am inclined to think, when once the fixity of species has ceased to be a matter of faith, as it certainly will do sooner or later, principles of nomenclature will be framed that will sweep away that dreadful incubus of synonyms under which we now labour.

"Let us try to answer the following question on this subject, Ought the North-American and the European analogues of each other to bear the same or different names? Where a difference of form exists between the individuals inhabiting the two extreme geographical points of a large area, as when a North British form can readily be separated from a South British one, ought the extreme and all the inter-

mediate forms to bear the same cognomen? In the latter case, I would say, let all the forms bear one name corresponding to what we now call the specific name, but which would be better termed the 'race name,' adding to that name the name of the district in which the distinctive form occurs. When, however, allied forms are separated by a wide ocean, and there is consequently no opportunity of tracing the relationship of consanguinity, and thereby of ascertaining whether the divergence has become so great that there exists an inability to interbreed, it is better to give distinctive specific or race names, however strong may be the suspicion that the difference would break down were the two forms supplied with the means of intermingling. The question resolves itself pretty much, therefore, into a geographical one, and as such it will ultimately be treated. We need not dwell upon those individual varieties that occur in the same broods of insects, nor on the question of the limits of genera. All are agreed that chance varieties should bear one common race or specific name, and it is manifest that if specific forms are found to be mutable the limits of genera cannot be more stable. Recent researches of entomologists prove that great differences exist between the external organs of generation of closely-allied species. To this circumstance probably may be mainly owing the fact that we find so few mules between races inhabiting the same district. This inability to interbreed may possibly prove to be one of the laws of Nature, by which excessive variation of individual forms is prevented.

"In our researches into the nature of species we need not attempt to go back to the origin of all things. Let the question of permanency or mutation of species be discussed as geological phenomena are reasoned upon by modern geologists,—beginning at the known, and working backward so far as reason and facts will safely carry us, leaving all anterior to that to speculative world-builders.

"The question of the primary origin of species has the same relationship to the question of the mutation or permanency of forms that Cosmogony has to Geology. One is a mere speculation, the other a precise science. We shall never know more about the first forms of the animals and plants that occupied the earth than we do about the origin of this planet itself, but we may surely entertain a doubt about the permanency of species without being ranked as dangerous schismatics. If, however, fair induction lead to the conclusion that all animal life evolved by slow degrees from some individual monad, I will not shrink from that conclusion. Surely it gives a worthier notion of a Creator to suppose that he foresaw all contingencies, rather than that he should be ever remaking and recreating by the direct interposition of his providence.

"In the eloquent language of an American writer, 'The scheme of creation is a question of *will*, and not, as the insanity of logic has assumed, of *power*. It is not that the Deity cannot modify his laws, but that we insult Him in imagining a possible necessity for modification. In their origin these laws were fashioned to embrace *all* contingencies which could lie in the Future. With God all is Now.'

Mr. Birchall did not see how the views of Mr. Brown differed from Mr. Darwin's theory.

The Rev. Joseph Greene remarked that East and West would produce forms of the same insect that, at a distance of time, would be mistaken for different species, and that before we can say an insect does this and does not do that, our observations must be much more extended than they are now.

It was also remarked that the wonder is that species have not varied more than

appears from the specimens exhibited, and the fact of the external organs of generations of closely-allied species differing so much tends to prove that species are permanent, also that some species so closely allied, in the imago as to be indistinguishable, are totally different in the larva state, and an interesting discussion ensued.—*G. H. Wilkinson.*

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

[It seems desirable to preserve some record of this important gathering, although the great extent to which the reports in the 'Times' newspaper have extended render anything approaching to a concise or condensed record extremely difficult. Below I have given but little more than the titles of the zoological papers, and some even of these have probably been omitted through inadvertence.]

Dr. T. Spencer Cobbold, F.L.S., offered some remarks on all the known forms of human Entozoa, illustrated by an extensive series of original drawings. He stated that the human body was liable to be infested by no less than thirty species of internal parasites, and he communicated the results of his studies and researches into the history, structure, habits, mode of development, and migrations of each individual form. He demonstrated the possibility of checking the progress of several fatal entozootic diseases, and he appealed to the Association to support him in his experimental researches into the mode of production of these remarkable animals. From the investigations which he had already carried on independently, Dr. Cobbold appeared to have obtained results of great importance, both in a social and economic point of view.

Professor Balfour read a paper by Mr. James Buckman, giving an account of experiments with the seed of malformed roots, and on the ennobling of roots, with particular reference to parsneps.

Dr. E. P. Wright read a paper, contributed by Mr. James Samuelson, "On recent Experiments on Heterogenesis, or Spontaneous Generation."

Professor Owen read a paper "On the Zoological Significance of the Brain and Limb Characters of Man, with Remarks on the Cast of the Brain of the Gorilla." The Professor exhibited two casts—one of the human brain, which had been hardened in spirits, and had therefore not preserved its exact form, but to all intents and purposes it would serve as an illustration of the human brain; the other cast was taken from the interior of the cranium of the gorilla. From an examination of these the difference between the brain of man and that of monkeys was at once perceptible. In the brain of man the posterior lobes of the cerebrum overlapped to a considerable extent the small brain, or cerebellum; whereas in the gorilla the posterior lobes of the cerebrum did not project beyond the lobes of the cerebellum. The posterior lobes in the one were prominent and well marked, in the other deficient. These peculiarities had been referred to by Todd and Bowman. From a very prolonged investigation into the characters of animals, he felt persuaded that the characters of the brain were the most steadfast; and he was thus induced, after many years of study, to propose his classification of the Mammalia, based upon the differences in the development of their brain structure. He had placed man—owing to the prominence of the posterior lobes of his brain, the existence of a posterior cornu in the lateral ventricles, and the presence of a hippocampus minor in the posterior cornu—in a distinct sub-kingdom, which he had called Archencephala, between which and the other members of the Mammalia the distinctions were very marked, and the rise was a very abrupt one.

The brain in his estimation was a far better guide in classifying animals than the foot, but the same difference that existed between their brains was also observable between their feet. The lecturer referred to a diagram which represented the feet of the aye-aye, the gorilla and man, pointing out the chief differences in the structure of the skeleton. These differences he considered sufficiently great to elevate man from the sub-kingdom to which the monkeys belonged, and to place him in a distinct sub-kingdom by himself.

Professor Huxley observed that the paper just laid before the section appeared to him in no way to represent the real nature of the problem under discussion. He would therefore put that problem in another way. The question was partly one of facts and partly one of reasoning. The question of fact was, what are the structural differences between man and the highest apes? The question of reasoning, what is the systematic value of those differences? Several years ago Professor Owen had made three distinct assertions respecting the differences which obtain between the brain of man and that of the highest apes. He asserted that three structures were "peculiar to and characteristic" of man's brain, these being the "posterior lobe," the "posterior cornu," and the "hippocampus minor." In a controversy which had lasted for some years, Mr. Owen had not qualified these assertions, but had repeatedly reiterated them. He (Professor Huxley), on the other hand, had controverted these statements, and affirmed, on the contrary, that the three structures mentioned not only exist, but are often better developed than in man, in all the higher apes. He (Professor Huxley) now appealed to the anatomists present in the section to say whether the universal voice of Continental and British anatomists had not entirely borne out his statements and refuted those of Professor Owen. The Professor then discussed the relations of the foot of man with those of the apes, and showed that the same argument could be based upon them as on the brain, that argument being that the structural differences between man and the highest ape are of the same order, and only slightly different in degree from those which separate the apes one from another. In conclusion, he expressed his opinion of the futility of discussions like the present. In his opinion the differences between man and the lower animals are not to be expressed by his toes or his brain, but are moral and intellectual.

Professor Rolleston said he would try to supply the members of the Association with the points of positive difference between the human and the ape's brain. For doing this we had been abundantly shown that the hippocampus minor and the posterior lobe were insufficient. As differentive they must be given up at last. But as much had recently been done for the descriptive anatomy of the brain by Gratiolet and others as had been done for astronomy by Stokes and Adams, for language by Max Müller, and that this had been ignored in this discussion was little creditable to British science. This analysis of the brain's structure had established as differentive between man and the ape four great differences—two morphological, two quantitative. The two quantitative are the great absolute weight and the great height of the human brain; the two morphological, the multifidity of the frontal lobes corresponding to the forehead, usually, popularly, and, as this analysis shows, correctly, taken as a fair exponent of man's intelligence, and the absence of the external perpendicular figure. This had been abundantly shown by Gratiolet. No reference to these most important matters had been made by Professor Owen, and this omission could not fail to put the British Association's repute for acquaintance with the work of foreign fellow-labourers at great disadvantage in the eyes of such foreigners as might be present. Professor

Rolleston concluded by saying that if he had expressed himself with any unnecessary vehemence he was sorry for it, but that he felt there were things less excusable than vehemence, and that the laws of ethics and love of truth were things higher and better than were the rules of etiquette or decorous reticence.

Mr. W. H. Flower, looking at the subject solely in an anatomical view and as a question of fact, stated that the result of a considerable number of dissections of brains of various monkeys was, that the distinction between the brain of man and monkeys did not lie in the posterior lobe or the hippocampus minor, which parts were proportionately more largely developed in many monkeys than in man, and that if these parts were used in the classification of man and the monkeys the series would be—first, the little South American marmosets, then would follow the baboons, the cercopithei, the macaques; then man must be placed, followed by the antropoid apes, the orang-outang, chimpanzee and gorilla, and last the American howling monkey.

Dr. Humphery and Dr. Molesworth having said a few words,

Professor Owen replied. Professor Rolleston had led the meeting to conclude that he had not paid any attention to the convolutions of the brain of mammals, and that the investigation of this subject was the exclusive property of the German anatomists, whereas he might be permitted to state that almost at the very time that Leuret wrote his memoir on this subject he had delivered a course of lectures on the convolutions of the brain, which, he regretted, had not been published, owing to the pressure of other labours; but the diagrams were still in existence, as his successor could testify, in the Museum of the Royal College of Surgeons.

Professor Owen next made some observations on the homologies of the bones of the head of *Polypterus niloticus*.

The next subject taken up by Prof. Owen was "On the Characters of the Aye-aye as a Test of the Lamarckian and Darwinian Hypothesis of the Transmutation and Origin of Species."

Mr. Newton read observations by Mr. A. D. Bartlett "On the Habits of the Aye-aye living in the Gardens of the Zoological Society, Regent's Park, London."

Professor Huxley observed that the Darwinian hypothesis must be worked out by patient inquiry, and be either confirmed or refuted by investigations and facts, which could hardly at present be gone into. All the necessary facts had not yet been discovered, and, if discovered, their significance could hardly be put clearly before a general audience.

The other papers read were by Dr. Cleland, "On Ribs and Transverse Processes, with special relation to the theory of the vertebrate skeleton;" and by Prof. Allman, "On the Structure of the *Corymorpha*."

Professor Owen exhibited and described the tooth of a mastodon, from tertiary marls near Shanghai, China.

Mr. H. C. Sorby, F.R.S., "On the Cause of the Difference in the State of Preservation of different kinds of Fossil Shells."

Dr. Allman, F.R.S., "On a New Form of Recent Echinoderm, and on its probable ontological Affinities."

Mr. J. W. Salter, F.G.S., "On the Identity of the Upper Old Red Sandstone with the Uppermost Devonian (the Marwood Beds of Murchison and Sedgwick), and of the Middle and Lower Old Red with the Middle and Lower Devonian."

Mr. S. P. Saville exhibited a skull of the *Rhinoceros tichorhinus*.

Dr. John Davy read a paper "On the Scientific Cultivation of Salmon Fisheries,"

by Thomas Ashworth, of Cheadle. The main objects of this paper were to show the great value of salmon fisheries, how they have been neglected in England, and how they might be improved. The produce of the English fisheries has fallen so low that it has been estimated not to exceed £10,000 per annum, and this including the fisheries of Wales; while the money value of the Irish, according to the reports of the Commissioners of Fisheries, is not less than £300,000 yearly: one fishery in Scotland, that of the Duke of Richmond, in the Spey, is said to return to his Grace £12,000 annually. The author, in illustration of what may be accomplished for the improvement of salmon rivers, describes what has been done at his fishery in Galway, and the results. In the short space of ten years the river has been rendered ten times more productive. During the present season as many as three thousand salmon have been taken with the rod. This great improvement has been chiefly owing to the great care taken in preserving the streams during the breeding season, at an expenditure of £500, and by introducing young salmon, artificially bred, into streams fitted for them, but from which the fish had before been excluded, owing to impediments preventing access from the sea. These impediments have either been removed or avoided by means of ladders so constructed as to render the passage to and from the sea easy. A striking example is given by him of a river in Ireland converted into an excellent salmon river by means of ladders. This river is in county Sligo, the property of Mr. Edward Cooper. The ladders are over a fall of about forty feet. So productive has this river, before barren, become, that in July last as many as a thousand salmon were captured in one week.

Professor Huxley made some remarks upon the natural history of the herring, and called upon

Mr. J. M. Mitchell, of Mayville, who read a paper "On the Food of the Herring," in continuation of observations communicated to the Association at Oxford and Manchester. Mr. Mitchell contended that the herring does not confine itself to one species of food, but that it feeds upon Crustacea, the young of other fishes, its own young, ova, worms and flies.

Dr. John Davy read "Some Observations on the Vitality of Fishes, as tested by increase of temperature." The experiments described by the author were made on eleven different species of fish of our lakes and rivers, of which the several kinds of Salmonidæ were of the number. The results were that a temperature of water between eighty and a hundred degrees was fatal to each kind. The Salmonidæ were those which were most readily affected by elevation of temperature, the other species bearing it according to their kind somewhat better. The results generally were pointed out as of some interest in relation to the *habitats* of different kinds of fish, and also as tending to prove that the accounts given by travellers of fishes existing in hot springs are exaggerated, and not founded on accurate observation.

Dr. John Davy also read "Some Observations on the Coagulation of the Blood in relation to its cause." These observations were chiefly made to test the hypothesis brought forward by Dr. Richardson, that the coagulation of the blood mainly depends on the escape of ammonia. The many results described by the author were opposed to this view. First he showed that blood in its healthiest state contains no appreciable quantity of the volatile alkali; and, secondly, that ammonia added to the blood in a notable quantity did not arrest the change. Other experiments were described of a confirmatory kind.

The conclusion finally arrived at was that we are yet ignorant of the cause of the

phenomenon, and that the hypothesis of Dr. Richardson, if acted on in medical practice, must be attended with risk.

Sir C. Nicholson gave a clear and succinct account, with the aid of a large map from the Royal Geographical Society, of recent explorations in Australia, especially those of Burke and Wills, Gregory, &c. The tide of emigration appears to be flowing northward of Queensland, as far as Cape York.

Mr. Dunn read "Some Observations on the Psychological Differences that exist among the Typical Races of Man."

M. Jules Gerard, the famous lion-killer, read a paper in French upon an exploration which he proposes shortly to make in Central Africa, from Sierra Leone to Algiers, by way of Timbuctoo. M. Jules Gerard bore high testimony to the merits, as an African traveller, of Mr. Oswell, who, thanks to his rifle, never found any difficulty in obtaining subsistence, and whose example would stimulate him in his expedition. On leaving Sierra Leone he proposed to visit the source of the Niger, and also the republic of Liberia. He should then make for the Kong Mountains, between which district and Timbuctoo a different race of natives was found. He did not propose to travel with a caravan, but with the tribes of the district. At Timbuctoo or Ain Saleh he hoped to discover the papers and journals of Major Laing, the African traveller, who was assassinated near Timbuctoo. M. Gerard expressed a confident belief that these papers were still in existence, since the natives of the interior had almost a superstitious veneration for written characters, and treasured the most worthless scraps until long after they were legible. His route would be through a country possessing a double interest, both geographical and ethnological. The journey was long and perilous, but he had weighed the difficulties of the route, and confidently expected to make his way from Sierra Leone to Algeria in safety.

M. DuChaillu said the section must rejoice at this new exploration of the interior of Africa, starting from the West Coast. Perhaps M. Jules Gerard would succeed in finding some new species of animals which would frighten us.

The Rev. H. B. Tristram, M.A., one of the deputation from Newcastle-on-Tyne, said that he had been in a portion of the country which M. Gerard proposed to visit, and had once met him in his Spahi uniform in the Desert, although M. Gerard was not likely to remember the circumstance. He could not but fear that M. Gerard had underrated the dangers and difficulties of his exploration. The great difficulty would be in getting from Timbuctoo to Ain Saleh. The tribe of Touaregs, who inhabited the Great Desert, were very suspicious and lived by black mail. If they were Pagan tribes M. Gerard would be safe in travelling with them. It was only where the Moslem bigotry came into play that the lives of Christians were unsafe.

M. Gerard said that Mr. Tristram was quite right. He knew the difficulties of his enterprise and had studied them a long time. He believed he should find friends among the native tribes in consequence of the recommendations he should procure from those who traded with them. He proposed to start next month for the western coast, which would be his point of departure.

ENTOMOLOGICAL SOCIETY.

October 6, 1862.—F. P. PASCOE, V.P., in the chair.

Donations.

The following donations were announced, and thanks ordered to be given to the respective donors:—‘Proceedings of the Royal Society,’ Vol. xii. No. 51; presented by the Society. ‘The Journal of the Royal Agricultural Society of England,’ Vol. xxiii. No. 49; by the Society. ‘The Zoologist’ for October; by the Editor. ‘The Intellectual Observer’ for September and October; by the Publishers, Messrs. Groombridge & Sons. ‘Exotic Butterflies,’ Part XLIV.; by W. W. Saunders, Esq. ‘The Journal of the Society of Arts’ for September; by the Society. ‘The Athenæum’ for September; by the Editor. ‘The Journal of Entomology, descriptive and geographical,’ No. 6; by the Proprietors. And the addition to the Library, by purchase, of the ‘Genera des Coleoptères d’Europe,’ Livraisons 108 à 111, was also announced.

Election of New Member.

Thomas Edward Hughes, Esq., of Wallfield, Reigate, was balloted for and elected a Member of the Society.

Alteration of the Bye-Laws.

A copy of the Bye-Laws of the Society, embodying certain proposed alterations therein, was laid on the table and taken as read to the Meeting. Notice was given that a Special General Meeting would be held, for the consideration of such alterations, on Monday, the 1st of December next, at 7 P.M.

Exhibitions, &c.

Mr. Stevens exhibited *Adelops Wollastoni*, of which he had recently captured upwards of a hundred specimens at Hammersmith, chiefly under rhubarb plants.

Sir John Harsey exhibited numerous Homoptera, principally *Cicadæ*, collected by himself in Northern India.

Mr. Desvignes exhibited a remarkable variety of *Cynthia Cardui*, taken on the sands at Margate, at the end of July or beginning of August last. The captor, Mr. Henry L. Stretton, of Forest School, Walthamstow, saw at the same time another specimen, which he considered to be the mate of the captured one; the latter was very similar to, but even more abnormal than, the variety figured in Westwood and Humphrey’s ‘British Butterflies’

Mr. C. Fenn exhibited a Lepidopterous insect, apparently of the genus *Aspilates*, which was taken near Black Gang, in the Isle of Wight, at the end of August last, in company with specimens of *Aspilates citraria*. It was considered by most of the Lepidopterists present to be a variety of *A. citraria*, and was remarkable for its extremely glossy and silken appearance, the absence of marking on the upper side, and the blackness of the under side of the wings.

Mr. F. Moore exhibited a specimen of the “*Kolisurra*” silkworm moth of the Deccan (*Antheræa Paphia*, var.), which had emerged from the pupa in this country on the 15th of September last. He also exhibited a specimen of *Epicopeia Polydora*, Westw., and a drawing of the larva. The imago had emerged on the 18th of August last. Both the pupa and the drawing of the larva had been received from Captain T.

Hutton, of Mussooree, N.W. India, with the following note, dated November 1st, 1861 :—“I captured here, this season, for the first time in twenty years, a specimen of *Epicopeia Polydora*. Since then I found, feeding on an oak tree (*Quercus incana*), at an elevation of 5200 feet, several caterpillars of a very curious appearance, which I am inclined to think belong to this species, simply because I know not to what else to refer them, and have never seen them before. When in motion they advance very slowly and awkwardly, with a wriggling gait, shaking themselves from side to side as if tottering on their feet; the head is only seen when the animal moves, and is jet-black, the whole body being densely clothed and concealed in long flossy stuff, an inch in length or more, resembling glossy floss silk, of a dazzling whiteness: this falls off to the touch in white powder. When the worm is ready to turn it descends from the tree, and spins a few silken threads around and over it, to hold dead leaves together, on the ground, in holes and corners at the roots of the trees, under stones, or such-like places, denuding itself of and enveloping itself in the white floss, for the purpose apparently of keeping itself warm during the winter months. The caterpillars were found small in the beginning of September, and in the first week of October they began to turn. The white floss stands up erect on the body, and has often a slight curl at the summit; when denuded of this the animal was of a dull livid olive-brownish hue.”

Prof. Westwood remarked that the exhibition of *E. Polydora* was peculiarly interesting, from the fact that for a long time only a single specimen of the imago was known; and it had been a question between the late Edward Doubleday and himself whether it was a butterfly or a moth. The discovery of the larva proved that the insect had been properly referred to the Bombycidæ.

Mr. Newman communicated the following remarks on the ravages committed by the larva of *Zeuzera Æsculi*, and stated that the damage done to the young hop-poles in a single plantation in Sussex was estimated at a thousand pounds at the least :—

Destructive propensities of the Larva of Zeuzera Æsculi.

“I beg to exhibit some young shoots of the ash, the vitality of which has been entirely destroyed by the larva of *Zeuzera Æsculi*. In some parts of Sussex, Surrey, Kent and Herefordshire immense numbers of these young ash trees are grown for hop poles; but I have never before met with an instance in which they were seriously injured by the ravages of an insect. The information I have now the pleasure to hand the Society has been kindly transmitted to me by Mr. Jenner, of Lewes, so well known for his researches into the Diatomaceæ. In the spring of the present year the woodreeve and bailiff of Mr. J. C. Courthorpe, of Whyleigh, near Ticehurst, in Sussex, were greatly surprised to see innumerable young stems of previously healthy ash trees dying and dead, the bare leafless tops being very conspicuous. This led to an examination with a view to ascertaining the cause. On cutting off a number of these tops, the interior of the shoot was found to be occupied by what was described as a large white maggot with a few black spots on it: this had eaten the pith and a great portion of the wood, leaving only a thin layer of wood within the bark, and invariably killing the whole of the shoot above the spot where the egg was laid, and where the caterpillar had originally entered. A few of these shoots are now before you, and the plantation consisted entirely of such, fine young plants full of vigour and three to five feet in height. Before Mr. Jenner's attention was invited to the subject, Mr. Courthorpe had ascertained that the larvæ were those of *Zeuzera Æsculi*. When

Mr. Jenner examined the sticks, he found that in some the larvæ had already turned to pupæ; in others the full-fed larvæ were still unturned. In July, three of the pupæ produced moths, one a female, the others males. One died in its abortive attempt to become a moth, the stick having been cut off close to its head: another, concealed in a stick which had been split and again tied together, changed to a crippled pupa, and so died. In no instance could it be ascertained that the larva had eaten after the stick had been cut and its occupant examined. A number of pupæ still remain in the cut sticks. A somewhat careful examination of the sticks has led me to the following conclusions:—that the egg is laid on the smooth bark of the ash, just above one of the cicatrices whence a leaf of the preceding year has fallen: the little grub, entering the bark through a minute hole which it has gnawed, ascends the stem, at least as far as the next cicatrix, the excavation thus made assuming the shape of a very acutely pointed inverted cone; when arrived at its distal extremity the larva appears to turn round and descend to the point whence it started, devouring and widening its gallery as it descends: when arrived at the starting point the figure of its gallery is entirely changed, and is now a smooth cylindrical bore; at the lower extremity the larva gnaws the wood away, making a convenient chamber for its transformation, and leaving only the outer cuticle of bark reduced to the thinness of tissue-paper: this is ruptured by the moth in its struggles to escape, and it emerges from its prison head downwards. There is no evidence to show the duration of the larva state”

Mr. Waterhouse and Mr. J. S. Baly referred to cases of damage done to ash-poles by *Pachyta collaris*; and Prof. Westwood mentioned instances of the destruction of hop-poles by *Clytus Arietis*; the poles attacked by the *Clytus* were, however, of oak and not of ash.

Mr. Stainton communicated the following:—

Note respecting the Micropteryx bred from Hazel-leaves by Herr Kaltenbach.

“Having long had an intense desire to know what was really the species that Herr Kaltenbach had bred from hazel-leaves, I visited Aix la Chapelle for the purpose of satisfying my curiosity, being of opinion that, especially in Entomology, there is no saying more true than ‘Seeing is believing.’ Having now seen a series of the *Micropteryx* bred by Herr Kaltenbach, I am able to verify his assertion that the insect is *Micropteryx fastuosella*; and having seen the dried hazel-leaves in which the larva had fed, I can no longer doubt that a *Micropteryx* larva does feed in the leaves of hazel (*Corylus Avellana*). *M. fastuosella* is closely allied to *M. subpurpurella*, which we know to be attached to oak, and which has now been bred by Mr. Wilkinson from larvæ mining in oak-leaves, and it was rather a doubtful question whether *M. fastuosella* was really distinct from *M. subpurpurella*. In conversation with Herr Kaltenbach I learned that *M. fastuosella* appears with him as early as March, and that the feeding larvæ are to be found in April, when the nut-leaves are not yet fully expanded, and the dried nut leaves which I saw fully confirmed this statement by their small size. By the end of April the season for these larvæ is over.

“I should trust that with this information we should next spring have no difficulty in finding the hazel-miners in England.”

Prof. Westwood exhibited a further portion of the additions recently made to the

Oxford Museum by Mr. Stone, of Brighthampton. The exhibition on the present occasion consisted principally of the dried leaves of trees and plants which had been mined by the larvæ of Lepidopterous, or in more numerous instances of Dipterous, insects. The leaves were arranged for the cabinet on cardboard, so as to show at a glance the distinctions between the various mines,—a point of considerable importance in the determination of the different species.

Prof. Westwood also called attention to the state of the turnip crops in the Midland Counties; he had been informed that the turnips had been attacked by a profusion of a green insect, like that on the rose, and hence he had inferred the presence of a species of *Aphis*. Some turnip-leaves had subsequently been sent to him; the outer ones were dead and shrivelled, and both sides of the leaves and the stems were coated with a thick white mould, but no Aphides were visible. Whether the white matter had by his informants been mistaken for the insect, or whether it was the result of the attacks of Aphides, the Professor was unable to state; but he thought the latter hypothesis the more probable, and that the plants had been reduced to a bad state of health by the attacks of an *Aphis*, and the mould had grown in consequence.

Prof. Westwood also made some remarks on the law of priority of nomenclature, with reference to Dr. Schaum's paper on that subject read at the April Meeting of the Society; he expressed his agreement with what is stated in the abstract of Dr. Schaum's paper (see 'Proceedings' for April), and was disposed to think that, at all events in some cases, a modification of the rule of priority might with propriety be introduced, as *e.g.* where the careful monographer of a group has been anticipated by a short interval of time by a mere casual describer.

Papers read.

The following papers were read:—"Descriptions of several new and rare Lucanoid Coleoptera," by Major F. J. Sidney Parry, F.L.S.; and "Descriptions of new East-Asiatic Species of Haliplidæ and Hydroporidæ," by the Rev. Hamlet Clark, M.A., F.L.S.—*J. W. D.*

Description of a new Species of Ptinella; being supplemental to the Paper referred to below. By the Rev. A. MATTHEWS, M.A.

THE *Ptinella* so often mentioned in my review of the genus (*Zool.* 8053—8060), under the name of *Ptinella ratisbonensis*, has proved to be a new and undescribed species. At page 8058 I alluded to the possibility of a mistake, as the name was founded on the conjecture of M. Aubé, who had never actually seen the true *P. ratisbonensis*. Only a few weeks ago Dr. Schaum very kindly gave me one of the original specimens from which Gillmeister's figure and description of *T. ratisbonensis* were taken; and I find it is totally distinct from the species in question. It has therefore become necessary to invent some fresh appellation for our British insect, and, considering the multitudinous

varieties under which it appears, I think "Proteus" is a very fit and proper term to use. Under the name of *Ptinella Proteus* I will now proceed to describe it.

PTINELLA PROTEUS, n. s.

L. c. $\frac{7}{16}$ — $\frac{9}{16}$ lin. Læte rufo-testacea, per totum corpus profunde-punctata, longius pubescens; capite magno, prominulo; pronoto capite latiori, antice dilatato, ad basim valde contracto, angulis anticis productis, rotundatis, posticis acutis; elytris oblongis, apicibus rotundatis, pronoto vix latioribus, sed multo profundius punctatis, longitudinem capitis atque pronoti fere adæquatis, plus quam dimidium abdominis tegentibus; abdomine longo, obtuso, segmentis quinque apertis; pedibus atque antennis pallidis, robustis.

Alata. Colori similis ab altero sexu tantum differt alis atque oculis semper nigris.

Aptera, vel alis quam imperfectis ornata. In hoc sexu oculi sæpe nigri, sæpe testacei variant.

Hæc species, maxima sui generis, permultum variat, alas nigras nunc amplas, nunc parvas, aut pallidas plus minusve imperfectas, vel omnino nullas habet; interdum pronotum foveas aut duas, aut quatuor, sæpe etiam unam adhibeat; atque oculi nunc nigri, nunc testacei videantur. Nihilominus ab omnibus aliis differt magnitudine majori, pube longiori, pronoto antice multo validius dilatato, elytris oblongis, et *P. Mariâ* tantum exceptâ, abdomine obtusissimo.

Bright rufo-testaceous, strongly punctured throughout, and clothed with a rather long pubescence. Head large and prominent, somewhat triangular; thorax wider than the head, dilated anteriorly, and much contracted towards the base; the anterior angles produced and rounded, the posterior angles acute; elytra more strongly punctured, and scarcely wider than the thorax, oblong, with the ends rounded, about as long as the head and thorax united, covering more than one-half of the abdomen; abdomen obtuse, with five segments uncovered; legs and antennæ robust, testaceous.

With wings. This sex differs only from the other in having the wings and eyes always black.

Without wings, or with rudimentary wings. In this sex the eyes vary in colour from deep black to pale testaceous.

This is a very variable species; in some specimens the wings are black, either large or small; in others pale and merely rudimentary,

and in a few they are altogether wanting. The thorax is sometimes marked with depressions, varying in number from one to four; and in what may be termed the apterous sex the eyes are either black or orange, or of any intermediate shade.

It is nevertheless well distinguished from its congeners by its large size and long pubescence, also by the greater dilatation of the anterior part of the thorax, by the oblong shape of the elytra, and from all, except *P. Maria*, by the obtuse abdomen.

A. MATTHEWS.

Notes on Sea Anemones. — For the information of the anemone-loving readers of the 'Zoologist' who may visit Tenby, I send the results of my researches at that charming spot during three weeks' residence in July last. The spring tides were not very favourable for collecting, owing to a strong west wind, which blew back the spray and prevented me from visiting Lidstep Caverns and the Woolhouse Rocks, the latter designated by Mr. Gosse as "that rich preserve of zoophytic game." I availed myself of the assistance of the local collectors, Jenkins and his son Lewis, most honest, attentive and civil men, whom I have great pleasure in recommending to the notice of all aquarian naturalists visiting Tenby. The following are the species of Actiniæ which I secured, in addition to specimens of *Echinus miliaris*, *Holothuria*, *Aplysia*, *Doris*, *Eolis*, *Terebella*, and many beautiful kinds of star-fishes:—

Sagartia nivea. Very fine specimens and plentiful at Castle Rock, and *var. obscurata* on the Ridge between Caldy and St. Margaret's Islands.

S. rosea. Fine specimens, but not very numerous, at St. Catherine's and the Ridge.

S. venusta. Beautiful specimens at St. Catherine's, and a less brilliant variety at the Ridge.

S. viduata. Very scarce. Three specimens only were met with, and those at Castle Rock.

S. Bellis. Rather scarce. *Var. tregiensis* found at the Ridge, and several of the *var. modesta* in the same locality.

S. Troglodytes. Very numerous. Small specimens on Gascar Rock, and fine ones at St. Catherine's. *Vars. scolopacina*, *Aurora* and *auricoma* taken (one specimen only of the last-mentioned).

S. miniata. Good at Castle Rock, but small. Fine specimens dredged off St. Gowan's Head.

Bunodes gemmacea. Beautiful specimens and tolerably plentiful on the south and west sides of Caldy Island.

B. crassicornis. Fine specimens dredged off St. Gowan's Head.

Anthea Cereus, vars. smaragdina and *rustica.* At the Ridge.

Actinoloba Dianthus, vars. brunnea and *sindonea.* At St. Catherine's and Castle Rocks.

Actinia Mesembryanthemum. Abundant everywhere, and, although of the commonest kind, not to be despised, for many are very pretty.

Several of the *A. Dianthus* were double, *i. e.*, two disks sprouting out of one column.

The curious glaucous warty anemone (*Bunodes thallia*), discovered by Mr. Gosse at Tenby in 1854, was not to be met with. The collectors had never seen it until I showed them the plate in that gentleman's 'Actinologia,' and so I fear it is extinct on the Welsh coast. It is to be found (though scarce) at Ilfracombe, for I have two specimens in my tank which I took last summer. It behoves amateur collectors to be careful with the hammer and chisel in removing specimens of all kinds of anemones, for it is to be feared that for one secured, a dozen are frequently destroyed. I speak from what I have often witnessed at the coast. I have observed in my tank the peculiar elongating of *one* tentacle only (mentioned by Mr. Gosse) in the following species, viz., *S. bellis*, *S. rosea*, *S. venusta*, *S. Troglodytes* and *S. miniata*. Is it possible that Nature intended this as a means of assisting the creature to procure food? for I often notice that it quickly sweeps to the mouth any passing atom brought by the water in syringing. I was fortunate in capturing a very beautiful specimen of the Portuguese man-o'-war (*Physalia caravelle*), with its attendant satellites, two *Velellæ*, on the Ridge before mentioned. I gave them to my friend the Rev. T. N. Hutchinson, but they survived only a day. They were the first taken at Tenby during the season, but Mr. Gosse, in a recent letter to me, says that "they occur on the coast round Torquay nearly every summer," and that "two have come under my notice this season." My old friends the *S. Sphyrodeta* (the spontaneous fission of which is described at Zool. 7977, but by an error therein called *S. nivea*) are well and thriving. The eight specimens which I received from Ilfracombe in August, 1861, have increased to *thirteen*, and so well and healthy are they, and of adult size too, that it is not possible to distinguish those which have spontaneously divided from their entire fellow captives. — *W. R. Hughes; The General Hospital, Birmingham, September 5, 1862.*

Collecting Sea Anemones.—Would you kindly allow me a small space in your valuable journal (the 'Zoologist') fully to indorse the opinion of your correspondent, Mr. W. R. Hughes, with regard to Jenkins and his son, of Church Street, Tenby. Last year I spent seven weeks at that place, and by the aid of Jenkins and his son I collected nearly all the same specimens of sea anemones mentioned by Mr Hughes, together with collections of shells and ferns (living and fossil), and have at all times found them just what Mr. Hughes says, most honest, civil and attentive men. But my present object in addressing you is to say that since I left Tenby I always have my sea anemones direct from Jenkins, and to ask some of your correspondents who are equally interested in the keeping of sea-water aquariums to do likewise, as they would by so doing not only forward an act of charity to a very poor but honest family, but would find themselves in possession of a very interesting collection of anemones. The last letter I had from Jenkins he bitterly complained of the way in which several of our London dealers in aquaria had treated him, some not forwarding his money at all, others only either after long intervals or until he had to pay a lawyer to get it for him.—*Frederick Newton; 12, St. Paul's Church Yard, October 3, 1862.*

[Although I shall always be willing to recommend a worthy man, I must caution my contributors against using the 'Zoologist' as a means of advertising: other collectors not thus recommended will consider it hard to have to pay for their advertisements.—*Edward Newman*].

NOTICES OF NEW BOOKS.

'*On Unity of System.*' London: E. Newman, 9, Devonshire Street, Bishopsgate. 1862. 24 pp. letterpress. Price Sevenpence, post free.

IN introducing this little *brochure* to the notice of my readers I wish to observe that, as the printer, I possess information respecting it which the author has omitted to impart to the public, namely, that although apparently complete in itself, this is but the first of a series of sheets to be issued at intervals; but just as (to use the author's own expression) "all the parts of creation represent each other, and are severally figurative of the whole plan," so does the sheet now before me represent truthfully the author's views of the "unity of system," however those views may be elaborated, extended and reproduced in the sheets which are to follow.

The way in which each paragraph is headed is somewhat novel in literature, and possesses the great advantage of giving concisely the author's interpretation of his own thoughts. I could wish this plan were more generally followed: how often do we not meet with long and involved paragraphs in mystical or speculative works, which, being unaccompanied by this key, leave no impression whatever on the mind!

"*The necessity and the advantages of system.*—The injunction in the Bible, to search and to investigate the works of creation, is accompanied with the assurance that the laws of Nature, the history of mankind, and what is contained in the Bible, are all parts of one system, and that the Sciences, or the various branches of knowledge, converge more together in proportion to their progress. Little more than one hundred years have elapsed since system, to any extent, was applied to Natural History; but the progress in that study, by means of the use of system was afterwards continually more rapid."—(P. 5).

The author's views of creation appear to approach those of Mr. Darwin, but whereas Mr. Darwin seems to imply the existence of a continual progress, and that all forms, even the most elaborately complex, may have been evolved from a single monad, the author of the 'Unity of System,' while he admits and defines the constant change, the constant divergence from a given type, yet assures us that

"*Divergence precludes progress.*—All creatures have one origin; for it is well known that there is no apparent difference between the

kinds of living creatures at the beginning of their existence, and that the great divisions of beings, from the lowest forms to the human race, are successively manifest during the growth, beginning with the distinction between the animal and vegetable kingdoms, and continuing through the lesser divisions of the animal kingdom to the distinction of species. It is obvious that if matter were merely to be raised from its lowest state to its highest degree, as it is in man, he would be the only kind of creature on earth; but the law of development acts by means of divergences. These divergences retard or regulate progress, and the way by which the law of divergence is controlled may be termed the law of degradation. In other words, all the developments are divergences; and no kind of creature, from the lowest to the highest, makes any progress towards a higher state in its development, or advances at all to the creatures which are above it in degree, but, on the contrary, diverges from them. And man also makes no real progress towards a higher state, by the development of his faculties, or by the progress of civilization, or by the arts of life.”—(P. 12).

The next paragraph comes more within the range of Natural History observation, but is based, as it appears to me, on a fallacy,—that we are acquainted with the first origin of “living creatures.” This is not the case: life may be compared to a thread, which appears to be severed at a point called death, but of which the other extremity is unseen and unknown; our author assumes a knowledge of that other extremity, and calls it the “first origin.”

“*The unity at the commencement of all kinds of life, or of all living creatures.*—All kinds of living creatures are alike in their first origin, and, in the progress of growth, the characters which are common to the whole animal kingdom first appear, and then the distinctive characters of the class, of the order, of the family, of the genus, and of the species, are successively evolved, until all the characters have their most full development, or until the creature has attained its most perfect state.”—(P. 12).

In Wagner’s ‘Physiology,’ which contains an admirable summary of observations, without much of that speculation which often obscures our scientific researches, we learn that the spermatozoon is a reproductive animal, and in all probability continues to transmit its form through countless generations, until one individual out of myriads achieves a higher destiny and higher development. Hence the inevitable conclusion that that spermatozoon is not the “first origin” of the “living creature” called man, but is only a point on that thread of life of which one extremity has always been hidden from man.

“*The systematic order in the epoch of each class of animals.*—It is well known that each class of animals had its peculiar epoch, in which it was supreme over other classes, and in which its forms or kinds had the highest development of the organic structure of its own class. In the following periods, up to the present one, the class above mentioned reappeared successively in other species, which were smaller in size or less highly endowed than those of its especial or most characteristic epoch.”—(P. 16).

In connexion with this subject are several facts which scarcely accord with the theory here explained, or at anyrate stand as stumbling-blocks in the way of our accepting it in all its entirety, for instance Dr. Lund, in his ‘Brazilian Researches among Fossil Bones,’ found those of a diminutive sloth closely resembling, if not identical with, the species still inhabiting the same regions; hence we cannot consider our diminutive sloths as Megatheriums and Mylodons reappearing of a smaller size, but more probably the lineal descendants of those small sloths which Lund assumes were synchronous with the gigantic Megatherium. In continuation and amplification of our author’s view, he thus continues:—

“*The connexion between the present epoch of animals and the former epochs.*—Geology has not only very much increased the knowledge of nature, by the discovery of many thousands of kinds of creatures that have passed away, but has also enlarged the knowledge of living animals, by showing that the latter, in their progressive growth, have suppressed resemblances of the structures that were perfectly developed in extinct creatures. Thus the knowledge of beings now existing is incomplete without the knowledge of the beings of former epochs; and the transitory state of later creatures may be most completely studied in the permanent state of earlier creatures.

“*The change in structure.*—The earlier change is most complete and most outwardly manifest in a large part of the animal kingdom, such as insects generally and some reptiles, in which the two successive forms of the same creature seem to be completely different from each other, and in which the transitory form appears for a long while to be the final and perfect form. This change becomes successively more and more inward throughout the ascending scale of creation.”—(Pp. 16—17).

The next subject may be said to have been well “ventilated;” it is now as trite and threadbare as it was once novel and glittering.

“*The earlier form of the higher creature corresponds with the final form of the lower creature.*—This discovery was made by John

Hunter, and has been thus expressed:—‘ Each stage in the development of the highest corresponds with the permanent form of some one of the inferior orders.’ Or in other words:—‘ In the earliest period of existence all animals display one uniform condition, but after the first appearance of special development uniformity is only met with amongst the numbers of the same primary division, and with each succeeding step it is more and more restricted. The mammal exhibits no likeness to the Invertebrata, except in the ovarian stage of the latter.’ Thus, in the animal kingdom, the creature passes through a series of changes which are permanent in all creatures below it in rank, and the various structures of the latter are all combined in the organization of the former. There are no direct degrees of perfection, and the elaboration of every creature does not raise it or bring it nearer to a higher form, but the development is lateral or deviating, and therefore recedes in some degree from the next superior state.”—(P. 19).

This cannot well be otherwise: we are agreed on two facts; first, that some animals are more highly developed than others, as for instance a bird than an oyster; secondly, that the same individual advances in development as it advances in age, thus the egg of a sparrow is gradually developed into a blind naked bird, and that blind naked bird acquires sight and feathers and powers of locomotion. The acorn is less developed than the oak, and supposing there to be a mature plant resembling an acorn it follows that the plant, *viz.*, the oak, has passed through the permanent form of that lower plant which resembles an acorn. These are simply facts, and I do not see how they could well be otherwise. Either every animal must come into the world perfect and mature, like Minerva from the brain of Jupiter, or must rise to maturity by progressive steps. The latter is the course appointed by an allwise Creator. In these progressive steps it will of necessity more or less resemble some inferior or less developed animal. To proceed.

“ *The variety effected by transfer.*—The one spirit effects all the variety of creation, by transferring a part or a degree to another part or degree. The power of life is to some extent withdrawn from one part of the structure, and is directed to another part, or is removed from one organ or limb or faculty, which then becomes slight and ineffective, while another organ is developed in proportion. The forms of this transfer are collectively a set of examples of the universal system of progress, by the process from the outward to the inward, or from the figure to the substance.

“*The system of the growth and the changes in form of each species represents the system or the classification of all species.*—The system or the classification of animals is wholly in unison with their chronological distribution, or with their creation in successive geological epochs, and accordingly affords innumerable illustrations of the law of degradation or of lateral development, which is manifest in all the successive subdivisions of the animal kingdom. This law is also apparent in every species, by the comparison of the early state with the final state of the creature, and of one part of the structure with another part.”—(P. 20).

In the next and only other paragraph I shall cite I must invite attention to the assertion “the epochs are longer and longer in proportion as they are more remote, &c.” Is there not a more obvious truth susceptible of this explanation? “the epochs are more and more obscure, their diagnostics are more and more concealed from us in proportion as they are more remote.”

“*The retrogressive lengthening of the epochs.*—The few thousand years which have elapsed since the beginning of the distinctly recorded epoch of man are a very brief period when compared to the shortest of the preceding epochs; and the epochs are longer and longer in proportion as they are more remote from the present one, and when they are retraced one by one they appear to be successively more immeasurable. The epochs of mammals and of reptiles, though they are long when compared with that of mankind, are very short when compared with the epochs of fishes and of mollusks; and the whole animal period, although it extends over unnumbered millions of millions of years, is very brief when it is compared to the preceding time, which was unattended by forms of life. In the creation it apparently lengthens backwards to countless repetitions of the above-mentioned numbers. This fact helps to demonstrate the everlasting continuance of progress.”—(P. 21).

In conclusion I need only add that this pamphlet exhibits great learning and the most profound thought: it ought to be read by every naturalist; but I cannot venture to say that the views it discloses are in accordance with my own, or that they are likely to meet with any very extensive reception, even in the present day, when Mr. Darwin's labours have led discursive minds to transform Natural History into a speculative study rather than an aggregation of facts.

EDWARD NEWMAN.

On the Ornithology of Northern Japan.

By Captain BLAKISTON, R.A.*

A COUPLE of sleepless nights on shore at Shanghai, from the effect of mosquitos and the intense heat of a Chinese July, after a five months' cruise on the Yang-tsze Kiang, were sufficient to cause me to decide on migrating to cooler regions. There were frequent chances for the southern ports of Japan; but, as luck would have it, an opportunity offered of a passage to the little-frequented port of Hakodadi, in the northern island Yesso; and through the kindness of Mr. Webb (the head of the firm of Dent & Co. at Shanghai), a gentleman well known to the ornithological world, I was allowed to take a passage in the good barque 'Eva,' commanded by Captain David Scott. The night of the 13th July, 1861, found us anchored in the outer roads off Woosung, at the mouth of the Shanghai river, and the day following we got clear of the muddy current of the Great River into blue water. Favoured by the south-west monsoon and fair weather, we made good progress for several days, and, passing through the Strait of the Corea, entered the Sea of Japan on the 17th. Beyond this the monsoon was feeble; but the Kuro-Siwo, a branch of the North-Pacific Gulf-stream, which sets through these straits and up the sea, helped us along in the right direction.

Sea voyages in general have but little interest to the ornithologist, and ours on this occasion was no exception to the rule. A few sea birds only were seen, but not identified; and a solitary dove flew on board, and remained about the vessel for some time, one morning. At certain seasons, however, on this passage, land birds are met with in numbers; and Captain Scott, during a voyage from China in the month of October, caught some quails, several of which he kept alive for a few days. The line of migration is probably between the Corea and Nipon, the largest island of the Japanese group.

On the 25th of July we sighted a small rocky island called Kusima (*sima* meaning island, and *yama* mountain), near the western entrance of the Strait of Tsugar, which separates Yesso from Nipon; and working up against a stiff breeze, we got under the shelter of the high lands for the night following. Next morning we commenced beating through the Straits, and, the set of the current being strongly in our favour, we, by successive tacks, made good progress towards the Pacific. Passing Matsumai (formerly the chief town of

* Reprinted from the 'Ibis' for October, 1862, and communicated by the Author.

Yesso) early in the forenoon, we came up to Tsiuka Point at sunset, and by nine P.M. were at the entrance of the Bay of Hakodadi, where it fell calm. This prevented our reaching the anchorage off the town until four the next morning. The harbour was crowded with saucer-shaped native junks,—clumsy, unpainted, and primitive-looking craft, each with one heavy single mast, used for hoisting a large square sail of cotton canvas. Each of them was secured by at least three or four anchors, and had half-a-dozen more grapple-looking affairs ready at the bows for use in case of bad weather. Each and every one of these junks was so much like another that, were it not for a slight disparity in size, they might all have been supposed to have been cast in one mould. Numerous boats, with creaking oars, were being pulled about by naked Japanese, engaged in loading and unloading junks, while the small caique-shaped canoes of the fishermen dotted the harbour in all directions. The only foreign vessel (“foreign” being generally applied to European and American persons and things in the far East), besides our vessel the ‘Eva,’ was a Russian despatch war-steamer, which lay in deeper water than the junks. We took up our berth near her, and discovered that she was on the point of leaving for one of the new ports on the lately acquired coast of Manchouria. A great number of gulls were disporting themselves over the placid water of the harbour, and collecting the refuse thrown overboard from the junks, or pieces of bait discarded by the fishermen; and as a thick fog precluded a distinct view of the shore, I watched these birds with much interest. Although varying very considerably in plumage, they were all of one kind, *Larus melanurus*, the only species in fact, as far as my observations went, that spends the summer at Hakodadi. This is, moreover, the only gull given in the ‘Fauna Japonica’ as inhabiting the Japanese islands; but Commodore Perry’s United States Expedition, which visited the country in 1854 (the Ornithological Report on which, by Mr. Cassin, will be found in vol. ii. of the Government publication), has added *L. ichthyætus*, *Pallas*, besides a single immature specimen of what was considered to be *L. brunneicephalus*, collected in the Bay of Yedo, on the east coast. The first was said to be abundant in March. In October I observed, at Hakodadi, two or three of a large species of gull, all white, except the back and coverts of the wings, which were of a light slate-colour. On one or two occasions I also saw a tern, certainly not *Sterna fuliginosa*, figured in the ‘Fauna Japonica,’ but a small slate-blue and white species.

I think I have here enumerated all the Laridæ known as belonging

to Japan. Their paucity induces me to believe that there is here a fine field of discovery open to any persevering ornithologist who may feel inclined to make a sojourn among the islands of this interesting group. In fact, I consider the Ornithology of Japan to be very imperfectly worked up. Siebold's specimens are all from the south, and probably most from Kiusu (the island on which Nagasaki is situated), while the fact of his having obtained them all, or nearly all, from the natives accounts for the want of information concerning habits and habitats in the 'Fauna Japonica,' otherwise so fine a production. All that is known of the Ornithology of Northern Japan specially is from the Expedition of Commodore Perry, already mentioned (most of the birds in which collection were obtained at Hakodadi), and from the later collections made by Mr. Maximovitch and myself. Mr. Maximovitch is a naturalist, but better known perhaps as a botanist, in the employ of the Russian Government, who, having been in Siberia and on the Amoor, was at Hakodadi during my stay there. His residence was of much longer duration than my own, and, as will be observed, the existence of many species is given entirely on his authority. I have, however, taken care to note when the fact is doubtful, because his only means of naming specimens at the time was by referring to a copy of the 'Fauna Japonica,' in the possession of the Russian Consul. Besides, most of his birds were packed up for going to St. Petersburg when I made his acquaintance, and consequently I had not an opportunity of examining them. He will publish the results of his labours on his return to Russia.

Hakodadi is situated at the southern extremity of Yesso, the northernmost island of the Japan group, on a small mountain peninsula jutting into the Strait of Tsugar, and is connected with the mainland by a narrow sandy isthmus, on the eastern shore of which break the rollers from the broad Pacific, while it forms a fine land-locked bay and shelters a convenient harbour on the other. The peninsula is a mountain rising 1100 feet above the sea, and is called Hakodadi Head. On three sides its slopes are precipitous, and an iron-bound coast gives it such natural strength that it might, with little labour, be converted into a Gibraltar; in fact, most visitors are struck with the natural similarity of the place, on a small scale, to the gate of the Mediterranean. On the northern side is the town, the present seat of the Government of the island of Yesso, and the residence of the Consuls of Russia, England and America, and of a few merchants of the two latter countries. It is small, but rapidly increasing in mercantile importance. The readers of this magazine will not care to know much

concerning how and why this is so, nor would statistics of its trade in dried fish, shell-fish, sea-weed, oil and timber, or the natural resources of the adjoining country in the way of coal, lead, iron or sulphur, be of much interest to ornithologists; and therefore it will suffice to say that the town is a collection of low wooden houses, overtopped with the shining tiled roofs of a few temples, and broken in its monotony by some black, sombre-looking Government establishments. A few houses straggle up the mountain side, whose rugged steep near its summit forms an admirable contrast to a thick forest of cedars and pines clothing its northern face. The Russian Consulate is a large imposing building, situate at one corner of this wood, and painted white; and this mark of foreign intervention is being increased by the addition of a Russian Hospital, and the British Consulate which is being built alongside.

A stranger landing from China is at once struck with the comparative wideness of the principal streets; but he cannot but notice that the ingenious Japanese, instead of paving or macadamizing them with stones, leave them to the care of an ever-watchful Providence, and pile the stones on the house-tops to keep the shingles (wooden tiles) from being blown away by the blasts of the typhoons which occasionally sweep over. The lowness of the houses is to be accounted for otherwise, namely, by the occurrence of earthquakes. Probably before you have taken many steps on the dry land of Yesso, you will have been made aware of the principal occupation of the inhabitants, and of one of the sources of wealth of Hakodadi, by the all-pervading odour of drying fish and sea-weed; and if an ornithologist you may repent that you had not in your earlier life rather turned your attention to "sea-side studies," on finding yourself everywhere surrounded by clams, cockles, kelp and cuttle-fish. But never mind—cheer up! Look at the fine mountain country across the bay to the northward—the thickly wooded hill-sides where sport woodpeckers of many hues, jays, nutcrackers and wood grouse. Turn to the fine fern-covered plains, the haunts of quail, larks, and the more obscure but not the less interesting buntings and their congeners. See oases of clumps of trees clustered round the dwellings or gardens of the scattered villages, where you will find various kinds of warblers, thrushes of several species, and other winged songsters little behind the most melodious of your own country. Observe the black-winged kite as he sweeps along the sea-beach, and the buzzard and harrier as they course the margins of lakes or hover over the reed-filled swamps, where

ducks and teal conceal themselves in quiet till the shades of evening remind them of their wonted habit to visit some distant feeding-ground. Then, again, glancing towards the rocky shore, cormorants in numbers may be seen perched on the ledges of the cliffs, which have become whitened from their constant occupation. Swallows are skimming over the ponds, or dipping in the brook-like streams which course the lower lands and abound in excellent trout and other fish. A shrike perched on a topmost branch awaits the coming of some choice kind of winged insect, which his eagle eye detects from afar.

[After noticing the occurrence of *Falco peregrinus*, *Accipiter nisus* and a supposed new buzzard, Captain Blakiston proceeds as follows].

Milvus melanotis. A single specimen of the black-winged kite was selected from among a number killed. It was a female, and measured $26\frac{1}{2}$ inches in length, and the wing 19 inches. The others were young males, and measured 25 inches, and from 18 to 19 inches in the wings. They were nearly all identical, but darker than the female, particularly on the under parts, which were much less rufous. The colour of the cere and feet, being light blue lead, differs from the plate in the 'Fauna Japonica.'

The occasion of my shooting several of these birds was during an ornithological excursion which I made, in company with one of the gentlemen of the British Consulate, round the shore of Hakodadi Bay, with the intention of doing something among the shore birds. We commenced soon after we got clear of the town by a terrible hunt after a kite, which we wounded when flying over our heads. Soon after this we shot a swallow (*Hirundo javanica*) which I had not before procured. We then pulled off our boots and socks, and tucking up our trousers walked along the sandy beach, generally in the water for the sake of coolness; for although there was a little breeze from seaward the August rays of the sun made themselves felt. We were not long unrewarded; for where a small creek emptied itself into the bay we came upon some sandpipers, and managed to bag a couple of Temminck's stints, also *Tringa crassirostris*, a species, by the way, very like the knot and the Kentish plover. We still continued along the beach, and a blackwinged kite was brought down. No sooner, however, had he fallen than another came over and was dropped upon the sandy shore; then another and another, until, without having moved from where we stood, we had five of these birds on the ground at once. After the slaughter we set to work to pick up the slain. We had a small Japanese boy with us, who carried my collecting-bag and

box, but as he was already pretty well loaded with our heavy boots and the smaller birds we made the kites into a bundle, which I shouldered. It would have done many an ornithologist good to have seen us trudging homewards without shoes, stockings or coats, and followed by our faithful "ankow" (boy). When we reached Kamida, the village previously spoken of, we stopped at a native house of call, where we procured a cup of Japanese tea, and then went off for a bathe in the creek. But our ornithological adventures had not ended, for we came upon some ducks while bathing, and my friend started off in chase, perfectly naked, wading up the middle of the stream, gun in hand, with the water nearly to his armpits; he, however, did not get a shot. After this we walked into the town. The effect of the sun and salt water, from having walked so long with bare legs, did not wear off for some days, and we felt as if we had had mustard plasters applied to our shins and calves, which kept alive in our recollection for some time our ornithological walk.

I must conclude my notes on the Falconidæ by mentioning that although I frequently observed harriers in the neighbourhood of Hakodadi in the autumn in the fine slate and white plumage of the adults, yet I did not shoot one. In like manner on a few occasions I observed eagles, and two young ones were kept alive by a gentleman and sent to Shanghai. Their plumage was dark chocolate and black, with horn-coloured bill, and feet straw-colour. Of owls I did not preserve a single specimen, but Mr. Maximovitch considers that among his collection he had *Strix nyctea*, *Otus semitorques* and *Scops japonicus*, while I myself had three in confinement for some days. One of them was a small-eared species with yellow eyes; another a medium-sized eared one, also with yellow eyes; and a third a small species with reddish eyes. On another occasion, while on an excursion, when we slept near the foot of the volcano of Comanataki, I saw a large kind of owl at night.

[Omitting several pages of less interest, I proceed with Captain Blakiston's account of *Parus rubidus* and *Sitta roseilia*.]

Parus rubidus. A single specimen was selected from a number of this well-marked species; it was obtained from a native birdcatcher. Being a common species, and very lively and interesting in confinement, this is a favourite cage-bird with the Japanese. As the autumn draws on and the summer residents somewhat regain the freshness of their plumage, spoiled by the labours of incubation, while other birds which have passed the summer in more northern climes arrive in the

neighbourhood of Hakodadi, the professed birdcatchers, boys, children, and others without any fixed occupation, devote themselves to the capture of live birds. Having a cage containing an individual of the species they are specially in quest of, they distribute small branches and twigs smeared with bird-lime in situations most tempting for the inquisitive, and, hiding themselves at a short distance, await the successive arrivals of those attracted by the voice or motions of the " 'coy," consigning each successive capture to the dark regions of a canvas bag. Others roam about the woods with long and slender bamboo rods, covered near their points with bird-lime, and stealthily approach unsuspecting birds perched on trees or bushes, pushing the bamboo through the leaves as gently as possible until close to the bird, when it is brought quickly in contact with him, and fluttering his wings he becomes securely fastened to the stick and is dragged down. I have seen birds as large as the green woodpecker caught in this way, and am only sorry that in the hurry of leaving I neglected to bring away with me any of this superior kind of bird-lime, or to gain any knowledge of its composition.

Sitta roseilia. A beautiful species of nuthatch, of which but one specimen was preserved. It was obtained on the 20th October, during my return from a very interesting and pleasant excursion to the active volcano of Comanataki, about five-and-twenty miles to the north of Hakodadi, and near the southern shore of Volcano Bay, an extensive inlet from the eastern or Pacific side, which nearly cuts off the southern portion of the island of Yesso.

On this occasion we left Hakodadi (a party of English and Americans, six in number) on the morning of the 17th, on horseback, having pack-animals, in charge of Japanese servants, carrying our provisions and blankets. Skirting the shore of the bay for about four miles, along which, as the tide was out, we were able to ride on the smooth sand-beach, we thence followed the northern road across a broad valley, or rather plain, which lies between ranges of hills on either hand, and is otherwise bounded by the sea. After the fishing hamlets on the shore, the little villages of neat wooden houses with thatched roofs, surrounded by gardens and coppices, in the midst of well-cultivated land, were refreshing and pleasing to behold. Most of the crops were already housed; but some little rice, owned probably by the more lazy farmers, was not cut, and potatoes, beans and the long white turnips, called 'dygons,' were being rapidly got up. We halted in the middle of the day at a large village called Ono, where we baited our animals and refreshed ourselves on boiled maize-heads,

pears, sweet cakes, tea and beer. Soon after leaving this place, we commenced to ascend, the road leading zigzag up the steep slope of a finely wooded ridge, until we reached the crest, where splendid views lay open on both sides. To the northward was the sharp peak and lava-covered sides of the volcano, with a beautiful lake reposing at its foot, and wild forest country all around; while behind us we looked down on the plain we had traversed, and the bay and peninsula of Hakodadi as a panorama. The weather was delightful, bright, clear and invigorating, and everything augured well for a pleasant excursion. Descending the northern slope of the pass by a road even more steep than that by which we had gained the summit, we soon reached the lake. Keeping the main road to the left, we skirted the shore, the road sometimes cutting off the points by passing through the woods, but coming to the lake again at the next bay, and at each successive return giving us a more beautiful view of the volcano and lake. The latter was reflected in the clear water with a distinctness that I thought I had never seen equalled, while the wooded points jutting out and some small islands gave an uncertainty to the extent of the sheet of water, and allowed scope for the imagination. The country all around was in a state of nature, heavily timbered with oak, ash, elm, beech, poplar, birch, and maple; and these, from the first frosts of the season, which had just occurred, had put on those colours so vividly impressed on the American traveller by the fall-dress of the woods of the more northern parts of that continent, while the weather was the exact counterpart of the "Indian summer." There were great numbers of ducks on the lakes, among which were the mallard, pintail, scoter, teal and a black duck with a peculiarly marked bill; but as we were travelling along quickly, I had only time to stop and shoot a couple for the pot. In the woods were numbers of migratory thrushes (*Turdus fus-catus*), the great black woodpecker (*Dryocopus martius*), other black-and-white woodpeckers, and a small species (*Picus kisuki*) sporting about in company with two or three kinds of tits, and the nuthatch named at the head of this paragraph. A jay (*Garrulus Brandtii*) and cuckoo were also shot during this excursion. Some geese were on the lake, but they kept themselves so far from shore as to be out of reach of our fowling-pieces. We put up for the night at a Japanese inn, and next morning started through the woods, under the direction of a native guide, to find a new route to the volcano. We had a tremendous day's walk through the thick forests, the only human beings whom we saw being some solitary charcoal-burners at the commencement of our journey; but after that, all was wild and un-

broken forest. We were in constant dread of poisoned arrows, for we had been informed that there had lately been Inos (original inhabitants of Yesso) about, setting bows with poisoned arrows for bears. We saw one bear, but as I was the only one who carried a gun, and was then in the rear, he escaped. Later in the day we came to where the eruptions of the volcano had devastated the forest, and uprooted trees: logs and branches were thrown about in such confusion that it was only with the utmost exertion that we made any progress even at the slowest pace. At last, to the great joy of all, we got out on the cinder-slope of the volcano, but it was evening. Notwithstanding, three of the party started for the ascent (I had been up before); but one very soon turned back, and the other two, after making an unsuccessful attempt to reach the summit, were compelled to return, thoroughly knocked up and parched with thirst. We had guided them back by making an immense wood fire, it being quite dark when they arrived. Knowing that it would be impossible to reach the house we had left in the morning, we made our way down the side of the mountain to one end of the lake, crossed a stream which flows out of it towards the sea, and got to a deserted house which we knew of. As luck would have it, we there found a Japanese officer, with two other men, who had come for the purpose of making the ascent of the volcano, and had put up there for the night; so getting a lot of bundles of dry grass for beds, and cooking a mess of rice with four grouse (*Bonasia sylvestris*), which I had shot during the day, and which I sorely wanted to preserve for specimens, we filled our stomachs and then tried to sleep. But it froze hard in the night, and as most of us had no coats with us, it was impossible to keep warm. We therefore started a joke about bears being very numerous at this place, and got one of our party so interested in the matter that I believe, had it not been that we could not all restrain our feelings, he would have marched up and down outside, keeping guard all the night. Next morning we started at an early hour, after finishing the cold rice, walked round the lake through deep swamps, then struck the road, and arrived at the inn before mid-day. In the afternoon some of us rode some miles to the shore of Volcano Bay, returning home by moonlight; and the following day we travelled back to Hakodadi, where an earthquake, which occurred during the night, disturbed very few of us.

[Here again I omit a more technical part of the catalogue.]

Bonasia sylvestris. I brought home a single young male specimen, which Dr. Sclater considers to be of this species, and which

Mr. Maximovitch, who had killed them, pronounced to be identical with those of the Amoor. The length was $16\frac{1}{2}$, and wing $6\frac{1}{2}$ inches. Eye hazel-brown; bill dark horn-colour; feet leaden flesh; over the eye orange-red. This is, I believe, the first instance of this bird being found in Japan; probably it does not inhabit the more southern part of the empire. As far as I saw, it has the same habits as the ruffed grouse of North America (*B. umbellus*). Four fine specimens, of which the males had black throats, were shot on another occasion in the thick woods.

Respecting other game birds, *Lagopus mutus* is given in the 'Fauna Japonica,' on the authority of a native drawing; it will perhaps turn out to be a winter visitant to Yesso. The quail (*Coturnix japonica*) was collected at Hakodadi by Commodore Perry's Expedition, and plenty are caught and sold in the town; besides I shot some which I considered identical with the Chinese bird, but, my hands being full with other birds at the time, none were even skinned. I have been informed of pheasants being seen in the neighbourhood of Hakodadi, and that at a certain season of the year they are brought in for sale: these may, however, be brought across the Strait of Tsugar from the larger island of Nipon; and although I was three months at Hakodadi, I did not see a single pheasant, nor did I ever hear of one being obtained there in a wild state. Mr. Maximovitch marks both *Phasianus versicolor* and *P. Scemmeringii* as having been seen in the hands of Japanese.

Podiceps minor or *phillipensis*. A male specimen, agreeing with the little grebe of Europe, is in my collection. I had another brought me one day, which proved to be young on dissection; it was too far gone for me to preserve it. The upper parts were black; under parts mixed gray. Length 13 inches, and wing 6·3 inches. Mr. Maximovitch considers he obtained the blackthroated diver (*Colymbus arcticus*). The rednecked phalarope (*Phalaropus hyperboreus*), identical with specimens from the Atlantic coast, was obtained by Commodore Perry's Expedition, as well as the hornbilled guillemot (*Uria monocerata*, Pallas).

I preserved no specimens of Anatidæ in Japan; but the following may be considered to belong to Northern Japan on good authority, except such as are marked doubtful:—*Cygnus musicus* (?), *Anser* (sp. ?), *Anser bernicla* (?), *Anas boschas*, *Querquedula falcaria*, *Mareca Penelope*, *Anas fusca* (?), *A. nigra* (?), *Dafila acuta*, *Nettion crecca*, *Spatula clypeata*, *Fuligula clangula* (?), *Mergus serrator*, *M. merganser* (?).

The Japanese are very expert in netting water-fowl, and they bring

in numbers to Hakodadi caught in that way. For ducks and teal the usual method is to clear away the grass from a swamp for a space of about 35 by 20 yards, so as to form a clear surface of open water, likely to attract the birds at feeding-time. Across this several nets are stretched, which are fastened to cords attached to stakes on either side, and hang vertically over the water, being about 2 feet above it at the bottom, and about 6 feet high. The net is made of fine twine, and with large meshes, so that it is not easily seen, and, being allowed to bag, easily entangles the birds when they fly against it in skimming over the surface of the pool before alighting. The evening is the principal time for the operation, and men sit watching the nets from small turf huts or screens made of branches. These duck-catchers mostly occupy themselves in cutting grass during the day. In October I saw a great many of these places, and probably the same plan is adopted in the spring.

One cormorant at least is very abundant at Hakodadi, and Mr. Maximovitch obtained a specimen which he called *Carbo cormoranus* of the 'Fauna Japonica.'

In closing this sketch of the birds of Northern Japan, so far as they are at present known, my thanks are due to Dr. P. L. Sclater for having examined my specimens, and as editor of the 'Ibis' for correcting and inserting scientific names of species and references to authorities. I have only to urge as an excuse for a more extended list that, during the latter part of my three months' residence in the country, I was engaged on some work at that time of more importance, although not so interesting to me as Ornithology. As we sailed steadily out of the bay before a light breeze, on the 6th of November, and passed between the mountain-head and the whitened cliffs of the opposite shore, shoals of bonitos played around our vessel, chasing the smaller inhabitants of the clear sea-water; the peak of the volcano of Comanataki, visible in the distance, grew dimmer and dimmer; the shore lines became gradually indistinct; the opening to the broad Pacific seemed to our eyes to become narrower and narrower; and we said good-bye to Hakodadi.

[In the parts omitted for the sake of brevity the following birds familiar to English ornithologists are mentioned: the stonechat, the gray wagtail, the cole tit, the great spotted woodpecker, the cuckoo, the siskin and the mountain sparrow.—*E. Newman.*]

Barn Owl Preying upon Fish?—For several nights past I have observed a barn owl about the harbour, but this evening, during a dead calm, and while the moon was shining very brightly, the bird appeared skimming rapidly within a short distance of the water. Suddenly it dropped towards the surface, and then instantly rising continued its flight towards the Isle of Sheppey. Some minutes afterwards it reappeared, repeated the same act, and again and again went through almost precisely similar manœuvres, until I had witnessed the occurrence perhaps eight or ten times. It is remarkable that the bird was never seen returning from the Isle of Sheppey; it invariably came from the direction of the opposite shore, so that the moon cast the shadow behind instead of before, and thus the fish could receive no notice of the approach of the enemy until it was close upon them. I was at too great a distance to see whether the birds' feet actually touched the water, but there can be little doubt not only that they did so, but that a fish was occasionally captured, for sometimes the bird after stopping rose hurriedly, and, describing a wide circle in its flight, returned near the same spot, and then made an apparently more successful pounce. Once it flew across without making any stop, but in this instance it returned sooner than usual. Several men belonging to this ship also witnessed the above, and one of them, a native of Kent, told me that when he was a boy, he used very often to find fish bones in a barn owl's nest, but although his assertion may be open to doubt, the accounts given by various authors have long since established the fact that owls do occasionally prey upon fish. I myself have found the remains of fish in the stomach of the tawny owl.—*Henry L. Saxby; H. M.S. "Devonshire," Sheerness, October 9, 1862.*

Notes upon the Migration and Song of the Skylark.—During the greater part of the day skylarks have been flying over in a south-easterly direction, in the teeth of a stiff breeze. They passed with a strong and steady flight, sometimes singly, but more frequently in small parties of perhaps half-a-dozen or more, keeping rather high, and occasionally uttering a short chirping note. I am at a loss to account for their movements, seeing that telegrams from the north still report the weather mild and seasonable. In Shetland this species is partially migratory; it is exceedingly abundant in summer, but no sooner does the cold weather set in than the numbers begin rapidly to diminish, and the few which remain collect into small flocks, frequenting stubble fields, and in very severe seasons farm yards. Between the middle of September and the first fortnight in November I have several times heard one in full song, and that, too, in damp, misty weather. During the summer they sing not only from sunrise to sunset, but even throughout the whole of the long cloudless night, so that the song may be heard almost incessantly for days and nights together.—*Id.; October 15, 1862.*

Thrush Singing in October.—Is it not unusual for the song thrush (*Turdus musicus*) to be heard singing during this month? I have twice this day heard one, and suppose that this uncommon occurrence may be attributed to the warm, showery weather of this day.—*Hugh Hornby; Preston Rectory, Wellington, Shropshire, October 11, 1862.* [My own experience is that the thrush is usually silent in October—*E. Newman*].

Occurrence of the Bluethroated Warbler at Brighton.—On the 1st of October a labouring boy brought me a specimen of the bluethroated warbler (*Sylvia suecica*). It proved to be a male of the red spotted variety, having the spot on the fore neck of a dark chestnut colour, which I believe is different from others that have been obtained in this country. The boy was walking amongst some thick furze on the Downs when he observed the bird, which he supposed to be a redstart, flying very swiftly from bush to bush, not uttering any note. It perched on the tops of the furze, and spread its tail

in the manner of a wheatear, never jerking it like a robin. He knocked it down by throwing a stick at it, and afterwards caught it. We kept it alive a few days, and thus had a good opportunity of watching its movements. It kept very much to the bottom of the cage, and whenever disturbed would spread out its tail extremely wide. I have now mounted it, and it makes a fine specimen.—*Henry Pratt*; 44, *Ship Street, Brighton, October 18, 1862.*

Corvus americanus: *Corvus corone* of *Wilson*.—No one the least conversant with the notes of the two could fail to notice the difference between the American barking, and the European croaking crow, though *Wilson* remarks, "The above description agrees so nearly with the European species as to satisfy me that they are the same, though the voice of ours is said to be less harsh, not unlike the barking of a small spaniel." The fact is, its note or cry is so like the barking of a dog that the most practised ear might be deceived, but like the snipe it may, according to *Wilson*, "be partially changed by difference of climate." *Wilson* says "the eggs are four, of a pale green colour, marked with numerous specks and blotches of olive," but *Macgillivray* states that the eggs of the European crow "are from four to six, of a pale bluish green, spotted and blotched with dark umber or clove-brown, and purplish gray." Though I have taken the eggs of the American crow—five in number—I will not venture to describe them; nor can I compare them, having no eggs of the European species, but *Wilson's* and *Macgillivray's* descriptions neither agree as to the colour or number of the eggs. Though common it is by no means numerous in Upper Canada, and is, if possible, still more shy and wary than the European species, so that I found considerable difficulty in procuring a specimen, but having^{at} last winged one, it ran so swiftly to a heap of large stones, on which it mounted, that I had some trouble in securing it. Its cries brought other crows within shot. Having taken it home and amputated the wounded part of the wing, it was placed in a basket, but not until it had dug its claws into my hand, and struck the cheek of a looker-on with its formidable beak. It is a very handsome bird in adult plumage, jet-black, with the exception of the outer webs of the quills, and the tips of the feathers of the back, which have a glossy bluish tinge. It is, I think, somewhat slighter and smaller than the European crow, its length being but 19 inches. Extent of wings 39 inches. Wing from flexure 13 inches; fourth quill longest; fifth but 1-tenth shorter; third 3-tenths shorter than the fourth; first $3\frac{1}{2}$ inches shorter than the second. Bill arched and very long, measuring 2 inches 9-tenths along the ridge; from the gape $2\frac{1}{2}$ inches. Upper mandible notched at $1\frac{1}{2}$ -tenth of an inch from the tip. The tail, which has twelve feathers, is rounded, and $7\frac{3}{4}$ inches in length. Tarsus $2\frac{1}{4}$ inches. Thigh $3\frac{1}{2}$ inches. Middle toe $1\frac{1}{2}$ inch, claw $6\frac{1}{2}$ -tenths; inner toe 1 inch 1-tenth, claw 6-tenths; outer toe 1 inch 1-tenth, claw 5-tenths; hind toe 1 inch, claw 8-tenths. Nostril nearly circular, quite concealed by the recurved feathers, some of which are 1 inch in length. Eye black, about 3-tenths of an inch in diameter. It would thus appear that the American crow not only differs from the European in voice but in size, and though a smaller bird has the bill more elongated.—*Henry Hadfield*; *High Cliff, Ventnor, Isle of Wight.*

The Cuckoo and the Gooseberry Grub.—I had always supposed that none of our British wild birds would touch the larva of the sawfly, *Nematus ventricosus*, which has for the last few years proved such a pest in our kitchen gardens, and which is vulgarly called the gooseberry grub. Often and often have I watched the sparrows and various warblers, in the anxious hope that I might detect them in the act of swallowing one of these noxious insects, but I have always watched in vain. I have gathered hand-

fuls of them, and given them to fowls and ducks, but they invariably turned from them in disgust. Towards the end of August, however, I happened to look out of my study window one morning after breakfast, when my eye rested upon a young cuckoo perched on a red-currant bush immediately opposite the window, and busily engaged in picking something off the branches. The tree was swarming with larvæ of *N. ventricosus*, and upon close inspection I found to my no small delight that he was making a hearty breakfast on this obnoxious pest. He flew from bush to bush for about half-an-hour, and then, having I suppose satisfied his appetite, took his departure. I have met with several gamekeepers who were stupid enough and ignorant enough to kill every cuckoo they come near, and whose masters did not possess sufficient ornithological wisdom and common sense to forbid such an act of wanton cruelty. Perhaps the foregoing remarks may in future save the life of a stray cuckoo or two.—*H. Harpur Crewe; The Rectory, Drayton-Beauchamp, Tring, October 26, 1862.*

[I have long been aware, from personal observation, of the interesting fact mentioned by Mr. Crewe: it is recorded in the 'Field' newspaper for May last.—*E. Newman*].

Abundance of Young Cuckoos at Deal.—A great number of young cuckoos are now being caught by the hand in and about gardens in this neighbourhood. Some fly into houses and sheds, and they are so abundant as to be noticed by the residents. They are extremely tame, and those which have passed through my hands are fat and in good condition. I believe them all to be young birds not yet able to take their flight.—*H. J. Harding; Deal, September 20, 1862.*

Occurrence of the Hoopoe at Deal.—A fine female hoopoe, shot near Deal in August last, has lately been brought to me to be preserved. It was very fat and in fine plumage.—*Id.*

Occurrence of the Hoopoe and Spoonbill in Surrey.—A fine specimen of each of these birds was killed a short time ago in this county, the first within a mile of this town, and the latter at Frensham Pond, where so many rare visitors have been killed, about four miles from Farnham.—*W. Bridger; Guildford, October 30, 1862.*

Occurrence of the Gray Phalarope in the Isle of Wight.—A beautiful specimen of this bird was shot on the 9th of October in a small pond in the centre of this village. Though surrounded by several persons it swam about with the greatest coolness, as if in its natural element—the sea. This morning another was seen in Freshwater Bay. A terrific sea was running at the time, but the beautiful bird seemed like a cork floating on the mighty waves. It was shot at three times, and hundreds of stones were thrown at it, none of which injured it, and just as I got on the beach it took wing over Afton Downs, and escaped its numerous persecutors.—*Henry Rogers; Freshwater, Isle of Wight, October 22, 1862.*

The Sandpiper a Diver.—In corroboration of Mr. Knox's statement (*Zool.* 8195), about the common sandpiper's diving I have to state the following. In the autumn of 1853, while staying at Mr. J. H. Hamilton's, Abbotsdown, near Dublin, I winged a common sandpiper while flying across a pond in his grounds. It swam directly to the shore, but on my approaching it, took to the water again and dived along the coast. I distinctly saw its motions under water, and saw it occasionally run on the bottom. I could not secure it without another shot. It used its wings under water with quick short jerks. The hoopoe has been noticed in this neighbourhood this autumn. Mr. Alfred Pearce, of Chantrey, saw one at a mill in this vicinity on the morning of the 9th of September, but had no gun with him at the time. He has shot the bird before, and is well acquainted with it.—*G. C. Green; Modbury Vicarage, October 20, 1862.*

Observations and Remarks on Scolopax gallinago and Corvus corone of Wilson. — Both these and other species have by some writers been considered identical with those of Europe, though they specifically differ, either in habits, plumage or organization. Both species, for instance, though bearing so strong a family likeness to those of Europe, are readily distinguishable by the careful observer; so that one cannot but feel surprised that such an experienced ornithologist as Wilson, to say nothing of the absurd notions of Buffon and other authors of the old school, should have confounded them. The American snipe, he says, "if not the same, has a very near resemblance to the common snipe of Europe;" then suggests whether it may not be "partially changed by difference of climate," yet how that could have given it the extra tail-feathers he does not explain, but it is a fact that ought to have settled the question, or rather have prevented its having ever been raised; and though they do not greatly differ in size, they do in colour, many of those I examined being darker than the European bird, particularly about the back and scapulars; however, the skin with which they were compared may possibly have been somewhat faded. And to crown all, the American snipe is a percher. This I know will not be credited by closet-naturalists, or by those authors who, having committed themselves to a contrary opinion, are not open to conviction: "A man convinced against his will is of the same opinion still;" "Straining at a gnat, yet ready to swallow a camel;" the old woman could believe in "mountains of sugar and oceans of rum," but nothing would convince her that there were flying-fish in the world. To prove that snipes perch I will now give an extract from my notebook: — "St. John's, Newfoundland, July 23, 1857. There being nothing particular to see in the town but the cathedral, or peculiar except the vast stages for curing cod erected on the precipitous banks of this noble land-locked harbour, I sallied forth to explore the neighbouring woods and swamps in quest of birds, having an eye to snipes, which the spongy nature of the soil led me to expect. A few robins and other birds were shot as I traversed the bush, not tall trees as in Canada, but pine and larch of a dwarfish growth, which on these bleak exposed hills and uplands, covered with the raspberry, gooseberry and strawberry, seldom exceed fifteen or twenty feet in height. Birds appeared scarce; I did not, I think, observe more than a dozen species. The most striking was a small active yellow bird, *Sylvia citrinella* I believe (a true willow wren), subsequently found so abundant in Canada. Having come to a promising marsh, I began to beat it in a regular manner, and ere long was rewarded by the springing of several snipes, which were shot in a sportsman-like manner, *i. e.*, on the wing. I then descried, on the topmost bar of a fence carried through the swamp, what appeared to be a somewhat strange-looking bird; so, being bent on securing rarities, I approached it as quietly as a huge pair of water-boots would admit, bringing my gun to the ready, but there was no need of such caution, the bird being seemingly in a deep reverie, out of which it was doomed never to awake. Fearing to spoil the specimen if I took many more strides in advance before firing, I knocked it over. It proved to be what I had half suspected, a snipe. My eyes thus opened, three more were on this and the following day shot in a similar manner, — a fourfold proof of the perching habits of *Scolopax americanus*." Though the 23rd of July, 1857, was one of the hottest days I ever remember, there had been the previous night a heavy fall of rain, which may possibly account for the number of snipes found basking in the sun. When it is affirmed that the partridges of Southern India and of Canada are perchers, the statement is received without question. My acquaintance with snipes dates from the year 1825, when I first began to shoot them, and I have in this country, in less than two seasons,

bagged eight hundred ; consequently I ought to know a snipe from a sandpiper, even on the wing ; but these birds were handled, and one of them skinned ; the rest I presented to the commander of the 'Circassian,' who said that though he had known many of his passengers go out snipe-shooting, I was the first who had brought any on board. They were preserved in ice and taken to Portland, Maine. Should there still be unbelievers, as doubtless there will, let them take ship for St. John's, and, though not very crack shots, may there shoot a snipe. I shall be ready to afford them every information, and point out where the snipes were found napping on the 23rd and 24th of July, 1857. Whether the European snipe perches I cannot undertake to say, but that it may do so I think not unlikely. A friend in the North, who has a good knowledge of birds, informs me that he has seen a snipe perched on a stone. Nor would it surprise me to hear that they had been found perching, during the heat of the day, on either rail or dyke. The following description (taken in the flesh) of one of the darker specimens of *Scolopax americanus* is extracted from my note-book :—"On comparing it with four others I find it considerably darker than the rest, and the scapulars more elongated. It is 11 inches in length, 17 in extent of wings, from flexure 5 inches 4-tenths. Bill along the ridge 2 inches 6-tenths. Tarsus 1 inch 2-tenths. Middle toe 1 inch 1-fourth, claw 2½-tenths ; inner toe 1 inch 1-tenth, claw 1½-tenth ; outer toe 9-tenths, claw 1¼ tenth ; back toe 3½-tenths, claw 1-tenth. The elongated scapulars and posterior feathers are black at the base and centre, margined on the outer webs with white tinged with yellow, and on the inner with small, oblong, reddish yellow and white spots on a ground of black on both webs, uniting on the shaft. Near the shafts on both webs are rows of still more minute spots of rufous, which, uniting at a quarter of an inch from the extremity, form an acute angle. Two of the posterior feathers are 2¼ inches in length, the axillaries being also very elongated, some of them measuring 2½ inches ; they are of a pure transparent white, with regular diagonal bars. Many of the scapulars, though sooty at the base, are of a pure glossy black towards the ends, which are slightly tipped with white. There are on some of these feathers three or four irregular bars of bright reddish yellow, with two and three white spots on the exterior margins. The upper mandible is of a dark horn colour, with a reddish tinge ; the lower is of the same colour, except at the base, which is light. There is a line of reddish brown down the centre of the head (which is black), and bands of the same at the sides, from the base of the upper mandible to the nape. There is also a patch of black from the gape to near the eye, bordered by gray. From the nape to the shoulder the neck is rufous, but each feather is black near the shaft, and some of them are margined and tipped with white. The feathers of the anterior part of the back are black, but mostly with the outer webs partially white or reddish yellow ; and some of the posterior feathers are grayish black, margined with white, but the greater part are reddish yellow, barred with triangular transverse black spots, the shafts being of the same colour. Upper tail-coverts of a yellowish brown, with transverse black markings ; some of the feathers tipped with white. The tail, which is rounded, is 2¼ inches in length ; it has sixteen feathers, the centre longest. They are all black at the base, except the three exterior ones. The first lateral feather is white, broadly barred with black crossing both webs, and it is slightly tipped with the same : the second is almost similarly marked, except that the white on the centre of the feather is tinged with rufous between the first and second black bar, and there is a minute black spot at the tip : third black from the base for more than half its length, with a spot of yellowish white near the shaft, and two more spots of the same colour on the margin of each

web; above that there is a broad band of pale reddish brown, bordered with white, succeeded by an irregular band of black; the rest of the feather white, tinged with yellow towards the extremity, which is slightly margined with black, the latter colour gradually increasing on the rest of the feathers: fourth almost similar, but the white at the extremity is tinged with yellow, and the black spot at the tip increases in size; this feather also is margined with black on the outer web: the fifth differs only from the last by having the reddish brown colour on the centre of the feather darker, with more black on the outer margin and at the tip, and the white towards the extremity of the feather has still more of the rufous tinge: sixth very like the former, except that the rufous tinge gradually darkens; the transverse black bar runs somewhat more diagonally across the feather, and the black at the base, bordering the centre patch of rufous, takes a diagonal form corresponding to the bar near the extremity: seventh almost similar, but the black bar is more inclined, so is the black patch at the base: the eighth is almost wholly black, the transverse band extending to the margins, and is prolonged on and near the shaft to the tip, which is also margined with black; the upper edge of the lower black portion of the feather is irregularly shaped, and the reddish brown colour is darker. The wing has twenty-five quills—the first longest, but the second only the tenth of an inch shorter; the rest of the primaries regularly graduating, the secondaries increasing, so that the longest is but half an inch shorter than the first primary. The quills are black, tipped with white; the first has the shaft white, except towards the extremity, where it becomes dark; the outer web very narrow, margined with white; the inner web is altogether dusky: the second quill is of a sooty black, very slightly margined with white on the outer web, and tipped with the same: third quill black, with the exception of being slightly margined on the inner web and at the tip with white: the rest of the primaries are dusky, and the white on the inner margins and at the points gradually increases: the white of the secondaries, which are incurved, is much broader, with the exception of the last elongated ones, which have very little white about them, except at the extremities; they are soft, glossy and almost transparent, of a dusky black on the inner webs, but towards the extremities there are a few spots and bars of rufous, besides some white patches on the margins; the outer webs are black, transversely and diagonally marked with zigzag bars of reddish brown, margined with white and tipped with the same, except at the extremity of the shaft, which is black. Some of these feathers, as well as scapulars, are very peculiarly marked, appearing as if another and smaller feather, with a rufous border, were laid on the top of a black one with a white margin. Upper primary coverts black, tipped with white. Secondary coverts black, with a spear-shaped spot of rufous in the centre; they are margined with white and light reddish brown, and have a spot of black at the tip. Under-wing primary coverts gray, spotted with white on the margins, and tipped with the same. The under secondary coverts, which are more elongated, are gray, barred and tipped with white. Chin and upper part of throat grayish white, with minute dark brown spots, and on each side of the neck there are narrow elongated black patches bordered with gray; but on the breast, as well as towards the sides, the feathers are black, broadly margined with grayish yellow, and tipped with white. Lower part of the breast barred with black and white in about equal proportions. Belly white. Feathers near the vent black, broadly margined, spotted and tipped with reddish yellow. Under tail-coverts, which reach to within a quarter of an inch of the extremity of the tail, are reddish yellow, with irregular black bars. Tarsus and toes dusky, with a greenish tinge." Having as yet had no opportu-

nity of studying the habits of *Scolopax Wilsoni*, I shall only observe that I have found it more sluggish than the common snipe of Europe, and somewhat less rapid of flight. They are exceedingly fat, the weight of one of the largest being about five ounces. The two extra tail feathers proving it to be distinct from the common snipe of Europe, I have thought it unnecessary to do more than allude to the difference in the plumage, though the second quill being margined with white is worthy notice.—*Henry Hadfield; High Cliff, Ventnor, Isle of Wight.*

[I must entreat that my readers will not enter on a discussion as to the perching of snipe: the subject is as interminable as that of vipers swallowing their young. Does my correspondent consider that *Scolopax gallinago*, *S. americanus* and *S. Wilsoni* constitute one species, two or three?—*Edward Newman.*]

Occurrence of the Knot in Lancashire in August, and its Eastern Range.—Being at Southport, on the Lancashire coast, on the 29th of August last, I noticed a curlew and sandpiper hanging together in a fishmonger's shop. A friend who was with me being fond of birdstuffing purchased the sandpiper and set it up, but subsequently not being certain of the species he forwarded it to me. On examination it turns out to be the knot (*Tringa Canutus*, Linn.) in a state of plumage intermediate between the summer and winter dress. It remains in my possession, and I send you this notice as its rather early arrival may be of interest to ornithologists who look to the 'Zoologist' for records of extraordinary occurrences in date and species of British birds. I may observe that I have looked back in the 'Zoologist' for several years, and can find but one notice of it in the month of August, which was in the Isle of Wight. With respect to the eastern range of the knot, Mr. Yarrell mentions his inability to trace it beyond Europe, except a single notice by Mr. Blyth of Calcutta. Mr. Blyth may however have confounded it with a closely allied species, *Tringa crassirostris* of Temminck and Schlegel's 'Fauna Japonica,' which I obtained ('Ibis,' iv. 330) in the northern island (Yesso) of the Japan group last year. I have also searched through different local lists—and the value of such lists cannot be overrated—published at various times in the 'Zoologist' and 'Ibis,' and, except a note of its having been seen only ('Ibis,' iii. 240) near Cawnpore in India, I cannot find any statements of its occurrence east of Europe. I should mention that besides considerable difference in markings the eastern bird is larger, being an inch and a half more in total length, and nearly an inch longer in the wing, no unimportant disparity in birds of that size.—*Thomas Blakiston; London, October 17, 1862.*

Occurrence of the Manx Shearwater at Sheerness.—Yesterday afternoon I saw a specimen of the above in this harbour. It was sitting rather deeply in the water, and although making vigorous use of its feet was being so rapidly carried backwards by the ebb tide and heavy south-west gale that it was occasionally compelled to take wing in order to avoid being drifted too close to the ships. It rose from the surface with very little effort, and had rather a graceful appearance when upon the wing, but its mode of flight was peculiar, owing to the bird's strange but well-known habit of making an occasional rapid stop, apparently with no other object than that of dashing aside the water with its breast, immediately afterwards ascending in a gentle curve. Although it was at times completely at the mercy of the wind and tide it seemed to be perfectly at ease, dipping and preening its feathers, and sometimes rising upon its feet as it flapped the water from its wings. The poor bird was engaged in this manner when it was killed by a shot from a boat. It proved to be a female in good condition, but the stomach was quite empty.—*Henry L. Saxby, H.M.S. "Devonshire," Sheerness, October 21, 1862.*

Occurrence of the Pomarine Skua in the Isle of Wight.—On the 22nd inst. I went out with my gun, and had the pleasure of shooting a magnificent specimen of the pomarine skua. It is a male in fine adult plumage. There were five of them together, and I had great difficulty in getting a shot at them, as they were very shy. After waiting a long time watching their rapid flight this one singled itself from the rest, and dashed much like a falcon in its swoop within a few yards of where I was concealed waiting for them, and the next instant it fell to my gun. I believe this is only the second instance of its occurrence in the Isle of Wight. The other is recorded in the 'Zoologist' (Zool. 978). A specimen of the Manx shearwater was shot in August, by Mr. G. Baird, near the Needles, and a second specimen was obtained many years ago near Yarmouth (Zool. 978).—*Henry Rogers, Freshwater, Isle of Wight, October 23, 1862.*

Coluber lævis identical with C. dumfriensis.—Mr. Buckland's communication on the birth of the six baby snakes is of great interest; and I shall anxiously wait further information as to the movements and food of the little strangers; but there is one fact in the bibliography of British reptiles that seems to me of still greater interest, and that is, that a supposed new snake was described a quarter of a century ago, as inhabiting Scotland, which agrees in its distinctive characters with *Coronella austriaca*. I allude to the *Coluber dumfriensis* of Sowerby, which was captured near Dumfries by Mr. J. W. Simmons, and described and figured in Sowerby's 'Miscellany,' p. iii. t. iii. and again in Loudon's 'Magazine of Natural History,' ii. 438, and again described in Bell's 'British Reptiles,' at p. 60 of the second edition. The first point of similarity I would observe is the smoothness of the scales; all the authors in describing *C. dumfriensis* say, "the scales are extremely simple, *not* carinated; the word *not* italicised, as in this quotation, proves that the new species could not be referred to the adder or the common snake, the scales in both these species being distinctly keeled. Mr. Bell is inclined to believe that the supposed novelty was a specimen of the common snake, and he seeks to overcome the difficulty of the smooth scales by suggesting that it was "very young." This appears to me most unsatisfactory, since I know of no reptilian scale which changes its form and structure as the animal advances in age. I have also to notice the number of ventral scales or scuta, which in the four supposed species stands thus:—*Coluber natrix* (common snake) 170, *C. austriaca* or *lævis* (lizard snake) 160—164, *C. dumfriensis* (Dumfries snake) 162, *Pélias berus* (the adder) 140—150. Thus the Dumfries snake and our supposed novelty correspond exactly in the number of ventral scuta. These two characters—the absence of a keel on the dorsal scuta, and the agreement in number of the ventral scuta—seem to go far to establish the positive identity between the two species which have been called *dumfriensis* and *austriaca*, after the localities in which they have been accidentally observed. Some doubt may exist as to which specific name should be adopted; but this difficulty is in some measure removed by Dumeril and Bibron, in their 'Erpétologie Générale,' vol. vii. p. 610, and also Schinz, in his 'Verzeichniss,' vol. ii. p. 45, having adopted the appropriate and descriptive name of "*lævis*." On the subject of names I may also remark that I see no reason for changing the old familiar generic name of *Coluber* for the modern, and, as I think, inappropriate name of *Coronella*; and I would suggest that hereafter all the three later names be dropped and forgotten, and the old and appropriate name

of *Coluber lævis* be restored to this lizard-eating ophidian.—*Edward Newman, in 'Field' Newspaper, October 18, 1862.*

Coluber lævis not rare in Sweden.—I see by your paper of September 13th that a snake (*Coluber lævis*, Lacep., *Coronella austriaca*, Gmel.) has been lately added to the British Fauna, and the only thing that surprises me is that it has never been identified in Britain before, for it is common on most parts of the Continent, and by no means rare in Sweden. It is met with as far north as Upsala, but nowhere more common than around Gothenburg. I take it that its general resemblance to the common snake often causes it to be overlooked by the casual observer. We call it in Sweden the “slat snok,” or smooth snake, and in this lies the principal distinguishing mark between the *C. lævis* and the *C. Natrrix*, or common ringed snake. In the common snake the scales on the upper parts of the body are imbricated, those on the back being lancet-shaped and distinctly keeled along the middle; whereas in *C. lævis* the scales are oval, altogether smooth, without the slightest indication of a keel. As far as I can observe, with us the *C. lævis* appears to be partial to stony tracts; they are perfectly harmless, and their principal food appears to be mice; and one which was kept a long time in confinement would not touch a frog. With us they rarely exceed about two feet in length; they appear to be of a much tamer and more companionable nature than the common snake. A most singular thing is that, according to Schlegel, the female brings forth living young. He says, “The eggs take three or four months to hatch inside the mother, and in the end of August she brings forth about twelve young, which are at first altogether white.” If this is the case, is it not the only non-venomous snake that does so? I ask for information.—*Mr. Wheelwright, in 'Field' Newspaper, October 18, 1862.*

The Iguana not an Inhabitant of Tasmania.—I observe a correspondent writes (Zool. 8006) of the iguana of Tasmania. This calling of creatures by erroneous names leads to endless confusion. This monitor group is commonly designated “iguana” also in India; and to the genus *Hydrosaurus* must be referred the Tasmanian reptile, which is utterly different from the veritable iguanas of the New World. As well write of the marsupial *Thylacinus* of Tasmania as the *hyæna* or the tiger, names which have been misappropriated to it in the colony.—*Edward Blyth; Calcutta, September 17, 1862.*

Capture of the Sword Fish (Xiphias Gladius) on the Essex Coast.—On the 23rd of last month some dredging-men in the employ of Mr. Wiseman, oyster merchant, of Poglieshorn, in this county, discovered a large fish in shallow water in a branch creek of the river Crouch, near Potten Island, and on rowing to it they found it to be a sword fish: it had plunged about, trying to get into deep water, and had driven its sword deep into the mud. They captured it alive, and found the sword to measure 3 feet, the length of the fish being 9 feet 1 inch, the weight about 2½ cwt., and the girth 46 inches. The sword is flat, an inch wide at the point, and a piece of it appears to have been broken off some time. — *C. Parsons; North Shoebury Hall, Essex, November 4, 1862.*

Lecture on Spiders.—At the Brighton Royal Literary and Scientific Institution, on Tuesday evening, the 6th of October, Mr. J. Robertson read a paper on spiders, which he said was not a compilation, but the result of original observations and experiments. Those whose habits he had watched were of five kinds:—1. Tunnel spiders, which formed tunnels several feet deep in the earth, lined throughout with silk, and closed at the entrance with a door on hinges, which the spider could hold fast on the inside against the attacks of small birds or other enemies. That the creature might not perish when thus shut up for want of air, all round the doorway were small ventilating tubes. It was a native of the West Indies, the Ionian Islands and Australia. The fangs of this creature worked horizontally, and it had six eyes, arranged horse-shoe fashion, with the opening in front. Seven years ago a specimen had been found near Hastings, confirming an old tradition that they did exist in England; and he had himself recently found one near Brighton. The tube of this creature, found in a lump of clay, was produced, as also another specimen (the upper part, including the trap-door) from Australia. 2. Spiders, tiny red creatures, which skate on the surface of the water. This, he believed, they accomplished by entangling in the brushes at the end of their feet warm, and, consequently, light globules of water, and with these as runners skimmed over the colder and denser water forming the strata below. 3. The diving spider, which makes a small cell, in the shape of an egg, beneath the water, and attached to the stem of some plant, but not of spun silk, the wall being formed of a secretion from the mouth. This creature collects globules of oxygen gas by the electrical attraction of the hairs of its body, and conveys them into its egg-shaped house, thus obtaining a supply of vital air beneath the water. Some spiders enclose their cast-off skins in a silken bag, possibly to stop the escape of noxious vapours. 4. Certain spiders can fly: they dart out threads from their spinners in a horizontal direction to a considerable distance. He saw one put out a thread six inches long, and, turning slowly round, “box the compass.” Lister witnessed the same fact two hundred years, and Latreille thirty years ago, though Blackwall denies that spiders have the power. There are spiders which send out their threads as floats, and are carried by them through the air. Frequently little cobwebs float over the fields, and if, when they descend to the earth, they be examined, are found each to contain a little red spider. In 1822 the yeomanry at Kidderminster fired a salute in honour of George the Fourth’s coronation, when down came a shower of these little red spiders. 5. Labyrinth spiders form a web in shape like a wide-mouthed funnel. Three of these creatures he placed in a box, with a glazed aperture at the top, so that he might observe their habits. Each spun a labyrinth near the opening, where the food was introduced. A blue-bottle fly they easily killed by leaping on his back and plunging the mandibles into his thorax. A beetle gave them more trouble, but they spun threads across his path as he walked about, and when his legs on one side became entangled in these threads, they tilted him over and so despatched him. They killed a moth by leaping on his back, but carefully avoided the strokes of his quickly vibrating wings, and a grasshopper by first clinging to one of his legs. Lastly, Mr. Robertson mentioned that he discovered between thirty and forty spiders working together, co-operatively, to form a large web covering a lump of clay, which he produced, with the web upon it. Some acted as overseers, others as woofers and others as warpers. Some conversation followed, and Mr. Robertson concluded by observing that studying the habits of spiders might even lead to important results, for if we learned how these

wingless octopods can fly, man, the wingless biped, might solve the problem of aërostation.

On some new or little-known Macro-Lepidoptera from England.

By Dr. HERRICK-SCHAFFER.

1. AGROTIS ASHWORTHII, *Doubleday.*

THIS insect was discovered by Mr. Ashworth in Wales, and was first described by Mr. Doubleday in the 'Zoologist' for 1855, p. 7449. Mr. Stainton introduces it into his 'Manual' (1857), p. 228, but says the caterpillar is green, with a pale dorsal line and whitish lateral lines, both of which are wanting in a figure forwarded by Mr. Doubleday. This is dark brown-green, with a rufo-ferrugineous head, and a large black oblong spot on either side of each segment.* Dr. Staudinger is not acquainted with it, but quotes *A. vallesiaca*, Stainton's 'Annual,' 1855, p. 41, figure 2, which figure can in no case refer to my *A. vallesiaca*, and just as little to *A. Ashworthii*, unless it be regarded as quite incorrect and unserviceable.

Agrotis Ashworthii is distinguished from *A. candelisequa* by its persistently smaller size; the anterior wings somewhat less expanded posteriorly, and of a much darker blue-gray tint, without any mixture of reddish; much sharper and thicker black markings; the anterior double line more vertical and straighter, the central shade blacker and broader; the teeth of the posterior dentated line not thickened at their tips, so as to form spots; the waved line throughout of a darker shade towards the base, and but little more strongly expressed at the costa.

In my 'Systematic Arrangement' it would be placed immediately next to *A. grisescens*, fig. 418, which I do not possess, and from which it would be distinguished as follows:—the anterior wings much narrower, the ground colour much darker violet-gray, the anterior dentated line more vertical, central shade blacker, waved line shaded with darker anteriorly, and posterior wings more blackish and without a curved line. At all events a comparison of the original examples of *A. grisescens* is necessary.

2. AGROTIS LUNIGERA, *Stephens.*

Pretty well figured and described by Stephens; however, my fig. 525, *A. Trux, var.*, is almost a better representation of the female,

* I have given a very minute description of this larva at p. 7677 of the 'Zoologist.'—*Edward Newman.*

only in this figure the fore wings are somewhat too broad posteriorly, the reniform stigma too white towards the base, and the hind marginal line too distinct, more especially too pale at the costa towards the hind margin.

The male is essentially distinct by its pale fuscous coloration; hence the orbicular stigma appears far less white, but the black marking comes out all the sharper, particularly a blackish spot, which is wanting in the female, is observable on the costa before the waved line.

This occurs in England on the sea-coast, especially in the Isle of Wight; it appears in July and August, and varies very little. It may be distinguished with certainty from the extremely variable *Agrotis Trux* by its somewhat smaller size; by the anterior wings, not so much dilated posteriorly; by the black border to all the spots; by the claviform stigma, almost entirely filled in with black; by the very different but persistent coloration of the two sexes; and by the constantly paler orbicular stigma.

3. *AGROTIS LUCERNEA*, *L.*

Is not unfrequently reared from the larva in England. The specimens from Wales are always smaller and darker than those from the southern districts of Great Britain.

4. *AGROTIS NEGLECTA*, *H.*

Abundant in Scotland, mostly the *var. cerasina*.

5. *DIANTHÆCIA CAPSOPHILA*.

Discovered in Ireland by Mr. Barrett, who kindly brought it to my notice by the communication of a male specimen. Those which I lately received from France under this name were the ordinary *D. carpophaga*. The one which I represented at fig. 462, from a specimen belonging to M. von Frivaldszky, is scarcely to be distinguished from the pale specimens of this species, as they so commonly occur in the South of England. Guenée's description applies pretty well to this Irish specimen, only it is not larger than the ordinary *D. carpophaga*, but much more blackish, with pure white and deep black mixed; white scales prevail on the thorax, around both stigmata, and in the sharp apices towards the base of the wing, also in the dots on the cilia at the ends of the ribs; the posterior double line is more parallel with the hind margin, whence the middle field is distinctly

broader, with a pale blotch between the hinder margin and the very black claviform stigma.

6. TAPINOSTOLA BONDII, *Knaggs*.

A good new species, discovered by Dr. Knaggs, in August, 1859, on the coast of Kent, and named by that entomologist. Larger than *Nonagria fulva* and *N. concolor* of Guenée (? *extrema*, *H.*, female), resembling the latter in colour, and differing from both in form. The body appears to me comparatively more slender, the antennæ of the male somewhat thinner than in either; the fore wings are much broader than in *N. fulva*, but longer than in *N. concolor*; the oblique direction of the hind margin is intermediate between the two; the coloration is whiter than in *N. concolor*—in the male throughout uniformly irrorated brown-gray, in the female only towards the strikingly whiter unspotted cilia; the row of dots the same as in *N. concolor*. In the male the hind wings are entirely irrorated with black-gray, somewhat darker near the hind margin; in the female the black-gray scales are more confined to a curved line behind the middle and at the hind margin. The fore wings are black-gray beneath, paler near the hind margin and near the costa; the hind wings are much whiter, the curved dark line being distinct in the male only. The legs are clothed with more blackish scales.

7. NONAGRIA CONCOLOR, *Guenée*.

I must here take the opportunity of making some observations respecting the above-mentioned *Nonagria concolor* of Guenée. It is briefly, but pretty distinctly, described by Guenée (1852), No. 158. In English works it first appears in 1850, as *N. extrema*, in the 'List of the Specimens of British Animals,' with the reference *H. fig. 412*: from this it appears that Mr. Stephens, the compiler of this List, had no doubt of its identity; he probably had similar specimens before him. I must, however, confess that the few specimens of this species which I have seen, and also those which I have represented at fig. 337 in my systematic work, differ too essentially from Hübner's figure to warrant the retention of that author's name, and the less so that I have myself in the above-mentioned work, page 228, vol. ii., under the name of *N. extrema*, which at most can be given to the female, quoted a male, which indeed unquestionably belongs to *N. Hellmanni*.

8. LITHOSIA MOLYBDEOLA, *Doubleday in litt.*

Occurring in the North of England, in boggy moors; hence Mr. Doubleday supposes the larvæ feed on the lichens growing amongst the heather. It comes very near *L. complana*, but has somewhat narrower wings; the costal border of the fore wings is straighter, less convex and somewhat more narrowly yellow; the hind wings are plumbeous from the costal border to the middle, even almost as far as the inner margin, narrowly slightly yellow near the base, more broadly so near the hind margin. This plumbeous colour of the hind wings is on the upper side but little paler than that of the fore wings, on the under side not at all paler, and occupies two-thirds of the length of the wing from the base; in the female, with which I am not acquainted, it should be entirely gray. The legs are more strongly irrorated with fuscous. This is scarcely more than a local variety of *L. complana*.

9. LITHOSIA PYGMÆOLA, *Doubleday.*

Specimens sent by English entomologists as *Lithosia pygmæola*, and more recently by Mr. Doubleday as *L. vitellina*, can hardly be distinguished from *L. pallifrons* of Zeller. The size and form are the same, but the colouring much more uniform, hardly yellow, more yellowish gray, more decidedly paler towards the costa, more decidedly yellow on the hind wings, blacker towards the costa to the same extent as in *L. pallifrons*, black-gray on the under side as far as the anal angle, the cilia whiter by contrast. The female is entirely grayish above, only the costal line being whitish yellow. *L. luteola* appears not to occur in England.

10. LITHOSIA STRAMINEOLA, *Doubleday.*

This species was first cited by Stephens, page 95, as *L. flava* of Fabricius; the latter author has it in his 'Supplement,' p. 461, from Italy, and says, "Media quasi inter *convolutam* et *luteam*, magnitudo et longitudo prioris, at color posterioris." As the former is *Chilo giganteus*, and the latter *Lithosia luteola*, the comparison but ill applies to our species, and Doubleday's name is rightly cited. Stephens's description agrees. The statement of the size—namely, 1" 4—6"—is especially distinctive, thus considerably larger than *L. aureola* and *L. helvola*. Guenée seems to pronounce it a variety of *L. griseola*; it of course approaches it very nearly in form: it is, however, still larger; the wings are broader, the costa of the fore wing not

quite so convex, its hind margin longer, straighter and more vertical ; the colour is quite that of *L. aureola*, a uniform pale yellow, a little paler on the hind wings, a faint approach to grayish on the under side of the fore wings to the same extent as in that species.

11. *EUPITHECIA SUBCILIATA*, *Guenée*.

Is certainly *E. inturbata*, *H., H.-S.*, as appears from a specimen sent to me by Mr. Doubleday, and not *E. laqueata*, as I formerly supposed.

HERRICH-SCHAFFER.

[It seems desirable to add that a few alterations from the German have been intentionally made ; for instance :—

Under *Agrotis lucernea* the word *southern* is substituted for *northern*.

Under *Tapinostola Bondii*, for *named by Mr. Doubleday* is substituted *named by Dr. Knaggs*.

Under *Lithosia molybdeola*, *where for miles no tree or shrub is to be seen* is omitted, as not strictly in accordance with fact.—*Edward Newman.*]

Occurrence of Chærocampa Celerio at Brighton.—On the 29th of October last a beautiful female specimen of *Chærocampa Celerio* was found by one of my servants resting on a wall by one of the windows of this house. From its condition I think that it could not long have emerged from the chrysalis. I have now in my cabinet specimens of *Deilephila Galii*, *D. Lineata*, *Chærocampa Celerio* and *C. Nerii*, besides the commoner species, all taken within two hundred yards of this house. Probably the town lights are very attractive to all the tribe.—*John N. Winter ; 28, Montpellier Road, Brighton, November 3, 1862.*

Description of the Larva of Demas Coryli. It falls off its food with a slight touch of the beating stick, but neither rolls in a ring nor feigns death. Head rather large, about the same width as the body, shining : body obese, the divisions of the segments strongly marked ; the anterior part of the third segment bears two distant brushes of orange-coloured hairs directed forwards ; the 5th, 6th and 12th segments bear each one brush of the same colour on the median line of the back, but in every instance the brush springs from two closely approximate warts. Head and ground-colour of the body pale red or dingy flesh-colour, in some specimens very pale, and in one example I have before me delicately white ; there is a rather broad median line of the back perfectly black ; this is interrupted on the 2nd, 3rd and 4th segments, and ceases on the 12th ; on the sides are numerous black markings, different in different specimens, but these markings constitute conspicuous patches on the sides of the 2nd, 3rd and 4th segments ; there is a yellow or white mark on the sides of all the segments, except the 5th ; these marks are situated before and beneath the spiracles : the legs and claspers are pale, and each is surrounded by a black ring : the belly is variegated with black and orange, black predominating : each segment of the body has eight warts,

and each wart emits a radiating fascicle of paler hairs, the central hair being generally twice the length of the others and of a silky character. The egg is laid in May, hatched in June or July, and the larva is full fed in September; it spins among the leaves a slight cocoon in which the hairs of the body are interspersed with the silk; the pupa is hairy. It remains in the pupa state throughout the winter, the perfect insect appearing in May. It feeds on *Carpinus Betulus* (hornbeam) and *Fagus sylvaticus* (beech). For this larva I am indebted to Mr. Wright, who beat several full fed specimens off the hornbeam in Epping Forest, on the 18th of September last.—*Edward Newman*.

Description of the Larva of Lobophora sexalisata.—Rests in a nearly straight posture, generally stretched at full length on the midrib of the leaf of its food-plant, the head being tucked in and the mouth concealed between the first pair of legs. It does not fall from its food or feign death on being disturbed. The head is rather narrower than the body, and distinctly divided into two rounded lobes on the crown: body uniformly cylindrical, without excrescences, but a good deal wrinkled, the 13th segment terminating in two divaricating points directed backwards. Colour of the head opaque yellow-green, of the body apple-green, with three indistinct whitish stripes down the back; the tips of the anal points are pink. Feeds on *Salix capræa* (sallow), and is full fed about the middle of September, when it spins a slight oval cocoon among fallen leaves. The pupa is short, smooth, chestnut-brown and shining; it remains in that state throughout the winter, the perfect insect appearing in May. I am indebted to Mr. Doubleday, who received his specimens from Mr. Robinson of Cockermonth, for the opportunity of describing this larva.—*Id.*

Capture of Æthia emortualis; Correction of an Error.—It may prove interesting to the London Macro-Lepidopterists to know that the insect captured by me in Epping Forest on the 12th of June, 1859, and announced in the 'Intelligencer' (vii. 188), and the 'Entomologist's Annual' for 1861, (p. 101), as *Herminia derivalis*, was not that species but *Æthia emortualis*. The specimen was exhibited at the Entomological Society on the 2nd of December, 1861.—*Charles Healy; 74, Napier Street, Hoxton, N.*

Lepidopterous Captures in the Isle of Wight.—I know not how other collectors have succeeded this season, but I have found it one of the worst I ever knew. Some insects that are generally common have not appeared, others generally considered scarce have appeared in great numbers. The following are the only captures I have made worth naming. In June I took a specimen of *Laphygma exigua*, very much worn, and in July I took three specimens of *Triphæna subsequa*; and last night, though blowing a gale of wind and raining in torrents, I took a beautiful specimen of *Leucania vitellina*. I took one three years ago, in the month of August, which is in Mr. Bond's collection. There were more insects at sugar last night than I have seen any night since July, and it is rather singular that five years ago, on the 20th of October, I took more good insects than I have taken since on any single night. Then it poured with rain, and so it did last night. This shows the necessity for working in all weathers, for it often happens that on the nights we think best there is not an insect to be seen, and yet on a fearful night like last insects were swarming at sugar.—*Henry Rogers; Freshwater, Isle of Wight, October 22, 1862.*

Notes on the Food and Economy of certain British Micro-Lepidoptera. By Mr. CHARLES HEALY.

1. *Renewed Observations on the Carnivorous Propensity and Economy of the Larva of Diplodoma marginepunctella.*

WISHING to observe the carnivorous propensity of this larva more closely, last June I searched for, and was fortunate enough to meet with, the larvæ in abundance: I found the males and females, and the larvæ in various stages of growth, all on the same fence at one and the same time.

My experience teaches me that, if well supplied with insects, the larvæ of this species evince no immediate desire to partake of whitethorn leaves; for example, on the 8th of June I put several larvæ into a jar along with an old case of the same species, one *Plutella xylostella*, one *Adela Degeerella*, one *Tortrix viridana*, and a leaf of whitethorn; on the 9th they had eaten all the particles of dead insects affixed to the old case; on the 11th the body of *P. xylostella* had disappeared; on the 14th the body of *A. Degeerella* had been devoured; on the 15th I observed them feeding on the body of *T. viridana*; at this date I put into the jar two specimens of *Arctia Menthastris*; on the 10th the body of *T. viridana* was entirely gone, and I observed they were all engaged eating the bodies of the two *A. Menthastris*; on the 21st I observed they had eaten the whitethorn for the first time; from that date up to the present I have continued to supply them with insects, only occasionally giving them a leaf of whitethorn.

This case-bearing larva is not affected by being kept in a glass-covered jar like a *Coleophora* larva would be.

I have been much struck with another circumstance relative to these exceedingly interesting larvæ, namely, after they have fed for a few days, they climb up the jar and suspend themselves for days and even weeks without partaking of a single particle of food. I am strongly of opinion that the economy of this species is similar to that of *Talæporia pseudo-bombycella*,—the female having deposited her eggs and covered them with down, that the young larvæ use the aforesaid down in constructing their first case. I observed a female laying eggs on my setting-board; she first laid an egg and afterwards covered it with down; then another egg, which she likewise covered; and so on, till she had deposited all her eggs: these eggs I put on one side for further observations, but unfortunately they were swept away and lost, and consequently I am unable to speak with certainty as to

whether the young larva appropriates the down in constructing its case.

I annex a list of the insects whose bodies have been eaten by these larvæ since they have been in my possession:—*Pygæra bucephala* (1), *Arctia lubricipeda* (4), *A. Menthastri* (2), *Bombyx neustria* (1), *Platypteryx unguicula* (1), *Xylophasia lithoxylea* (2), *Aplecta tincta* (1), *Ephippiphora fœneana* (1), *Tortrix viridana* (4), *T. adjunctana* (1), *Adela Degeerella* (1), *Yponomeuta evonymellus* (3), *Plutella xylostella* (1), and *Musca Cæsar* (2).

2. *Renewed Observations on the Carnivorous Propensity of the Larva of Talæporia pseudo-bombycella.*

In May, 1860, I sent you an account of the carnivorous propensity of this larva. On the present occasion I purpose giving you a short account of my renewed observations on its carnivorous habits. Desirous of testing their carnivorous habits more fully, I collected several larvæ and placed them in a jam-pot, and fed them entirely on dead insects.

The following is a list of the insects whose bodies have been eaten by these larvæ at the present time:—“*Eupithecia coronata* (2), *Tortrix rosana* (1), *T. corylana* (1), *T. unifasciana* (1), *T. viridana* (1), *Scardia cloacella* (1), and portions of the bodies of two *Tipula hortorum*.”

Some of these larvæ are now leisurely feeding on the bodies of some *Yponomeuta evonymellus*. At the end of June I brought home three fresh larvæ, and put them into the jug containing the larvæ of *Diplodoma marginepunctella*, along with which larvæ they fed, to all appearance in perfect harmony, during the months of July and August. I never observed them feeding on anything else than the bodies of the insects in the jar.

3. *Economy of Psyche roboricolella.*

The eggs of this species are laid inside the case, covered with down, and when the larvæ are born they envelop their bodies in the same. This is an old observation, made in 1860, since which time I have been unable to meet with the larva again, in order to fully test its carnivorous habits.

4. *Economy of Xysmatodoma melanella.*

The female of this species lays her eggs inside her case. The eggs are covered with down, and the young larvæ appropriate the same in fabricating their cases.

I have not yet observed this larva to have a carnivorous taste.

5. *A Suggestion as to the probable Food of the Larva of Micropteryx calthella.*

Determined, if possible, to discover this larva, early last May I visited Bishop's Wood, Hampstead. I observed the imagos in abundance, as usual, on the buttercup flowers, and, after a careful search, failed to meet with them on any other plant. Having sketched out a rough plan, showing the various spots where the imagos were abundant, I revisited the plants every week, and searched the leaves for the existence of a mining larva without success until the 21st of June, when I found a larva making a large mine in the leaf; this, however, was considered to be a sawfly larva. I resumed my search, but not meeting with a larva making *linear* excrement in the buttercup leaves, I commenced searching the leaves of the birches growing over the aforesaid buttercups, and, after hunting over a whole host of leaves mined by coleopterous, and dipterous larvæ, I found some true *Micropteryx* larvæ. I continued searching the buttercups and neighbouring plants up to the end of July, without finding any trace of a *Micropteryx* larva. I therefore point to the birch as the probable food of this larva.

6. *A Suggestion as to the probable Food of the Larva of Micropteryx Seppella.*

In June, 1861, I observed this species swarming in a little lane near Addington. Being desirous of finding the larva, I sat down on the bank and endeavoured to discover a preference on their part for any particular plant; but, after spending some time watching their movements, all that I observed was that they fluttered over and settled on the grass stems. On the 25th of the following month I revisited the locality, and eagerly searched amongst the low plants for evidence of a *Micropteryx* mine, but without success. Failing amongst the low plants, I ran my eye over the various privet, hazel and oak bushes, and whilst doing so I observed a small birch, nearly buried by the surrounding bushes, every leaf of which, on closer acquaintance, I found had been tenanted by a *Micropteryx* larva. Lower down the lane I observed another small birch, in the leaves of which I found two larvæ. Body faint green; head light brown; the 2nd, 3rd, 4th, 5th and 6th segments having each a small black spot, diminishing in size. All the other larvæ had vacated their mines. From the previous abundance of the perfect insect in this locality, and the total

absence of a *Micropteryx* mine in everything but birch, I am inclined to think that the birch will prove to be the food of this larva.

7. *A Scented Micropteryx Larva.*

Whilst collecting birch-feeding *Micropteryx* larvæ, during the last two seasons, my attention has been drawn to the circumstance of one of the larvæ having a musky scent attached to it. The larva is of a very dark gray colour.

When I first noticed the scent I considered it arose from the leaves, but last May I found the larva feeding in company with a white *Micropteryx* larva, which was quite scentless, whilst the dark brown larva retained its peculiar faint musky smell.

8. *Micropteryx Larvæ infested by a Dipterous Larva.*

Last May, whilst engaged sorting the empty leaves from the tenanted, I observed several *Micropteryx* larvæ remaining motionless in their mines. Having allowed an interval of two or three days to elapse, and finding they were still in the same position, I ejected them from their mines, and found they were dead. From the appearance of the larvæ I was induced to open them, when the cause of their death became apparent by finding that each larva had a dipterous-looking larva feeding on its intestines.

CHARLES HEALY.

74, Napier Street, Hoxton, W.

Capture of two Coleopterous Insects new to Britain.—I have recently taken and determined two insects, which have not hitherto been recorded as British:—

1. *Aphodius Zenkeri*, *Erich.* It is in general appearance more like *A. Porcus* than any other British species. Short, ovate, convex, chesnut-brown. Head black, with pale margins to clypeus, which has three tubercles, the central one prominent in the male, and distinctly angulate in front of the eye. Thorax with disk dark, thickly punctate; anterior and lateral margins chesnut-brown. Elytra with obscure dark maculations, a large oblique patch on each behind the middle; the striæ punctate, and the interspaces elevated and smooth, with their margins punctate, giving the appearance of compound striation; basal joint of posterior tarsi elongate. Length about 2 lines. I took about thirty specimens in human excrement, at Mickleham, in August, 1862.

2. *Tachyusa coarctata*, *Erich.* Nearly allied to *T. constricta*, the abdomen being constricted at the base, but not quite to the same extent. It is smaller, polished, with a fine gray pubescence, and my specimens are entirely black, with a bluish tinge like that of *T. leucopa*, with the exception of the mouth and tarsi, which are testaceous-yellow. The tibiæ are darker than the tarsi, but paler than the rest of the body.

The abdomen is more polished than other parts. Length about $1\frac{1}{2}$ line. I took two specimens on the banks of the Mole, in August, 1862, in company with *T. constricta* and *T. umbratica*, the latter of which was also new to the British Fauna, until it was taken and determined by Mr. Janson, previously to my capture of it, first at Haliford, and afterwards near Mickleham.

I have also taken another *Tachyusa*, undoubtedly new, and an *Oxypoda* from nest of *Formica fuliginosa*, both at Mickleham, but have as yet been unable to determine them.—*John A. Power*; 52, *Burton Crescent*, October 17, 1832.

Occurrence of Gymnusa brevicollis in Scotland.—This species, which Stephens, in his 'Manual,' declares to have been improperly recorded as British, is now represented, I believe, in some cabinets by undoubted English specimens. The insect occurs in Scotland also, two specimens having been taken by me in a wet bog in Berwickshire, in August last, along with a pair of *Myrmedonia collaris*.—*Robert Hislop*; *Blair Lodge, Falkirk*, October 20, 1862.

Rare Scottish Coleoptera.—A few other noteworthy species were picked up during my visit to the Border. *Boletobius inclinans* and *Quedius fulvicollis* were found among moss in a fir wood, along with *Mycetoporus clavicornis*. *M. splendidus* and *Q. ruficollis* accompanied. On the summit of Dirrington Law, which is only 1145 feet above the level of the sea, I met with a lovely specimen of *Leistus montanus*. *Hydnobius strigosus* and *Miscodera arctica* were found on the same level. Lower down *Tarus Vaporariorum* and *Bradycellus collaris* (*harpalinus*?) were met with. I may add that *B. inclinans* was taken by me for the first time in March last in this neighbourhood, fifty miles to the west of the former locality. An interesting addition has been made to our Scottish list by my young friend Mr. Charles Millingen, who took *Claviger foveolatus* near Neidpath Castle, in its usual ants' nest.—*Id.*

Coleoptera in the New Forest.—Having recently had an opportunity of examining the insects captured by Mr. Farren in the New Forest, I am enabled to add the following to the list given in the 'Zoologist' for August (*Zool.* 8141):—

Liodes humeralis. Common in Fungi on trees.

L. axillaris. Three or four specimens are distinctly referable to this species, having slightly dilated anterior tarsi and simple posterior femora in the male.

L. orbicularis. Not rare, with *L. humeralis*.

Agathidium seminulum and *A. rotundatum* are apparently the only ones found here.

Paromalus parallelopedus. I have seen a specimen of this in the Rev. A. Matthews' rich collection, and have obtained three specimens from the New Forest under bark.

Rhizophagus parallelocolis and *R. cæruleus.* One specimen of each, and a few abnormally small specimens of *R. ferrugineus* that might pass for *R. parvulus*, *Payk.*

Microrhagus pygmaeus. A magnificent female under bark; the largest specimen I ever saw.

Athous rhombeus. Two fine specimens; one bred from the larva.

Elater lythropterus and *E. Pomonæ.* In tolerable numbers; also a few specimens of *E. elongatulus.* All the *E. bipustulatus* belonged to the supposed variety, whereas at Andover this never occurs.

Tetratoma Desmarestii. From Fungi.

Melandrya canaliculata. One specimen, in company with numbers of the common *M. caraboides*, under bark.

Conopalpus testaceus. A few specimens from whitethorn.

Cryptocephalus bipustulatus. The habits of this species certainly do not tend to unite to *C. lineola*, though in form and sculpture it would be hard to find much difference.

Sundry genera remain as yet unexamined; *e.g.* *Cerylon*, of which I cannot but consider that we have more than two species; the red specimens that I have obtained are almost all identical with specimens of *C. deplanatum*, *Gyll.*, that I have received from the Continent, but I have two that resemble the *C. angustatum*, *Er.—G. R. Crotch; Weston-super-Mare.*

Life-Histories of Sawflies. Translated from the Dutch of M. SNELLEN VAN VOLLENHOVEN, by J. W. MAY, Esq.

(Continued from p. 8178.)

LOPHYRUS SIMILIS, *Hart. Hartig, Fortsliches Convers.-Lexicon*, 2nd ed. [p. 987; *Blatt und Holzwespen*, p. 160, No. 10. *Ratzeburg, Die Forst-Insecten*, vol. iii. p. 116, No. 25, tab. ii. fig. 3. *Snellen van Vollenhoven, Schadelijke Insecten*, p. 58.

Lophyrus ♂ *niger*, *punctatus*, labro palpisque brunneis, antennis thoracis longitudine, pedum genubus, tibiis tarsisque pallide rufo-flavis; ♀ sordide flavus, capite, maculis tribus dorsalibus thoracis et macula magna irregulari in abdominis dorso nigricantibus, antennarum parte externa cærulescenti nigra.

If any sawfly is aptly named it is the species we are now about to treat of, for, having regard to this insect in its perfect state, it is extremely difficult to distinguish it from the imago of *Lophyrus Pini* described at page 7887. Although there are some general characters by which the species may be distinguished, they are still so nearly alike that the separation of individual specimens is very difficult. On the other hand, the larvæ are so differently coloured that there is no danger of confounding the two species in that state. To any one not acquainted with these facts from a study of the works cited above, and who, having first reared one of these species, is afterwards watching for the appearance of the imago out of the cocoons of the other, it is somewhat surprising to get an insect the male and female of which differ greatly from each other, but are both respectively precisely like a species which he had reared from entirely different larvæ.

The observer is naturally impelled to conclude there must be some mistake in his observations.

I first found the larvæ at a country seat near Rotterdam, on the Weymouth pine (*Pinus Strobus*); the trees had a sickly appearance, arising probably from the fact that they were growing in an uncongenial soil. From their variegated colours the larvæ were very conspicuous, so much so that many persons called my attention to them. It was with some of these larvæ that I there made the observations which I alluded to in my description of *Lophyrus Pini*. I left the larvæ quite at liberty, and allowed them to pupize as they pleased. Some spun oval cocoons upon the branches of the trees on which they had lived; others descended from the tree, and spun up at its foot among the roots and the surrounding moss; these cocoons were paler or more of a gray tint than the others. I collected both in separate boxes. From the first cocoons, namely, those attached to the branches, I got nothing but a species of *Pteromalinus*; while the others, which I had found at the roots, produced perfect sawflies, only here and there one containing a dried-up larva. Can it be that the circumstance of a sawfly larva being infested with parasites renders it so weak or so sluggish that it is unable to get through the journey along the branches and down the stem of the tree? If so, why does it not simply let itself fall from the branches? I am unable myself to reply to these questions. I must also state that I have had no opportunity of repeating this observation, and therefore it may be that the whole matter is nothing but a chance coincidence which may never be observed again. The larvæ have been once taken by Dr. M. C. Verloren at Driebergen, and several times by Dr. J. Wtte-waal at Voorst; this gentleman sent me the specimens from which the figs. 1, 2 and 2a, plate 8, were drawn. On comparing this plate with the 11th of the first volume, one sees at once the great difference between the larvæ of these so nearly allied species. It must be remarked that the larva of *Lophyrus Pini* is of a darker shade and more variegated with spots than as represented in the said plate, but the bright yellow and dark blue, which are such conspicuous colours in the larva of *L. similis*, are not found in that of *L. Pini*. I have a drawing, made since the publication of vol. i., of a larva which I did not take to be that of *L. Pini*, but which has nevertheless produced that species: I shall perhaps be able to give this figure on some future occasion.

The larva of *L. similis* attains a length of 3 centimetres, and a circumference of nearly 15 millimetres. Head bright shining black, round, depressed, not elliptical. The six corneous thoracic legs are

black; the skin at the joints is softer and pale-coloured, so that the legs appear to be ringed. The general colour of the skin is a very dark blue, or even a bluish black variegated with yellow and pale blue. There is a narrow pale blue stripe down the middle of the back; this is best shown at figure 1. At some distance on either side is a yellow stripe, which appears to be made up of spots placed close together; the rest of the space, as far as the spiracles, is beset with small round and elliptical pale blue and yellow spots. The legs are pale blue, with a quadrate black spot at the base and outer surface; above the legs are some rather large oval spots placed lengthwise. The first segment, or what might be called the neck, is almost wholly yellow.

The position of all these markings can be more readily made out from the enlarged drawing of the seventh and eighth segments given at fig. 2*a*. From this it can be seen that the skin of each segment is divided on the dorsal surface into six folds of unequal dimensions, and that the two yellow dorsal stripes are composed of spots divided from each other by the black epidermis lying between the folds. The first two spots on the folds, or rather to say, dermal eminences, are of equal length, but the first is a little broader, the third is of the same breadth as the second, but prolonged a little further down the side; these three are yellow. Then follow two smaller pale blue spots on narrower folds, and lastly a large yellow spot on a second eminence.

It is not worth while to give a detailed description of the size, shape and position of the other spots and dots, as these will be more readily made out from the figure. We must, however, point out that the first, third and sixth dermal folds are beset with spines, as is the case with *L. Pini*, only in the latter they are black and in this insect yellow.

There are sixteen abdominal claspers in all. The posterior termination of the body is almost always kept bent round towards the abdominal claspers. When the larvæ are touched they throw the head and fore part of the body violently backwards, and then hold on by only four or five pairs of claspers. When left at rest they assume the position represented in the plate.

It is worthy of remark that while Hartig and Ratzeburg both assert that *L. similis* has the same habits as *L. Pini*, and the first-named author distinctly states that he met with his examples in the larva state on Kufern-Stangenhölzern, with us the larvæ have never been observed but on the Weymouth pine (*Pinus Strobus*). Further, Dr. Witewaal informs me that he found fully grown larvæ on the 24th of June, 1856, the 25th of June, 1857, and the 15th of September, 1858,

always on *Pinus Strobus*, and those which I found at Rotterdam inhabited the same species of tree. I have no record of the species of pine on which Dr. Verloren met with his larvæ; it was probably not communicated to me. From the fact of the larvæ making their appearance in the months of June and September it clearly appears that there are two generations in the year. The usual course is this: the individuals which spin their cocoons about the 1st of October come out in April or May, pair, and deposit their eggs from which larvæ are produced, spinning up about the 1st of July; imagos appear about the end of that month, whose larvæ pass the winter in the cocoon. Meanwhile I must here observe that two larvæ which had spun up on the 1st of October, 1858, had not assumed the pupa state on the 29th of May, 1859. It is thus very possible that in some years this species produces but one generation, the same as *L. Pini*. This insect cannot be said to be destructive to our Weymouth pine trees, it having only occurred in the Netherlands sporadically and in small numbers.

The cocoon of this sawfly, as represented at fig. 3, is of precisely the same shape as that of *L. Pini*; it is also equally hard and pergamentaceous, but it differs in colour. The cocoons of *L. Pini* run through a number of tints intermediate between brown and silverygray, those of the present species range from obscure brown to dull yellow, no gray-coloured cocoon being observed. As before stated, the cocoons are found both on the branches and in the moss on the ground. Dr. Wittewaal writes, "The cocoons are attached lengthwise to the branches and also in the angles, this latter position being the most frequent," and makes no mention of their occurrence at the roots, which he thus appears not to have observed. Neither Hartig nor Ratzeburg gives any information as to the place in which the cocoons were found.

The imago liberates itself by gnawing out a little lid in the same manner as already described in the case of the other species. I have never been able to observe the pupa; I have either opened the cocoons too soon or waited too long, as in the case of those I took at Rotterdam.

It will be unnecessary to give a particular description of the imago of this species, as was done in the case of the common pine sawfly. It will suffice if we explain the points of difference between the two. It must here, however, be observed that the distinctive characters are not always to be clearly made out, and that varieties of the two species approach each other so nearly that all differences disappear, and the species are no longer to be distinguished.

Most males of *L. similis* differ from those of *L. Pini* in the following

particulars. In the head the whole of the upper lip and the palpi to the base are reddish brown. The antennæ are longer, being nearly as long as the head and thorax, and have from twenty to twenty-two pectinations. In the case of this species also the teeth on the outside are much longer than those on the inside, as is clearly shown in fig. 4 *a*, which represents two joints of an antenna, each having a process on either side, and showing very plainly that the left hand process, which is the outer one, is much longer than the right hand or inner one. The tegulæ are usually more clearly rufo-testaceous than in *L. Pini*. In the abdomen the white spots on the pointed prolongation of the dorsum of the first segment are wanting; on the other hand the under side of the abdomen is of a general reddish tint, and the horny plate above the organs of generation is distinctly red. The legs offer no points of difference either in colour or shape. We must here state that Ratzeburg very plainly intimates that there is a difference in the neuration of the wings which he considers to be constant. It does not, however, appear that this distinction is always equally observable in Netherland examples of the insect. We prefer giving this characteristic difference in his own words.

“Bei *T. similis* werden nemlich oft 2 Zellen fast vollständig getrennt, dadurch dass dem ungewöhnlich langen Scheidenerven gegenüber der hornige Anfang der 2ten Hälfte liegt und dass beide durch einen hellen Nerven verbunden werden, an welchem man entweder bloss die beiden Ränder oder zwischen diesen auch eine Körnige Ausfüllung bemerkt. Nur 2 meiner Stücke zeigen dies undeutlich; bei *T. Pini* finde ich aber nicht an einem einzigen Exemplare jene Verbindung deutlich, ja es kommen Exemplare vor, an welchen der Scheidenerv fast ganz fehlt. Ist bei *T. Pini* einmal eine weisliche Fortsetzung der Scheidenerven deutlich, so ist sie immer mehr gegen den Vorderrand gerichtet und würde, wenn sie vollständig wäre, eine fast ovale erste Zelle einschliessen, während bei *T. similis* die Scheidenervenfortsetzung immer vom Randnerven abwärts strebt, meist sogar etwas bogenförmig und dadurch eine abgerundet-viereckige Zelle bildet: der innere Nerv dieser Zelle beträgt die Hälfte des ganzen Scheidenerven, oder noch mehr, während er bei *T. Pini* viel kürzer ist, als die Hälfte.”

Against this we have Hartig's statement, who first described this species, and has carefully compared it with the so nearly allied *L. Pini*, and who simply says, “In der Flügel-Bildung und Färbung findet kein Unterschied zwischen diesem und dem männlichen *L. Pini* statt.”

And now as to the female, the following will be found to be the distinctive characteristics of the two species. The head is generally speaking darker, and not only brown but brownish black, without any paler spots below the eyes or above the trophi. The antennæ also are darker, bluish black even, with the exception of the two basal joints, which have a yellow tint; the antennæ are also somewhat thicker in the middle and at the end. The breast of the thorax has almost always a black shining spot; the scutellum is almost entirely yellow. The legs are of a more obscure yellow, that is to say a yellow mixed with gray or brown, the extremities being of a somewhat darker reddish brown.

The saw and ovipositor (fig. 6) are nearly the same as in the female of *L. Pini*; only it appeared to me that the teeth of the saw in this species were generally smaller.

I am not aware of the appearance of the egg nor of the place in which it is deposited; it is probably laid in a slit in a pine leaf, as in the case of the allied species.

This species is observed in Germany and the Netherlands. There is no reason for supposing it may not be found in other contiguous European countries or in countries having the same mean temperature, although I am not acquainted with any record of its appearance there. Dahlbom and Lepeletier make no mention of this species.

In May, 1856, and April, 1857, two ichneumons appeared from cocoons of this insect which my friend Wttewaal had in his house, that on the latter date being *Tryphon marginatorius*, *F.* (Grav. *Ichn.* ii. p. 191), and that on the former date a species of *Tryphon*, which appears to me to be undescribed. Hartig does not mention that he reared any parasitic Hymenoptera from the cocoons, but says that some maggots made their appearance which afterwards produced *Tachina bimaculata*. Ratzeburg, however, in his 'Wirths-System,' gives the names of three species of ichneumon which had lived in the larvæ of *Lophyrus similis*, namely, *Campoplex argentatus*, a very common species in various sawfly larvæ, *Entodon canaliculatus* and *Torymus minor*. I have had no opportunity of determining which species of *Pteromalinus* I obtained from the larvæ which I first found (1837 or 1838).

List of Phryganidæ taken in 1862. By PERCY C. WORMALD, Esq.

THE following is a list of the Trichoptera which I have captured (with few exceptions) during the present year. I did not meet with a single species till the 1st of May, when I took two, *Limnephilus costalis* and *L. fumigatus*, though there is one species, *Brachycentrus subnubilus*, *Curt.*, which appears in April, and has been taken in Devon by Mr. Parfitt. It is said to occur near London, but my search for it was unsuccessful. During a short visit to North Wales I captured a *Rhyacophila* new to Science, which has been named *R. obliterata* by Mr. M'Lachlan.

Phryganea grandis, *L.* Common on palings at West End, Hampstead, end of May and beginning of June.

P. striata, *L.* One specimen near Hampstead, May 18.

Colpotaulius incisus, *Curt.* Common at Hammersmith Marshes, June 28.

Limnephilus pellucidus, *Oliv.* Hampstead, Hendon and Ruislip (Middlesex), West Wickham and Epping Forest; appears throughout the summer; first seen May 19, last seen September 13.

L. vitratus, *De G.* Kilburn, Kew, Ruislip and Bala Lake (N. Wales), middle of June to October.

L. rhombicus, *L.* Canal near Willesden (Middlesex), from middle of June to beginning of September.

L. marmoratus, *Curt.* Kew and Ruislip, August; common at the former locality.

L. flavicornis, *Fab.* One specimen near Hampstead, June 7; common at Ruislip in August and September.

L. stigma, *Curt.* One specimen, June 26, at Ruislip; common in August and September at the same place.

L. bipunctatus, *Curt.?* One specimen near Hendon (Middlesex), June 22. This appears to be rather a scarce species.

L. auricula, *Curt.* Near Hampstead, Coombe Wood, Epping Forest and Ruislip; also at Llangollen and Bala (North Wales); end of May to end of August.

L. costalis, *Step.* A very common species, at the commencement of the season, in most woods, &c.; is out from the beginning of May to September.

L. vittatus, *Fab.* Ruislip and Epping Forest, end of June to end of September; common.

L. centralis. Hampstead and Epping Forest, June and August; not common.

L. irroratus, *Steph.* (*hirsutus*, *Kol.* non *Pict.*) Canal at Willesden, beginning of May to end of July. I have not as yet met with this species anywhere else, but it is very abundant there in June.

L. hirsutus, *Pict.* Two specimens on thistles after dark, in July, 1861. Received three specimens from Mr. Corbin, of Ringwood, this year.

L. sparsus, *Curt.* Ruislip, Epping Forest, Llangollen and Bala (N. Wales), August.

L. fumigatus, *Germ.* One specimen at Willesden, May 1.

Anobolia nervosa, *Leach.* Very common at Willesden, August to October.

Stenophylax hieroglyphicus, *Steph.*, *M^cLach.* Two specimens at Hampstead, May 18 and October 25.

S. stellatus, *Curt.* Six specimens at Bala Lake, August 18. Received a large female specimen from Ringwood; it is at least half as large again as those from Wales.

Halesus digitatus, *Schrk.* Common at Willesden, September and October.

H. flavipennis, *Pict.* Five specimens at Llangollen, August 17 and 22.

Sericostoma Spencii, *Kirby.* One specimen at Llangollen, August 22. Received one from Ringwood.

Goëra fuscicornis and *G. capillata*, *Pict.* Willesden and Kew, common; middle of May to August. I think Dr. Hagen is correct in his opinion that these two species of Pictet are synonymous. (*Ent. Ann.* 1859, p. 102).

Silo pallipes, *Fab.* Llangollen, common; August.

Mormonia hirta, *Fab.* Very common at Llangollen, Corwen and Bala (N. Wales), in August.

Odontocerus albicornis, *Scop.* Five specimens at Llangollen, August 22.

Molanna angustata, *Curt.* Willesden and Kingsbury, June to August; common.

Leptocerus fulvus, *Rbr.* I again met with this species at Ruislip Reservoir, middle of June to August.

L. cinereus, *Curt.* Banks of Thames and Bala Lake, very common; June to August.

L. annulatus, *Step.* Two specimens at Bala Lake, August 18.

L. aterrimus, *Step.* Willesden, &c., common; May and June.

L. dissimilis, *Step.* Banks of Thames at Kew, and Bala Lake, not common; August 9 and 18.

L. tineoides, *Step.*? Two specimens—one at Kew, the other at Bala; June 21 and August 18.

L. bicolor, *Curt.* Willesden and Ruislip; very common at the latter locality in June.

L. albifrons, *L.* Kew, common, June to August; also at Bala Lake.

L. pilosus, *Müll.* Hyde Park and Ruislip, June to August.

Mystacides atra, *Pict.* Willesden, July and August.

M. nigra, *Pict.* Kew and Bala Lake, August; not common.

M. quadrifasciata, *Fab.* Hyde Park and Ruislip, June and July.

Setodes testacea, *Curt.* Ruislip, June to end of August.

Rhyacophila dorsalis, *Curt.* Llangollen, August.

R. obliterated, *M^cLach.* A new species, of which I took two male specimens at Llangollen (N. Wales), on the 22nd of August, 1862. I have two female specimens which may belong to this species, but I am unable to speak positively.

Glossosoma Boltoni, *Curt.* (*fimbriata*, *Step.*) Common at Llangollen, August.

Agapetus funereus, *Step.*? Two specimens at Llangollen, August 18.

Polycentropus pulchellus, *Curt.* Common near Willesden, in May and June; taken also near Kew.

P. bimaculatus, *L.* Kingsbury and Willesden, July and August.

Philopotamus (?) *occipitalis*, *Pict.* (*subaurata*, *Step.*) Four specimens at Llangollen, August 22.

Tinodes pallescens, *Step.* Willesden, Kew, and Bala Lake, in August.

Psychomia annulicornis, *Pict.* Very abundant on the banks of the Thames near Kew, June to August.

Hydropsyche angustata, *Pict.* One specimen near Kew, August 9.

H. fulvipes, *Curt.* Willesden, Kingsbury and Kew, July and August.

H. Danubii, *Brauer*, *Neurop. Aust.* p. 40. There is at present a great deal of uncertainty as to the species of the genus *Hydropsyche*, but I think I am correct in recording this species as new to Britain. It is certainly not included in Dr. Hagen's 'Synopsis.' The following is a translation of Brauer's description:—“Lower appendices of the male dilated at the apex, yellow. Sheath-valves of the female divergent, strongly springing outwards. Upper appendices of the male closed, with a deep oval incision at the hind margin; last segment of the abdomen on the top narrow, black, raised. Sheath-valves of the female at the raised margin straight, cut short, brownish, covered with bristly hairs. Wings gray, speckled with pale yellow. Sides of the

thorax entirely gray or streaked with yellow. Antennæ yellowish brown, ringed with black. Head and thorax clothed with yellowish hairs above. May." Exp. alar. of the male 10 lin. One male specimen was sent to me by Mr. G. B. Corbin, of Ringwood, Hants, at the commencement of the season.

H. atomaria, *Step.* Banks of the Thames near Kew, June.

In addition to the above I have a *Limnephilus* which is new to this country, and possibly entirely new.

Amongst the Neuroptera I have met with the following species:—

Libellula striolata, *Charp.* One specimen at Ruislip, August 27.

Calopteryx splendens, *Harris.* One specimen, Lewisham, June 4.

Agrion minium, *Harris.* Willesden and Ruislip, in June.

A. elegans, *Vand. Lind.*, and *A. Puella*, *L.* Common at almost all ponds, in June and July.

A. mercuriale, *Charp.* Willesden and Hampstead, May and June.

Chrysopa vulgaris, *Schw.* Twyford (Middlesex), October 11.

C. flava, *Scop.* Hampstead, Coombe Wood and Ruislip, June to August.

C. alba, *L.* West Wickham and Hampstead, May and June; common.

C. angustipennis, *Step.?* Three specimens at Hampstead, Ruislip and Coombe Wood, June and July.

C. tenella, *Schw.* Three specimens at Hampstead, June and July.

C. Perla, *L.* West Wickham and Hampstead, May and June.

Sisyra fuscata, *Fab.* Willesden, Kew and Bala, June to August.

S. terminalis, *Curt.* Banks of Thames near Kew, June 21.

Micromus paganus, *Vill.* Four specimens at Hampstead, Willesden and West Wickham, May and June.

Hemerobius micans, *Wesm.* West Wickham, Ruislip and Epping Forest, not common; May to August.

H. ochraceus, *Wesm.* Not included in Dr. Hagen's 'Synopsis.' Two specimens at West Wickham by beating firs, in May.

H. nervosus, *Fab.* Hampstead, &c., in August; common.

H. phaleratus, *Hoff.* Dartford Heath, in April; Coombe Wood, in July.

H. punctatus, *Goëze.* Not included in 'Synopsis.' One specimen at West Wickham, August 26, 1861.

Coniopteryx tineiformis, *Curt.* West Wickham and Hampstead, May (end) and June.

C. psociformis, *Curt.* Willesden, West Wickham and Coombe Woods, &c. Beginning of May, and June.

Sialis lutarius, *L.*, *Panorpa communis*, *L.*, and *P. germanica*, *L.*
Common.

Psocus immunis, *Step.* West End, Hampstead, on palings, in July and August.

P. quadrimaculatus, *Step.* Hampstead, on palings; July and August.

P. subocellatus, *Step.* One specimen, Epping Forest, August 28.

P. immaculatus, *Step.* One specimen, Ruislip Wood, June 26.

P. phæopterus, *Step.* Two specimens on palings near Hampstead, July 19.

P. flaviceps, *Step.* Near Acton and Hampstead, July and August; on palings.

P. abdominalis, *Step.* One specimen on palings near Hampstead, July 19.

P. lineatus, *Latr.* One specimen near Llangollen, August 17.

P. nebulosus, *Step.* Two specimens at Llangollen and Epping Forest, in August.

P. variegatus, *Latr.* On palings near Hampstead, common in June.

H. bifasciatus, *Step.*? Three specimens on palings near Hampstead, August 2 and 3.

In addition to the above I have some half-dozen species of the Planipennes and Psocidæ not yet determined, besides a number of the Ephemeridæ and some Perlidæ.

PERCY C. WORMALD.

Kilburn, London, N.W.,
October 27, 1862.

Occurrence of Portuguese Men-of-War off the Isle of Wight. — On the 7th of August we had a most terrific gale, and for several days after our shores were lined with hundreds of *Physalia*, or Portuguese men-of-war, as I believe they are called in England: they were not only at the back of the island, but also on the south shore of the Solent. I picked up several, and had a great number brought to me to be named for different visitors: many of them were alive, and one lived for two days in a basin of salt water; it changed its shape continually, and reflected all the colours of the rainbow. I believe this is common on the shores of the Mediterranean, but only rarely captured on the British shores. — *Henry Rogers; Freshwater, Isle of Wight, October 22, 1862.*



