THE

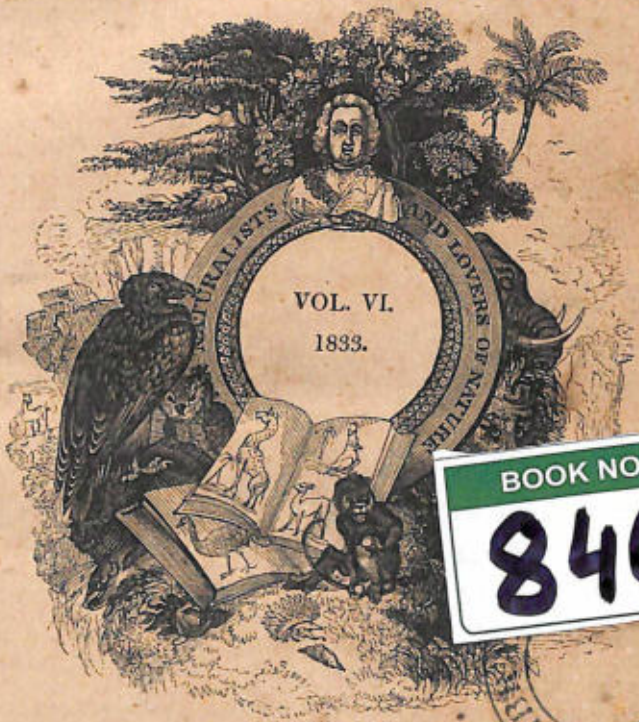
MAGAZINE OF NATURAL HISTORY,

AND

JOURNAL

OF

ZOOLOGY, BOTANY, MINERALOGY, GEOLOGY, AND METEOROLOGY.



BOOK NO.
846

CONDUCTED

By J. C. LOUDON, F.L. G. & Z.S.

MEMBER OF VARIOUS NATURAL HISTORY SOCIETIES ON THE CONTINENT.

LONDON:

PRINTED FOR

LONGMAN, REES, ORME, BROWN, GREEN, AND LONGMAN,

PATERNOSTER-ROW.

1833.

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PREFACE.

EVERY additional Volume which appears of the Magazine of Natural History bears evidence of the increasing taste for pursuits of this kind in the reading world, as well as of the augmentation of our readers and correspondents.

The present Volume, among other valuable information, contains notices of various new cheap publications on the subject of Natural History; the sale of which, to such an extent as to remunerate the publishers, may be considered as an undoubted evidence that a taste for this science has pervaded all ranks. It is gratifying to us to reflect that we have been among the first to rouse this dormant love of nature and truth; and still more so, to look forward to the influence which a love of nature, simple truth, and matters of fact, must one day have on the general state of society. The first symptom of the decline of superstition, and of a blind reverence for whatever has the sanction of antiquity, is the incipient desire of examining the tangible objects which surround us. The first taste of mankind is for fables; the last, for matters of fact. As the spread of a taste for natural history all over the world interferes with no political or religious interest, it is already making rapid strides towards that desirable period, when, in the figurative language of the Bible, the knowledge of the Lord shall cover the earth, as the waters cover the seas.

In thanking our contributors for the continued assistance which they afford us, we have at the same time to apologise for the tardiness with which some of their communications are inserted, and for the abridgment of others. The truth is, that so abundant is our supply of materials relating to the delightful subjects which our work embraces, that we could, with the greatest facility, as far as matter is concerned, bring out this Magazine twice as often as it now appears.

J. C. L.

Bayswater, Oct. 16. 1833.

CORRECTIONS.

In addition to those which, in p. 159. 273. 464., have been already indicated, the following may be made:—

In p. 121. for "Gastracánthus" read "Hetróxys;" and see p. 495.

In p. 173. line 4. from the bottom, for "dumbledove" read "dumbledore."

In p. 185. place the semicolon between the last two words instead of before them.

In p. 200. line 8. from the bottom, for "sighs" read "sings:" at least, the latter is the word in some editions.

In p. 364. for "Houghton le Steane" read "Haughton le Skerne."

In p. 420. Cephalonòmia, see the correction directed in p. 495.

In p. 447. line 1. for "apivórus" read "apivorus."

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Accn. 884
dt. 27/12/06

THE MAGAZINE

OF

NATURAL HISTORY.

JANUARY, 1833.

ORIGINAL COMMUNICATIONS.

ART. I. *Chit-chat.* No. II. By JOHN F. M. DOVASTON, Esq. A.M., of Westfelton, near Shrewsbury.

> " So water, trembling in a polish'd vase,
> Reflects the beam that plays upon its face;
> The sportive light, uncertain where it falls,
> Now strikes the roof, now flashes on the walls."
> *Virgil.* Æn. viii. 22. &c., trans.

SCENE — *The library, Westfelton.* TIME — *After dinner.*

DOVASTON *and* VON OSDAT.

Dovaston.

STORMY and loud, the wind roars among the labouring woods, and howls through the trees in gigantic harmonies.

Von Os. With now and then a double diapason in the chimney-tunnels; as though Polypheme of capacious mouth accompanied the hailstone chorus over his Pan's-pipe of stupendous reeds.

Dov. I hope he will not cut any of them down to concert pitch.

Von Os. While here we sit snug and cheery; a good fire blazing beside us; good liquor, nuts, and fruits, before us; and around us, in mute but intellectual array, multitudes of the Mighty Dead.

Dov. The Living, rather. Often when alone, I imagine a Library like a *cozie* corner of Elysium; where a select assembly of the fanciful, the philosophic, the enlightened, and the learned condescendingly administer to the instruction or amusement of their less-gifted guests.

Von Os. Secluded from the cold and callous world without: its toils and tumults, noises and nonsenses; which, by fancy and reflection, the quiet mind may convert into playthings. I have just now been shutting my eyes, and comparing the uproar of these woods to the distant swells and falls of the troubled and tumbling ocean. I once caught a glimpse of Caernarfon Castle; its tall towers glimmering in the hectic light of a wet and stormy sunbeam.

Dov. Poor Joe Warren ——

Von Os. Oh! long and late beloved; oh! early lost: — "his bright and brief career is o'er."

Dov. Ay. Poor Joe ——

Von Os. —— whose warm heart and brilliant fancy would frequently play off more jets of joyance in a momentary conversation, than we could pump into a day's discourse, ——

Dov. —— felt intense delight while listening to my descriptions of scenery, after any of my long summer excursions. One evening after tolerating, to some length, my attempt to give him something like an outline of The Trossachs — the strange, abrupt, wild, and beautiful succession of stupendous wonders in those roaring and romantic passes in Perthshire; — laying down his pipe, he suddenly sprung up, exclaiming, — "Come into the garden, and I will show you *how to see a Trossach.*"

Von Os. What! amid the mills and machinery of Strath-Morda, as ye called it?

Dov. Even there. Hard by, you know, there is a prodigious overshot dam of a millpool on the Morda. He now bade me keep my eyes absolutely and constantly shut, and, taking my arm, walked me slowly about the garden, colouring, as he well could do, with his *cannie* and courteous voice, and painter's powers, the outline I had just been sketching.

Von Os. Excellent! I begin to see them now myself.

Dov. Sometimes, on suddenly turning the corner of a walk, he would squeeze his kind hand close on one of my ears; and, on turning another corner, would suddenly take it off: so that, what with the powerful torrent, mingled with the various noises of the distant mills and machinery, his glowing descriptions, and soul-enkindling names, I soon found myself among the uproar and ecstasies of those romantic regions: soon, under the sprays of dangling birches, entered those awful and tremendous portals, on narrow paths of rocks, with narrower skylight of fleecy blue, meeting the white and stunning torrents, tumbling and tearing among their massy and ponderous fragments, overhung with dismal crags, mantled with oak and old birches, that wave their venerable tresses over deep and dark abysms, and insulated rocks shaggy with long hoary

heather; millions of spikes, grey with lichens and green with moss, assuming the fantastic forms of castles, turrets, towers, and battlements, pyramids and pinnacles: and over all, moving as I moved along, just the tip of Ben An, like a single stone, flaring in sunshine. Now the path somewhat smoother, and the noises somewhat subdued; then bursting out again, from gloom to gleam, from uproar to serenity; till at length Loch Katherine gleamed expansive in blazing and intense glory, with the full height of the lofty Ben An, and the purple side of Benvenue, terminated with the terrific and rugged cliffs of the frightful Mealaonah, all peacefully reposing in the blessed sunbeams of evening: —

> " So wond'rous rich, the whole might seem
> The scenery of a fairy dream."

Von Os. Bravo! I shall remember this; and hereafter put into requisition our poor friend's recipe, " *How to see a Trossach.*"

Dov. Closing his own eyes, to enjoy the creations of his own fancy, one of us tumbled over the garden roller; and the other upon some rockwork, to the destruction of sundry specimens of sedum, saxifrage, and navelwort.

Von Os. " Tilly valley! Sir John."

Dov. What the devil do you mean by Tilly valley?

Von Os. Why what has all this to do with natural history?

Dov. Just as much as yonder nuthatch, so pertinaciously picking a bone on the ornithotrophe.

Von Os. Mine is fixed on a post, and the cats often rob it. I see the trencher is much better when suspended by three wires, like a scale, from a ring to slide along a line, stretched from the window to a tree.

Dov. And ye may have two or more on the same line, trimmed with bones, seeds, and various food; piercing the trencher with a few holes, to let out the wet. It is extremely amusing to see the various birds that so become familiar; and I find many gentle-minded people, since Bewick published in his Preface an extract from one of my letters describing it, have adopted my pleasing little machine, that I jocularly called the ornithotrophe.

Von Os. Do you think these birds are the same individuals who frequent that hung before your dining-room windows?

Dov. A few may frequent both: but, in general, I am certain all birds have their particular beats, or haunts; and very rarely intrude on those of others; when the invaded never omit repelling the forcible entry, by taking the law into their own hands. Robins have their own beats, even on the different

sides of a small cottage: there are four distinct pairs of robins around this house; and one is attached exclusively to my brew-house. In the wide and wild woods, too, I am certain they keep to the same beats; as I noticed for months by the singularly loud, and unusual sort of, song in one belonging to the great cedar of Lebanon near my south entrance: and another, while I was working in a wood, lit on the handle of my spade, while I was eating my bread and cheese; this I chanced to catch, and, marking him with a scissors by a black cross on his breast, I found he continually kept to the same spot.

Von Os. How pugnaciously they will fight! There is a Greek proverb, That two robins will not inhabit the same bush. Should you think the word erithiacus derived from the Greek word signifying *strife*, which it much resembles?

Dov. It may: though it still more nearly resembles another Greek word signifying *red*.

Von Os. How do you take these birds at the ornithotrophes?

Dov. Easily, by a trap cage: and having taken one, the rest are all your own. They must, however, be marked with great delicacy and caution: for if tawdrily, or too conspicuously, their own friends will fall upon, pummel, and sometimes kill them. When an idle and playful schoolboy at Shrewsbury, under my ever-honoured Master, the learned and munificent Dr. Butler, I put the good people of that town into a day's uproar, by marking a bird.

Von Os. The Dickens!!!

Dov. Having taken, in a fall-trap of four bricks, one of those most radically plebeian of all birds, a dirty town sparrow, I dexterously with a bit of cobbler's wax fastened to his head a fine erect crest of very bright scarlet feathers; having previously subjected him to the ordeal of the ink-pot. He soon acquired numerous pursuers, and as many outlandish names; and before nightfall, three, four, and five guineas were offered. He was at length brought down by the celebrated Sam Hayward, the notorious poacher: and the universal and instantaneous opinion arose that it was a *marlock* of young DERIWAG — for such was my scholastic cognomen, from a cunning knack at *waggish derivations*.

Von Os. So, you had a character there, then?

Dov. Yes, — and have still, which I will endeavour to deserve and retain to the last hour of my life.

Von Os. In one of the lectures delivered to that town in Freemason's Hall, I am told you very much amused your audience, by an account of some experiments on swallows.

Dov. I hope, I did. Many years ago, a garret window in

my house was accidentally left open, and a pair of *rustic* swallows built their fretted nest among the rafters, at which I was much pleased: and when they had hatched and reared their young, both they, and their parents, finding they were favourites, continued to play about the room all summer; and always roosted in it at night. Before they departed, a thought struck me to play them an innocent trick. One night I shut the window-sash, and took them all in an angler's landing-net, and fastened round their necks, without hurting them in the least, rings made of the very fine wire that laps the lower strings of a violoncello. At this they took no offence, but played about till their departure. At their appointed period they vanished, with their friends. The following spring the window was carefully set open for their admission; and they came accordingly, after "the daffodils had taken the winds of March with beauty;" and, to my great delight, four had the rings. One pair re-occupied the old nest, and another pair, or more, built in the room. Emboldened by their kindness and constancy, having a pretty little Greek story, you well know, in my mind, I ventured, in addition to the light wire, to affix on the neck of one, a thin round smooth piece of copper, on which I engraved, in Latin (being the tongue most universally known), *Quò abis à Salopiâ?* [Whither away from Shropshire?] But whether he perished, or whether he met with his friend the gentle Athenian, I wot not: for, alas! he returned unto me no more.

Von Os. This, then, establishes your opinion, that migratory birds, or their progeny, or both, do return, year after year, to the very same places.

Dov. Yes; unless I was played a trick.

Von Os. Perhaps the extraordinary success of the circumstance induces you to suspect a trick?

Dov. Partly so: and partly that for many years, and at that time, a young gentleman resided at our then worthy old rector's, his guardian, an orphan boy, who had an incessant, and I may say rabid, propensity to playing practical tricks upon all sorts of people; but most particularly on whom he called philosophers, and the fair sex. He assisted me to fix the wires upon the birds, and might have fixed wires on others at their return.

Von Os. I know whom you mean: he was inexhaustible in tricks ridiculously wanton, and ingeniously malignant.

Dov. From which it was impossible to reclaim him by the kindest admonitions and severest punishments.

Von Os. I was at school with him; and one of his tricks there, was to watch the algebraical students from their studies,

and then go alter the signs in their unfinished calculations; changing their −s into +s or ÷ or =s; causing incalculable errors, and exhausting perplexities.

Dov. "Tilly valley, Sir" Von.

Von Os. Oh! Natural history still: the weeds and flowers of the mind are as much within her province, as those of the fields. But did you never question him?

Dov. He left the country; and I was too idle to repeat the experiment: the servants grumbled at the dirt made by the swallows; and I grumbled at the pigeons getting in, and breaking windows and looking-glasses; so the light-winged wanderers were ejected. But that migratory birds, or some of their progeny, do return to, and build in, the very same spot, I have no doubt. A spotted flycatcher has invariably built in the same corner of my piazza, as long as I can remember, though the other corners are equally accommodated with brackets or perches: a wren usually occupies another; but she is not so constant as the traveller: and last summer a female wasp planted on the ceiling, and rapidly increased, her colony, who suspended their flaky ball of streaky olive papery folds, close to the door; yet was no person stung or molested all the season.

Von Os. Migration has long been absolutely established. I wonder it was ever doubted, particularly by such a man as White; but he — mild, amiable, and modest creature — was over-influenced by the great names of Pennant and Daines Barrington.

Dov. Yet he never quite gave in to their notion of the torpidity of birds. I will read you a passage of great beauty, describing a single straggler at sea: not that I doubt migration, and that they travel in companies; but merely that my CHIT-CHAT may have some little in it that is really good.

Von Os. The Public unfeignedly like your Chit-chat, by what is said by some of our best contributors; and the private letter of the editor: — and much of it is copied into the newspapers.

Dov. Like as the grinding of tunes on barrel-organs is always a proof they are approved. I thought it best to wait some time for the opinions of the subscribers; and I have now had letters enough to satisfy a more modest scribbler: for *myself*, indeed, the approbation, however slight, of such a man as Waterton alone were amply enough — the intrepid traveller, the accurate and almost unerring observer, the benevolent protector, the classic scholar, the animated writer, the ——

Von Os. Enough, enough; though all true. His descrip-

tion of the noises of the birds all night, in his *Wanderings in Demerara*, and their universal clamour at sunrise, is a glorious burst of amazingly fine writing. But, to your quotation; or, mayhap, he may "pick a *crow*" with you.

Dov. "The Lord keep me from Sir Harry Vane!" said Cromwell. Here it is, — I have at last found it, at p. 286., in No. 10. of the *Edinburgh Philosophical Journal*.

Von Os. Read it.

Dov. (*reads*). "On the 21st of November, in lat. 6° 4′, and long. 20° 31′, we experienced those heavy squalls and rains which are uniformly met with in this climate. The storms are occasionally sublime, and worthy of a minute description. After the most perfect calm, heavy, dense, and gloomy clouds are seen collecting at every point of the horizon: they form themselves into vast arches, having their abutments on the ocean. Suddenly, at one point, they blacken to an inky hue: the sails are furled, the crew stand in mute attention, each at his station, and every eye is directed towards that vast and hideous mass of clouds, which, resting on the surface of the deep, and reaching heaven with its top, advances upon the devoted vessel. Now, sweeping the ocean, it pours a deluge on the ship; the storm rages; and, by the terrific force of the blast, the masts seem ready to start from the decks. When these squalls happen at night, and are attended with much rain, a ball of meteoric fire is seen at the mast-head, tending to increase the horrors of the storm. On the 21st, whilst beset on all sides by the squalls, a swallow suddenly appeared close to the ship. There was no known land nearer than 300 miles. The swallow was seen first during a calm, skimming round the vessel with great velocity, and seemed to feed abundantly on the flies which hovered round the ship's sides; but, during the squall that succeeded, its actions became those of self-preservation, and were admirably adapted to that purpose. As the rain poured in torrents, it beat down the swallow's head in spite of all its efforts, thus interrupting its flight round the vessel. When the bird perceived this take place, it rose perpendicularly through the air and dense rain; fluttering, moreover, incessantly: thus throwing the water off its wings. The amazing courage and strength displayed by this bird, in contending against the numerous storms with which we were assailed, during many hours, convinced me of its power to perform the longest migrations, with comparative safety. The swallow remained with the vessel during two days, and sought shelter in the shrouds only at the approach of evening."

Von Os. Bold, intrepid little bird! — and beautifully told.

Ay; let the shutters be closed; and the lights are cheerful. How awfully the storm peals it over the woods!

Dov. I have often, when riding with you in the night, Von Osdat, admired the unerring accuracy with which you have named the trees, from their mere outline dimly marked against the sky.

Von Os. It was from an observation of yours I acquired it; that every tree had invariably its distinct physiognomical character.

Dov. I have nearly the same nicety of ear in that respect: so that, sitting here, I can discriminate almost every sort of tree, as it is called upon, either solo or in score, to take part in the grand choral harmonies of the tempest. Now it roars deep and still among the oaks just behind this book-room; anon, breathes hoarse and hollow upon the dark old Scotch pines of the cider-mill grove; groans through the sycamores and lime avenue, "that weather-fends my cell;" rattles the bony boughs of the skeleton ash; howls through the elms; hisses (and each obviously different) in the cedars, spruce, and silver fir; whistles through the larch; whispers in the Weymouth and aphornousli; and suddenly whisks a solitary cypress; while the evergreens, and dry-leaved hornbeams, keep up a constant accompaniment, each after his kind.

Von Os. Encore! Egad, our good cheer enables us to convert even the conflicting elements into a noble concert: and I have been thinking these *stridulous* owls in the bushy ivy about our chimney-top, and their hooting counterparts in the woods, no bad vocalists.

Dov. I love the owl more than many do the fiper melodists. If you used the word counterpart designedly, you do not agree with him of Selborne, who says they always hoot in B flat.

Von Os. I am sorry to differ from such authority: but, most certainly, they use various keys.

Dov. So do the cushat and cuckoo, and many other such even-tenour performers.

Von Os. This Virginia smokes divinely. Have you the *horned* owl ever in your prodigious ivies?

Dov. Not of late years. When a little boy, as I well remember, just at sunrise, I was fearfully terrified at a pair I 'spied sitting on an old Portugal laurel, close to the oak we have since inscribed to our learned, gifted, and beloved friend Rylance. I was early a fond reader of poetry, and fancied them marvellous messengers just arrived from the enchanted regions of romance.

Von Os. A fitting guest for the tree of our merry friend — the Attic bird.

Dov. Ay, either: be it Minerva's, or that of Tereus, the "merry nightingale," as Coleridge most cordially calls him. Not only the notes of birds, but scenery itself; nay, everything, takes its tone infinitely more in accordance with our own present feelings, than from any thing inherent in itself: or as he, who so pithily knew that "brevity is the soul of wit," more quaintly expresses it: "there is nothing either good or bad, but *thinking* makes it so." I actually once heard an ignorant pert officer say, he knew not why people liked the robin, unless it was for his impudence.

Von Os. Puppy!

Dov. Why, you have snuffed the candles out!

Von Os. I believe, many birds, formerly not uncommon, have of late years disappeared; or become, in these parts, extremely rare. I remember bevies of quails common enough.

Dov. When a fly-fishing boy on the Vyrnwy, I have occasionally put up the bittern (*Ardea stellàris*). I have not now seen him many years; though I have sometimes heard him *boomping* in the sedgy pools, as I have gone out into the garden at night, with poor Warren, to ——.

Von Os. "See a Trossach."

Dov. Our ancestors set the back claw in silver for a toothpick, and believed it had the virtue of preserving the teeth; and they supposed it always gave an *odd* number of *bombs* at a time, three or five. Willughby found this not the case. It sits in rushes, with head and neck erect: in autumn, at sunset, it will soar spirally to a vast height, with an unusual sound. This is what the vulgar call the night-raven; saying it portends death; and, flying in the night, resembles "*a flagging collar.*" Pliny calls him *taurus* (the bull), *butorius*, and *botaurus*; the Welsh, *derin-y-bwmp.*

Von Os. The Welsh language is most amazingly expressive in its radicals, and surprisingly beautiful in its combinativeness: the name of every animal, plant, or place is self-descriptive. In the abundance and powers of its vowels, the euphonious change of its consonants, and the melting union of its confluents, it really rivals the matchless Greek itself.

Dov. Among the treasures of its poetry, dormant in the dust of *great* men's libraries, is a curious epigram on the silkworm, composed entirely of vowels. Observe, I can recite it without closing or moving lips or teeth: —

"O'i wiw ŵy i weu é â, a'i weuaw
O'i wyau y weua;
E' weua ei wî aia',
A'i, weuau yw ieuau iâ."

"I perish by my art; dig mine own grave;
I spin the thread of life; my death I weave."

Von Os. Curious: a difficult trifle. But, surely, the Welsh knew nothing of the silkworm.

Dov. That is a very strong inference that the poem is not ancient; though it might serve for *any* caterpillar as well as the *P*halæ`na mòri.

Von Os. It is roundly asserted in Dr. Rees's *Cyclopædia*, "and that by those who have examined it attentively, who think they speak within compass when they affirm, that each ball (of the silkworm) contains silk enough to reach six English miles."

Dov. This good and excellent little girl, who waits upon us so quiet, effectually, and fairy-like, measured, at my desire, two cocoons last August. How much did they measure, my dear cousin Sarah?

S. D. Sir, one measured 285, and the other 306 yards; allowing a little for loss at each end.

Dov. Very well; and can you give us any more information?

S. D. Only, Sir, that the duck is ready in the dining-room; and the oysters are come by coach.

Dov. Best news of all. Come, my dear Von, to a warm dissertation on the *A*nas *B*óschas, and a practical discussion of the molluscous bivalves.

Von Os. Then will we quaff some brimmers (with many a fragrant whiff) over our heartiest good wishes to Loudon and his labours.

Dov. Not forgetting his labourers: and close this night's CHIT-CHAT with healths to our brother cullers of simples, and our really earnest request that they will ——

Von Os. — say that you have plaguily too much ornithology in it.

Dov. Ornithology! — why, my dear fellow, 'tis a main point of my religion.

Von Os. Your religion! marry, as how?

Dov. Why, a certain great, big, burly, rich personage, who, not a century since, filled the civic chair as chief magistrate in a neighbouring town, and who gives grand venison feasts, with his "*candle-Abraham*" ——

Von Os. Ha, ha, ha! — and which you easily and effectually persuaded him was not even a "*candle Isaac*," but merely a "*Jacob*" —

Dov. Taught, by the inimitable Sir John Falstaff, how much "a lie, with a slight oath, and a jest, with a serious brow, will do with a fellow that never had the headach in his shoulders —"

Von Os. Well?

Dov. Well: this sapient personage being told that I was an

ornithologist, exclaimed — "*Horn-i'-th'-hollow-jest!* A bitter Whig, I know he is, as ever growled at placeman or parson; and is not ashamed of it: but I never thought the crazy Counsellor had any Religion; but 'tis better he be of *that*, than of no Religion."

Von Os. Ha, ha, ha! — a joke of your own making! — too good to be true.

Dov. Really as true as that my name is

JOHN F. M. DOVASTON.

Westfelton, near Shrewsbury,
Oct. 28. 1832.

ART. II. *Address to the Members of the Berwickshire Naturalists' Club, Sept.* 19. 1832. By GEORGE JOHNSTON, M.D.

THE Berwickshire Naturalists' Club was instituted in September, 1831, by some gentlemen who interested themselves in natural history, and were anxious to do their best to aid one another in their pursuits, and to diffuse a taste for them among others. The club meets four times in the year, and the place of its meeting is changed every time, to afford the members an opportunity of examining in succession every part of the neighbourhood. The members meet early in the morning; they spend the forenoon in excursions, and they again assemble at dinner, after which any papers that may be laid before them are read and discussed freely. The first anniversary meeting was held at Coldstream on the 19th of September, 1832, when the following address was read by the president on his resigning the chair.

Gentlemen,

BEFORE I leave the distinguished station which, by your favour, I hold in this club, you will permit me to take a cursory view of what has been done, during this the first year of its existence, towards forwarding the objects for which we principally associated ourselves; a more accurate knowledge, to wit, of the natural history and antiquities of Berwickshire and the adjacent parts of the neighbouring counties: and I am induced to do this, not because our labours have elicited much of interest or importance; not because I can hope to give any additional impulse to your zeal, or direction to your future pursuits; but that I may, so far as in me lies, set an example to my successors in this chair to give you, at each

succeeding anniversary, a summary of the communications and researches of the members during the year; so that the results of these may not be lost, and that their bearings and connections may be pointed out. The review, also, may serve to remind us of those departments of the natural history of the county which have received the least notice and illustration, and where, of course, our enquiries may be most usefully directed in future.

[*Birds.*] — At our meeting in July, it was mentioned that a male bird of the rose-coloured ouzel * had been shot at West Ord, in the vicinity of Berwick, on the 13th of that month, by the Rev. Mr. Campbell. No previous instance of the occurrence of this beautiful bird in North Durham is known; and very few instances of its occurrence in the north of England are on record.† It is a summer visitant, coming to us at uncertain intervals; and (it may be conjectured) compelled, perhaps, to make these parts by the force of some contrary storms: and in this respect it resembles another bird, the Egyptian goose ‡, a small flock of which is recorded to have visited the Tweed, at Carham, in the beginning of February last.§ This flock, as is conjectured by Mr. Selby, may probably have made its escape from Gosforth, the seat of the Earl of Wemyss, upon the Firth of Forth, where great numbers of these birds are kept in the artificial pieces of water. ‖

These are the only birds remarkable for their rarity, which have occurred during the year; for I do not remember that any such was met with in our excursions. In that of June, made to Langleyford, at the foot of Cheviot, our distinguished colleague, Mr. Selby, entertained some slight hopes of meeting with the ring thrush ┼, which, it was supposed, might breed near this sequestered hamlet: but the information of the respectable tenant proved the contrary; for the bird is seen there only in the later autumnal months, on its return from still more inland and more remote moors. During our ascent of Hedgehope, on that day, the curlew ¶ first, and, somewhat higher up, the golden plover ** (uttering,

* Pástor ròseus *Tem.*, *Túrdus* ròseus *Lin.*

† Mr. Selby has a specimen, shot near Bamborough; and two others have been taken not far from Newcastle. (*Trans. Newc. Soc.*, i. 263.) It is singular that these were all males.

‡ *Anas* ægyptìaca *Lin.*, *Chenalòpex* ægyptìaca *Steph.*

§ Kelso Mail for Feb. 6. 1832; Mag. Nat. Hist., vol. v. p. 565.

‖ Trans. Newc. Soc., i. 290. Five were seen on the Fern Islands in April, 1830; and in March, 1831, a female was killed near Berwick. (*Ibid.*)

┼ *Túrdus* torquàtus *Lin.*

¶ *Scólopax* arquàta *Lin.*, Numènius arquàta *Lath.*, Whaap *Prov.*

** *Charàdrius* pluviàlis *Lin.*

as it flew from us, its shrill plaintive cry), were seen in their breeding-grounds; and the blackcock * was heard calling harshly to his mates. On this occasion, as on several previous ones, I was struck with the cries of the birds we noticed: there was no sprightliness in them, nor melody; but all were plaintive, or rapid and harsh, and tended to increase that still sobriety — that almost solemn mood — which irresistibly steals over the mind of him who traverses these noiseless, wide, dark-brown moors. The melody of the groves is not in harmony with the scene; and the warblers leave it willingly for haunts nearer the cheerful buzz of man and civilisation. But our excursion in July presented us with a most remarkable contrast to the scenery of the Cheviots: a wide and rough-rolling sea, a coast fronted with lofty, dark, and precipitous rocks, caverned with gloomy recesses, so bold, so rugged, and naked, that Scotland scarce boasts one of superior grandeur. And how diverse were its feathered tenants in appearance and habits! The slender-legged tribes of the moor, clothed in a mottled plumage, were here replaced with birds distinguished by short legs, strength of body, and by colours disposed in large and unmixed patches, often strongly contrasted: and while the former wheeled round and about us in circles, muttering their cries on wing, the latter flew out in a straight undeviating line, and silently. Nor were they less distinguished by their voices; for the cries of seafowl are never plaintive, but most harsh, and most consonant with the pictorial character of their haunts. Pennant has given a description of these, so excellent, that I must be allowed to quote it here, with only a very few alterations, to make it more exact to St. Abb's Head, the place of our visit. This magnificent promontory is a huge insulated mass of trap rocks †, whose seaward sides form precipices of vast height, hollowed in many places into caverns, in which the wild pigeons ‡ build their nests, and nurture their young in safety, amid the spray of waves that never sleep in rest. In some parts, the caverns penetrate far, and end in darkness; in others, are pervious, and give a romantic passage by another opening equally superb. Many of the rocks are insulated, of a pyramidal form, and soar to a great height. The bases of most are solid; but in some pierced through and arched. They are covered with the dung of the innumerable flocks of birds which resort here annually to breed, and fill every little projection, every hole, which will give them leave to rest. Multitudes were swimming about; others swarmed in the

* *Tétrao Tètrix Lin.*, Female, Grey hen, *Prov.*

† Flora of Berwick, i. pref. xiv. xv.

‡ *Colúmba Lívia Selby.*

air, and stunned us with the variety of their croaks and screams. Kittiwakes, sea mews, and black-headed gulls, guillemots, auks, and corvorants, are among the species which resort hither. "The notes of all seafowl are most harsh and inharmonious. I have often rested under rocks like these, attentive to the various sounds over my head; which, mixed with the deep roar of the waves slowly swelling, and retiring from the vast caverns beneath, have produced a fine effect. The sharp voice of the gulls, the frequent chatter of the guillemots, the loud notes of the auks, the screams of the herons, together with the deep periodical croak of the corvorants (and the boding voice of the raven), which serves as a bass to the rest, have often furnished me with a concert, which, joined to the wild scenery surrounding me, afforded, in a high degree, that species of pleasure which results from the novelty and the gloomy majesty of the entertainment." *

I must not leave this majestic coast, without mention of another of its feathered tenants, the Cornish chough †; which, indeed, was not seen by us on this occasion, but is certainly ascertained to breed in the rocks between St. Abb's and Fast Castle. This fact, distinctly mentioned by Bishop Leslie, in his history *de Origine Scotorum*, published about 300 years ago ‡, has been overlooked or disregarded by naturalists, who have considered the bird peculiar to the western shores of Britain §; and it is to the Rev. A. Baird that we are indebted for the confirmation of the accuracy of the bishop's information; and, of course, for showing that the limits usually assigned to the distribution of the chough in this country are erroneous.

[*Reptiles.*]—Of the reptiles of Berwickshire, the frog ‖ and the toad ⸸ have met us every where; and in our excursions to Penmanshiel Wood, and to St. Bathan's, a viper ¶ was taken; but no communication relative to any of this neglected tribe of animals has been laid before you.

[*Fishes.*]—Mr. Embleton gave us, at our meeting in December last, a description of a singular individual of the salmon **, which had been caught near Coldstream. It was distinguished by being spotted over, in a leopard-like fashion, with pale marks, by having its gill-covers beautifully streaked

* Arctic Zoology, i., Introd. p. xii.
† *Córvus Gráculus Lin.*, *Pyrrhócorax Gráculus Tem.*
‡ P. 17. Published in 1578.
§ "Inhabits the *western* side of the island." *Flem. Br. Anim.* 89.
‖ *Rana temporaria Lin.*, Paddock *Prov.*
⸸ *Rana Bufo Lin.*, *Bufo vulgaris Flem.*, Taed, *Prov.*
¶ *Coluber Berus Lin.*, *Vipera communis Flem.*, Adder, *Prov.*
** *Salmo Salar Lin.*

with red lines, and by leather-like fins; and these peculiarities were not the effects of disease, for the fish was in good condition, and perfectly sound. At the same meeting I presented to the club a list of the less common fishes found on the coast of Berwickshire, of which list the most remarkable, for their rarity at least, were the common tope *, the starry ray †, of which I have had several specimens brought me, the top-knot ‡, the toothed gilt-head §, the lunulated gilt-head ‖, the sea perch ⊣, the basse ¶, the horse mackerel **, the fifteen-spined stickleback ††, which is by no means uncommon on this coast, and is occasionally taken at the mouth of our river during the summer months. Besides these, there have occurred four species, which, in our latest system of British animals, are said to be confined to the "English coast;" and which may therefore be considered as additions to the fishes of the Scottish shores. These are, the greater weaver ‡‡, inaccurately characterised by Dr. Fleming; the lesser spotted dog-fish §§, the hag-worm ‖‖, and the tadpole fish ⊣⊣. The hag-worm, so remarkable for the peculiarities of its structure, is, according to the testimony of our fishermen, rather common on the coast of Berwickshire; and the size of the specimens I have seen, and I am assured they are not larger than the average, is much superior to what is stated in our systematic works; for, instead of 8 in., they were 14 in. and 15 in. in length. Of the tadpole fish, which is one of the rarest British species, and previously known only as an inhabitant of the shores of Cornwall, I had the pleasure of exhibiting to you a living specimen, which had been captured in Berwick Bay. When alive, and when recently dead, the body appeared every where smooth and even; but, after having lain three days on a plate, and become a little shrivelled, there appeared an obscure row of tubercles, running backwards from the pectoral fins, and these pea-like tubercles could be more readily distinguished by drawing the finger over the skin. I would call attention to this fact, because the only good distinction between the Rániceps trifurcàtus, and R. Jàgo of Dr. Fleming, is derived from the pre-

* *Squàlus Gàleus Lin.*, *Gàleus* vulgàris *Flem.*
† *Ràia* radiàta *Donov.* ‡ Pleuronéctes punctàtus *Pen.*
§ *Spàrus* dentàtus *Stew.*, *Bràma* marìna *Flem.*
‖ *Spàrus* auràtus *Lin.*
⊣ *Pérca* marìna *Lin.*, *Serrànus* norvégicus *Flem.*
¶ *Pérca Làbrax Lin.*
** *Scómber Trachùrus Lin.*, *Trachùrus* vulgàris *Flem.*
†† Gasteróstеus Spinàchia *Lin.*, Spinàchia vulgàris *Flem.*
‡‡ Trachìnus màjor *Flem.*
§§ *Squàlus Cátulus Lin.*, *Scýllium Cátulus Flem.*
‖‖ *Myxine* glutinòsa *Lin.*
⊣⊣ Batrachöides trifurcàtus *Davies*, Rániceps trifurcàtus *Flem.*

sence of these tubercles; in the former the lateral line is said to be tuberculated above the pectoral fins, in the latter it is said to be smooth: but here we have a specimen which, when alive, exhibits the character of the Jàgo; when dead, that of the trifurcàtus; and hence I am induced to think that both are the same animal, having the tubercles more or less prominent and obvious according to the leanness, or other conditions, of the body.

[*Insects.*] — Since no communication has been laid before us relative to the entomology of Berwickshire, it is beyond my province to make any remarks on the subject; but you may permit me to notice one family, too beautiful, too generally distributed, and too obtrusive, not to have attracted our attention: I mean, the butterfly tribe. Of this, 85 species (including 11 that perhaps may properly be considered as varieties) have been ascertained to be natives of Britain; and of these we have, in Berwickshire, only 16 distinct species, or somewhat more than one fifth of the whole. Four belong to the family *P*apiliónidæ; nine to the Nymphálidæ; and three to the Lycæ'n*idæ* *. None of the species are esteemed rare by experienced entomologists; but in Berwickshire I never observed the Hippárchi*a* Sémel*e*, until on our visit to St. Abb's Head, in July last, where we found this fine active insect in great profusion. The more common Hippárchi*a* Ægèri*a*, also, I have seen in one locality only in this county, viz., on the wooded banks of the Eye, below Ayton House, where it may be captured in the months of June and July. The Póntia cardámines is likewise a local species with us; it very rarely occurs in the neighbourhood of Berwick, but appears soon after passing the village of Paxton, on the road to Swinton, and abounds all along that low tract. It is also common on the road between Swinton-Mill and Coldstream; but I have not noticed it elsewhere in Berwickshire.

[*Exannulòsa.*] — Communications relating to the exannulose invertebrate tribes have been made as yet only by myself, but I have now a zealous cooperator in our secretary, whose situation is peculiarly favourable for the investigation of these intricate and vastly curious creatures, among whose multitudes, it may be truly said, "We meet with forms and structures as varied and unexpected as if they had been the tenants of another planet." A collection of the zoophytes of the coast was exhibited at an early meeting, which I have

* *a.* *P*apiliónidæ: Póntia brássicæ, P. ràpæ, P. nàpi, P. cardámines. *b.* Nymphálidæ: Vanéssa urticæ; V. Atalánta, Cynthia cárdui, Hippárchia Ægèria, H. Sémele, H. Megæ'ra, H. Janira, H. hyperánthus, H. Pámphilus. *c.* Lycæ'n*idæ*: Lycæ'na Phlæ'as, Polyómmatus Aléxis, P. A'rgus.

since described at length in the *Transactions of the Natural History Society of Newcastle** ; and I flatter myself that no department of the natural history of Berwickshire is now so well known as this, in reference to species: their habits and economy require for illustration a person of more uninterrupted leisure. Our Actíniæ, or animal flowers, on which I read a separate paper, are remarkably interesting. I know no marine worm that, for beauty and elegance, can be compared with the Actínia plumòsa; and such of you as had the opportunity of seeing the specimen that I preserved for some time alive, will recall with pleasure the splendid spectacle. Actínia Tuèdiæ† was still more interesting, to me at least, for the species was new to naturalists, and, fortunately, possessed characters that distinguished it decidedly from every other. The Actínia coccínea and viduàta of Müller are also denizens of our shores; but the first was considered as a smooth variety of the senilis, and the other a small streaked variety of the equìna.

A passing notice of some invertebrates which I have described and figured in the *Magazine of Natural History* for the present year [1832] may perhaps be excused, since the subjects of them were procured in Berwick Bay. The Pranìza fuscàta [Vol. V. p. 521.] is a minute crustaceous insect, and the E'olis rufibranchiàlis [Vol. V. p. 428.], a molluscum new to naturalists; and the Planària cornùta [Vol. V. p. 344.] appears to be likewise an acquisition to the list of British worms. They afford a small sample of the many remarkable invertebrates that inhabit our shores, and which have found, to this day, no one willing to make known their singular forms and structure, that, through the medium of his intelligent creature, they may praise their Creator, and evidence still farther the endless variety in his works and wisdom. "Let the heaven and earth praise Him," says the Psalmist, "the seas, and *every thing that moveth therein*."

[*Plants.*] — I turn now with pleasure to the vegetable kingdom; for here I have to speak of others' discoveries, and not of my own. It might, perhaps, be presumed that, because a flora of the district had been so recently published, there was little here to reward the student; but the fact is greatly otherwise: and I esteem the numerous discoveries which have been made of species, and of new stations for the rarer ones, as a proof of the utility of our club; for the zeal which led you on was surely kept alive by the knowledge that there

* This valuable paper is noticed in our Vol. V. p. 702. — *J. D.*

† Figured and described, Vol. V. p. 163.

were around you some who interested themselves in your researches, and were ready to give you their meed of approbation and applause. The sternest stoic of us all, it has been observed, wishes at least for some one to enter into his views and feelings, and confirm him in the opinion which he entertains of his favourite pursuits.

Since the publication of my *Flora of Berwick*, there has been added, exclusive of some naturalised or recently imported species, to the wild plants of Berwickshire, 20 dicotyledonous, 8 monocotyledonous, and 18 cryptogamic species, the names, stations, and discoverers of which are inserted in your minutes. By much the most interesting of these, whether we consider it in reference to its beauty or rarity, is the *Saxífraga Hírculus* * discovered in the parish of Langton, by our ingenious colleague, Mr. Thomas Brown. Only two stations for this saxifrage have been recorded in our British floras, and both are in the south of England; so that Mr. Brown has had the good fortune — and good fortune never waits but on the industrious and intelligent — to make one of the most interesting additions to the Flora Scotica that has been made of late years. Another addition to that flora is due to Misses Bell and Miss Hunter, who have found, for the first time in Scotland, the *Sison Amòmum* growing at the Hirsel Lough, near Coldstream; and these ladies, who are members of this club, deserve our best thanks for their contributions, and still more for their devotion to botany; as their example and success cannot fail to recommend it powerfully to popular attention. The *Hieràcium aurantìacum*, the discovery of Miss Hunter; the *Hieràcium mólle*, and *Càrex fúlva*, both detected, in the first instance, in Berwickshire, by Mr. Brown; the *Hýpnum stramíneum* (in fruit), another of his interesting additions to our list; and the *Láthyrus sylvéstris*, and the *Càrex dístans*, lately discovered near Berwick by Mr. Dunlop, deserve to be particularised on account of their rarity: the Pulmonària marítima restored to our shores by the researches of the Rev. J. Baird and Mr. Carr, and the *Myosòtis sylvática* of Langton woods, are preeminent for their beauty; and the Chenopòdium úrbicum is interesting as the subject of a strange story, which purports that this weed could by cultivation be turned into a real strawberry, and relative to which there is a curious letter from the hapless Josephine to

* "*Hírculus*, a diminutive from *hircus*, a goat. Now look at the hair which *beards* our plant, and you will see why Linnæus calls it a 'little goat.' It is just like that happy playful fancy which he possessed so remarkably." — *Mr. Brown, in litt.*

her gardener, in her lately published *Memoirs*, for a knowledge of which, as of the plant itself, we are indebted to Mr. Embleton.

While, on the one hand, the Scottish flora owes two good additions to this club; on the other, it has contributed two also to the floral catalogue of Northumberland; and both of these are the discoveries of our secretary. It was long believed that the vernal squill was peculiar to the western coasts of England; but the discovery of it by the Rev. A. Baird on the coast of Berwickshire removed this their peculiar ornament and boast; and Mr. Embleton has extended its eastern range, for he finds it in abundance at Dunstanborough Castle. Aspidium *Thelýpteris* is the other new Northumbrian plant; and it is not a little curious that this fern, which is stated by Dr. Hooker to be abundant in Scotland, should not be found at all in Berwickshire, and is so rare in the north of England that it has escaped the notice of the many acute botanists who have botanised there, until this late date, when Mr. Embleton drew it from its lurking-place in Learmouth bogs, on the very verge of the kingdom.

May I urge those members of the club who devote themselves more exclusively to botany, to continue the researches which have been so productive during the past year? for the field is not exhausted so long as there remains a corner of the county unexplored; and there are, I ween, not a few

> ——— "spots that seem to lie
> Sacred to flowerets of the hills,"

where no one has yet wandered, and where no one will wander, "save he who follows nature." There is too much to learn of the habits and properties of our common plants; and I may mention, as an illustration of the remark, the observation which was made on the butterwort (Pinguícula vulgàris) during our excursion to Cheviot. It was then accidentally observed, that, when specimens of this plant were somewhat rudely pulled up, the flower stalk, previously erect, almost immediately began to bend itself backwards, and formed a more or less perfect segment of a circle; and so, also, if a specimen is placed in the botanic box, you will in a short time find that the leaves have curled themselves backwards, and now conceal the root by their revolution. Now, the butterwort is a very common plant; yet I am not aware that this fact of its irritability has been ever mentioned.

[*Geology.*]—In illustration of the geology of the county, a very elaborate paper was read to us, at an early meeting, by our zealous colleague, Dr. Thomson. He has described, in a

clear and interesting manner, the geological structure of the parishes of Eccles, Greenlaw, Polwarth, and Longformacus; and thus has made a valuable addition to the sketch of the geology of Berwickshire which Mr. Baird has given in the introduction to my *Flora*, and which had more peculiar reference to the eastern parts. I feel myself unqualified to estimate the merits of this paper; nor is it necessary to enter into any analysis of it here, since it has been printed in the last Number [September, 1832] of the *Magazine of Natural History* [Vol. V. p. 637—646.].

Such, Gentlemen, is a rapid indication of the results of our first year's exertions; and, in my opinion, they do not discredit, but rather justify, the expectations of those who moved the institution of this club, which, I doubt not, will work still more efficiently in future years. But, when I estimate the advantages of our association by the acquisitions it has made to the natural history of the county, I do it great wrong; for I hold it to be more useful, as affording a point of rendezvous for the naturalists of the district, where they may cultivate mutual acquaintance; where they may talk over their common pursuit and all its incidents; where they may mutually give and receive oral information; where each may nourish his neighbour's zeal; where we may have our "careless season," and enjoy "perfect gladsomeness:" and, assuredly, the good feeling and humour which have hitherto characterised, and will continue to characterise, our every meeting, vindicate me in assigning, as the distinctive character of this club, its social character.

I cannot, I must not, conclude this address, without an expression of, I trust, our united gratitude to the Preserver of all and the Giver of all good. That fatal disease which has walked over the length and breadth of the land, with fear in its front and mourning in its rear, has not left this county altogether unvisited; and we cannot yet think of its ravages in the place where we are now assembled, without deep feelings of pity for the loss sustained by the survivors, and without gratitude that here its desolating course was stayed. No member of the club has been removed by death; neither has misfortune visited any of us, save only one, who has been afflicted with a severe and lingering sickness, and has, in consequence, been hindered giving us that attendance and assistance which none was more willing and none more able to give.

Gentlemen, it is unnecessary to add any plea to induce you to continue your efforts in favour of this club. The pleasure attendant on our pursuits is so pure and genuine, and so

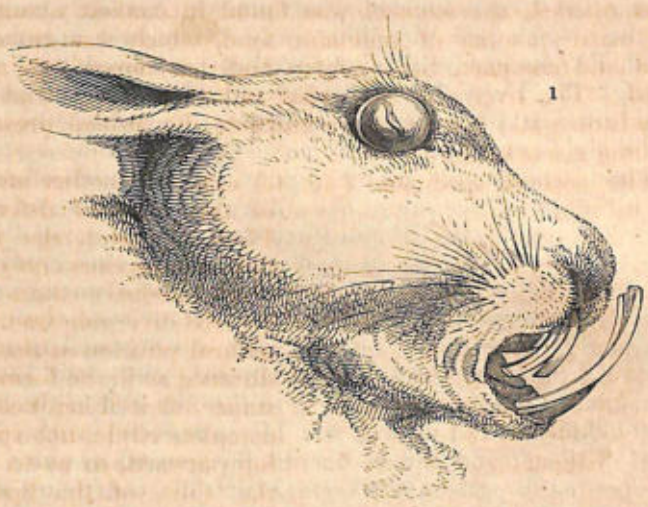
various, that I cannot fear that any one who has fairly entered into their spirit will turn him away. The best argument, indeed, I know in favour of our studies is derived from this fact; for the Deity has never affixed pleasure (I mean, a pleasure which the conscience approves, and which the memory delights ever and anon to recall) to any sublunary pursuit that is unsuitable to the dignity and condition of man. When the conscience utters her still voice to reprove or condemn, it is time to desist, and leave the path we are following, however gaily it may be strewed; but, where she approves, there let us follow, certain of reward. And who among naturalists ever found the fruit of his study turn ashes in the enjoyment? Nor can it be: for what our internal monitor approves, the Scriptures also commend, and send us for instruction to the meanest things, to the ant and to the lilies of the field; and bid us seek out His wonderful works, and to tell of them; and thence borrow their moral lessons; and call upon us to praise the Creator, in "his contriving skill, profuse imagination, conceiving genius, and exquisite taste; in his most gracious benignity and most benevolent munificence," through his creatures, from the creeping things of the sea even to his behemoth and leviathan.

ART. III. *On the extraordinary Growth of the Incisor Teeth, occasionally met with in the Wild Rabbit.* By FRED. C. LUKIS, Esq.

Sir,

THE extraordinary growth of the incisor teeth of the wild rabbit (*Lèpus Cuniculus*) has already been treated of in this Magazine (Vol. II. p. 134., and Vol. III. p. 27.); but, as two additional instances of this deviation from the stated order of nature have come under my notice, I beg to annex some sketches relating to them, as it is instructive to compare these anomalies of nature.

The specimen (*fig.* 1.) presented an animal rather below the usual size, apparently not an old one; the incisors of the upper jaw proceeded regularly in contact as far as the cutting edge of the posterior or small pair of teeth in that jaw (which were about double their usual length); they then diverged equally on both sides, and, when the mouth closed, touched the base of the lower pair, dividing the gums so as to give the appearance of two tongues when the mouth was partly opened. (*fig.* 2.) These teeth had acquired a length of about four times those in the ordinary rabbit. The incisors



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in the lower jaw extended upwards about 1½ in. beyond the gums, forming a regular curve over the nose, and showing an inclination to twist towards the right side of the head. The grinders were next examined, and found to be longer than usual; the two sets on the right side of the mouth were considerably elongated, and worn on one edge, forming an acute wedge shape (*fig.* 3.); but those on the left side preserved their natural outline. When the mouth was closed as much as the incisors would permit, the upper set descended below the gums of the lower jaw. These appeared to have been used by the animal for the purpose of mastication, or to have impeded that operation at their own cost. If the elongation of the grinders were the consequence of the increased growth of the incisors, and the want of the accustomed attrition, it is remarkable that all should not have equally grown. An unequal or rapid secretion of osseous matter on one side more than on the other might account for this difference; or perhaps the animal had not the power to use them equally, from some impediment caused by the intersection of the incisors. The rabbit under notice was caught by a dog; and

2

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when opened, the stomach was found to contain about half the usual quantity of vegetable food, which was extremely hard and compact, having been badly or imperfectly masticated. The liver was somewhat reduced, sickly, and with very little gall; but in other respects the animal presented nothing remarkable.

The second specimen (*fig.* 4.) exhibits another instance of this singular deformity. Here, however, the upper pair of incisors only had been affected: these commenced diverging from their natural position at the same distance as in the former instance, describing nearly a complete circle, but spreading outward, so as to leave the sides of the lips untouched. The curve thus formed was regular, and not entirely destitute of elegance: the lower pair of incisors were of their natural size, though somewhat worn on their outward edges, from their friction against the diverging planes of the upper pair. The grinders presented nothing remarkable. The disposition of the teeth in this specimen could not so much impede the feeding of this animal as in the other example; but the displacement of the lower incisors, as in that instance, must have speedily proved fatal to it.

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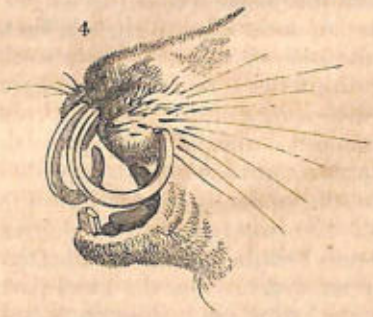


The primary cause of this anomaly in the incisors of this class of Rodéntia has been attributed [See Vol. II. p. 134., Vol. III. p. 27.] to the accidental direction given to the teeth in the first stages of growth, or the loss of one or more of the opposing set, or to too soft food. If, however, the soft quality of the food were a cause of the disease, I think that frequent examples of this monstrosity would be found among the tamed or domesticated rabbits, which are often entirely fed on soft food.

I am, Sir, yours, &c.

Guernsey, Nov. 1. 1830. FREDERICK C. LUKIS.

THE head of a wild rabbit was, six or seven years ago, [illegible] to me with the four principal incisors in the two jaws [illegible]erably elongated and curved: it came off the premises of Robert Bevan, Esq., Rougham, Suffolk, and the animal itself, which, as I understood, was caught and killed, in

common with other rabbits, before the peculiarity of its teeth was observed, was in an emaciated condition.

The relative condition of the teeth is as follows: — In the upper jaw the two hinder incisors, if incisors they should be called, are a little and unequally lengthened, and they divaricate slightly. The larger incisors in front of them are unequally elongated, the right hand one (supposing one's self the animal) to more than half an inch beyond the usual length, the left hand one to more than a quarter of an inch, and both together are curved towards the interior of the mouth, so as to resemble a large capital of the letter c set backwards (Ↄ); at and towards their tip they divaricate a little. The incisors of the lower jaw are more and as unequally lengthened, but less suddenly curved upwards; and thus space is provided for the motion of the curve of the upper incisors within the wider curve of the lower ones. The jaws have had an oblique action, and the degree of obliquity will be clear from the fact, that the right incisor of the upper jaw rests on the basal part of the left incisor of the lower jaw, although it does not stand (so much as) accurately over it; and thus the left incisor of the upper jaw and the right incisor of the lower jaw, when the mouth is closed, have no tooth directly opposed to them. This derangement has affected the grinders thus: the right hand grinders in the upper jaw have worn the grinders opposed to them in the lower jaw in a very oblique form on their inward side; and the left hand grinders in the upper jaw have worn the grinders opposed to them in the lower jaw in an oblique form on their outward side: the grinders in the upper jaw are obliqued, to correspond with those in the lower jaw, and in both jaws the grinders appear to have been elongated to meet and accommodate each other. On the cause of all this derangement I can offer no positive evidence, but notice that the right side of the lower jaw, in the part out of which the grinders arise, exhibits a formation plainly, although not conspicuously, misshapen, and defective in the solidity and compactness of the bone, apparently the result of a fracture at some past time in this part, and the grinders on this side are less uniform in their height and parallelism, and one of them less perfect, than are the grinders in the opposite side of the same (lower) jaw.

In examining the teeth, in their natural and proper condition, of some live and dead rabbits, preparatory to one side the above description of the anomalous formation, I c[illegible]rence; that in all of them the lower incisors struck upon the inward face of the upper ones. This fact may have been deemed too well known for mention by previous contributors on this sub-

ject; but it seems to me to deserve consideration in relation to the causes, whatever they may be, of preternatural elongation. If it be one of the offices of the lower incisor to keep the upper ones cut down, by collision, to their proper length, and this by attrition on their inward face, the elongation and curvature of the upper incisors across the lower incisors' line of action (which is the case when they lengthen and curve into the mouth) is the more remarkable, and gains one step in tracing the original cause, by referring such an elongation of the upper incisors to the incompetence of the lower incisors to prevent it by their due abrasion, either from their absence, shortness, weakness, or divergence.

I may here introduce, from a newspaper, a paragraph on this subject, which I have long possessed.

A rabbit was killed, on the 31st of January, at Curcey, Cornwall, which, instead of the two lower front teeth, had two ivory tusks, in the shape of those of a wild boar, that measured, previous to being taken out of the jaw, an inch and a half in length. (*Morning Herald*, Feb. 14. 1823.) — *J. D.*

ART. IV. *Something about Sea Birds.* By RUSTICUS.

Sir,

ON a fine morning, towards the end of May, three of us mounted the (Rocket) Portsmouth coach; double-barrelled patent percussions having been previously duly prepared, and a suitable supply of copper caps, powder and shot, and the et ceteras of bird-stuffing laid in; and the close of day found us at Newport, in the centre of the Isle of Wight. The next morning we reached Freshwater, or Freshwater Gate, as the natives term it, to breakfast, experiencing, together with ravenous appetites, a most sanguine and sanguinary feeling against all manner of sea fowl and ornithological rarities: we, however, soon learned that we must reserve our ardour until the following morning, for that the birds went to seaward at sunrise, and did not return until it was too dark at night to get any shooting; so we wandered about the neighbourhood all day, and shot a stray summer snipe or two, and two or three old crows. As for myself, being a little bit of an insect-hunter, I was well enough amused in netting butterflies; a very beautiful one, called Cinxia, being abundant here: there were also great quantities of a yellow moth, with black spots, which is called the dew moth (Lithòsia irròrea). In the way of botany, too, we had

a treat in finding a sort of bog completely covered with the beautiful bogbean (*Menyánthes trifoliàta*), in full blossom.

At Freshwater Gate there is but one inn, and, unfortunately, its *all* of beds was occupied; however, there is a little square building belonging to the same establishment, but disconnected, and situated farther down the beach; and in this the accommodating landlady made up three beds: and here, after making an agreement with two fishermen for the services of themselves and their boat at three o'clock the next morning, we turned in for the night, the chambermaid fastening the door outside with a wooden button, to keep us from harm: other fastening there was none. It may be supposed we did not sleep very soundly; the incessant roar of the sea, as its waves broke on the shingly beach, and approached within a few yards of where we lay; the odd fastening of our apartment; tales of smugglers and pirates, which we had been listening to; and the anticipation of a novel and exciting sport, furnished us amply with amusement and talking materials, until, at half past two, one of the fishermen unbuttoned our door, and expressed himself at our service.

Having provided overnight a pretty good store of provision for the expedition, we had no cause for delay, but were soon ankle-deep on a beach, over which a long swell was alternately forcing forwards a multitude of pebbles, or drawing them with it as it retired towards the ocean, and producing an incessant and monotonous rattle, none the more pleasing to our ears that we had been compelled to listen to it for the last five hours. The night air still blew cold and clammy from over the expanse of waters; and though the first blush of morning was visible to landward, over the sea all was gloom. The fishermen pushed off the boat, and in a minute they were steadily labouring against a heavy swell and a rising tide; we were alternately lost in the hollows, or mounted on the crests of the swell. After an hour's hard pulling, in which two of us occasionally joined, we found ourselves under the highest point of the cliff. The spot is marked by a red streak, which commences at the velvet turf at the summit, and is distinctly traceable down to the water's edge. The height of the cliff is 615 ft.; its face is nearly perpendicular; yet, notwithstanding this, the samphire-gatherers and the egg-collectors scale by means of ropes nearly its whole surface: two lads employed in the latter occupation had been dashed to pieces only the day before we were there, by an accidental slip of the one who held the rope. The fishermen from this spot pointed out to us a king's cutter in chase of a smuggler. They were so far out to sea as to have escaped our notice alto-

gether. The smuggler was a small dandy-rigged fore and aft craft, of about fifty tons, her canvass brown as though tanned. The cutter was twice the tonnage at least, with a tremendous mainsail, foresail, jib, flying jib, and gaff topsail, all as white as snow, and now bright with the first light of morning. The fishermen told us the smuggler had most likely landed her cargo at Hurst Castle in the night, as she never would have been hovering about the coast after daybreak with any thing on board. The sight was one of great interest to ourselves as well as our companions, who were completely engrossed with it, and loudly expressed their pleasure when they saw that the cutter, spite of her superiority in canvass, was dropping astern, and the distance between the two consequently increasing. A puff of white smoke issued from the bow of the cutter, it passed along the deck, and was speedily far behind: the chase was hopeless; the cutter tacked; and the report, reaching the shore, echoed among the rocks like distant thunder.

While engrossed in this animated chase, we had reached the region of birds. Between the highest part and Sun Corner the cliff is more than perpendicular, it positively overhangs: here, then, is the retreat of innumerable sea birds; here the foot of man has never trodden; here patent percussions are of no avail. The inmates were already on the move: guillemots and razorbills, in parties of tens, twenties, and thirties, were continually dropping from their stations, and whirling on rapid wing towards the ocean; the great grey sea-mews wheeled in straggling companies, far far above the summit, round and round, like eagles, and uttered continually their sonorous and piercing call; while in the distance the black-headed gulls were collecting by hundreds about the Needles. The fishermen now pulled us right in for the cliff; and, as we approached, what a sight did we witness! every inch of projecting rock was occupied: there were hundreds, thousands, millions of birds. I should premise, that throughout the surface of the cliff are excavated ledges, which are caused by layers of a softer substance intervening, that has crumbled, perhaps partly with frost, and partly with the operations of the tenants: these softer strata are perforated like honeycombs by the puffins and razorbills. Along these ledges the birds were crowded so thickly as positively to push the foremost ones off by the pressure from behind, as fresh troops issued from their holes: these would fly a little way, and, returning, settle on the heads of the others, and thus, by slipping in, find themselves a footing, the foremost birds being obliged to tumble off, as these intruders had previously done.

By far the greater proportion were razorbills, distinguishable even at this distance by their snow-white breasts and black heads and backs: among them were scattered guillemots in considerable abundance, perhaps as one to four: these sit more upright than the razorbills, are of less bright plumage, and keep their heads close on their shoulders, as though they had no neck. Some ledges were occupied solely by puffins, of which the conspicuous bills and squat though upright position rendered them instantly distinguishable. The little fellows turned their heads sharply on their shoulders, first on one side, then on the other, like people holding an animated conversation. They have white cheeks with a black hood, which seems fastened under the chin with a band of the same colour. A few of the delicately white kittiwakes were perched here and there on a projecting crag; and, scattered at regular intervals, like stern, upright, solitary sentinels, stood the corvorants, spotting with black the whole surface of the cliff. A noise, as one might suppose like that of disembodied spirits in purgatory, issued from every part of the rock; it proceeded from the razorbills or guillemots, we could not discover which; but, of all the horrid and piteous groanings I have ever heard, these were the most so. Perhaps it was only a morning hymn of thankfulness and happiness; perhaps the soft note of love; perhaps the united cry of thousands of the young for food. Being sufficiently near to see very clearly the whole mass of living creatures before us, the fishermen suggested that a single barrel should be fired at random, at the same time they both gave a tremendous shout. Words cannot describe the scene that followed: corvorants, mews, gulls, terns, kittiwakes, puffins, razorbills, guillemots, all left their stations; the very surface of the cliff came towards us. The remaining barrels were soon emptied, and all was one wild uproar: the sky was positively darkened; the air filled with heterogeneous sounds; the screams, the calls, the groans of the birds; the continued ringing of the fishermen's shouts; the almost everlasting echoes of our guns, which every crag and cranny seemed determined to reiterate; and, above all, and harmonising all, the tumultuous roar of the restless ocean, as its long and heavy swell dashed against the perpendicular but rugged cliff, produced such a combination of sights and sounds, as, once seen and heard, can never be forgotten.

But where was the produce of our united discharge? Twenty or thirty birds, at least, ought to have fallen plump into the sea; for we fired right in their faces, and some of them seemed to be within ten yards of us: however, not a bird fell, nor did there appear to be a single feather touched.

We stood gaping at one another in unfeigned astonishment. Was the miss to be attributed to the rolling of the boat, or the swell? Certainly not; for in such a crowd all nicety of aim would have been useless. Had we forgotten to put in the shot? Still very improbable. The fishermen explained the mystery; and I doubt not your ornithological readers have done the same: the feathers on the breasts and necks of sea birds are so closely matted together, and form a covering so smooth and compact, that shots striking in front will not enter, but instantly glance off, without doing the slightest injury. As soon as we understood our error we were determined to rectify it, and were loading again in an instant. Now, as each little covey (for they fly in coveys, like partridges) passed over us, we took them in the rear, and to every barrel a bird fell thud into the water. This plan answered delightfully; and, finding its efficacy, our spirits, which were somewhat damped by the first disappointment, now rose with the excitement of the scene; and though, partly owing to the motion of the boat, our shots were not invariably successful, yet we soon managed to cover the greater part of the bottom of the boat with the slain. Among them was a considerable number of the black-headed gull, in all the varieties of plumage: the head of this bird changes from light grey to sooty black, without moulting; the feathers themselves undergoing the change. I am not aware whether this is generally known.

The birds, after the first rush, soon diminished in numbers, and in about an hour became so thin as scarcely to afford us the chance of a shot; so we proceeded on our way past Sun Corner, and found that between this point and the Needles a whole colony of corvorants had established themselves, and the old hens were visible by dozens sitting on their nests. One of our party was a collector, and a most inimitable preserver of birds, and the only individual I ever knew who could give to a stuffed bird the appearance of a living one: he was particularly desirous of obtaining specimens of this bird; and we were all determined to make the attempt. Precisely under the cliff where the corvorants were was a narrow slip of beach. On this we landed with great difficulty, as the swell of the sea continued very heavy, and the bottom is here very bad; and, being almost perpendicularly under the birds, we could plainly see their long necks and stiff still heads poked out to seaward: so we spent much time, swan-shot, bullets, and excellent powder; and finding that they did not move their heads one inch to the right or left, we got into our boat, and floated onward with the tide towards the Needles; resolving, however, to try the effect of shots from above, as it was very clear

they took no effect from below. To accomplish this, we had to pass through the Needles, and land in Alum Bay, from which there is a decent footpath up the cliff, and across to the top of that other cliff, on the ledges of which the old hen corvorants were so sedately planning for the welfare of their future progeny; in fact, where they were reckoning their chickens before they were hatched. The water had gone down about three hours, and the passage through the Needles was a ticklish affair. The gap which we were about to attempt was little wider than our boat, and had a constant current running rapidly at ebb time towards Alum Bay. The depth varied as each successive swell rolled in from the ocean, from 1 ft. to 20 ft., and at low water was left quite dry. Two of us knew something of old ocean and old ocean's ways; and though we were ignorant of this particular spot, we learned sufficient from the fishermen to know the thing was to be done. Off went the coats; two men to each oar: we held our craft steadily against the current, which was tremendously strong, and kept her head right for the opening. An enormous swell rolled seaward, leaving us almost aground: rattle, rattle, and thump, thump, we heard the stones and fragments of rock beneath us; it seemed an hour running out: at last another came: "Here she comes again! keep her head right, and stand by!" up, up, we rose. "One stroke, up oars, let her drive!" and through we went, in gallant style, on the very crest of the swell. On the Alum Bay side of the Needles there was no swell to be felt; but the meeting of opposing tides and currents, the influence of the winds, and the rough rocky bottom keep the water in a sort of perpetual boil. As we approached the shore, we had to pass over a good many lobster pots, which we took the liberty of examining, and found, among other contents, a great many soldier-crabs, which had established themselves in the shells of the common whelks: we did not rob the poor people of their lobsters, but carried off the soldiers and a few species of crabs which could only be useful to a naturalist. The geology of Alum Bay must be very interesting; the cliff above it presents all the colours imaginable. The poor people in the neighbourhood get sands from it of a dozen different colours; and, running them into a phial, make each colour form a distinct ring, which has a very pretty effect: these phials, so filled, they sell for a shilling each.

We ascended the cliff, examined the lighthouse, purchased a variety of eggs, and crossed the hill to the corvorant colony: then, by lying down on our bellies on the turf, we quietly peeped over the edge of the cliff, and obtained an excellent

view of the amiable company, from which a stench arose almost enough to suffocate us. There were young ones of all sizes, some almost ready to fly, some only covered with down; some nests had one or two eggs, which are very small in proportion to the size of the bird, and of a dirty white colour: many hens were sitting, and here and there a solitary old cock (the crested corvorant of Bewick) was perched on his triple support of tail and feet, contemplating the expanse of ocean, as motionless as a statue. One of the party now determined on the hazardous experiment of leaning over the cliff and shooting them as they sat; the other two remonstrated, but to no purpose: so a line was formed; the first held tight the coat tails of the shooter, the others locked hand in hand; thus making a dead weight of four against one, in case of any propensity on the part of the first to lose his balance. Thus arranged, the adventurer shouldered his double-barrelled, and, actually bending over the cliff, he pulled the trigger. An old corvorant fell five hundred feet down the cliff, upon the little narrow beach before mentioned; another trigger was pulled, and down went another corvorant. The shooter then exchanged guns with him who held him by the coat tails, and with each barrel of this he also sent a corvorant to the bottom; so there were four, as we supposed, quietly waiting our return. Emboldened by this success, we proceeded more than a mile along the top of the cliff, continually peeping over. We discovered two nests of the black-headed gull, each with four eggs, of an olive brown colour, with darker spots: the nests are made of dried grass and fern. But the greatest curiosity we observed was the nestless and solitary egg of the razorbill, balanced, as if by a geometrician, on the bare rock, and looking as though the least puff of wind would blow it off its station into the sea. We learned from the fishermen, and some boys of the neighbourhood, that the puffins never expose their eggs, like the corvorants, razorbills, guillemots, and gulls, but lay them at the end of long holes, which they hollow out of the softer parts of the rock. We bought a few of these eggs to bring home; they were dirty white, with darker spots.

After having satisfied our curiosity here, we returned to our boat, and, crossing Alum Bay, we again passed through the Needles, and pulled in for the beach at Sun Corner, where the corvorants had fallen. Three were quite dead, the fourth had got into the water, and was swimming about in style. We chased him more than an hour, firing at him about forty times, but to no purpose, as he dived the instant the trigger was pulled: at last we very reluctantly gave up the

pursuit as hopeless, the wind having freshened, and made the swell rather too heavy for an open boat; the tide, too, was quite out, and the rocky bottom occasionally peeped up all round us in the hollows of the sea, looking very black and disagreeable. Two of us took a spell at the oar, by turns, with the fishermen, and worked away like Britons, till a noble swell laid us high and dry on the shingles at Freshwater.

I am, Sir, yours, &c.

Godalming, Sept. 16. 1832. RUSTICUS.

ART. V. *Instances of singular Nidification in Birds.* By the Rev. W. T. BREE, M.A.

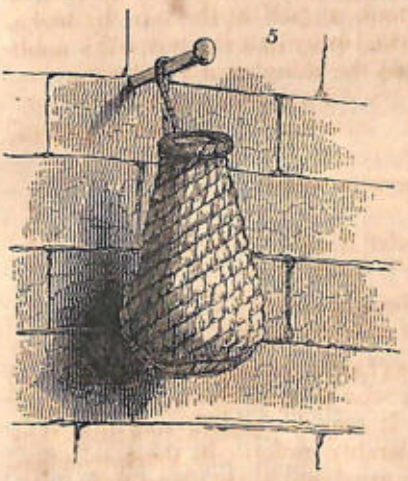
——— " Heteroclita sunto."

" Let them be called heteroclites."

GILBERT WHITE remarks (Letter 16. to Daines Barrington) that " birds, in general, are wise in their choice of situation " [for building their nests]. It may be added, too, that they are, for the most part, tolerably uniform in their selection. Every schoolboy knows the usual and likely places to find this or that bird's nest; and when a nest of any kind is found, though at the time it may be destitute of eggs, he is seldom at a loss in deciding, from its structure and location, to what species it belongs. There is no rule, however, without its exceptions; and, accordingly, instances occur not unfrequently, in which the little architects deviate from their usual course, by infringing one or both of the above rules, and evincing neither wisdom nor uniformity in their choice.* Foremost, perhaps, and most conspicuous in the catalogue of heteroclites, stands the small titmouse or bluecap (Parus cærùleus). Indeed, the instances of this bird's eccentricity in the affair of nidification are so numerous, that, with it, the exception almost becomes the rule. Notwithstanding the many examples of the kind already recorded in this Magazine, I cannot forbear adding to them one which fell under my own observation when a boy; though it is by no means so remarkable as the one related by Scólopax Rustícola (Vol. V. p. 289.), of the bird's taking up its quarters, for two years together,

* White mentions a swallow that " built, for two years together, on the handles of a pair of garden-shears, that were stuck up against the boards in an out-house, and therefore must have her nest spoiled whenever that implement was wanted; and, what is stranger still, another bird of the same species built its nest on the wings and body of an owl that happened by accident to hang dead and dry from the rafter of a barn." — *In Letter* 18. *to Daines Barrington.*

within the mouth of Tom Otter, who had been executed for murder, and hung in chains. At Leamington, a blue titmouse built its nest, for three years successively, if not successfully, in the betwell, or batwell (*fig. 5.*), which hung upon a peg, not more than six feet from the ground, against the wall at the back of a cottage. The betwell, it may, perhaps, be necessary to inform some of our readers, is an implement made of close basket or wicker work, about the size and shape of an ordinary decanter, and used in brewing, being placed in the bunghole of the mash-tub, for the purpose of preventing the escape of the hops, &c., when the beer is to be drawn off into another vessel. Of this betwell the tomtit made choice for its



" pendent bed, and procreant cradle;"

and no bad thing was it for the purpose; provided only the bird had so timed its labours between the intervals of brewing, as not to have interfered with that operation, which, of course, would put the betwell in requisition. Our Leamington titmouse was not so provident. The first year of its selecting this situation, the nest, I was told, happened not to be discovered till after the beer was brewed, when the old woman, upon cleaning out her betwell, was not a little surprised to find therein a bird's nest full of eggs. Recollecting the circumstance, and having occasion to brew again about the same time the following year, she took the precaution to examine the betwell previously, and found it again occupied by the tomtit. The nest was unceremoniously removed, and the brewing proceeded as usual. In spite of former failures, the tomtit made a third attempt, the following year; and, as a reward, I suppose, for its perseverance, was permitted to retain possession of the utensil. It was upon this occasion that I was witness of the fact, just as the eggs were on the very point of being hatched. On my going to the house to see this curiosity, the betwell, with its contents, was immediately taken down from its peg and placed in my hand for inspec-

tion, the bird all the while sitting within it, upon its nest, which it made no attempt to quit, but merely gave signs of anger by frequently bristling up its wings and feathers, and by hissing. As a proof, if further proof were needed, how much "the natural timidity of birds is lessened during incubation*," I may mention, that the tomtit had (as I was informed) suffered itself to be carried in its wicker habitation about the village (Leamington at that period was only a small country village), and exhibited to the visiters.

At Knowle Hall, Warwickshire, a wren (Troglódytes europæ'us) built its nest in the skeleton body of a heron which had been nailed up against a wall, and formed part of what has been facetiously called, "the countryman's museum." And I have heard of a bird of the same species, which, for three successive years, selected for the purpose an old garden watering-can.

The redstart (Sýlvia *P*hœnicùrus) is another bird which occasionally makes choice of odd places for nidification. (See Vol. V. p. 572.) At Springfield House, Warwickshire, a pair of redstarts once built under an inverted garden pot (*fig.* 6.)†, accidentally left on a gravel walk, and, of course, entered their habitation from above, at the drain hole. The nest attracted attention, and was watched daily, as it became an object of interest in the family to ascertain when and by what means the young birds would emerge from under the pot, and make their debut. How long they might have continued in confinement, if left

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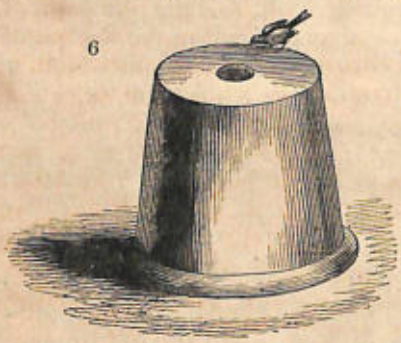

* See, Vol. II. p. 63., a notice of the blue titmouse building in an old pump, and suffering a part of its tail to be rubbed off by the friction of the pump-handle. Also Vol. V. p. 656, 657.; and Mr. Dovaston's account of the greater titmouse which built in a similar situation, Vol. V. p. 660. The groove or interstice in which the pump-handle works appears to offer great temptation to birds of this genus. An instance occurred, within these few years, in this village, of a tomtit (I am uncertain which species) selecting a pump-handle for its nest.

† The large titmouse (Pàrus màjor) sometimes makes choice of the same convenience. (See Vol. V. p. 289.)

The following appeared in a London paper, extracted from the *Preston Chronicle:* — "In a garden belonging to Edward Clayton, Esq., Bamberbridge, near this town, a flower-pot was turned down over a tender plant, in the early part of the spring, to succour it from the inclemency of the weather: a few weeks ago it was removed, and placed in the same in

to themselves, it is not easy to say, as they were eventually indebted to female curiosity for their emancipation. A lady lifted up the pot, to see whether the birds were there; when the whole brood, taking advantage of so favourable an opportunity, made their escape, darting forth in all directions, like rays from a centre.

A few years ago, a pair of robins* took up their abode in the parish church of Hampton in Arden, Warwickshire, and for two years in succession affixed their nest to the church bible, as it lay on the reading-desk. The worthy vicar would on no account have the birds disturbed; and accordingly introduced into the church another bible, from which to read the lessons. A question has been facetiously asked, whether these birds were not guilty of sacrilege, not so much on account of the daring liberty they had taken with the sacred volume, as for having plundered the rope-ends out of the belfry, wherewith to construct their habitation. Be this as it may, the old women of the village took it into their heads that the circumstance of the robin's building on the bible was highly ominous, and foreboded no good to the vicar. It so happened, that he died in the month of June of the second year of the bird's building in the church; an event which, no doubt, confirmed the old women in their superstition,

" Ni frustrà augurium vani docuere parentes;" *Virgil.*

———" Unless
My parents taught me augury in vain;" *Trapp's Translation.*

and will be remembered and handed down to posterity, for the benefit of any future vicar, should the robins again make a similar selection.

Wild ducks will occasionally make use of a deserted crow's nest, &c., for the purpose of rearing their own brood; more frequently they will build on the head of a pollard willow,

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verted position, on a vacant part of the flower-bed, near the verge of a gravel walk. Two small birds of the tomtit species having found their way into the concavity of the pot, through a circular aperture, about an inch and a quarter in diameter, in the centre of the bottom, have made it their habitation during the time of incubation. A carpet is laid, in an inclined direction, over the whole area, of fine fibrous moss; at the summit is constructed a little nest, in contact with the internal side of the pot, the lining of which is a mixture of hair and feathers. When it was first discovered, there were six eggs in it, which were soon augmented to ten; and at this time there are the same number of young living birds, in a forward state, which will be on the wing in a few days."

* In the *English Chronicle* of June 15. 1830, the following appeared, on the authority of the *Bolton Chronicle*:—" There is now in the yard of James Cross, Esq. of Mortfield, a robin sitting upon five eggs, which had chosen for the situation of its nest the nave of an old cart-wheel."

which overhangs the water; and, in these cases, it has been suggested that the young ducks, as soon as they are hatched, are probably dropped, one by one, into the water by the parent. In the neighbourhood of Balsal Temple, Warwickshire, a pair of wild ducks hatched their young in an old crow's nest, situated on the top of a lofty oak tree at some distance from any water. The old birds must, in this instance, I conclude, have conveyed away their young from the nest to the water, by carrying them in their bills.

From the above examples of singular nidification among the feathered tribes, there can be little doubt but that they who are curious in such matters might readily be gratified by having many an odd and extraordinary bird's nest about their premises, if only they would be at the pains of contriving suitable accommodations for the purpose. (See Chit-chat, Vol. V. p. 502. [and Vol. VI. p. 6.]) Let an old betwell, or a basket, or the like, be hung up in some retired nook; an inverted flower-pot or two be placed in some snug corner, &c. &c., and the chances are that one or other of them would not remain untenanted. Indeed, the successful employment of sparrow-pots (which is precisely a case in point) is a proof that birds are not backward in availing themselves of artificial conveniences prepared for them. A friend of mine, in Staffordshire, has some half-score, or more, of such pots, suspended on pegs, in suitable places, about his house and buildings. The sparrows take freely to the pots, and produce several broods in the course of the summer: and thus not only are several dozens of these predaceous birds destroyed in a season, but a good sparrow-dumpling, also, is from time to time supplied for the table.

To these instances of heteroclite nidification may be added a very interesting one of the robin, described in p. 68, 69. of the present Number; and to them also, perhaps, may be added that of a pair of robins building their nest in an unoccupied birdcage in an outhouse, as mentioned Vol. V. p. 597. Mr. Waterton's communication, in the present Number, p. 38, 39., shows that diverse species of birds may, by a little inviting accommodation, be induced to build their nests and rear their young in one locality. We may add, from a letter from Mr. Waterton, dated Oct. 21. 1831, that, in that year, besides the species mentioned in p. 39., wrens and wagtails formed part of the populous republic. From the same letter we transcribe two instances of singular nidification well worthy of record in connection with those already enumerated by Mr. Bree; they are these:—" . . . . It was on this old ruined

gateway [noticed Vol. V. p. 12., Vol. VI. p. 38.] that a wild duck hatched her young, about three years ago; and, when this used to be the entrance into the island on which stands my house, I have known, year after year, the common fly-catcher make her nest in a hole at the top of one of the doors; and, though that door was opened and shut by every passing person, still she did not take fright, but sat on the nest, as the gate moved on its hinges." This last case may also serve as another example of the natural timidity of birds being lessened during incubation. — *J. D.*

ART. VI. *The Starling.* By CHARLES WATERTON, Esq.

" I CAN'T get out, — I can't get out, said the starling." I know not any thing, except Gay's " Hare and many Friends," that made so much impression on me, when a boy, as Sterne's description of the captive starling in its cage. His attempt to relieve the prisoner bird, — its pressing its breast against the wires, — its telling every body who came down the passage that it could not get out, — its remaining in hopeless captivity, — all tended to make this pretty bird particularly interesting to me; and, in days long past, I have spent many an hour in listening to its morning warblings, and in admiring its aerial evolutions towards the close of day.

I wish I could do it a friendly turn, for the pleasure it has so often afforded me; but, in taking up the pen to clear its character, my heart misgives me, on account of the strong public prejudice against it.

There is not a bird in all Great Britain more harmless than the starling: still it has to suffer persecution, and is too often doomed to see its numbers thinned by the hand of wantonness or error. The farmer complains that it sucks his pigeons' eggs; and, when the gunner and his assembled party wish to try their new percussion locks, the keeper is ordered to close the holes of entrance into the dovecot overnight; and the next morning three or four dozen of starlings are captured to be shot: while the keeper, that slave of Nimrod, receives thanks, and often a boon, from the surrounding sportsmen, for having freed the dovecot from such a pest. Alas! these poor starlings had merely resorted to it for shelter and protection, and were in no way responsible for the fragments of egg-shells which were strewed upon the floor. These fragments were the work of deep designing knaves, and not of the harmless starling.

The rat and the weasel were the real destroyers; but they

had done the deed of mischief in the dark, unseen and unsuspected; while the stranger starlings were taken, condemned, and executed, for having been found in a place built for other tenants of a more profitable description.

After the closest examination of the form and economy of the starling, you will be at a loss to produce any proof of its being an egg-sucker. If it really sucks the eggs of pigeons, it would equally suck the eggs of other birds; and, those eggs not being concealed in the dark recesses of the pigeon-cot, but exposed in open nests on the ground, and often in the leafless bushes of the hedge, this fact would afford to the inquisitive naturalist innumerable opportunities of detecting the bird in its depredations. Now, who has ever seen the starling in the absolute act of plundering a nest? It builds its nest here, in company with the ringdove, the robin, the greenfinch, the wagtail, the jackdaw, the chaffinch, and the owl, but it never touches their eggs. Indeed, if it were in the habit of annoying its immediate neighbours, upon so tender a point as that of sucking their eggs, there would soon be hue and cry against it; nor would the uproar cease until the victor had driven away the vanquished. So certain am I that the starling never sucks the eggs of other birds, that, when I see him approach the dovecot, I often say to him, "Go in, poor bird, and take thy rest in peace. Not a servant of mine shall surprise thee, or hurt a feather of thy head. Thou dost not come for eggs, but for protection; and this most freely I will give to thee. I will be thy friend, in spite of all the world has said against thee; and here, at least, thou shalt find a place of safety for thyself and little ones. Thy innocence and usefulness demand this at my hands."

The starling is gregarious; and I am satisfied in my own mind that the congregated masses of this bird are only dissolved at the vernal equinox, because they have not sufficient opportunities afforded them of places wherein to build their nests. If those opportunities were offered them, we should see them breeding here in multitudes as numerous as the rook. They require a place for their nest, well protected from the external air. The inside of the roof of a house, a deep hole in a tower, or in the decayed trunk or branch of a tree, are places admirably adapted for the incubation of the starling; and he will always resort to them, provided he be unmolested. The same may be said of the jackdaw.

Attentive observation led me to believe that the great bulk of starlings left our neighbourhood in the spring, solely for want of proper accommodation for their nests. For many years, two pairs of starlings only remained on my island.

One of them regularly built its nest in the roof of the house, having found entrance through a neglected aperture; the other reared its young, high up, in the deep hole of an aged sycamore tree. Two or three pairs frequented the dovecot; but I observe that they built their nests in the crannies, and not in the holes made for the pigeons. These poor birds, together with the owl, had to suffer persecution from wanton ignorant servants, until I proclaimed perpetual peace in their favour, and ordered, I may say, the Temple of Janus to be shut, never more to be opened during my time.

Having been successful in establishing the owl in the old ivy tower over the gateway [see Vol. V. p. 12.], I conjectured, from what I had observed of the habits of the starling, that I could be equally successful in persuading a greater number of these pretty lively birds to pass the summer with me. I made twenty-four holes in the old ruin; and in the spring of this year I had twenty-four starlings' nests. There seemed to be a good deal of squabbling about the possession of the holes; till, at last, might overcame right. The congregated numbers suddenly disappeared, no doubt with the intention of finding breeding quarters elsewhere; and the remaining four and twenty pairs hatched and reared their young, causing, I fear, the barn owls, their next-door neighbours in the tower, many a sleepless day, by their unwelcome and incessant chatterings.

On the one hand, when we consider how careful the starling is in selecting a place for its incubation, sheltered from the storm; and, on the other, when we look around us, and see how many old houses have been pulled down, where these birds found a refuge; and when we reflect how modern luxury, and the still more baneful turf, have forced many a country squire to fell his aged oaks, his ash trees, and his sycamores, which afforded the starling a retreat; it will not require the eyes of Argus to enable naturalists to discern the true cause why such numbers of assembled starlings take their leave of us in early spring.

This year, seven pairs of jackdaws, twenty-four pairs of starlings, four pairs of ringdoves, the barn owl, the blackbird, the robin, the redstart, the house-sparrow, and chaffinch, have had their nests in the old ivy tower. The barn owl has had two broods, and, while I am writing this, there are half-fledged young ones in the nest. As far as I can learn, there has been no plundering of the eggs of this community, on the part of the starlings.

Now that autumn has set in, the movements of this delightful assemblage of birds already warn us to prepare for winter's

chilling blasts. The redstart is gone to Africa; the chaffinch has retired to the hawthorn hedges: the ringdoves, having lost half of their notes by the first week in October, became mute about ten days ago; and have left the ivy tower, to join their congregated associates, which now chiefly feed in the turnip fields; and will return no more to the ivy tower until the middle of February. The jackdaws are here, morning and evening, and often at noon; and at nightfall they never fail to join the passing flocks of rooks in their evening flight to their eastern roosting-place at Nostell Priory, and return with them after daybreak. The starlings retire to a dense plantation of spruce fir and beech trees, and in the morning come to the ivy tower to warble their wild notes, even when the frosts set in. These birds are now in their winter garb, which they assumed at the autumnal equinox, much duller, and of a more greyish white appearance, than that which they had in the summer. I cannot find that naturalists have noticed this change.

The starling seems to be well aware of the peaceful and inoffensive manners of the windhover. This hawk rears its young in a crow's old nest, within two hundred yards of the ivy tower. Still, the starlings betray no fears when the windhover passes to and fro; but they become terribly agitated on the approach of the sparrowhawk. I often see this bold destroyer glide in lowly flight across the lake, and strike a starling and carry it off, amid the shrieks and uproar of the inhabitants of the tower and sycamore trees.

The starling shall always have a friend in me. I admire it, for its fine shape and lovely plumage; I protect it for its wild and varied song; and I defend it for its innocence.

CHARLES WATERTON.

Walton Hall, November 3. 1832.

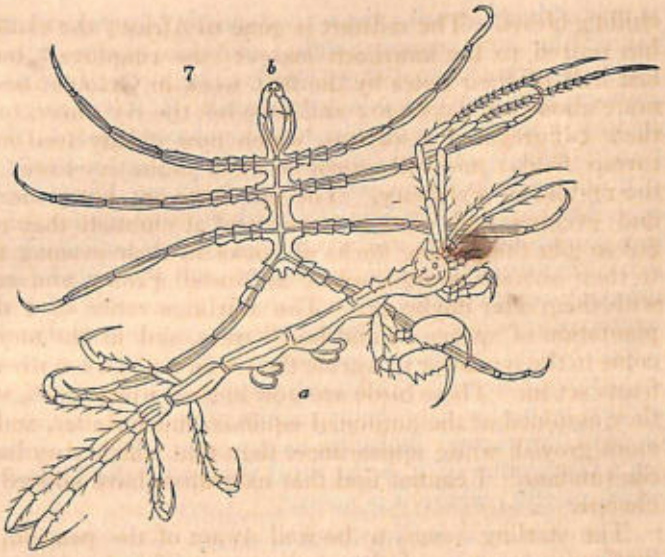
ART. VII. *Illustrations in British Zoology.* By GEORGE JOHNSTON, M.D., Fellow of the Royal College of Surgeons in Edinburgh.

THE bizarre figures here delineated may remind some of your readers of a passage in Pliny, which says: — "While I contemplated Nature, she wrought in me a persuasion, that I should look upon nothing as incredible that related to her;" and the additional experience of many centuries seems to have added only greater force to the justness of this remark.

The first figure (*fig.* 7. *a*) represents the

7. CAPRE'LLA ACUMINI'FERA,

a small crustaceous insect, which has not, so far as I am



aware, been previously honoured with a portrait. Mine was drawn from an individual captured among some corallines that had been dredged up in Berwick Bay, a place which I am in hopes of proving, by means of these Illustrations, to be not less deserving of celebrity, for its productiveness in sea monsters, than the shores of Devon. The "living anatomy" in question attracted attention by its motions to and fro in the basin, and might have easily escaped the fatal notice of him who thus stamps it with immortality, had it remained at rest; for, from its very slender form and colourless body, it is scarcely distinguishable in that state. The motions of the creature are quick and awkward, propelling itself forward by alternate archings and elongations of the body, in the manner of many caterpillars: but its superior rapidity is probably derived from the branchial processes, that are obviously well fitted for the purpose of oars, whatever other function they may fulfil.

Caprélla acuminífera is about half an inch in length, very slender, pellucid, and colourless, except at the joints of the legs and the vesicular processes, which are spotted with red. The superior antennæ are as long as the body, and the last articulation of these is as long as the four inferior, being composed of a number of short joints, that are bristled with very short cilia. The inferior antennæ are half the length of the others; and beneath them we observe the short articulated palpi. The eyes are round and scarlet; head obtuse, with a spinous process above the front, and two less ones behind;

first pair of hands small; the second much larger, oval, serrated on the inner margin, with a toothlike process above, and armed with a curved sharp claw. The joints of the wrist are short; the brachial one lengthened. The vesicular or branchial processes are in pairs, oval, and compressed; they appear to consist of a bladder filled with an opaque matter, and are connected with an anterior vesicle, situated just at their base. The three hinder joints of the body are each furnished with a pair of slender monodactyle legs, the last articulation of which is slightly curved, and, besides its tooth at the upper side, is minutely serrated and grooved on the inner edge for the reception of the claw. A straight intestine runs down the centre: but I could not observe any trace of a circulating system.

I do not know to whom the discovery of the animal just described is due; it is probably to Montagu: but I claim the subject of the second figure (*b*) as my own. I have already given a description of it in the third volume of the *Zoological Journal*, p. 489., where it is named

8. Ny'mphum cocci'neum;

and I shall not be the first to change the designation, although some parts are wanting that are generally deemed essential to the species of that genus. The description is as follows: — Body and legs slender, of nearly equal thickness, of a uniform fine transparent red colour, with the joints and tarsi yellowish. Rostrum yellowish: mandibles like the body. When magnified, a central vessel, distinguished by its deeper tint, is seen running uninterruptedly through the body and legs; and the latter are somewhat clothed with very soft white delicate hairs. Rostrum cylindrical, subclavate, not jointed, divided beneath by a longitudinal line, terminal. Mandibles two, originating from the first segment of the body, biarticulate; basal joint long, second short and ovate, armed with two small equal claws. Body four-jointed; tubercule oculiferous; eyes two? Legs eight, three times the length of the body, equal. Coxæ four, articulate; the two basal joints short and equal, the two following a little longer. Thighs as long as the coxæ, very slightly dilated. Tibiæ of two equal joints, each nearly as long as the thigh. Tarsi tri-articulate, first minute, second rather long, falciform, with a few teeth on their internal edge, and terminated by a single rather long claw. Tail without any appendage.

I have seen five or six specimens of this singular creature, and they were all alike in size, shape, and colour; so that there can be no doubt of its being perfect in all its parts. It lives among sea-weeds in Berwick Bay; and when at rest, with the legs drawn up, it so closely resembles some of the fine

coloured confervæ, but more especially a detached portion of the Chóndria articulàta, as to be easily overlooked. It appears to me interesting, in so far as its transparency allows us to examine its circulating system with an accuracy which perhaps no dissection could enable us to amend. Close to the tubercle we see the vessel (for there is no heart) divide into two equal branches, one to each mandible; and the flux and reflux of a fluid is easily observable in them. From the tubercle the vessel runs down the body, giving off a single branch, equal in size to the trunk, to each leg; and this branch continues uninterrupted to the tarsus. Neither in the trunk nor branches could I perceive any movement of the fluid.

Berwick upon Tweed, July 16. 1832.

ART. VIII. *A short Notice of the Habits of Testacéllus Scùtulum.* By Mr. THOMAS BLAIR, of Stamford Hill, near London.

Sir,

I HEREWITH send you specimens of a species of slug, the individuals of which I have watched for the last four years with considerable interest. They are generally to be found near the green-house; I believe I have seldom seen one more than fifty yards from it. It is of a dirty yellow colour, and when crawling on the surface of the ground is about 3 in. in length, and is furnished with a small rudimentary shell at the tail end.

In winter it buries itself from 1 to 2 ft. deep in the earth, and appears on the surface of the ground occasionally with other species; but, from the time of my first observing it, until the present, I have never seen it feeding on any species of vegetable. One morning last spring, on passing a narrow border, which had been previously watered with lime-water for the purpose of destroying slugs, I observed several of the yellow species amongst others dead, and close beside or near the head of several of them lay a dead worm. A man who had performed the watering informed me that they had been disgorged by the slugs. I found one considerably larger than the others, in which, on cutting it open, I found a large worm.

About the middle of last month, during fine mild weather, I observed one on the surface of the ground, firmly fixed to the middle of a large worm, the head of the slug being so buried in it, that it appeared to be nearly cut in two; it appears to me, however, that they generally contrive to seize them by one end, otherwise it would be difficult to swallow them whole

as they do; and I think there is no doubt that they generally get hold of them under ground, as the one above mentioned had most likely been dragged to the surface by the worm. I determined, however, to watch its motions; but a heavy rain coming on prevented me, and when the shower ceased they had both disappeared.

A few days ago, one was turned up with a spade, having hold of a worm by the head, with about half an inch of it swallowed; the worm appeared quite alive and strong, and turned the slug over with every twist of its body. The slug kept its hold for some time, but ultimately quitted it, probably in consequence of being disturbed. In digging up the specimens to send to you, one of them was cut with the spade, in which a small slug was found of the common species.

I am, Sir, yours, &c.

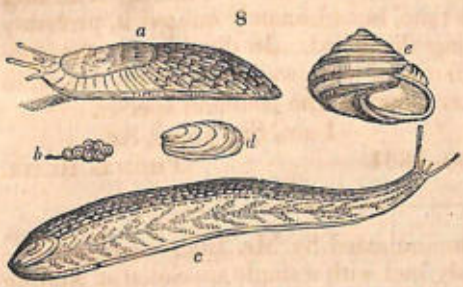
Stamford Hill, Nov. 30. 1831. THOMAS BLAIR.

THE specimens communicated by Mr. Blair were very fine ones. I had previously met with a single specimen at Notting Hill Terrace, Kensington: it was crawling across the public footpath, and appeared to have just quitted one of the little gardens which front the houses in that place. I have since learned that they are not very rare in the kitchen and forcing gardens attached to the royal palace at Kensington, whence I have seen specimens; and a single living specimen was found by Mr. Campbell, in the garden of the late Comtesse de Vandes, on the 4th of October, 1832. On mentioning these habitats to Mr. J. D. C. Sowerby, who possesses several preserved specimens, he stated that the only habitat from which he had previously derived it is a garden in the Kennington Road, Lambeth, where the individuals, although constant, are never numerous: he farther remarked that it has also been found beside the Hampstead Road.

Shortly after I had acquainted Mr. Sowerby with the Kensington habitat, his son, Mr. J. Sowerby, visited it, to collect specimens; and learned from Mr. Plimley, the distinguished gardener of the forcing department, that they are comparatively frequent, although, on the morning on which he called, which was a cold one, very few were above ground. Most of those he saw were crawling on the gravel walks, with the colour of which the colour of the slugs agrees. After he had confined some individuals in a box, and kept the box a short time in his pocket, he found, on opening it, that one of the slugs had disgorged a worm; probably, as he conceived, in consequence of the heat communicated to the animal from the pocket. I called on Mr. Plimley on December the 8th,

who informed me that the part of the year in which they are more readily met with is from August to November, both inclusive: and that he has never observed them to feed on any kind of vegetable. Not a single specimen was observable on the walks or borders at this date; but I did not explore them very diligently.

As consorting with this mention of Testacéllus Scùtulum *Sowerby*, it may not be disapproved to present here, from the *Encyclopædia of Agriculture*, ed. 2. p. 1121. § 7706., a notice of a kindred species, T. Maugèi of *Férussac*, which exists, or recently did exist, at Bristol, and the figure of which (*fig.* 8. *c* and *d*) will also serve, by its resemblance, to give a pretty precise idea of T. Scùtulum. The notice in the *Encyclopædia of Agriculture* is this: — "The shell slug, Testacéllus Maugèi (*c*) is a native of Teneriffe, and has likewise been found in several parts of France and Spain: it has recently been discovered in some gardens near Bristol, by Mr. Miller of that city. It is a highly curious animal, remarkable for feeding upon earth-worms; and may therefore be beneficially introduced into such gardens as are overstocked with that otherwise useful animal. It is readily distinguished from all other slugs in this country [T. Scùtulum seems here to have been forgotten] by having a thin oval shell (*d*) affixed to the hinder part of its body."*



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Mr. J. D. C. Sowerby conceives that T. Maugèi is not indigenous to Britain, but that the specimens at Bristol were imported, probably by accident, along with plants from Teneriffe or elsewhere: and he believes that they have been since protected in a green-house, and their preservation attended to. This remark, and the fact that Mr. Blair never finds T. Scùtulum far from the green-house, and that in the Kensington forcing gardens, where it occurs, green-houses and other conveniences for forcing abound, suggest that T. Scùtulum itself may also be comparatively tender, and that it is just possible, as well, that it may have originally been imported with plants from abroad.

* The figures accompanying Testacéllus Maugèi, being on the same block, are inseparable: they represent, *a*, Limax agréstis; *b*, eggs of Limax agréstis; *c*, shell of Hèlix nemoràlis.

T. Scùtulum, as Mr. Blair remarks above, is of a dirty yellow hue, and T. Maugèi differs from it in having its back of a dark brown colour, and in the more cylindrical form of its shell. The French naturalists, Mr. Sowerby remarked, suppose the English T. Scùtulum, with which they possess almost no practical acquaintance, to be identical with the T. haliotídeus of Faune Biguet, and described in Férussac's *Histoire*, and to which, indeed, it is most closely allied, but differs in the form of its shell. T. Scùtulum is figured in Sowerby's *Genera of Shells*, T. Maugèi in Sowerby's *Genera of Shells*, and in Férussac's *Histoire*, pl. 8. fig. 10. 12.; and T. haliotídeus is figured in Férussac's *Histoire*, pl. 8. fig. 5—9., and two views of its shell are given in Sowerby's *Genera of Shells*. — *J. D.*

L*ìmax Sowérbyi of Férussac.* — In Vol. V. p. 694. it is conjectured that Férussac's "plate viii. D.," which he cites for a figure of this species, had not been published up to the date of offering the conjecture. The fact is otherwise: Mr. J. D. C. Sowerby has since informed me that Férussac's "plate viii. D." is published.

Food. — *L*ìmax Sowérby*i* feeds on cabbage leaves when no other food is obtainable. On Nov. 20th I shut up twenty or more living specimens, and with them portions of cabbage leaves plucked fresh off the plants, in a box, where they remained confined until Nov. 26. On opening the box then, the cabbage leaves had been much eaten, and although the remains of them were then yellow, putrescent, and fetid, some of the slugs were feeding upon them. I have subsequently learned from Mr. Blair, in a note dated Dec. 2. 1832, that "at this season *L.* Sowérby*i* is very destructive to the celery under ground; and," Mr. Blair adds, "in taking up, lately, my bulbs of Tigrídia Pavòn*ia*, I found many of them destroyed by it."

Eggs. — On August 31. 1832, I found an egg or two of this species, as I then fully believed; but, fearing the possibility of error, I did not mention the fact in the notice, Vol. V. p. 693—697. On Nov. 29. I found a cluster of about a dozen of precisely similar eggs attached to the head of a living *L.* Sowérby*i* which had buried its head in the soil, in its act of depositing its eggs beneath the surface. I may here remark that other individuals, on the same plot of ground, seemed to have crept into the hollows and crannies of the soil, as if in shelter from the approaching cold weather. I brought away some of the eggs, and shall here attempt to describe one, as a sample of the rest. The egg, in figure, inclines to oval, is soft, elastic, nearly two tenths of an inch long, more than half its length in breadth, as transparent as ground glass, but of a yellowish

hue; the coats of the egg, which appear two at fewest, by close inspection are found to be clouded with numerous and very minute white freckles, and these produce the resemblance to ground glass, already mentioned; the jelly within the egg is viscous. — *J. D.*

ART. IX. *Some Account of an aged Yew Tree in Buckland Churchyard, near Dover.* By the Rev. W. T. BREE, M.A.

" A noble wreck, in ruinous perfection."

Sir,

IN Buckland churchyard, about a mile from Dover, there stands a yew tree (*fig.* 9.), of such high antiquity and sin-

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gular conformation, that a few remarks on it may not, perhaps, be without interest, or be deemed altogether foreign to the general object of this Magazine. When we consider the very slow growth of the yew, and its equally tardy progress towards decay, we may safely rank the present specimen among the very oldest vegetable remains to be found in the kingdom, not

excepting even the celebrated Tortworth chestnut*, or the most time-worn relics of the "monarch of the forest," the oak itself. It would be in vain to enquire of the inhabitants about the age of the tree; and were I express my own sentiments on the subject, I should, perhaps, appear to some as a visionary enthusiast.† At all events, to this yew may with propriety be applied the following beautiful lines which Cowper has addressed to the Yardley Oak: —

> ——— "Oh! couldst thou speak,
> As in Dodona once thy kindred trees
> Oracular, I would not curious ask
> The future, best unknown, but at thy mouth
> Inquisitive, the less ambiguous past!
> By thee I might correct, erroneous oft,
> The clock of history; facts and events
> Timing more punctual, unrecorded facts
> Recov'ring, and misstated setting right:
> Desp'rate attempt, till trees shall speak again!"

The mere antiquity, however, of the tree is not so much the object of my calling attention to it, as some other circum-

* See a figure and account of the tree in Strutt's *Sylva Britannica*.

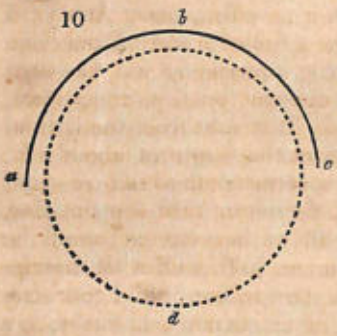
† It may, perhaps, be objected, that I am here inferring the tree to be of greater antiquity than it really is, and assigning to it a date anterior to the building of the church; whereas (it will be urged) the yew must, in all probability, have been *planted* in the churchyard after the erection of the edifice, as the usual appropriate emblem of funereal rites, &c. But may it not admit of a question, whether, in some particular cases at least (I am far from saying in all), the church may not have been brought to the yew tree, rather than the yew tree to the church? In ancient times, probably, the yew occurred in greater abundance, as a spontaneous native plant, than it does at present; and, without doubt, its propagation and growth were then far more generally and sedulously encouraged. The wood is now no longer needed, as formerly, for the supply of implements for war or for the chase; and the well-known injurious effects of the foliage on cattle, at least when eaten in a *withered* state, have doubtless tended to the extirpation of the tree in pastures, &c., to which our domestic animals have access. I should not, therefore, be surprised to learn, that, in the "olden time," the species was copiously scattered about in most parts of the country; or that, in some instances, a particular spot might have been selected rather than another, for the erection of a church, among other reasons, mainly on account of some yew tree that grew upon it. I am the more inclined to this opinion by observing the very high antiquity of some of our churchyard yews, which have the appearance of being more than coeval with the churches near which they are found: in saying this, I am, of course, not alluding to churches of modern erection.

It has been suggested to me, by an able and valued antiquarian friend, that, though he sees no objection to the above hypothesis, still a more simple argument may be formed on the great probability of the church having undergone an *ancient* re-edification or alteration; and that, perhaps, an inspection of the very church in question may show certain portions, pillars, e. g. windows, or doorways, supporting this conjecture. I regret that I did not happen to examine Buckland church with sufficient accuracy to enable me to state how far my friend's observations may be applicable to the present case.

stances connected with its present state and appearance. Upwards of sixty years ago (as I am informed by an old inhabitant of the place), the tree was shattered by lightning, which at the same time demolished also the steeple of the church close to which it stands. To this catastrophe, no doubt, is to be attributed, in great measure, much of the rude and grotesque appearance which it now presents. At a yard from the ground, the but, which is hollow, and on one side extremely tortuous and irregular, protruding its "knotted fangs," like knees, at the height of some feet from the surface, measures 24 ft. in circumference. It is split from the bottom into two portions; one of which, at the height of about 6 ft., again divides naturally into two parts; so that the tree consists of a short squat but, branching out into three main arms, the whole not exceeding in height, to the extreme top of the branches, more than about 25 ft. or 30 ft. Of what may be regarded as the *original* trunk and arms, but little, I conceive, now remains alive: two considerable portions, however, are still conspicuous in the state of dead wood; viz., one on the inner part of the northern limb, hollow, and forming a sort of tunnel or chimney; the other on the western limb, more solid, and exhibiting the grain of the wood singularly gnarled and contorted. These, which I have ventured to call portions of the *original* trunk and arms, are partly encased, as it were, on the outside by living wood of more recent growth (as is frequently seen to be the case in other old and decayed trees); the dead portions seeming to evince a disposition to *slough out* (if I may use such an expression), like fragments of carious bone separating from the flesh, but kept fixed in their position by the living wood, lapping over, as it does, and clasping them firmly. If this view of the subject be correct, it would seem almost impossible to set limits to the duration of the yew*, as it appears that fresh wood continues to form externally long after the more central parts have completely decayed. Nor is this circumstance, I am aware, peculiar to the

* In proof of the toughness and durability of the yew, I may here mention a circumstance relating to a tree of this species in Coleshill churchyard, Warwickshire. The tree consists of a mere thin hollow shell, not more than half of the whole circumference, and carries, perhaps, its due proportion of top and branches. More than forty years ago, a near relative of mine, as I have often heard him state, once stood for half an hour watching this tree during a tempestuous gale of wind, in order to witness its fall, expecting every moment that it must inevitably be blown down, it bent, and wreathed, and twisted so, under the influence of the boisterous elements. My friend has been dead some years; the yew remains to this day precisely in the same condition in which it existed when I first knew it in my childhood.

yew: it is common, also, to the oak, and to many, perhaps most, other trees. And hence, in calculating the girth which a tree would have had in its sound and vigorous state *, merely from the data afforded by a remaining portion of its shell, the measure is apt to be somewhat overrated. If, for example, the segment *a b c* (*fig.*10.) be supposed to represent a fragment of a hollow shell, and to measure from *a* by *b* to *c* just 12 ft., it is sometimes too hastily assumed that the circumference of the whole tree, when perfect, must have been double that dimension, or 24 ft.; allowance not being made for the exterior increase of the shell (*a b c*) subsequently to the loss of the absent portion: whereas the utmost circumference of the entire trunk might not probably have exceeded the dimension represented by the inner dotted circle (*d*).



But to return to the Buckland yew: the encasing of the old dead wood by that of more modern formation † is well displayed also in one part of the southern limb of the tree, where an aperture occurs, which exposes to view the dead wood completely enveloped and embedded within the living. The trunk, I have said, is decayed, and hollow at the bottom; but from within the shell there arise two or more vigorous detached portions, of small diameter, which soon unite with the main wood, and run up to a considerable height, lapping into one another, twisting and interlacing in a very striking manner, so as to suggest the idea that the trunk has been ripped open, and is now exposing to view its very entrails. Imagination, indeed, might readily trace a fanciful resemblance between this vegetable ruin, as viewed in a particular position, and some anatomical preparation of an animal trunk, of which the viscera are displayed, and preserved entire. On the whole, I cannot but consider this yew as a most curious and

* See some observations of Mr. South, in his letters on the growth of oaks, addressed to the Bath Society, quoted in Strutt's *Sylva Britannica*, 8vo edit., p. 20.

† This may be seen well exemplified in an old yew tree close to the parsonage (?) house at Barfreston, and in another in the churchyard at Waldershare. Many fine old specimens of yew trees occur in the neighbourhood of Dover; one in a churchyard by the side of the road to Deal, near Walmer, of which I had only a passing glimpse, I regret that I had not an opportunity of visiting and examining them at leisure.

interesting relic. And it is much to be regretted that they, whose right and business it is to afford it protection, are not at the pains to secure it from wanton spoliation. Boys are permitted to mutilate its venerable limbs, and crop its sable branches, in sheer sport and mischief; and many considerable boughs, which must have trailed almost on the ground, and greatly heightened the picturesque effect, have lately, it seems, been lopped off, in the true spirit of modern Vandalism.

The accompanying woodcut, it is proper to add, has been taken from a drawing made on the spot some years ago, and made not so much with a view to illustrate those peculiarities of the tree, which I have endeavoured, however imperfectly, to describe, as merely to afford a picturesque sketch or study from nature. I have to regret, therefore, that the cut does not square so well with the above account as might be wished; and the more so, as the tree itself baffles all description of the pen. To illustrate the subject fully, not only drawings of detached portions of the trunk and limbs on a larger scale would have been desirable, but also figures of the entire object; and these, too, taken, perhaps, from somewhat different points of view from the one here presented to the reader, in which the fault I have chiefly to complain of is, that it represents the tree with far too large a top, and consequently gives to the whole an air of greater stateliness and magnificence than is really to be found in the original, at least in its present condition.

ART. X. *Brief Notices of the Plants observed during a Tour through a Part of North Wales, and some of the adjoining Counties.* By WILLIAM CHRISTY, Jun. Esq. F.L.S.

JUNE 4. 1832. After passing through Uxbridge, *Clématis* Vitálba, and the usual plants of a chalk district, began to make their appearance; but nothing rare occurred till we were descending Stokenchurch Hill, when we noticed abundance of *Listera* nidus-àvis, and *Epipáctis* grandiflòra, in the edges of the woods; and, on a small grassy slope, an *Orchis*, which was probably *O.* militàris. *Atropa Belladónna* grows on the chalky banks; and we observed a single and rather large tree of *Tilia* parvifòlia. At Oxford, the heavy rain prevented our botanising, except on the old walls, which were covered with abundance of *Senècio* squálidus, and a *Hieràcium* not in flower (*H.* amplexicaúle?). These plants have probably originally escaped from the botanic garden; an inter-

esting establishment, which we much regretted being unable to take more than a very cursory view of.

June 5. and 6. The roadside between Witney and Northleach was adorned with the magnificent *C*nìcus erióphorus; and, just at the entrance of Great Malvern, we noticed some bushes of *S*ambùcus nìgra β (frúctu álbo, the white-berried), but too near some cottages to be considered wild. On the walls and roof of the fine old abbey church we gathered Grammìtis *Céterach*, and *S*èdum refléxum; and, on a rock above the village, *C*otylèdon Umbilìcus. On the hills, we could meet with no plant rarer than Mœ´nch*ia* erécta; but took a few insects, the best of which was E´later cùpreus. *V*inca màjor grows among the ruins at Little Malvern church, but has apparently escaped from an adjoining plantation. *C*ólchicum autumnàle seems to be common in meadows and orchards about Ledbury.

June 7. Our road through Ludlow, Bishop's Castle, and Welchpool, to Oswestry, afforded us nothing rare. Near Ludlow, by the roadside, is a very large tree of *P*ỳrus torminàlis; and, on banks, *F*umària capreolàta, *L*epídium Smíth*ii*, and *R*anúnculus parviflòrus occur in abundance, and appear to be common in the counties of Hereford and Salop. *M*yosòtis sylvática is frequent about Bishop's Castle.

June 8. At Llangollen, we visited the ruins of Castle Dinas Bran for the purpose of ascertaining whether the variety of *P*ỳrus *A*ria formerly mistaken for *P.* pinnatífida (*S*órbus hýbrida *Lin.*) still grows there. In a meadow, through which the footpath from Llangollen passes, we gathered a few specimens of *O*rnithógalum umbellàtum; and, on the hill, *S*èdum ánglicum, *M*yosòtis collìna, and *V*ícia angustifòlia. We also took Anómala hortícola, and E´later cùpreus; which latter was abundant. Our search for the *P*ỳrus was long unsuccessful; but at length we discovered a single bush of it growing in an almost inaccessible part of the external wall, and with some difficulty obtained a specimen. It differs from the common state of *P. A*ria, in the leaves being more deeply toothed or lobed, and, as Sir J. E. Smith justly remarks, not truly pinnatifid. It is certainly not *P.* pinnatífida; but it appears almost equally distinct from *P. A*ria. To me it seems to come nearest to *P.* edùlis or intermèdia. I am, however, not at present prepared to offer a decided opinion on the subject. On various parts of the ruins we found Hutchíns*ia* petræ`a, Cistópteris dentàta? and the beautiful spotted-leaved variety of *H*ieràcium murórum, not uncommon; also *T*eesdàl*ía* nudicaúlis, sparingly. A steep limestone declivity, on the left of the road just after leaving Llangollen, was completely covered with *P*olypòdium calcà-

reum; and, a little farther, we noticed, in the edges of the woods, Aquilègia vulgàris, both the red-flowered and blue-flowered varieties. In the rocky bed of the river, at the bridge and salmon-leap of Pont-y-pair, we gathered the pretty dwarf variety of Solidàgo Virgaúrea, commonly known as S. cámbrica. On reaching Capel Curig, we found our friends, Messrs. Newman and Doubleday, who were on an entomological tour. We strolled out in the evening along the banks of a mountain stream, which afforded us *Tróllius* europæ'us, *Myrìca Gàle*, and Pinguícula vulgàris: we also took a few trichopterous insects, among which was Philopótamus scopulòrum. On the banks of the lake, near the inn, we observed the green sandpiper (Tótanus óchropus); we also noticed the grey wagtail (*Motacílla* Boárula), and the merlin (Fálco *Æ*salon). The water ousel (*Cinclus* aquáticus) is not uncommon in the mountain streams.

June 9. We started early to ascend Snowdon, with every prospect of a fine day; but we soon found that little reliance was to be placed on a mountain climate. As, however, our adventures of this day have been so well detailed by my friends, in their interesting paper in the *Entomological Magazine*, I shall merely advert briefly to what we collected. Immediately on leaving the Pass of Llanberis, we gathered Lycopòdium alpìnum, clavàtum, and *Selàgo*; with *Polýtrichum* alpìnum. On some moist shady rocks, a little higher, Hymenophýllum Wilsòn*i* occurs sparingly. *Saxífraga* stellàris is common in rills and moist places in all parts of the mountain. Many insects now made their appearance (principally *Carábidæ*), including *Cárabus* glabràtus, catenulàtus, and arvénsis; Helòbia Gyllenhàl*ii* and Marshall*àna*; also E'later cùpreus and pectinicórnis; with a Býrrhus, which proves to be undescribed * (B. alpìnus *Newman*). In our ascent to the summit, we observed but few of the plants common in alpine situations, and these occurred in small quantities. The principal were, Silène acaúlis, *Saxífraga hypnöides*, Oxýria renifórmis, and Cryptográmma crìspa. The clouds were so dense that we could not see many yards: we therefore very soon left the summit, and retraced our step to an old-copper mine which we had passed in our ascent. On the banks of the small lake near it we noticed a few plants of *Thalíctrum* alpìnum and Lycopòdium *selaginöides*; while the lake afforded us some good insects; one of which, a new species of Colymbètes, has been described by Mr. Newman, in the *Entomological Magazine*, under the name of C.

* Entomological Magazine, No. I. p. 53.

snowdónica. The Carábidæ were numerous, but of the same species as those we had met with in the commencement of our ascent. Having reached the Pass of Llanberis, we parted, my companions returning to Capel Curig, while I followed my party to Llanberis. We however agreed, if the following day proved fine, to meet again for the purpose of ascending Glyder. In the evening, I walked to the junction of the two lakes of Llanberis, to look for *Alisma* nàtans, but was unsuccessful. On docks, by the roadside, I took abundance of Chrysomèla ráphani.

June 10. A very fine morning having succeeded the rain, I met my entomological friends at the entrance of the Pass of Llanberis, and from thence we commenced the ascent of Glyder. On the grassy slopes immediately after leaving the road, we gathered a single specimen of Habenària álbida, and took a number of insects. *Carabus* glabràtus and arvénsis, Cychrus rostràtus, Elater cùpreus, *Atropa* cervìna, with several *Sylphidæ*, were not uncommon. Among the loose debris covering the side of the mountain, Cryptográmma crispa was growing in much greater abundance than we had observed it on Snowdon. The rocks just below the summit are covered with *Juniperus* nàna, on which we looked in vain for Chrysomèla cereàlis; my friend, Mr. Wilson of Warrington, having several years since taken a specimen on this spot.* Being obliged to return to Llanberis, in order to proceed with my party to Carnarvon, I was reluctantly obliged to leave my entomological friends, and descend the mountain. In my way down, I noticed in a little rill a *Caltha* (*C.* mìnor ?) somewhat resembling *C.* radìcans, but without the almost triangular leaves which distinguish that species, if species it be. A root which I brought away is living in my garden, and retains its habit, being very much smaller in all its parts than *C.* palústris. We reached Carnarvon in time to walk round the town before dark, and on a wall by the water side I noticed a single specimen of Koniga marítima (*Alyssum* marítimum *Willd.*); but it had undoubtedly escaped from a garden, as has been the case in the situations in which I have seen it on the banks of the Thames, and as I believe to be the case in all recorded British stations.

June 11. Between Carnarvon and the Menai Bridge we observed no plants of particular rarity. The banks and walls by the road side were covered with *Lepidium* Smíthii, *Fumària* capreolàta, and *Cotylèdon* Umbilìcus. The weather

* Almost immediately after I had left Messrs. Newman and Doubleday, they discovered Chrysomèla cereàlis, of which they took eight or ten specimens; for one of which I am indebted to their kindness.

being very wet and stormy, we did not alight at the Menai Bridge; and I thus missed gathering *Rosa Wilsoni*, and several other plants, to which I had directions from Mr. Wilson. The road from the Menai Bridge to Beaumaris is extremely beautiful. It follows the shore of the Menai Strait, which is wooded to the water's edge. The woods were filled with *Vicia sylvatica*, while the rocks which overhung the road were fringed with *Geranium sanguineum* and *Rubia peregrina*. On the sandy shore at Beaumaris we gathered *Trifolium suffocatum* and *Sagina maritima*? We returned by way of the Menai Bridge to Bangor, and thence to Conway. The weather continued so exceedingly stormy, that we were unable to botanise on the Penmaen Maur, over which our road lay. The only plants which which we noticed were *Statice Armeria* and *Silene maritima*, which latter, occurring in large patches on the dark rocks, had a very brilliant appearance.

June 12. Immediately after breakfast we surveyed the beautiful ruins of Conway Castle, on which, with other plants, we gathered *Orobanche minor* and *Sedum dasyphyllum*. We then proceeded, by a very winding and bad road, to the Great Ormes Head. On the sandy shore of Llandudno Bay, between the Great and Little Ormes Head, we noticed *Crambe maritima*, *Glaucium luteum*, and *Scilla verna*; the two former in abundance, but were unable to find *Lithospermum maritimum*, which is recorded as growing there. *Rosa spinosissima*, in the dwarfest state we had ever seen it, covered the sand-hills. On reaching the village of Llandudno, the weather, which had previously been fine, though cloudy, became very wet, and the heavy and continued rain entirely confined the rest of the party to the little inn at which we stopped. I was, however, too anxious to gather Cotoneaster vulgaris to be detained by the weather; and accordingly set off, accompanied by a guide who could speak no English, but who, the landlady assured me, knew both the plant and its places of growth. Following a steep narrow road up the hill above the village, we reached some copper mines overhung by a range of limestone precipices. On these rocks the Cotoneaster grows abundantly, but, owing to being continually browsed on by the sheep, it is very dwarf, and, probably from the same cause, appears seldom to flower. Sir J. E. Smith, who, by the by, has committed various errors in his *English Flora* relative to the period of the flowering of various plants, mentions July for the Cotoneaster; whereas the few fertile specimens I found bore fruit considerably advanced. Mr. Wilson mentions May, which certainly agrees better with the state in which I found the

plant. The rocks were every where covered with a profusion of Heliánthemum cànum (*Cistus marifòlius* of English botany, although not of Linnæus), which grows intermixed with the common H. vulgàre. There are several other fine ranges of rocks above the village, which produce *Chrysócoma* Linosỳris and other rarities; but the heavy rain, and the circumstance of our having a long stage to go after getting back to Conway, prevented my exploring them. In the salt marshes by the river side, near Conway, Cochleària dánica? grows abundantly. As we approached Holywell, *Viola* lùtea appeared common by the road side, and the heaps of rubbish round the lead mines were completely covered with Arenària vérna.

June 13. From Holywell to Chester and Liverpool we observed no plants worth naming.

June 15. We travelled from Liverpool to Bolton, by the railway, at a speed which almost precluded any botanical observation. I nevertheless noticed a patch of the white-flowered variety of *Trifòlium* praténse, and on Chat Moss abundance of Osmúnd*a* regàlis.

June 16. At Egerton, near Bolton, we gathered *Vaccínium* Oxycóccus (Oxycóccus palùstris *Pursh*), *Equisètum* sylváticum, *Polypòdium Dryópteris* and Phegópteris, with a white-flowered variety of *Lýchnis* Flos cùculi.

June 21. I spent this day with my excellent friend, Mr. Wilson, at Warrington. A pond in his garden was completely a sheet of white with the flowers of *Alisma* nàtans, originally introduced from the lake of Llanberis. With it were also growing Callítriche autumnàlis, and *Elátine* hexándra and Hydrópiper. He has succeeded in cultivating that rare moss Schistóstega pennàta, on the inner surface of a stone trough, from which the light is excluded. In the afternoon we visited Woolston Moss, an extensive morass, producing many good plants. Among those we gathered were Andrómed*a* polifòlia, *Rùbus* suberéctus and nítidus? Drósera ánglica, Aspídium rígidum, Utriculària mìnor, *Hýpnum* flùitans and Cænómyce cóccifera. Hippárchi*a* Dàvus was flying about in considerable number; but I was unable to meet with *Carabus* nìtens, which Mr. Wilson informed me sometimes occurs there.

June 24. At One Ash Grange, near Bakewell, I was much pleased to find a station for *Rùmex* alpìnus, which, as a British plant, has, I think, hitherto been confined to Scotland. It is perhaps a doubtful native of this country. The limestone rocks in all the dales about Money Ash, are completely covered with Gàlium pusíllum, and those which are shady and moist with *Geum* rivàle and Cistópteris dentàta.

Approaching Castleton from Bakewell, *Viola lùtea*, varying greatly in size and colour, occurs plentifully, with Arenària vérna, about the lead mines.

June 25. Some wet rocks, at the entrance of a narrow glen behind Peveril Castle, afford *Hieràcium muròrum*? and Cochleària officinàlis. After visiting the celebrated Peak Cavern, and the Speedwell mine, we walked up that singular glen the Winnetts. Here we met with abundance of *Polemònium cærùleum* and *Gèum* rivàle. Just at the entrance of the Winnetts we noticed two species of Cistópteris growing intermixed, C. dentàta? and C. angustàta? * Between Castleton and Eyam we observed, in a field by the roadside, *Geràn*ium praténse and *Hésperis* matronàlis. In the romantic limestone valley of Middleton we gathered, in abundance, Silène nùtans, and also noticed *Thalictrum* mìnus.

June 26. At Matlock, *Polypòdium* calcàreum, Cistópteris dentàta, and *Cardámine* impàtiens are common on the calcareous tufa near Cumming's Hotel. In the woods on the opposite side of the river, *Epipáctis* latifòlia, *Myosòtis* sylvática, and *Tilia* parvifòlia occur; and in a very small cave I obtained some interesting specimens of *Scolopéndrium* vulgàre in a seedling state. The roof of the cavern was almost covered with Schistóstega pennàta†; but I could find no specimens in fructification. Abráxas ulmàta, apparently just come out of the chrysalis, was flying about in great numbers, and I also took several specimens of Pyróchroa rùbens.

June 27. On our way to London by Ashbourn, Newcastle under Lyme, and Coventry, we observed no plants of any rarity, except Geràn*ium* pyrenàicum on a bank just as we were entering the village of Allesley, the residence of that amiable naturalist the Rev. W. T. Bree.

ART. XI. *Plants observed in the Neighbourhood of Barmouth, North Wales.* By THOMAS PURTON, Esq., Author of "A Midland Flora."

Sir,

HAVING spent a few weeks this year at Barmouth, during the latter part of June and the whole of the month of July,

* I hesitate to name these positively, having understood from Dr. Hooker that considerable confusion exists among the British species. No one can be better able than he is to clear them up.

† I am not quite sure that I am right in this, having mislaid my specimens.

I send you a list of the plants which I found growing on the hills, and in the neighbourhood of that place. Many that are rare in the midland counties of England I found to be very common in North Wales: Geránium sanguíneum and Cotylèdon Umbilìcus; the former on the hills, and the latter on every wall and rock in the neighbourhood.

Lichens. — I found but few lichens that I had not previously met with in Worcestershire, on Malvern Hills. Parmèlia conspérsa of Acharius was the only new species. On the same stone I also found (and in fruit) Parmèlia olivàcea. The rocks were chiefly covered with Parmèlia omphalòdes, Lecídea cónfluens, L. geográphica, Lecanòra parélla, and Porìna pertùsa; Sphæróphoron corallöìdes and S. frágile were equally diffused. Endocárpon miniàtum I found growing on the rocks at Harlech, below the principal inn.

Of the Mosses, the only rare one was a variety of Spláchnum vasculòsum, tab. 311. of Greville's *Scottish Cryptogamic Flora*, which I found in great plenty on the top of Cader Idris. Trichóstomum lanuginòsum appears to be very common on the stone walls on the hills about Barmouth. Psámma arenària, Anagállis tenélla, Anthýllis Vulnerària, Arenària [Adenàrium *Rafinesque*] peplöìdes, on the sands near to Barmouth. Arenària rùbra, on the ruins of Harlech Castle. Artemísia marítima, Asplènium Adiántum nìgrum, very common on rocks and walls; accompanied by *A.* Trichómanes, and what I supposed to be *A.* lanceolàtum, with a purplish stem; and the pinnulæ, before efflorescence, are recurved. Blèchnum boreàle, common. In similar situations I discovered Cistópteris dentàta α and β of Hooker's *British Flora*. Cakìle marítima, Callùna vulgàris, Cárduus tenuiflòrus; Càrex arenària, ovàlis, and dístans; Carlìna vulgàris, Cómarum palústre, Conỳza squarròsa, Corydàlis claviculàta, on the hill above Barmouth. Cotylèdon Umbilìcus, Críthmum marítimum, Cryptográmma críspa, on Cader Idris. Diánthus deltöìdes: this beautiful and elegant little plant is very common on the side of the hill close to Barmouth. Drósera rotundifòlia, Eleócharis aciculàris, Erióphorum angustifòlium, Èrica Tétralix, nearly as common as *E.* cinèrea. Eròdium cicutàrium var 3. of Withering, Erýngium marítimum, Erythræ`a Centaúrium, Eupatòrium cannábinum, Euphórbia Paràlias, a beautiful plant, growing on the sands close to Barmouth. Geránium columbìnum, sanguíneum, Robertiànum, and var. β of Smith and Hooker. (See *G.* purpùreum, tab. 2648. of Sowerby's *Supplement to English Botany*.) Gnaphàlium mínimum, on the rocks that are barely covered with earth. Habenària bifòlia, Helmínthia echiöìdes, Hydrocótyle vulgàris,

Hyoscyamus niger. *Hypéricum púlchrum*: this beautiful hypericum is common on the sides of the hills. *H.* humifúsum, rare. *Jasione montana*, very common. *Júncus acútus*, common on the sands. *J.* squarrósus, abundant on the commons about Cader Idris. *Láthyrus* latifólius, on the hill immediately above Borthwen, in several places; probably was planted there (see Vol. II. p. 400.), "as it is too often the outcast of gardens." (*Hooker.*) Lycopódium clavátum, L. *Selago*, at the top of Cader Idris. *Lycópsis arvénsis*, Matthíola sinuáta. *Melampyrum praténse*, common; *M.* sylváticum, rare. *Myrica Gale*, on the side of the road to Dolgelly. *Nárdus stricta*, very common. Narthécium ossífragum, common on every bog. *Nymphæa alba*, opposite the turnpike, on the left side of the road to Harlech. *Onónis arvénsis* (inérmis); *Origanum vulgare*, very common. *Orobánche májor*, on the hill above Mr. Barnet's. Parietária officinális, common on some old building near to the turnpike leading to Harlech. *Pediculáris palústris*, Pinguícula vulgáris, common in boggy places on the hills. *Plantago maritima*, *Polýgala vulgáris*, *Polýgonum Bistórta*: I recognised the last on each side of the road, in low swampy ground, in several places, as I travelled from Llangollen to Barmouth. *Rosa spinosíssima* (a dwarf variety), on the hills and sandy shores. *Rúmex Hydrolápathum*, with *Cómarum palústre* and *Nymphæa alba* growing in the same place. Salicórnia herbácea, Hooker's *Brit. Flora*, var. *α.* Salsola *Kali*, very common. *Saxífraga stellaris*, on the top of Cader Idris, under the dripping rocks. *Sedum Telephium*, common; *Sedum ánglicum*, very common on every wall and rock from Dolgelly to Barmouth; *S.* Forster*iánum*, in the same places. *Senecio sylváticus*. Spérgula nodosa, an elegant plant, on the sands before Barmouth. *Státice Limónium*, tab. 102. of the *English Botany*; *S.* spathulata of Hooker (*S.* binervosa, tab. 2663. of Sowerby's *Supplement*): both species were gathered near Barmouth. *Trifólium arvénse*, very common. Triglochin maritimum, rare; I also found a few specimens of T. palústre. *Vaccínium Myrtíllus*, *Vícia Crácca*, very common, and remarkably luxuriant.

There are many more of the rarer plants to be met with in the neighbourhood of Barmouth, if I could have afforded more time to search for them. I was scarcely two hours on Cader Idris; and, therefore, many rare species, I know, must have escaped my notice. I was surprised that I found not a single Glaúcium lúteum on the coast at Barmouth, as it was very common at Aberystwith but a few years ago.

I am, Sir, yours, &c.

Alcester, Warwickshire, T. Purton.
Sept. 20. 1832.

REVIEWS.

ART. I. *Catalogue of Works on Natural History, lately published, with some Notice of those considered the most interesting to British Naturalists.*

Macgillivray, W., M.A. (Conservator of the Museum of the Royal College of Surgeons of Edinburgh, Member of the Natural History Societies of Edinburgh and Philadelphia, &c.): The Travels and Researches of Alexander von Humboldt: being a condensed Narrative of his Journeys in the Equinoctial Regions of America, and in Asiatic Russia; together with Analyses of his more important Investigations. With a portrait of Humboldt by Horsburgh, a map of the Orinoco by Bruce, and 5 engravings by Jackson. Foolscap 8vo, 424 pages, forming the tenth volume of the *Edinburgh Cabinet Library*. Edinburgh and London, 1832. *5s.*

We have given the above detailed title to excuse our wilful omission of an analytical notice of the book, for which we have not space. We may briefly state that the volume is a most entertaining one, and is rich in notices of numerous and various objects of natural history; while the extraordinary spirit of enterprise manifested by the travellers, Humboldt and Bonpland, must delight the old, and excite the young to emulate it.

We would record our apprehension, that the cut of the "Dragon Tree of Orotava" (p. 48.) has, if the plant be of the species Dracæ`na Dràco *L.*, had its characteristics sacrificed for the sake of increasing its beauty as a picture: the ugly cut of the same living tree, which occurs in the *Penny Magazine* for December 1. (p. 352.), we should consider, from a practical acquaintance with the Dracæ`na Dràco in English stoves, to be a much truer resemblance.

Featherstonhaugh, G. W., F.G.S. &c. &c.: The Monthly American Journal of Geology and Natural Science; exhibiting the present State and Progress of Knowledge in Zoology, Botany, Mineralogy, Comparative Anatomy, Chemistry, Meteorology, Physical Natural Agents, and the Antiquities and Languages of the Indians of the Ame-

rican Continent. 8vo; with 14 plates, or lithographic prints, in the 12 numbers. 1831, 1832. Price 3 dollars and 50 cents a year, payable in advance.

Nos. 11. and 12. of this journal have been shown us. No. 11. contains, besides minor communications and extracts, the following original papers of importance: — "On mineral and metallic Veins;" "On the *modus operandi* of Phosphorus on the living System, by J. R. Coxe, M.D." "Observations on the anatomy of the Sloth, Brádypus tridáctylus *L.*, by R. Harlan, M.D." This is a valuable contribution to zoology, and is enounced in a manner which instances its author as technically familiar with comparative anatomy. He alludes to Mr. Waterton's notices, in his *Wanderings*, on the habits of this animal, and admits most of his conclusions; and agrees fully with Mr. Waterton, that the apparent anomalies in structure, which this animal exhibits, are but so many instances of a remarkable adaptation of formation to the creature's destined habits of life. "Proceedings of the Geological Society of Pennsylvania," and "Meteorological Observations made at Wilmington, Delaware, by Henry Gibbons, M.D.," also deserve mention among the original papers in the number.

No. 12. Its principal contents are as follows: — An interesting letter, of nine pages, from J. J. Audubon to the editor, dated Bulowville, Jan. 12. 1832: it is descriptive of a tour in which Audubon was then engaged; the scenes and incidents noticed are interesting. "Remarks on the article contained in Silliman's *Journal* for April, 1832, entitled 'Mr. Lea on the Naiades.'" In Silliman's *Journal*, it appears, Mr. Lea's performance has been unduly eulogised; and the present paper supplies a critical analysis of it, occupying 12 pages, in evidence that it deserves not the character ascribed to it in the above *Journal*. The next article has also reference to the same *Journal*, in which M'Murtrie's translation of the *Règne Animal* has been highly praised. Nine pages are devoted to the review of this translation, in the course of which numerous instances of the translator's having misunderstood the author are pointed out. The paper next in interest is entitled *A Synopsis of the Trilobites of North America*. This paper describes several species, and is illustrated by a lithographic print, exhibiting figures of ten of them; and is stated to be but the forerunner of a book on the subject, which is nearly ready for the press, and, in illustration of the species described in which, casts in plaster of Paris will be supplied by the author to purchasers, who will

thus " be enabled to correct for themselves any errors committed by the author." The editor's address to his subscribers, minor communications, extracts, and an index, finish the Number, which completes the first volume. The work deserves the patronage of English naturalists.

Blewitt, Octavian: The Panorama of Torquay, a Descriptive and Historical Sketch of the District comprised between the Dart and Teign. Embellished with a map, and numerous lithographic and wood engravings. Second edition, 8vo, 288 pages. London, 1832. 7*s.* 6*d.*

This guide-book merits our notice, on account of the cognizance of natural history taken in it. Geology, meteorology, botany, and conchology include the natural objects noticed. The geology of the neighbourhood is described, and marked, on the map prefixed to the volume, by arbitrary colours, which are explained: besides this, Thomas Northmore, Esq. of Exeter, contributes 29 pages on " Kent's Cavern," his first discovery of fossil bones in it, and the geological deductions inferable from them; and his remarks will, doubtless, interest geologists. Meteorology receives its share of consideration in the treatise on " the climate of Torquay," which occupies 25 pages, and is rich in scientific and medical considerations. The climate of Torquay is " soft and soothing," and accordingly eligible for all to whom this condition is suitable. Mrs. Griffiths supplies the lists of rarer phænogamous plants, ferns, mosses, *Algæ*, *Confervöideæ*, molluscous animals, and shells, and possesses specimens of most of them. This lady is well known for her researches in marine botany; and among the *Algæ* and *Confervöideæ* are species marked as " rare, very rare, and particularly rare," as well as intimations of undescribed ones. The list of shells is ample. Neither birds nor insects are given. The birds, it is stated, are omitted for want of space, and because Dr. Moore has enumerated those of the south of Devon, in the *Transactions of the Plymouth Institution.* The scenery of the neighbourhood is beautiful, and rich in numerous objects of interest. These, the views and objects, are severally described in an agreeable manner, and many of them illustrated by lithographs and woodcuts, all respectably executed.

In conclusion, although the natural history of the neighbourhood is done but imperfect justice to in this work, we take with gratitude the attention which has been paid to it; and are cheered by the anticipation that natural history will henceforth become a prominent topic in local histories and guide-books: when this shall have been done, the generaliser

on British natural history will experience efficient facilities by the aggregation of such histories. No one can evince more desire to render a local history of general interest, and to exhibit the relation which local and individual facts bear to the elucidation of the universal principles of knowledge, than does, in the work before us, the amiable author of *The Panorama of Torquay.*

Mudie, Robert: Guide to the Observation of Nature. 12mo, 372 pages. 1832; Whittaker and Co., London; Waugh and Innes, Edinburgh. Vol. lxxvii. of Constable's Miscellany.

This little book is remarkable for the perfect originality of the thoughts, and of many of the facts described in it. The author, in his "prefatory notice," expresses the difficulty he has felt in adjudging it a suitable title; and states that "Hints of Inducement to the Observation of Nature" should be taken as the fair interpretation of that which has been adopted. Those who are already acquainted with *The British Naturalist*, and the *Botanic Annual for* 1832, by the same author, will be prepared to expect to find his pages not "sicklied o'er with a pale cast of thought," but replete "with enterprises of much pith and moment;" and we dare assure them that their expectation, in the present case, will not be disappointed. We shall not give space to any analysis of the book; but present an extract from the "prefatory notice," which will well explain its scope and character: — "A man's contemplation of nature is, like his religion, a subject of personal pleasure to himself; and, as is apt to be the case with religion, if he makes too much parade of it before the world, he runs some danger of losing it. Besides, although there are few occupations more pleasant than rational conversations on natural history with friends, especially with young friends, when one can instruct them without appearing to act the schoolmaster, yet still the sweetest hours of a man's converse with nature are those during which he has it all to himself. It is then that the career of thought runs free and far as the light of heaven; and vanity is subdued, and bitterness is sweetened, and hope is elevated, by the comparisons of one's own little acquirements and cares with the mighty expanse around; and of the perfect nothingness of this life, in respect to that which then rises clearly and convincingly in the anticipation. This is the feeling of natural objects which I have wished to excite and encourage." The author does not strive to effect this by lauding nature, and the scenes and objects of nature. "Mere panegyric," he observes, "does not put

any one in the way of knowing what it lauds." He strives to effect it (and we think, with success) by discursive analyses of the mode in, and extent to, which the human senses and mind are ordinarily educated by the objects of nature; and by indicating fresh paths, through which this worthiest object of our being may be more intensely and extensively furthered. The book is excellent.

Owen, Richard, Member of the Royal College of Surgeons in London, and Assistant Conservator of the Museum of the College: A Memoir on the Pearly Nautilus (*Naútilus Pompílius L.*), with Illustrations of its external Form and internal Structure. Published by direction of the Council. 4to, 68 pages, 8 plates. London, 1832, W. Wood, Tavistock Street.

Systematic classification is found to be most valid and permanent when based on conformity of structure, as this conformity is the surest index of natural affinity: hence, anatomical analyses of the structure of animals have become essential to a knowledge of systematic zoology. The present able memoir exhibits, in great detail both of description and illustration, the anatomy of that most interesting animal, the *Naútilus Pompílius L.*; and, in the process of doing so, indicates the adaptableness of the structure discovered in the animal to the functions required of it in its habits of life: throughout the investigation, comparisons are made with the structure of other mollusques. The *Memoir* is a very interesting one to anatomising zoologists.

Rennie, James, M.A., Professor of Zoology, King's College, London: Alphabet of Insects for the Use of Beginners. Small 8vo, 108 pages, with many woodcuts. London, 1832. 2*s.* 6*d.*

This is probably worth its price to any one beginning to study insects; because into it are collected all the elementary terms in use in entomology (or, at least, most of them), with explanations and illustrations of them. These, as is known, are for the most part applied to the external organs of insects; but, in the present little book, the internal structure is (briefly) also explained. Several (not very weighty) imperfections in the book have been pointed out to us, and we could cavil at a few points ourselves; but we will not: the diligent user of the book will discover and correct them.

Rennie, James, M.A., Professor of Zoology, King's College, London: A Conspectus of the Butterflies and Moths found

in Britain; with their English and Systematic Names, Times of Appearance, Sizes, Colours; their Caterpillars, and various Localities. Small 8vo, 300 pages. London, 1832. 7*s.* 6*d.*

The previous work was for beginners; this is for those who have begun to collect butterflies and moths, and desire to ascertain their systematic names. It contains the characters of the genera and species; and, by a diligent comparison of the specimens captured with these characters, the student will be enabled to trace out, severally, their names. The book is wholly in English, save the names and terms, and is purely a technical manual. We say this, lest some, like ourselves, may suppose that, besides the systematic information, it may contain amusing anecdotes on the habits and manners of the moths and butterflies. It is without woodcuts; and surely not over cheap at 7*s.* 6*d.*

Don, George, F.L.S.: A General System of Gardening and Botany, containing a complete Enumeration and Description of all Plants hitherto known; with their Generic and Specific Characters, Places of Growth, Time of Flowering, the Manner in which they are cultivated, and their Uses in Medicine and Domestic Economy; preceded by an Introduction to the Linnæan and Natural Systems, and a Glossary of the Terms used. Founded upon Miller's *Gardener's Dictionary*, and arranged according to the Natural System. In 4 quarto volumes. Vol. II. 875 pages, with numerous woodcuts, 3*l.* 12*s.*; or in monthly Parts, 6*s.* each. London, 1832.

In our Number for January last (Vol.V. p. 74.), we noticed the first volume of this work: in the Number for the present January, we have to record the publication of the second volume. Thus this great undertaking seems advancing in its progress with most satisfactory steadiness.

When the work is complete, it will contribute most effectively to the promotion of systematic botany in Britain, and in every place where the English language is known. There are, it is true, already extant several general works in which the genera and species of plants are enumerated and described; but these are written in Latin, and are, besides, devoid of very many genera and species which will be enumerated in this work. The reason is this: independently of our wealth and scientific reputation as a nation, enabling us to acquaint ourselves with the labours of all the botanists in the world, we, by means of our commerce, our colonies, and the attention which has of late been paid to natural productions by our

travellers, possess extensive stores of information peculiarly our own: and original descriptions of all these will enrich the present work, in addition to translations and transcripts of the characteristics of all the genera and species hitherto published in other works.

This second volume commences with the extensive second subclass Calyciflòræ, and describes thirty-nine natural orders included in this subclass; and the remainder belonging to it will form the initial part of the third volume. The vast order Leguminòsæ occupies 385 pages, and supplies descriptions of a comparatively endless number of species of the pretty plants of this really ornamental and very interesting natural order. The orders *A*mygdàleæ, *R*osàceæ, *P*omàceæ, *O*nagràriæ, *L*ythràriæ, Melastomàceæ, and *M*yrtàceæ, as part of the thirty-nine, all and each of which contain plants so very beautiful, fall into this second volume.

Rennie, James, M.A., Professor of Zoology, King's College, London: Alphabet of Botany for the Use of Beginners. 1832 [dated 1833]. Small 8vo, 123 pages, and many cuts. London. 2*s.* 6*d.*

Explains and illustrates the technical terms and elements of botany, and may satisfy those whom a superficial knowledge of the science will content. Those who desire an intimate and extended knowledge of it will find no book extant so fit to lead the way to it as Lindley's *Introduction to Botany*, noticed in our last Number. (Vol. V. p. 706.).

Phillips, Sir *Richard*: An Essay on the Physico-Astronomical Causes of the Geological Changes on the Earth's Surface, and of the Terrestrial Temperature; with Notes. Republished, with a Preface, by Wm. Devonshire Saull, F.G.S. A.S. and R.A.S. (Geological Museum, Aldersgate Street.) 8vo, 80 pages, 1832. Sherwood and Co.

We hope to supply a notice of this essay in a future Number.

ART. II. *Literary Notice.*

A POPULAR *Introduction to the Study of Geology*, by Mr. G. Mantell, with numerous plates, is in the press, and will shortly be published.

SHORT COMMUNICATIONS.

A WHITE Donkey. — In the village of Hampton Wick, a poor man is possessed of a young female donkey, perfectly white, without spot or shade of any kind: it is a lively sportive animal, now about six weeks old. The only peculiarity observable in its formation is a remarkably small and narrow mouth, more like the mouth of a sheep than of an ass: its coat, of which much care is taken, is full and soft. The queen lately sent for it to Windsor, and was much pleased with the little creature. It is likely to prove a valuable acquisition to its poor master, who, in addition to the donkey, is blessed with a wife and nine small children. (*Literary Gazette*, June 2. 1832.)

Monstrosity in a Calf. — A cow belonging to a small farmer, near Macclesfield, recently produced a calf with two heads, five legs, and two tails, and double back: it lived about two hours. (*Birmingham Journal*, June 9. 1832.)

A Dog that reasoned Riding to be preferable to Walking. — Sir, I was lately a witness to a most striking instance of canine sagacity. Whilst an omnibus was waiting to receive passengers at the Blue Coat Boy, April 28. 1832, a dog, of the setter breed, forced his way into the omnibus, much against the consent of the conductor and passengers, as the dog did not belong to either, and who used every means to entice him out, which he constantly resisted, in the most surly manner, so much so that they were in danger of being bitten, if they endeavoured to force him. These attempts were repeated each time the omnibus stopped, until they arrived at the Eagle, in the City Road, when the door was opened, and he then made his exit, apparently as much at home there as if he had purposely taken a ride to the spot. This instance is in accordance with Mr. Blaine's ideas of the instinct of dogs, in his *Treatise on Canine Pathology*, new edition, p. 37, 38. As you may have noticed, he says, "Innumerable actions are daily performed by them; all of which are totally unconnected with these great instinctive principles. It must be, therefore, self-evident, that all such action must be extra-instinctive, and the result of rational operations of the brute mind." — I am, Sir, &c. — *Cattus.*

About fourteen years ago, a strong but simple piece of

framework, probably designed for placing parcels upon, stood beside the kerb-stone, opposite one side of the Elephant and Castle Inn, in fact, between the pavement and the road. On the inner face of one of the upright posts of this framework there was fastened a sheet of copper, exceeding in size an octavo page. On this were inscribed "in good set terms," an elegy to one "Ralph," a raven of celebrity, who in the days of his life had been a distinguished member of the Elephant and Castle establishment. A stander-by, I remember, in reply to my enquiries, told me several instances of Ralph's sagacity, and, among the rest, that from Ralph's intimacy with the coach-drivers, who were in habitual ply to and from that inn, he would, and this not rarely, take short jaunts out on the coach top with them, until he met some other coach, whose driver he also knew, passing in a homeward direction, when Ralph would change coaches, and return. — *J. D.*

The Instinctive Properties of Animals never completely obliterated by Domestication. — Sir, The following is an instance, additional to others already on record, tending to prove that the natural disposition even of our most domesticated animals, however subdued by long habit and constant intercourse, will evince itself at times under the most unaccountable circumstances.

A friend of mine, who keeps a number of gold and silver pheasants, kept in the same yard with his breeding birds a thorough-bred pointer, which ran among them for two years loose, both day and night, without ever having ruffled a feather; yet, during one night last month, he killed every bird in the yard (upwards of 30); and, what is more singular, did not eat one, but carried each to a distance, some to above a quarter of a mile; burying them in separate places, which was only discovered by the fresh turned earth and loose feathers. I am, Sir, yours, &c. — *J. Warwick. Surrey Zoological Gardens, March* 15. 1832.

The elegant Cowper has prettily adverted to the persistency of instinctive emotions, in his poems of "The Faithful Bird" and "On a Spaniel, called Beau, killing a young Bird," and in "Beau's reply." — *J. D.*

The Robin's Confidence in Man. — Sir, Poets from time immemorial have sung the praise of the robin redbreast, alike "the friend of man, and sacred to his household gods." But still, as prose matters of fact are often acceptable corroborations of poetical theories, I shall make no apology for offering the following instance for insertion in some spare corner of your interesting Magazine. Early in March, in the library of a gentleman's house, in one of our northern

counties, a mysterious sprinkling of dried leaves had been frequently seen on some of the book shelves; and these accumulations, though repeatedly swept away, had as repeatedly been renewed. Conjecture was on the alert, but no adequate or rational cause could be assigned, until, on or about the 15th or 16th of the above month, the mystery was thus satisfactorily solved. The library, it should be observed, as well as the dining-room, opens upon a lawn, under cover of a veranda projecting over, and common to, both. As the latter was not frequented by the family before the usual luncheon hour, at one o'clock, whenever the windows were open, as they were on the day mentioned, any intruder from the lawn and shrubbery might obviously have remained unmolested, from the moment the housemaid quitted the room in the morning, till the cloth was laid about noon, at which hour the servant observed in the hollow festoon of one of the window curtains, a large collection of leaves, evidently placed as part and parcel of a nest, the rapid and busy morning's work of a couple of robins, who were seen hovering near with "eye askance," or escaping through the window when the door was opened: and which, if left to themselves, were thus prepared to rear their brood in the immediate presence of the daily assembling family party. Every sympathising reader of your Magazine will doubtless conclude that the happy pair were allowed to remain, and that their progeny were destined to be reared in the mantling folds of so enviable a retreat. Alas, poor robins! the lady of the house, excellent and worthy in all respects, the single point excepted, of preferring the unsoiled damask of her curtains to a nest of redbreasts, gave orders for the removal of so foul an affront on the decorum of her furniture; and, notwithstanding the loud lament of a neighbouring naturalist, ejected the fond and familiar pair, whose bridal couch of withered leaves was once more scattered before the winds, to become the prize of other and more fortunate tenants of the air.—*E. S., F.L.S. March* 30. 1832.

This interesting communication supplies another instance to Mr. Bree's list of unusual situations chosen by birds for their nests, p. 32—36; and naturally arranges itself beside that which he relates of the robin, p. 35.—*J. D.*

Is the Robin known to possess Sympathy for other Birds, as ascribed to it in this paragraph? — A remarkable instance of the known kindness of the robin is to be seen at the Old Palace bowling-green. It appears the landlord took a thrush's nest with four young ones, and put them in a cage in the garden, where they are constantly fed by the two old

birds and a robin. (*Kentish Gazette, as quoted into the Hereford Journal, May* 9. 1832.) [See p. 83.]

The Alarm-note of Birds universally understood by them. — In Montagu's *Ornithological Dictionary*, under the article "Song of Birds," there is the following remark: — "Regarding the note of alarm which birds utter on the approach of their natural enemies, whether a hawk, an owl, or a cat, we consider it to be a general language, perfectly understood by all small birds, though each species has a note peculiar to itself." I was, last April, very much pleased at witnessing an illustration of the truth of this opinion. I found a nest of young throstles at the root of a hazel; and although they could scarcely fly, yet, as they were near a footpath, and the next day was Sunday, when many idle and mischievous lads would be rambling about, I thought they would be safer out of their nest than in it; and as I knew that, when so far fledged, if they were once disturbed they would not continue in the nest, I took one out, and made it cry out, and then put it back again, but in one minute not only it but its three companions had disappeared in the long dry grass which was round about. On hearing the cry of their young one, the parent birds set up such a shriek of alarm as brought all the birds in the wood to see what was the matter. I noticed the blackbird, the chaffinch, the titlark, the redbreast, the oxeye [greater titmouse], the blue and marsh titmouse, and the wren, all uttering their cries of alarm and apprehension: even the golden-crested wren, which usually seems to care for nothing, was as forward and as persevering as any of them in expressing its fear on this occasion; indeed, the only bird which seemed indifferent to all these manifestations of alarm was the creeper, which continued its anxious and incessant search for food as it flitted from one tree to another, examining them from root to branch, without ever seeming to understand or care for what seemed to have so much frightened all the others. — *T. G. Clitheroe, Lancashire. June* 30. 1832.

A late Brood of young Martins. — Sir, On the 14th of October last, as I was passing by a house near the extremity of this village, I was rather surprised at hearing what I took to be the chuckling twit of young martins (*Hirúndo úrbica*); and, on looking up, I perceived one of their nests under the eaves of the house. I say I was *surprised* at what I heard; because the martins had entirely disappeared from my view some time before, nor had I been able to see even a single one for some days previously. The person of the house, whose attention was attracted by my standing to gaze at the

nest, informed me that they were not martins, but sparrows, that I heard; which latter birds, he said, had taken possession of the clay-built mansion in the summer, to the expulsion of the rightful owners, and that he had already taken one brood of sparrows from the nest in question. My ears, it occurred to me, could hardly be so deceived as to mistake the comfortable twit of the martin — a note so peculiarly expressive of domestic satisfaction — for the vulgar chirp of the sparrow. However, in order to "make assurance doubly sure," a ladder was procured; and the nest, as I had expected, was found, upon examination, to contain a brood of young martins. The old bird, whose plumage seemed weatherbeaten and discoloured, flew off, and, sporting high in air, was soon joined by another individual of the same species, which, doubtless, was the other parent bird. I watched the brood from time to time, which remained in the nest till the 23d of October, when I had occasion to leave home for a few days; but strictly enjoined my informant meanwhile to keep an eye on the motions of the feathered youngsters. They continued, he informs me, snug in their quarters till the 25th, after which day he saw them no more. He had expected, indeed, that the young birds, after they were once launched into the air, would have been seen sporting about in the vicinity of their native abode, and trying their powers of wing, for some short time at least, previously to their setting out on their first long autumnal voyage; but the martins themselves, we may conclude, judged that it was already time, and more than time, to be off at once to warmer regions: at all events, they were not to be seen after the 25th of October. I do not recollect that another instance of a brood of *Hirúndines* reared at so advanced a period of the autumn, ever came under my observation before; and I have very little doubt that the few stragglers which are occasionally to be seen long after the main body has taken its departure, consist mostly of such late-hatched broods, or of their parents, which have been detained in the country on the business of incubation and rearing their young. In the present instance, the lateness of the brood may perhaps be accounted for by the circumstance, already mentioned, of the martins having been dispossessed of their dwelling in the earlier part of the season by the usurping sparrows; and thus the family arrangements of the former became protracted.

The following are the dates of the last appearance of the *Hirúndines* in this neighbourhood for the autumn of 1832: their arrival in the spring of the same year has already been recorded, Vol. V. p. 596.: — Swift, last seen (1832), August

6th; swallow, October 17th; martin, October 25th. I am, Sir, yours, &c. — *W. T. Bree. Allesley Rectory, Nov.* 22. 1832.

The Departure of the Swallow. — I observed two swallows, on the 22d instant, between 8 and 9 o'clock in the morning, flying about, over the gardens of the houses of the south side of the principal street of this town. The morning was very mild and bright, the temperature, at the time, 42° of Fahr. After watching them for more than half an hour, I returned to the house, but did not see them again in the course of the day. A single swallow had been noticed by my friend S. L. Kent, Esq. on the preceding day, at the end of the town. The general flight of the swallows from this place occurred on the 7th of October. — *James G. Tatem. Wycombe, Nov.* 24. 1832.

The Swallow near the Conway, Caernarvonshire. — The swallow was first observed here in 1824, on April 19.; in 1825, on April 21.; in 1828, on April 13.; in 1830, on April 18.; in 1831, on April 14.; in 1832, on April 21. — *Ll. Con. Ty Deon. Nov.* 1. 1832.

Dates of the Appearance of some Spring Birds, in 1832, *in the Neighbourhood of Clitheroe, Lancashire.* — Young rooks heard 5th April; house martin, seen the 14th; sandpiper, 14th; willow wren, spring wagtail, and redstart, 17th; wheatear, 19th; sand martin and swallow, 22d; cuckoo heard, 26th; wood wren, blackcap, and whinchat, 28th; mocking bird and whitethroat, 4th May; swift, 7th; fly-catcher, 11th; and fieldfares were seen until the 2d of May, which is later than I ever observed them before. [In the parish of Allesley, near Coventry, fieldfares were observed so late as the 14th of May: see Vol. V. p. 594. — *J. D.*] No doubt many of these birds were in the neighbourhood earlier than the dates I have attached to them, but they are the periods at which I first saw or heard them. The study of natural history is, perhaps, as little followed in this neighbourhood as in any part of the kingdom, notwithstanding the facilities which are offered. Our flora is beautiful, varied, and possesses many rare plants, yet I only know of two herbariums: the birds are abundant, yet there is but one collector of them; and as for insects, although I frequently take what I consider to be rare species, yet I cannot find an entomologist in the whole district, or I would send them to him. In conclusion [this communication is but one of several sent by T. G. at the same time], allow me to add, that the leisure hours I have, from a somewhat busy life, which has been spent in those pursuits, have

been some of the happiest of my existence, and have awakened and cherished such an admiration of nature, and such a love for the country and its scenes, as I think can never be appreciated by the inhabitants of large towns, and which I cannot describe so well as in the words of one of my friends, in a beautiful apostrophe to England, when leaving it — never to return: —

> " To thee,
> Whose fields first fed my youthful phantasy,
> Whose mountains were my boyhood's wild delight,
> Whose rocks, and woods, and torrents, were to me
> The food of my soul's youthful appetite,
> Were music to my ear, a blessing to my sight.

I am, Sir, yours, — *T. G. Clitheroe, Lancashire, July* 17. 1832.

Some of the Habits of Bombýlius màjor L. — Sir, That interesting and most agile insect, *B*ombýlius màjor, presented itself to my notice this day, for the first time during the present season; and I was much amused with witnessing its evolutions, as it hovered over a frame of alpine plants in my garden. The object on which it appeared to have set its affections was a pot of Aubriè*tia h*esperidiflòra, an elegant little plant, much resembling the old *A*lýssum deltöideum *L.*, figured in Curtis's *Botanical Magazine*, t. 126.; and which is now an Aubriè*tia* also, being called Aubriè*tia* deltöidea by Decandolle. The *B*ombýlius poised itself in the air (much in the same way as the common kestrel or windhover, Fálco *T*innúnculus *L.*, does), with its body perfectly motionless, but its wings all the while vibrating most rapidly. It then, by a sort of sudden jerk (like the kestrel again), descended nearer to the surface, and to the object it had in view. After several evolutions of this kind, the insect at length settled upon one of the blossoms, its legs firmly fixed on the petals, its wings at the same time vibrating with astonishing velocity, and its proboscis inserted into the tube of the flower. In this position it remained for several minutes, pumping away with its long proboscis among the anthers of one and the same blossom; every crevice and corner of which, high and low, it must have probed again and again to the very bottom. During the above operation, I observed that the fore legs of the *B*ombýlius were frequently applied to the proboscis, probably to clear the instrument of any farina that might adhere to its exterior. From what I witnessed on the present occasion, I cannot but conclude that this insect must have a powerful effect in scattering the pollen of plants on the stigma, and those parts that require fructification. The above remarks

may, perhaps, be deemed too minute and trifling; but I was not myself previously aware that the insect in question, when once fairly settled upon a flower, still kept its wings in most rapid vibratory motion; nor did I ever before witness so good an exhibition of its pumping a blossom with its proboscis. I have observed the vibration of the wings in other dipterous insects (*Múscæ* [flies], for example) when settled on an object which could not afford them any supply of food. Some of the Díptera are, perhaps, of all other insects, those which evince the greatest power and dexterity of wing. I am, Sir, yours, &c. —*W. T. Bree. Allesley Rectory, April* 4. 1832.

The Poisonous Properties of the Seeds of the Laburnum (*Cýtisus Labúrnum* L.). — It is generally believed that the seeds of the laburnum are very poisonous; and, in consequence, children are frequently warned against eating them. Their poisonous quality is also mentioned in some botanical works; but as no notice is taken of this opinion in Dr. Christison's *Treatise on Poisons*, or in Dr. Beck's *Medical Jurisprudence*, it may be of some importance to mention the following circumstance: — On Saturday last (September 15. 1832), I was called to see three children, of the ages two and a half, five, and about seven respectively, who, having been sent into the garden to amuse themselves, were induced to eat a small quantity of the seeds of the laburnum, which they mistook for *mouse peas.** Very shortly afterwards all the children were taken very sick, and vomited repeatedly, the youngest and the oldest with less violence than the other. After vomiting, they were soon relieved, and in the evening had recovered their usual health and spirits. — *George Johnston, M. D. Berwick upon Tweed, Sept.* 17. 1832. (*Communicated to the Berwickshire Naturalists' Club, Sept.* 19. 1832.)

About thirteen years ago, I knew two young ladies at Cambridge, who were rendered unwell by steeping the seeds of laburnum in their mouths, to the end of passing a needle the more easily through them, in threading them into necklaces. The ladies were in age about 18 and 23, and the symptoms of their illness were headach and slight vomiting: after the vomiting they soon recovered. The seeds of laburnum are kidney-shaped, dark brown, have naturally a polished exterior, and, when perfectly ripe and dry, are so hard that a needle is not easily forced through them. On this last account it is that they are occasionally soaked previously to threading them; but, I believe, not if the needle can be

* The seeds of all our wild vetches, more particularly those of *O'robus tuberòsus*, are, in the north of England and south of Scotland, called mouse peas by children.

passed through them without it, as soaking is deemed to lessen, somewhat, the brightness of their natural polish. As, too, the threading is frequently begun before the soaking is found to be necessary, the moistening them in the warm spittle is a very natural resource for producing the softening required at the instant. — *J. D.*

New Species of enormous fossil Reptile. — At a meeting of the Geological Society, on Wednesday, December 5., Mr. Mantell of Lewes exhibited a magnificent specimen of the remains of a new species of fossil reptile, discovered in the strata of Tilgate Forest, embedded in calcareous grit. The animal was of smaller dimensions than the great Iguánodon, which the same gentleman discovered in similar strata a few years since, of which an anatomical description, with plates, was given by Mr. Mantell, in the *Philosophical Transactions* for 1825, No. 1.; and in his interesting account of the "*Fossils of Tilgate Forest*," now out of print. From the paper which was read by Mr. Mantell, containing a detailed account of the osteology of this newly discovered reptile, we learn, that it differs in some characteristic parts of the skeleton from any known animal; its structure in some of the bones approaching to that of the crocodile, in other parts resembling that of the Iguánodon, while again there were parts approaching to that of the Plesiosaúrus. A remarkable feature in the appearance of this animal, when living, was a ridge of scaly processes on the back, six or seven inches in length, which it probably had the power of erecting at pleasure, and which would give to it a terrific similitude to the fabled dragons of Eastern mythology. The Iguánodon was seventy feet in length: this animal was probably not more than half that size. To impress on the mind more forcibly the idea of the enormous magnitude of these reptiles, Mr. Mantell exhibited a drawing of a leg covered with flesh and scales, and armed with claws, of the just dimensions which it must have had when living. The leg extended from near the ceiling to the floor. Mr. Mantell is now of opinion, from the state in which the bones are found, that the animal had been the inhabitant of a distant region, and that the body had floated down an ancient river of vast magnitude, like the Ganges, and had been partly torn to pieces before the putrefactive process was completed. Had the naked skeleton been subjected to transportation with blocks or fragments of stone, the bones would have been water-worn and broken, and the parts of the skeleton that are united would not have been found in juxta-position, as at present. On the contrary, had the animals whose remains are found in Tilgate Forest origin-

ally lived upon the stratum where they occur, as he formerly supposed, it is scarcely possible that more entire skeletons should not have been discovered. — †††

The very fragile Texture of the Limestone which forms the secondary Marble from the Meuse. — Sir, Many public buildings in Belgium are constructed of the secondary marble from the Meuse, which is also wrought into posts, door slabs, window sills, &c. It is a blue, close-grained, fetid limestone, and has a peculiarity which is worth notice. If laid firmly throughout its length, and not resting hollow on two supporters at its extremities, the slab is apt to break asunder: therefore most of the door steps where it is used are left hollow underneath, or scooped out, to prevent an accident of this kind. The peculiar inclination of this stone to fracture was shown during the *four days* of October, 1830, when the houses around the park in Brussels were exposed to the fire of the Dutch troops. Nothing which occurred to the buildings about Waterloo equalled the ruin which befell the Hôtel de Bellevue, the Café de l'Amitié, the old palace of Prince Frederick, or the gates of the park. The surfaces of the three former buildings were completely destroyed: the musket balls merely left a mark of lead upon the stone; but the grape-shot starred it, and the cannon-shot chipped out great masses, which flew about in all directions, like splinters on board ship. When it is considered that nearly 4000 shot marks were counted in one front of the Bellevue hotel, some idea may be formed of the ruin which it suffered. At the Café de l'Amitié, most of the shot struck the wall at an acute angle: the stone was therefore chipped off in a more longitudinal direction; but the stone chain posts, in front of the two buildings, and, in fact, all along the Rue Royale, were better examples of the fragile nature of the marble in question. The tops of many of them were cut off in a sloping direction, as neatly as the angle of a cube of fluor spar is cleaved by the knife; in this case the shot did not chip the stone, but cleaved it, another form of breakage similar to that observed in the flat slabs. The magnificent gate of the park leading into the Place Royale was completely destroyed: it was chipped and cleaved into fragments, and the splendid marble statuary on the top of the pillars carried away piecemeal. Several of the figures were cut in two, a calamity which happened also to the beautiful sculptures in the avenues of the park itself, most of which have for ever been crippled. One specimen of art, a lion of most exquisite workmanship, was singularly mutilated. When the French, during the old revolutionary wars, attacked Brussels, this famous fellow lost his tail by a shot;

and in October, 1830, he had the misfortune to lose his head by a similar accident. The fracture in each case was incisive; the marble (in this instance statuary) was cut away as clean as if it had been a pat of butter. Few evidences now remain in Brussels; for, though the Belgian congress, in its wisdom, voted a law that no shot marks were to be completely repaired for twelve months, and the *glory spots* remained even on the king's palace till after Leopold's accession, M. Profft has contrived to fill up his marks on the Bellevue hotel with real shot themselves, stuck about the walls, like plums outside of a Scotch cake, and the Café de l'Amitié has been restored to its pristine smoothness of exterior; yet there may be here and there a post still looking like a broken stick of barley sugar; and if any one should be curious to observe the truth of what I have mentioned, he will see many slabs hollowed out below all over Belgium, and a garden wall at Hougoumont, in the field of Waterloo, the upper part of which is built of the same limestone, shattered in the same way as the posts and walls in Brussels, the shot having wounded it in the same manner in 1815 as in 1830. — *W. B. Clarke. Parkstone, Dorset, Sept.* 6. 1832.

P. S. My object has been, in the above, to speak of the limestone; but it may be permitted, perhaps, to mention, even in a book of science, that the shot at Brussels did droller mischief than described above. There is an iron plate on the corner of the "Hotel de l'Europe," with these words thereon. A nine-pound shot carried away five letters, and the inscription left was "Hot..... Europe!"

A remarkable Meteor observed from Bury St. Edmunds. — At about a quarter before twelve o'clock in the night of September 4., a remarkable meteor was observed from this town. The first appearance was that of a triple flash of lightning, after which it took the form of a very large star surrounded by a bur or halo; and, having moved slowly along the sky for a considerable space, separated in the middle with two points, and disappeared. (*The Bury and Norwich Post, Sept.* 12. 1832.)

MISCELLANEOUS INTELLIGENCE.

Art. I. *Retrospective Criticism.*

Apology to Professor Rennie from Mr. Doubleday and the Conductor. — Sir, Allow me, through the medium of your pages, to offer an apology to Professor Rennie, for a very unhandsome and uncalled-for attack upon him, which I was guilty of in your November number, p. 767. The injunction being now removed, I do not hesitate to withdraw entirely the charge I there brought against him, and to express my sincere regret that I should ever have acted towards him in so unbecoming a manner. I do this the more willingly, as I have no personal enmity against him whatever. Yours, &c. — *E. Doubleday. Epping, Dec.* 1. 1832.

We are perfectly aware of the great talents of Professor Rennie, and his ability to treat the subjects upon which he has written; we therefore sincerely regret having admitted the article of Mr. Doubleday alluded to, both on that account, and because we consider it to be discreditable to the Magazine to contain in its pages an article in such excessively bad taste. How it escaped us we really cannot say, having before rejected an article by the same writer in the same strain. We shall endeavour to be much more particular in future, and trust never again to give the professor any cause for complaint. — *Cond.*

Three Calves produced at a Birth, all fertile. (Vol. V. p. 765.) — An opinion having prevailed very extensively, that in twin-born calves, one is generally, if not invariably, sterile, and that this occurs in the female, when the twins are of different sexes, and this opinion having been sanctioned, to a certain extent, by the authority of John Hunter, although he states instances to the contrary; and others are mentioned by Dr. Moulson (Vol. V. p. 765.), it may not be uninteresting to your correspondent U. of Cambridge (p. 396, 397.), and may assist him in his enquiries on the subject, to be informed of three calves having been produced at a birth, and all proving fertile. At the Hill Farm, about a mile from this town, a small polled cow, the property of Mr. Reuben Allen, brought forth three cow-calves, in the early part of January, 1828, which were reared, and each has calved twice, and are all expected to calve again in the course of next month. These animals now belong to Mr. Samuel Treacher of Wycombe, and are rendered

further remarkable by their likeness to their mother; and so great is their resemblance to each other, as to size and colour, that a stranger cannot, for some time, perceive any difference in them. — *James G. Tatem. Wycombe, Nov. 26. 1832.*

Changes in the Colour of the Coverings of Animals towards Winter. — Sir, As Zoophilus, in his paper (Vol. V. p. 718.) on the change of colour in the external covering of animals and birds in winter, has not touched upon, what I consider, the more important and obvious uses of this beautiful provision of nature, I trust he will not feel displeased if I offer a short explanation of them for the information of your younger readers, by way of rider.

A white animal, or bird, upon the snow, is, doubtless, less conspicuous, and consequently less exposed to danger from its natural enemies, than in its ordinary costume. It is, therefore, quite legitimate to argue that this change is given to the weaker and more defenceless tribes, for their protection; being somewhat analogous to the near approach we observe in the colour of many birds and insects to that of the places they commonly frequent. But the great polar bear, the arctic fox, &c., can need no such aids; and even the tiny weasel has agility and courage enough to defend itself. Yet these also are clad in the usual winter garb of high latitudes. And how does the matter stand as to some aquatic birds, which also assume a white, or a whiter, plumage in winter, but which certainly are thereby made more conspicuous in their common haunts, whether these be the dark surface of the water under the lowering skies, and during the long nights of winter, or the black rocky beach, between the high and low water-mark, where snow cannot lie? These exceptions, and others which might be named, are, I think, sufficiently weighty to render the argument untenable, and to induce us to search elsewhere for a more philosophical and satisfactory explanation.

That the changes in question are chiefly, if not solely, influenced by a great diminution of ordinary temperature, is proved by their being more or less rapid, as well as more or less complete, in proportion to the early or late approach of cold, as well as to the degree of its intensity. Many instances of these modifications are on record, and they strongly support the view I have taken, namely, that this change from the usual colour to white is primarily designed to protect the animal from the severe cold to which, from its locality, it is necessarily exposed, and which, without some such provision, the structure of its organisation could not withstand. And here, as every where in nature, we see cause and effect mutually

act and react upon each other. Cold is the exciting cause of a process, the object and result of which is to enable the creature to resist cold. And how is this effected? It is well known that substances of a black or any dark colour absorb heat more rapidly, and are more perfect conductors of it, than the same substance would be if white, or of any light colour. In other words, the former both receive and part with it quicker. Let us now consider the circumstances of the case. The animal is placed in an atmosphere of a temperature infinitely lower than that of its own body; and the grand object is, to keep in the internal vital heat as much as possible. By the law just mentioned, a coat of black fur would carry it off from the system, and dissipate it by radiation into the cold atmosphere much more speedily than a white one; while the latter would retain it the longest and most effectually. This, therefore, is wisely and kindly given. Besides this change of colour, the whole clothing becomes much longer in winter*, and is thickened by the addition of a coat of short wool concealed among the hair or fur of animals, and one of down among the feathers of birds; and these substances being, independent of their whiteness, the best non-conductors of heat, the best possible provision is made for resisting the extreme rigours of an arctic winter. This under coat, also, is produced earlier or later, and is more or less dense, according to the setting in of the frost, and the severity of the season †, and falls off in spring as the cold departs. The whole arrangement is one of those innumerable instances of adaptation which point so clearly to the Great Author of all things, and make the devotion and feelings of every one who studies and appreciates them as he ought, purer and stronger. Let this, which ought to be the grand end and aim of every student in the boundless and enchanting field of natural science, never be lost sight of by the young enquirer.

It will not be out of place here, to hint that a similar provision for the protection of *vegetable life* is given in *snow*, whose white colour and soft light texture make it the best possible non-conductor that, under the circumstances, could be provided, and the most effectual agent for preventing the escape of heat from the surface of the earth. Plants defended by this warm and fleecy mantle cannot be subjected

* Hence horses, &c., that lie out through the winter have a long and shaggy coat; while those that are kept in a warm stable, especially if clothed, retain the short and sleek dress of summer.

† On this account the furs taken by the arctic hunters after the setting in of the frost are the thickest and the most valuable. The very best are those of the severest winters.

to a greater degree of cold than about 32° Fahr., and it is well known that the want of it, and of the consequent uniform temperature, renders it so difficult to preserve Alpine plants through our own milder and more variable winters, where they are often left unprotected to severe frosts, or liable to rot off by exposure to unseasonable warmth and moisture.

It is also a modification of the same law of radiation, as connected with colour, which has given to the natives of hot climates a black or swarthy skin; though dark colours, from their more rapid absorption of heat, may, at first sight, be thought the worst calculated to relieve the body, as we know from experience that a black dress is hotter than a white one. The fact is, that we think more of the external heat of the sun and atmosphere than of the internal heat of the body. But here, again, let us consider the real state of the circumstances, and the object to be attained. The temperature of the air, even within the tropics, is but seldom, and then but for a few hours out of the twenty-four, above that of the human body, or about 98° Fahr. According to a general law, there is a constant tendency in all material substances to impart a portion of their caloric to contiguous ones of a lower temperature. It therefore follows that the *greater heat* within the body has generally a tendency to radiate into the atmosphere; and therefore the more effectual is the apparatus provided for this purpose, the more rapid and copious will be the escape. The object in view, it must be borne in mind, is to relieve the system from the accumulation of excessive heat; and a dark or black skin, from its superior absorbing and conducting powers, is manifestly the best adapted for this function. — *J. E. Bowman. The Court, near Wrexham, Dec.* 1832.

Animals direct their Actions by a Species of Reasoning. — A correspondent from Donegal (Vol. V. p. 582.), speaking of the Lóxia Coccothraústes, grosbeak, vulgarly but significantly called cross-beak, says, "I shot a pair of these birds, a few days ago, in fine plumage: the first instance, I believe, of their occurring in Ireland." There was a flight of these birds in my plantations for weeks in 1813 or 1814, an account of which was sent at the time to the *Belfast Magazine*. It would be advisable to memorial such accidental visits, which may be likened to the forced passage formerly of the Welsh to America, if Mr. Southey is to be credited, or of Tuwarri and his party, who, not long since, were certainly driven in their canoe six hundred miles out of their course.

Few circumstances have more attracted the curiosity of mankind than the passage of birds, I mean their periodical

migration; a return and departure which seldom exceed, from year to year, and at great intervals, more than a few days. Then comes the query, whence the cause? Which is answered compendiously, by repeating the term instinct. In this case, instinct acts by wholesale and retail. Some birds pass from the river to the lake, from the land to the moor, from the plain to the mountain. Some cross the narrow seas, others despatch the broad deep and continents in their transit. Some birds assemble in bodies, and seem to hold aggregate meetings to counsel respecting their departure; while other birds escape individually, as if any notice of their intent might subject them to a *ne exeat regno* [a forbidding to leave the kingdom]. For men to call all these movements instinct, is to give a name to ignorance, and to take credit for their philosophy when they discredit themselves. A change of local position is also common to many of the four-footed race. The passage of pigeons, mentioned by Bruce in Egypt, is not more certain than that of deer in the polar regions; and M'Gregor mentions the remains of approaching fences of many miles' length, in Nova Scotia, by the Acadians, to bring the moving herds within a narrow pass, to be taken or killed. Birds and beasts, and fishes, for they journey to and fro in the ocean, as their fellows of the air and earth tread or wing their way, are moved by the temperature of the element of their existence, and the means of their feeding. These often rule the migration of cattle in their artificial state. Hill and valley are not more certainly interchanged than the sheep in Spain are driven north and south as the year changes, and as the herbage, in consequence, is scanty or plentiful. Breeding of the racer is not a predisposing cause; it may be an accident or not. The Esquimaux shift their position for the convenience of food only, and these are kindred with lower animals. When men use the word instinct, they use it for the most part in contradistinction to reason. Yet reason, or that which regulates man's motions, is often the arbiter of the progress of birds. Men in the infancy of navigation crept along the shore, or navigated from headland to headland; or, in crossing, chose the narrow passes, and those which were assisted by intervening islands. Birds of passage adopt all these facilities. The birds which migrate from Scotland to Ireland, proceed by the Straits of Portpatrick; and the flights of larks, lapwings, starlings, &c., by this track are enormous. Besides, it has been observed, that these birds begin with the morning, and wait for a side wind. The same is observable in other parts of the world. They seize the smallest advantage, and Capri has been in all

times the first place of repose to birds crossing the Mediterranean, particularly to quails, the tithe of which affords a considerable part of the revenue of the bishop. In fact, birds exhibit forecast, so far as an opportunity of judging is afforded, in various ways. Thus it is notorious that swallows (Aristotle had rather have chosen them for his simile of the luxury of royal sojourning), on their return from wintering in southern latitudes, resume their last year's summer houses as surely as any curiosity-hunter, who, after his lounge in Italy, repairs on the vicissitude of the seasons to his brick building in London. [See Mr. Dovaston, p. 5.] After this attempt to bring birds nearer to the lords of the creation in their self-assumed attribute, I shall conclude with a fact respecting the most luxurious and aristocratic of all the feathered race; nor is the submission of other birds to their prerogative less than their own presumption. The cuckoo, though some absurdly pretend to doubt the fact, lays its eggs in the nests of various small birds, wagtails, hedge-sparrows, titlarks, &c. In my neighbourhood, a tenant's son found a cuckoo in a moss-cheeper's (the vulgar name for titlark) nest. He brought it home, and fed it on potatoes and oatmeal dough. In a few days two wrens who had a nest with eight eggs in the eaves, and just above the window fronting the cage in which the cuckoo was placed, made their way through a broken pane, and continued to feed it for some time. The cage was small, and the boy preferring a thrush to the cuckoo, took it away, to give greater room to the thrush. On this the wrens repaired to their own nest, and brought out the eggs that had been laid. This is very curious, and seems like fascination, — to leave their own nest, and abandon their progeny in their incipient state, to feed a stranger, and, to them, a monster. — *George Ensor. Ardress, Nov.* 10. 1832.

These remarks, valuable to all our readers, will be perused with peculiar satisfaction by J. J., whose communications, in the same spirit, will be found Vol. IV. p. 498., Vol. V. p. 276. — *J. D.*

The Means by which the Vulture (*Véltur Aúra* L.) *traces its Food.* (Vol. V. p. 233.) — Sir, I have been waiting for some time back in earnest expectation of some one of note in the ornithological world taking up the cudgels in defence of Mr. Audubon's able exposure of the fallacy of attributing the power of scent in an extraordinary degree to the vulture tribe; but as no one has yet stepped forward, I shall take the liberty of requesting you to allow Mr. Audubon to speak for himself, by the following extracts, which, I hope, if you can spare

room, you will publish entire from Jameson's *Journal*, and which appear to me unanswerable. I will also, with much deference to Mr. Waterton (being a fervent admirer of that talented gentleman's *Wanderings*, on account of which I am sorry Professor Rennie has not included its author in his list of "philosophic naturalists and original observers;" no one, in my humble opinion, being more justly entitled to that honourable distinction), make bold to remark that his account of the habits of the *V*últur Aúra (Vol. V. p. 233.) are at variance with the observations of Wilson, Humboldt, and Azara; three of the most philosophic and observant naturalists that ever lived. According to them, the *V*últur Aúra *is gregarious*, being generally found in flocks of from forty to fifty, "who," says Audubon, "go turning in large circles, often intersecting each other in their lines, as if forming a vast chain of rounded links: some are high, while others are low; not a spot is passed unseen, and, consequently, the moment that a prey is discovered, the favoured bird rounds to, and by the impetuosity of its movements, gives notice to its nearest companion, who immediately follows him, and is successively attended by all the rest." The *V*últur Aúra does feed on live animals, even in *preference*, where they can be procured with facility, to *carrion*, being in some parts the terror of the poultry-yard; and frequently, to use Mr. Waterton's own words, "*do soar to an immense height in the sky.*" I am, Sir, yours, &c. — *Perceval Hunter. Oxford, July* 2. 1832.

Extracts from an article published in No. 3. of Jameson's *Edinburgh New Philosophical Journal*, entitled "Account of the Habits of the Turkey Buzzard (*V*últur Aúra *Lin.*), particularly with the view of exploding the Opinion generally entertained of its extraordinary Power of Smelling. By John James Audubon, Citizen of the United States:" —

"As soon as, like me, you shall have seen the turkey buzzard follow, with arduous closeness of investigation, the skirts of the forests, the meanders of creeks and rivers, sweeping over the whole of extensive plains, glancing his quick eye in all directions, with as much intenseness as ever did the noblest of falcons, to discover where below him lies the suitable prey; —when, like me, you have repeatedly seen that bird pass over objects calculated to glut his voracious appetite, unnoticed, because unseen; and when you have also observed the greedy vulture, propelled by hunger, if not famine, moving like the wind, suddenly round his course, as the carrion attracts his eye; then will you abandon the deeply rooted notion, that this bird possesses the faculty of discovering, by his sense of smell, his prey at an immense distance.

"This faculty of smelling so acutely, I adopted as a fact from

my youth. I had read of this when a child; and many of the theorists to whom I subsequently spoke of it, repeated the same with enthusiasm, the more particularly as they considered it an extraordinary gift of nature. But I had already observed that nature, although wonderfully bountiful, had not granted more to any one individual than was necessary, and that no one was possessed of any two of the senses in a very high state of perfection: that if it had a good scent, it needed not so much acuteness of sight, and *vice versâ*. When I visited the southern states, and had lived, as it were, amongst these vultures for several years, and discovered thousands of times that they did not smell me when I approached them covered by a tree, until within a few feet, and that, when so near, or at a greater distance, I showed myself to them, they instantly flew away, much frightened, the idea evaporated, and I assiduously engaged in a series of experiments to prove, to *myself* at least, how far this acuteness of smell existed, or if it existed at all.

"I sit down to communicate to you the results of those experiments, and leave for *you* to conclude how far, and how long, the world has been imposed on by the mere assertions of men who have never seen more than the skins of our vultures, and heard the accounts from men caring little about observing nature closely.

"My first experiment was as follows: —

"I procured a skin of our common deer, entire to the hoofs, and stuffed it carefully with dried grass until filled, rather above the natural size, — suffered the whole to become perfectly dry, and as hard as leather, — took it to the middle of a large open field, laid it down on its back, with its legs up and apart, as if the animal was dead and putrid. I then retired about a few hundred yards; and in the lapse of some minutes a vulture, coursing round the field, tolerably high, espied the skin, sailed directly towards it, and alighted within a few yards of it. I ran immediately, covered by a large tree, until within about forty yards; and from that place could spy the bird with ease. He approached the skin, looked at it without apparent suspicion, jumped on it, raised his tail, and voided himself freely (as, you well know, all birds of prey in a wild state generally do before feeding): then, approaching the eyes, that were here solid globes of hard dried and painted clay, attacked first one and then the other, with, however, no further advantage than that of disarranging them. This post was abandoned; the bird walked to the extremity of the pretended animal, and there, with much exertion, tore the stitches apart, until much fodder and hay was pulled out, but no flesh

could the bird find or smell; he was intent on discovering some where none existed; and, after reiterated efforts, all useless, he took flight, coursed about the field, when, suddenly rounding and falling, I saw him kill a small *garter snake*, and swallow it in an instant. The vulture rose again, sailed about, and passed several times over my stuffed deerskin, as if loth to abandon so good-looking a prey.

"Judge of my feelings when I plainly saw that the vulture, which could not discover, through its extraordinary sense of smell, that no flesh, either fresh or putrid, existed about that skin, could, at a glance, see a snake, scarcely as large as a man's finger, alive, and destitute of odour, hundreds of yards distant. I concluded that, at all events, his ocular powers were much better than his sense of smell.

"*Second Experiment.* I had a large dead hog hauled some distance from the house, and put into a ravine, about 20 ft. deeper than the surface of the earth around it, narrow and winding, much filled with briars and high cane. In this I made the negroes conceal the hog, by binding cane over it, until I thought it would puzzle either buzzards, carrion crows, or any other birds to see it, and left it for some days. This was early in the month of July, when in this latitude a dead body becomes putrid and extremely fetid in a short time. I saw, from time to time, many vultures in search of food sail over the field and ravine in all directions, but none discovered the carcass, although during this time several dogs had visited it, and fed plentifully on it. I tried to go near it, but the smell was so insufferable, when within thirty yards, that I abandoned it; and the remnants were entirely destroyed at last through natural decay. I then took a young pig, put a knife through its neck, and made it bleed on the earth and grass about the same place, and, having covered it closely with leaves, also watched the result. The vultures saw the fresh blood, alighted about it, followed it down into the ravine, discovered the pig by its blood, and devoured it when yet quite fresh, within my sight. Not contented with these experiments, which I already thought fully conclusive, having found two young vultures, about the size of pullets, covered yet with down, and looking more like quadrupeds than birds, I had them brought home, and put into a large coop in the yard, in the view of every body, and attended to their feeding myself. I gave them a great number of red-headed woodpeckers and parrokeets, birds then easy to procure, as they were feeding daily on the mulberry trees in the immediate neighbourhood of my orphans. These the young vultures could tear to pieces by putting both feet on the body, and

applying the bill with great force. So accustomed to my going towards them were they in a few days, that when I approached the cage with hands filled with game for them, they immediately began hissing and gesticulating, very much like young pigeons, and putting their bills to each other, as if expecting to be fed mutually, as their parent had done. Two weeks elapsed; black feathers made their appearance, and the down diminished. I remarked an extraordinary increase of their legs and bill; and thinking them fit for trial, I closed three sides of the cage with planks, leaving the front only with bars for them to see through; had the cage cleaned, washed, and sanded, to remove any filth attached to it from the putrid flesh that had been in it; and turned its front immediately from the course I usually took towards it with food for them. I approached it often barefooted, and soon perceived that if I did not accidentally make a noise, the young birds remained in their silent upright attitudes, until I showed myself to them by turning to the front of their prison. I frequently fastened a dead squirrel or rabbit, cut open, with all his entrails hanging loosely to a long pole, and in this situation would put it to the back part of the cage; but no hissing, no movement was made: when, on the contrary, I presented the end of the pole, thus covered, over the cage; no sooner would it appear beyond the edge, than my hungry birds would jump against the bars, hiss furiously, and attempt all in their power to reach the food. This was repeatedly done with fresh and putrid substances, all very congenial to their taste. Satisfied within myself, I dropped these trials, but fed the birds until full grown, and then turned them into the yard of the kitchens, for the purpose of picking up whatever substances might be thrown to them. Their voracity, however, soon caused their death: young pigs were not safe, if within their reach; and young ducks, turkeys, or chickens were such a constant temptation, that the cook, unable to watch them, killed them both, to put an end to their depredations.

"I could enumerate many more instances, indicating that the power of smelling in these birds has been grossly exaggerated; and that, if they can smell objects at any distance, they can see the same objects much farther. I would ask any observer of the habits of birds, why, if vultures could smell at a great distance their prey, they should spend the greater portion of their lives hunting for it, when they are naturally so lazy, that if they are fed in one place, they never will leave it; and merely make such a change as is absolutely necessary to enable them to reach it.

"Having heard it said, no doubt with the desire to prove

that vultures smell their prey, that these birds usually fly against the breeze, I may state, that in my opinion this action is simply used because it is easier for birds to maintain themselves on the wing encountering a moderate portion of wind, than when flying before it; but I have so often witnessed these birds bearing away under the influence of a strong breeze, as if enjoying it, that I consider either case as a mere incident connected with their pleasures or their wants."

Hydròbius lateràlis. (Vol. V. p. 86. 556.)—The explanation offered at p. 556. respecting this insect may be very ingenious, but, as it is an American species, something more is required to prove that it has been taken in England; and the gentleman who is designated as "highly respectable," I do not doubt, could explain the affair in a very different way, if he thought it worth while to take up the subject.—*J. Curtis. Grove Place, Lisson Grove, Sept.* 19. 1832.

Early Appearance of Gonépteryx rhámni. — Sir, I once saw this insect on the wing, in an adjoining parish, on the 28th of February, 1828, which is the earliest appearance of any butterfly I ever observed, except that (which I have already recorded, Vol. V. p. 595.) of Vanéss*a* urtìcæ, on the 8th of January, 1805, in the Isle of Wight; and the latter species, also, elsewhere, on the 28th of February, 1815. Your correspondent Sigma, who writes from Saffron Walden, says he saw Gonépteryx rhámni, "with the early white butterfly (Póntia Charicl*èa*), on Feb. 10. 1831." (Vol. V. p. 753.) I never knew an instance of Póntia Charicl*èa* appearing so early in the season; nor, indeed, before the month of April. Might not Sigma probably have mistaken the female of G. rhámni, which is of a greenish white, and not readily to be distinguished, *on the wing*, from other white butterflies, for P. Charicl*èa*? Why, also, is P. Charicl*èa* styled "the *early* white butterfly," when there are at least two other species, viz., P. ràpæ and P. nàpi, which invariably appear before it? —*W. T. Bree. Allesley Rectory, Nov.* 10. 1832.

Vernal Appearance of Vanéssa Atalánta and Cýnthia cárdui. Sir, Mr. Stephens, speaking of the genus Vanéss*a*, remarks (*Haustellata*, vol. i. p. 41.) that "all the species hybernate," i. e. survive the winter in the winged state, and reappear in the spring. The observation is, I believe, a very just one, so far, at least, as regards the British species, with whose habits alone I happen to be acquainted. Vanéss*a* Atalánt*a* is, in this part of the country (save in some particular seasons, when a specimen is scarcely to be met with), the most abundant of the genus, except V. urtìcæ; and yet it is seldom seen in the early spring. On referring to my calendar, kept for more

than thirty years past, I have in two instances only observed this species before the month of June, and only once before April. Cýnthi*a* cárdui, also, is in much the same predicament: it is common enough (in particular seasons) in the autumn, and, like the Vanéssæ, hybernates; but, with one single exception, I do not recollect to have observed it earlier than June. I subjoin the dates of the first appearances of these two insects, so far as I have noted them; and should feel obliged to any of your entomological readers if they could assign a probable reason why the vernal appearance of these two species should be so much later, and of rarer occurrence, than that of other *P*apiliónidæ which hybernate. It can hardly be supposed that the insects in question require a greater degree of warmth, and a more powerful sun, to recall them into active life; when it is known that each of them, and especially Atalánt*a*, can endure the chills of autumn, and is among the very last that linger on with us till a late period; visiting our gardens, and spangling the ivy bushes, the asters, georginas, &c., long after most other butterflies have retired from view. In the Isle of Wight, I have seen V. Atalánt*a* bold on the wing so late as the 9th of November, 1804; and, in 1818, I observed a specimen, in this parish, floating on the surface of a pond, and *alive*, on the 5th of December. Vanéss*a* Atalánt*a* appeared March 13. 1805 (Isle of Wight), April 27. 1819, June 7. 1822, June 12. 1804, June 12. 1811. Cýnthi*a* cárdui appeared April 6. 1827 *, June 12. 1804, June 30. 1830. — *W. T. Bree. Allesley Rectory, Nov.* 10. 1832.

V*ícia sylvática* L. *with difficulty raised from Seeds artificially sown; and a Warwickshire Habitat of it.* (Vol. V. p. 768.) — Sir, I was greatly puzzled, in the first instance, to discover what village in Warwickshire was meant by "Hort's Hill, Hey's Wood, just ten miles from Coventry," which is mentioned by Aliquis (Vol. V. p. 768.) as the prolific habitat of *V*ícia sylvática. I know of no such village or place as "Hort's Hill" in Warwickshire; and presume that it is a mere misprint for *Hartshill*, which is about ten miles from that city. This error, if error it be, ought to be corrected. After several trials, I have always found this beautiful vetch difficult to raise from seed. I have now in the garden a vigorous young plant of it, raised this last spring, the only one that came up out of many seeds sown, at different times of the season; as, e. g., autumn and spring, and the early part of the summer; and in different situations, in the borders and in pots. I am, Sir, yours, &c. — *W. T. Bree. Allesley Rectory, Nov.* 10. 1832.

* I could not observe a single specimen either of Atalánt*a* or cárdui throughout the whole autumn of 1827.

ART. II. *Queries and Answers.*

THE Preservation of dead Insects. —Sir, Your correspondent M. P. affirms (Vol. V. p. 746.) that "it is impossible to apply the solution to every part of the inside of most insects." I beg permission to remind him, that there is no fighting against impossibilities; and that, where his assertion holds good, the case is hopeless. With regard to his observation, that he has found "the solution cannot be applied to the outside of most insects (especially Libéllulæ), without, in course of time, injuring their colours," I request his attention to the few following observations: —There are two grand distinctions to be made in the colours of insects. Those colours which originate from without, as in the moths and butterflies, remain unimpaired in pristine splendour after death, until they are destroyed by force or by accident. On the other hand, those colours which have their source from within, and proceed from moist substances, gradually fade after the death of the insect; and, in some cases, even totally disappear, when the substances from which they drew their origin have become dry and hard. By long experience, I know that the colours of insects which are produced internally, as in the red dragon fly of Guiana, cannot be made permanent, by any process, after the death of the insect; but those colours can be renewed with great and durable effect. Suppose your correspondent were to take an English dragon fly (which, I must inform him, I have never dissected), and sever the head from the thorax, the thorax from the abdomen, and then subdivide the abdomen at every third ring: this would enable him to clear away all the moist internal parts, from whence the colours draw their source. A nearly transparent shell would remain; and he would only have to introduce into it colours similar to those which the insect exhibited in life, after having washed it well with the solution. The joining again of the dissected parts would complete the process. All this appears difficult: still it may be effected. I have read somewhere of a Frenchman who could harness a flea: I, myself, have dissected the Cayenne grasshopper, and renewed its colours with great success. In 1808, after dissecting the bill of the toucan, I completely succeeded in renewing the blue, which had been removed by the knife; and, I believe, the specimen which I produced was the first ever exhibited, in its renewed colours, since the discovery of America. Should your correspondent ever stumble on the *Wanderings*, he will see a full account of this.

As to the *decay* to which your correspondent alludes, I am at a loss to know what to say on the subject; because, where

the solution cannot possibly be applied, the specimens will be apt to decay in time, even though he were to dry them by a slow heat, and put them beyond the reach of damp. Do what he could, the colours would all be spoiled and faded; and the shrivelled and distorted insects (except those of the beetle family) would be rendered hideous, even to a common inspector.

On using the Spirit of Turpentine. (Vol.V. p. 746.) — I take this opportunity of informing the Rev. Mr. Bree, that I have long and successfully made use of the spirit of turpentine. In 1808, having tried many useless experiments to expel living insects from dead ones, and from other preparations in natural history, on opening, one day, an old magazine (I forget now of what denomination) in a planter's house in Essequibo, I read the following remark: — "Spirit of turpentine is known to be the most fatal poison to insects." Taking it for granted that the spirit was fatal through an atmosphere; as I was sure no insect would drink it voluntarily, and I did not see how it could be forced down their throats, I put some spirit of turpentine into a trunk of preserved skins of birds, and into which the moth had found its way. The next morning, I saw that the spirit of turpentine had killed all the moths. In the course of time, the use of the corrosive sublimate in alcohol succeeded to this, and rendered the spirit of turpentine wholly unnecessary, wherever the sublimate could be applied to every part of the preserved specimen. But as, on some occasions, I only washed the inside of the skins, and, in this case, the feathers themselves, not having received the poison, were still liable to injury from insects, especially in tropical climates, I always took the precaution to have spirit of turpentine in the box. In order to make myself clearly understood by the Rev. Mr. Bree, I will describe exactly what I did. I bought common hair-trunks which are sent out with goods from Europe to South America; I strewed the bottom of the trunks with cotton, upon which I placed the preserved bird-skins, and the different insects which I had collected. Both birds and insects were placed promiscuously in the same trunk. I then saturated a piece of sponge with spirit of turpentine, and hung it up in a corner of the trunk: I renewed the spirit from time to time. From that period to this, no living insect has been detected in the trunks. The plumage of the birds is as vivid as it was at the time I shot them; and the moths and butterflies as splendid as when in life: but most of the other insects, except some of the beetles, have faded, through the cause which I have already stated to M. P. Thus I am enabled to say, by actual experiment, that

the atmosphere of spirit of turpentine will allow neither *Acarus* nor any insect to live in it; and, moreover, that it does not injure the colour of preserved birds, and furs and insects, provided they do not come in contact with the spirit of turpentine. I beg to inform the Rev. Mr. Bree, that I have used corrosive sublimate in paste for years; that I have applied the solution to my hat, and to the long Indian arrows (which are very subject to be eaten by the worm), with complete success; and that here, in Europe, with equal success, I have applied it to ladies' ostrich feathers, to camel-hair brushes, and to the lining of my carriage. The solution has been the remote cause of my discovering an entirely new method of preserving specimens in natural history; and which method at once shows upon what erroneous principles the old method has been, and is still, conducted. To conclude, the solution has proved my best support: without it, I could have done nothing. "Hoc solamen erat, sylvis hoc victor abibam." — *Charles Waterton. Walton Hall, Nov.* 20. 1832.

Preserving the Colour of the Legs and Bills of stuffed Birds. —Will Mr. Waterton inform me what is the best method for effecting this object? I generally use mastic or copal varnish; and, if put on soon enough, it answers the purpose, as regards colour, sufficiently well: but it gives a gloss which, to the legs of many birds, is quite unnatural. —*T. K., Killaloe, Sept.* 21. 1832.

How can the Spirit in which Animal Substances are preserved be best kept from evaporating?— I find that the spirit prevents putty from hardening; and, consequently, from confining it, and even from keeping the glass tolerably tight. — *Francis Orpen Morris. Charmouth, Dorset, Sept.* 1832.

In a collection to which we have access, two or three modes of stopping the phials, and other glass vessels which contain the preparations, are practised. For all those objects which are frequently, or even occasionally, wanted for practical examination, cork or ground glass stoppers are preferred: it being deemed less expensive and less troublesome to add spirit, as it may evaporate, than to renew the more permanent covering. Should permanent stopping be required, two modes of effecting it are practised. First mode. Tie down, over the bottle's mouth, a piece of softened bladder; upon that place a circular piece of sheet-lead or sheet-tin, of the size of the top of the bottle: then tie over a second piece of wet bladder, and cover both bladder and tying with two or three coats of black varnish. Second mode. Fit into the mouth of the bottle a piece of good cork, and cut it off even with the edge

of the bottle; and, reversing the bottle, give it, by dipping, three or four coats of melted caoutchouc, till thick enough to prevent evaporation. When cool, apply the black varnish, if neatness of appearance be desired. — *J. D.*

A Bird whose nightly Note foretells approaching Weather. — Sir, During many midnight rambles in Suffolk, I have been often startled at the peculiar cry of some bird in the air, resembling the stifled scream of a person in distress. So great a resemblance does it bear to the latter sound, that, when I first heard it (which was on the border of a lonely wood, some two miles from any human habitation), I freely confess the action of my heart was materially accelerated, and (to use a very hackneyed expression) my hair stood on end, "like quills upon the fretful porcupine," and I fully expected to hear it followed up by a cry of murder. No such awful sound, however, vibrated on my tympanum; and well pleased was I to find, on a nearer approach, that it did not proceed from a terrestrial but from an aërial visitant. But the most singular circumstance is, that whenever I heard the shrill note of this unknown bird, rain, hail, or snow *invariably* followed. In no one instance, and I have heard the solitary cry of this nightly wanderer some hundreds of times, did a contrary result happen. And with such a degree of confidence could I rely on the meteorological information of this "knight errant" of the air, that I was enabled to determine the state of the ensuing morrow, and could foretell a fall of rain, hail, or snow with some degree of certainty. Even when the barometers and hygrometers in the neighbourhood were, to use a nautical phrase, "taken aback," I could, by listening for the cry of my unknown monitor, determine whether a continuance of fine or foul weather was to be expected, and have been enabled to excel all the weather-wise old men as a prognosticator of the weather. I generally heard his note when the whole surface of the heavens was covered with a dense mass of cirro-stratus clouds; but at other times he would "pipe cheerily," when the moon shone forth in unclouded serenity; when —

> "Nox erat, et cœlo fulgebat luna sereno
> Inter minora sidera." — *Hor.*
>
> ["'Twas night, and in the unruffled vault of heaven,
> The moon shone forth amidst the smaller stars."]

Yet, whether dark or clear, warm or cold, rain, hail, or snow invariably followed, and that within two or three days, but generally on the day ensuing. I was never fortunate enough to get a glimpse of him; and, if I had, I am not ornithologist enough to have determined to what genus or species he

belongs. On clear nights he appeared, from the modulation of the cry, to be at some height in the air. I have no doubt some of your readers will confirm me in my statement, and I am sure that the cry of this nocturnal visiter is too frequent in Suffolk to have escaped observation. Is it the night heron (*Ardea Nycticorax Linn.*, *Nycticorax europæus Stephens*)? I heard it the other night in Clapton. Does the night heron ever approach so near to the metropolis? Does the night heron delight in rainy weather? Perhaps some of your readers can answer my interrogations; if they can, I shall be obliged to them for doing so. I am, Sir, yours, &c. — *H. T. Clarke. Clapton Square, May 2.* 1832.

Mr. Dovaston's notice of the night calls of the bittern, p. 9., may be read in connection with this article; not that I would represent it as answering Mr. Clarke's query. — *J. D.*

What is the Name of that Insect so frequently found encysted by the side of the Head of the Prawn (*Cáncer Squílla* L.)? — When at the sea-side, a few weeks since, we discovered, in several of the prawns at breakfast, an insect, having some resemblance to the woodlouse (*Oníscus*), in a cyst or bag by the prawn's head. Fishes are at times greatly tormented with insects; and I have frequently, while fishing in the Thames, caught gudgeon (*Cýprinus Gòbio L.*) with a small flat-shaped insect adhering to the side of the fish's mouth. — *O. Clapton, Aug.* 30. 1832.

The animal referred to by our correspondent, as found encysted by the side of the head of the prawn, is the *Bópyrus Squillàrum* of Latreille. A notice of this species, by the late Colonel Montagu, will be found in the *Transactions of the Linnean Society*, vol. ix. p. 104., under the name of *Oníscus Squillàrum*; a short description also occurs in the last edition of Pennant's *British Zoology*, vol. iv. p. 41. A figure of *Bópyrus Squillàrum* will be found in the excellent work of M. Desmarest on the *Crustàcea*.

In the paper by Col. Montagu, before mentioned, a second parasite (*Iòne thorácicus Lat.*), also infesting another species of Crustàcea (*Callianássa subterrànea Leach*), is described, with figures of both; and a description of this parasite will also be found on the same page of Pennant's work with that of the *Bópyrus*.

The small flat-shaped animal, seen occasionally adhering to the soft parts of the surface of some of our freshwater fishes is probably the *Argulus foliàceus* of Jurine, fils, of which a description and figure will be found in the work of M. Desmarest before quoted. (See p. 329. and pl. 50. fig. 1.) The small animals infesting fishes are, however, more nume-

rous in the salt water than in the fresh. In the *Dictionnaire des Sciences Naturelles*, M. Blainville has described about forty species that were formerly included under the term Lernæ'a, but are now divided into several genera: see the last edition of Cuvier's *Règne Animal*, tom iii. p. 255. et seq.; and Desmarest, p. 343. et seq., note. Five species of Lernæ'a are described and figured in Shaw's *Naturalist's Miscellany*, vol. viii. p. 296., pl. 295., and four others described in Pennant's *British Zoology*, vol. vi. p. 113. The particular species which attaches itself to the sprat is figured in Sowerby's *British Miscellany*, plate 68.; and a full description by Dr. Grant, with a magnified representation of a large species which has been found firmly fixed to the cornea of a shark, is inserted in vol. vii. of the *Edinburgh Journal of Science*.

The Lernæ'æ, although numerous, form but a very small proportion of those parasitic pests with which the various animals of almost every class are infested. So numerous, indeed, are they, that nearly every species bearing a parasite has been found to maintain one peculiar to itself, which feeds on the excreted matters of the skin, or sucks the vital fluids from the interior. The natural history of many is well known, and the various animals distinctly classed; but the internal structure, and the mode of generation in the Lernæ'æ, and even the place which they occupy in the scale of animals, are still undetermined. Their external forms are as various as they are remarkable, and appear to exhibit in the same individual a combination of the characters of the entozoa, and of insects: possessing the soft body of the former, with rudiments of antennæ peculiar to the latter. Like intestinal worms, they have a simple structure, with a soft and naked body, and are permanently fixed upon the animal. This latter circumstance led to a supposition that the sexes were united in the same individual; but it has also been suggested that the males of the Lernæ'æ, like the males of some other parasitic animals, whose economy is better understood, swim freely to and fro in the water, and that it is the females only which attach themselves. — *S. T. P.*

Acorn-eating Curculiónidæ at Philipsburg, in Pennsylvania. — Our correspondent R. C. Taylor (Vol. V. p. 456.) sent us, in October, 1831, some acorns off two species of oak which grow on the Alleghany Mountains, and which at Philipsburg are called the white oak and the red oak. The acorns were desperately infested with the larvæ, large ones, of some kind or kinds of Curculiónidæ; and we register this fact, that on its meeting his eye, he may put things in train for granting our request for a supply of perfect specimens of this or these

acorn-eating species. We had not facilities for feeding the larvæ received into a perfect state; and as some of the acorns seemed emptied of the kernel, and yet the larvæ not fed to the state of changing into pupas, we presume that a stock of acorns is necessary, that when a larva has emptied one it may enter another. — *J. D.*

The Mazarine Blue Butterfly. — I wish some correspondent would oblige me with information respecting, and an accurate description of, the azure blue butterfly. Stephens (in *Syst. Cat.* ii. 23.) and Rennie (in the *Conspectus of Butterflies and Moths*, &c., 17.) give Polyómmatus A'cis as the mazarine blue, Mrs. Jermyn, in her *Butterfly Collector's Vade Mecum*, p. 148., gives P. Cỳmon: and in Constable's *Miscellany*, lxxv. p. 164., P. Arìon is given for it. I have by me a few butterflies which I have this summer captured, and which, as far as I am able to judge, I take to be the mazarine blue. The following is the best description I can give of the fly. Wings, when expanded, 1¼ inch; upper surface blue, of rather a deeper shade than that of P. A'rgus, shading off into a black band on the outer edge, and terminated with a white fringe; under side of rather a leaden grey or bluish ash colour, deepening towards the scutellar and humeral angles: the superior wing has a lunated black spot in the centre, surrounded by a white atmosphere: between this and the outer margin a bent band of eyelets, with black pupil and white iris. The eyelets are generally seven in number, and differ considerably in size; but I have a specimen in which the band consists of only four eyelets all of equal size. Inferior wings; a single eyelet near the base, then two eyelets between it and the outer margin; underneath these eyelets, and towards the centre of the wing, is a very indistinct lunated spot: between this spot and the outer margin, and between the space occupied by it and the anal angle, is a band of six eyelets, the two nearest the angle being nearly confluent. The whole of the eyelets on both wings consist of a black pupil in a white iris. This butterfly is by no means common in the neighbourhood; I have never captured it but in one small field of not more than an acre in extent, sporting about the hay, with P. A'rgus, in about the end of June and beginning of July. Is this the mazarine blue, or is it not? If not, what butterfly is it? I have not seen it in cabinets nor amongst the specimens in the possession of dealers. — *X. Monmouthshire, August* 24. 1832.

THE MAGAZINE

OF

NATURAL HISTORY.

MARCH, 1833.

ORIGINAL COMMUNICATIONS.

ART. I. *Notes on the Weather at Philipsburg, Pennsylvania, from November, 1831, to December 9. 1832; with Remarks on its Influence on certain Animals and Plants; including a detailed Description of a North American "Ice Storm."* By R. C. TAYLOR, Esq.

Sir,

MR. BREE'S "remarks on the spring of 1832, as compared with that of 1831" (Vol. V. p. 593.), remind me that a few extracts from my "rough notes" on the corresponding season, on this side of the Atlantic, may, perhaps, possess some interest.

I have stated in a former letter, which I see you have thought worth insertion (Vol. V. p. 456.), the position, latitude, elevation, and other circumstances essential to a general knowledge of the situation from which I am writing; so I need not repeat them.

Contrary to your experience of the winter in England, ours in America was unusually protracted and severe: commencing in the middle of November, and ending with March. Snow lingered on the Alleghany Mountains until May, and some was even seen in the deep shady woods in June. Mr. Bree's observations as to the backwardness of the last spring, in Europe, equally applies to this continent. During the month of June, we experienced weather sufficiently cold to render fires in our sitting-rooms almost essential; and to cut off nearly all the young apples, peaches, and other fruits of the orchard.

As I do not register minutely the meteorological details, I

shall limit my notices to such circumstances as were most characteristic of the year which is now [Dec. 10. 1832] about to terminate.

I have stated that our winter set in with unusual severity, in the middle of November, 1831, when the cold north-west snow storms were severely felt by both men and animals. On the 28th, a large bear was killed in this neighbourhood, which had not retired to his winter quarters. I observed a woodcock on the 30th. This month, and all December, were characterised by a succession of gales and snow storms from the north-west, accompanied by severe cold, reaching to 9° below zero in the third week in December. The barometrical fluctuations at this time may be worth noticing.

During the gales, and for twenty-four to thirty-six hours preceding them, the mercury generally descended to about 28½ in.; and, in the calm intervals, returned to 29½ in.

Thus: — Dec. 16th, 29½ in., clear; 18th, 28½ in., gale; 20th, 29½ in., calm; 24th and 28th, 28½ in., gales and snow storms. 1832, Jan. 3d, 29·4 in., frost; 6th, 28·9 in., thaw.

During the first part of winter, the ground remained covered with snow of an average depth of about 2 ft.; and even deeper in the forests, where the sun's rays had little influence.

In some warm water-springs near my residence, I frequently noticed frogs, large tadpoles, and lizards, in a state of activity. In clearing away stones in a quarry, the winter habitations of myriads of mosquitoes were disturbed. These insects enter the fissures of the stone at the fall of the year, but cannot penetrate far enough to be beyond the influence of frost.

Jan. 14th to 21st. After two months of unusual severity, the frost moderated; and a thaw commenced, and lasted a week. The thermometer, on the 14th, stood at 54° in the shade; and in the sun, against a building, rose to 84° at noon. At Philadelphia, it reached 60° in the shade. The waters, so long consolidated in ice and snow, now descended rapidly from the mountains, and covered the Beaver Dams, forming our "first freshet." Observed one of the large black and red hairy caterpillars crawling in the road. This species is the latest to conceal itself in autumn. Some scarlet cardinal birds previously appeared on the 12th; and the ravens and crows, enjoying the genial return to a mild temperature, were loudly croaking in the neighbourhood of the settlements. The red and the great black squirrels resumed their wonted activity among the lofty pines; the harsh scream or cry of the ground squirrels was occasionally heard, and was probably uttered to attract their mates; while the persevering tribe of woodpeckers made the woods resound with their incessant hammering on

the bark of some decayed hemlock [*Pinus canadénsis*] or spruce. Snow soon returned.

Jan. 27th. An exceedingly cold day. In the sun, at nine o'clock, the thermometer was 10° below zero; at half-past seven, it was 16°; and, at sunrise, was 21° below zero.

Feb. 5th. A second remarkable transition from cold to warmth took place. In the open clearings, nearly all traces of snow suddenly disappeared; the roads were broken up and miry. Early indications of spring, announced by the noisy cawing of the carrion crows, and in the arrival of a flock of of "blue birds." Mosquitoes came out of their hiding-places, and danced in clusters in the sunshine; while a solitary house-fly circled round our sitting-room. For the second time, the waters of the Moshannon rose, and overspread the Beaver Dams.

Feb. 8th. This morning, a heavy rain set in after the thaw, and increased in violence throughout the day and night: and now commenced the most singular, and even sublime, meteorological phenomenon I have observed in this region. It was an occurrence of unusual note, and extended over a large area in this and the adjoining state, and is commonly referred to under the name of the "ice storm." I shall be somewhat minute in describing so much respecting it as fell under my own observation, as noted at the time. Immediately on the descent of the rain, it froze, so as to envelope the trees and earth with a thick coating of transparent ice, and to render walking no easy process.

Feb. 9th. Such an accumulation of ice had now formed upon the branches of the forest trees, as presented a beautiful and extraordinary spectacle. The small underwood or "brush" was bowed to the earth, while the noblest timbers were every where to be seen bending beneath the enormous load of ice with which their branches were incrusted, and the icicles which thickly depended from every point. The heavy foliage of the hemlock and spruce was literally encased, or rather formed solid masses of ice, the smallest twig or blade of grass being surrounded by more than an inch of ice, and resembled the vegetable substances, sometimes occurring in masses of crystal. Rain fell in torrents all this day and the chief part of the ensuing night; until there were about 4 in. of clear ice overspreading the surface of the ground. The change which this phenomenon effected in the usual appearance of the woods was striking. The bushes, and smaller trees, extending to those of 50 ft. in height, were now bent to the ground, and pressed upon each other beneath their unwonted burden, resembling, in some respects, fields of corn

beaten down by a tempest. Above, the tall trees drooped and swung heavily; their branches glittering, as if formed of solid crystal, and, on the slightest movement of the air, striking against each other, and sending down an avalanche of ice. During the night of the 8th, and on the succeeding morning, the limbs of the trees began to give way under such an unusual load. Every where around was seen and heard the crashing of the topmost branches, which fell to the earth with a noise like the breaking of glass, yet so loud as to make the woods resound. As the day advanced, instead of branches, whole trees began to fall; and, during twenty-four hours, the scene which took place was as sublime as can well be conceived. There was no wind perceptible, yet, notwithstanding the calmness of the day, the whole forest seemed in motion; falling, wasting, or crumbling, as it were, piecemeal. Crash succeeded to crash, until, at length, these became so rapidly continuous as to resemble the incessant discharges of artillery; gradually increasing; as from the irregular firing at intervals of the outposts, to the uninterrupted roar of a heavy cannonade. Pines of 150 ft. and 180 ft. in height came thundering to the ground, carrying others before them; groves of hemlocks were bent to the ground like reeds; and the spreading oaks and towering sugar maples were uprooted like stubble, and often without giving a moment's warning. Under every tree was a rapidly accumulating debris of displaced limbs and branches; their weight, increased more than tenfold by the ice, and crushing every thing in their fall with sudden and terrific violence. Altogether, this spectacle was one of indescribable grandeur. I could not resist devoting the whole day to the contemplation, notwithstanding the continued rain, of the desolating and tremendous effects of this unusual phenomenon. It was necessary, however, to be careful to remain at a prudent distance from the falling timber. Of all the scenes in the American forests, this was the most awful I had witnessed. The roar, the cracking and rending, the thundering fall of the uprooted trees, the startling unusual sounds and sights produced by the descent of such masses of solid ice, and the suddenness of the crash, when a neighbouring tree gave way, I shall not easily forget. Yet all this was going on in a dead calm, except, at intervals, a gentle air from the south-east slightly waved the topmost pines. Had the wind freshened, the destruction would have been still more appalling. It was awful to witness the sudden prostration of oaks of the largest class. These trees were the greatest sufferers; and it seemed remarkable that the deciduous trees should be less able to bear the additional burden than the

heavily laden evergreens. The branches of the oaks rapidly gave way, while the thickly encased foliage of the hemlocks hung drooping around the stems, upon their long pliant branches, until they appeared like a solid mass, or monumental pillar of ice. In order to obtain some data for estimating the increased weight which the forest trees had now to sustain, I cut off and weighed several boughs of different species, and compared them after the ice was removed by thawing. The following is the result: —

	Weight in the frozen state.	Weight when thawed.
No. 1. A branch of white pine [*Pinus Strobus*]	15 lbs.	¾ lb.
2. Another bough	17	1
3. Hemlock or spruce branch	20	1
4. Another	17	¾

By this it appears that the evergreens had about twenty times their accustomed burden.

Feb. 10th. This morning was clear and frosty; the rain had ceased, and the wind changed to north-west, although it was scarcely perceptible. A check seemed to have been given to the work of devastation. Fewer branches fell to the earth; yet still, throughout this day, one heard in all quarters the loud thundering crash of falling timber echoing through the woods. Those whose dwellings were situated in the dangerous proximity to these scenes have had two sleepless nights. Within the limits of fifteen acres of wood in my own occupation, I have had fifty of my largest trees overthrown, and not a single deciduous tree in that area escaped entire. This "storm" has produced, as may be conceived, numerous accidents and inconveniences. Few travellers that were passing through the woods on the 9th and 10th escaped without being hemmed in, and their vehicles blocked up by the fallen timber. Waggons, slades, and sleighs were necessarily abandoned, and the horses, in some instances, with difficulty saved. All the roads around this place were thus stopped up by fallen timber, and by loaded carriages, for some days. At the interval of nearly a year, the navigation of the Moshannon Creek, from hence to the Susquehanna, continues choked by the trees which fell into it during this period. On the summit of the neighbouring Alleghany Mountains, where the pitch pines [*Pinus pungens Lambert*] are almost the only trees that attain to any magnitude in that elevated and barren region, there has been prodigious destruction; and, in some spots, not a single pine has been left standing. The white-oak groves have particularly suffered, and incalculable numbers have been uprooted. Accounts

reach us of this "ice storm" extending through Pennsylvania, and part of New York state, and of the travellers who were constrained to pass the night in the woods, hemmed in by the fallen timber. Months after, I observed its effects in the pine forests, at the distance of a hundred miles, and the oldest settlers affirm that nothing equalling it, in extent and destruction, has occurred in their recollection. On the 12th, a thaw, accompanied by heavy rain, soon cleared the drooping forest of its unwonted covering.

January and February. The snow, though almost constantly on the ground, was not accumulated to such a depth as last winter, owing to the occasional thaws. Flocks of green-finches continued in the vicinity of the warm springs, near my residence, throughout the winter.

Feb. 27th. Several white sea-gulls appeared this day. 29th. A few straggling blackbirds.

March 2d. A large flight of wild geese passed towards the north. 3d. A single robin appeared on the Beaver Dams, followed by considerable numbers on the next day. 5th. A solitary frog commenced croaking in the swamps. Some wild ducks shot, and trout caught by angling. 6th. Numerous spring visiters enliven the surrounding woods. The hen hawks scream harshly as they wheel in circling flights. Jays abound; thrushes sing cheerily; crows loudly caw; cat-birds are heard in the bushes; and bluebirds are busy running over the lately flooded meadows. The ditches swarm with pretty speckled lizards, which, warmed by the cheerful sun, have crawled out of their muddy retreats. 11th. Blackbirds (*Icterus phœniceus*, red-winged starling, or marsh blackbird, of Audubon), in flocks of more than a thousand, resume their cheerful chirping, or rather screaming. Sometimes these great flocks will suddenly alight on the summit of a lofty pine, and commence their gossiping concert, after a short preliminary pause. This commencement seems to be regulated by a signal from their leader. Then follows another pause, and perfect silence prevails: and, again, every bird in company strains his throat, as if desirous to be the loudest in the choir. Again a pause, and off they all fly, and vanish in an instant, seeking some other tree, whereon again to resume their discordant yet social concert. 13th. A flock of fifty wild swans alighted upon the Beaver Dams, and some were shot. My space obliges me to omit further details of this spring. The summer and fall have been unusually dry and temperate. The navigation of the creeks and rivers has been suspended, for want of water, to the present time.

Dec. 9th. Very little appearance of winter at present, and

the air as mild as in November in England. After two days' rain, the Moshannon Creek has at length filled its channel, so as to form a small freshet. Several species of birds are even yet lingering in the woods. A young bear appeared at the bottom of my garden, within 60 yards of my house, last week, and frightened my children not a little. The cry of a panther has also been heard near us. The wolves have deserted us.

I am, Sir, yours, &c.

RICHARD C. TAYLOR.

Beaver Dams, Philipsburg, Centre County, Pennsylvania, United States, Dec. 10. 1832.

ART. II. *An Account of the Hurricane at Thorndon Park, the Seat of Lord Petre, October* 12. 1831. By JACOB GEORGE STRUTT, Esq.

——— " Venti vis . . . . .
Interdum, rapido percurrens turbine campos
Arboribus magnis sternit, monteisque supremos
Silvifragis vexat flabris." *Lucretius*, lib. i. l. 272.

——— " Oft through the ravaged plain
In sudden whirlwind sweeps the furious gale,
O'erthrows majestic trees, and with strong blasts
Vexes the lofty mountain."

Sir,

IN transmitting to you the enclosed account, from the Chelmsford paper, of the storm that took place in Lord Petre's park at Thorndon, in Essex, on the evening of the 12th of October, 1831, I have little or nothing to add, besides my own testimony, as an eyewitness, to the fidelity of the description. The rumour of this extraordinary operation of the fury of the elements reached me in a distant part of the country, and irresistibly tempted me, as an ardent admirer of sylvan scenery under every variety of aspect, to explore the scene of devastation. Accordingly, armed with my crayon and pencils, I repaired to the spot, where I passed the chief part of the day in rambling about, and sketching the most remarkable features in this tract of desolation.

The accompanying cut (*fig.* 11.), which has been beautifully executed by Mr. Williams, from a pencil sketch which I traced on the block, represents a prostrate oak, which had stood nearly in the centre of the havoc, and at no great distance from the road leading to the Lion Gate.

I am, Sir, yours, &c.

Norwich, July 26. 1832. JACOB GEORGE STRUTT.

11

The Hurricane at Thorndon Park.— On the evening of Wednesday the 12th instant [October, 1831], a destructive hurricane ravaged a considerable portion of the park of Thorndon Hall, the seat of Lord Petre, near Brentwood. The blast came on about eight o'clock, and in less than four minutes the work of havoc was completed. It appears that the wind came from the south-west, and entered the park near the Lion's Lodge, where it threw down a small portion

of the paling. It then traversed the park in a varying sweep of about 150 yards' breadth. It is difficult to form any idea of the manner in which it took its course, as it has made many singular selections of spots and single trees. The line of desolation is not an uninterrupted one: in many places, a large breadth of trees has escaped unhurt, while others, apparently sheltered by them, have been shivered or torn up by the roots. In some groups of three or four trees, one of the least exposed has shared in the ruin, while its more exposed neighbours have not lost a leaf. On entering the park at the Lion's Lodge, on the west or Warley side, the eye is immediately attracted to the right hand by several oaks, 60 feet long, which have been torn up by the roots, and to which are adhering masses of earth, 14 feet in length, and from three to four feet in thickness. A beautiful beech has been partly removed from the soil by the uptearing of neighbouring trees, and its lofty top rests on others, at an angle of about 30 degrees. The stems of many trees are off within a few feet from the earth, some at a height of two or three feet, others at a greater height; and one elm has been severed at about 20 feet from the ground, 15 feet of the stump having had half its body torn away. In one place, about 100 yards from this spot, the destruction has been tremendous. In a circle of nearly 40 yards' diameter, whole trunks, huge limbs and branches, with immense masses of earth, lie on the ground in wild confusion, mingled in such a manner that it is impossible to count the number of trees destroyed. It appears as if a battery of heavy artillery had been directed against a great mass of timber, which had crowded that part of the park. In some instances the stems exhibit to the eye the appearance of having been cut off; in others, they are rent from top to bottom, or have had their giant limbs twisted off, as if they had been but so many twigs. Lofty oaks have been struck near their summits, and immense portions of their upper limbs and branches torn down, but are not quite severed from their parent stem, and, with their heads resting on the ground, form a sort of tent of foliage upwards of 30 feet high. The hurricane spared neither the lofty nor the lowly, neither the mighty oak nor the humble holly: the strong and the weak alike fell before the blast; and stripling trees, which one might have supposed would have escaped, shared the same fate with the monarchs of the park. Several oaks had at least a dozen immense branches torn off, while the majestic trunk has not lost a foot of its height, and in many instances the limbs and branches of standing trees are twisted and interlaced in a variety of fantastic shapes, and, whichever way the spectator

turns, he beholds the most awful and surprising evidences of the stupendous might of the angel of the storm. Indeed, the scenes of destruction are so varied in their appearance and extent, that we find it impossible to give any thing like a methodical description of them. As we have before observed, the blast has not taken a direct and lofty course, sweeping all before it; and we can form no other idea of it, than that it moved with infinite velocity, undulating like the rushing of a mighty sea; sometimes passing over the spires of the gigantic oaks and elms, and then striking the earth, rebounding and insinuating itself beneath some trees, and levelling others by its force operating near the earth. On leaving the right hand side of the carriage drive, we find that on the other side there has been great havoc, and the same singular escapes and selections are visible. As we approach the mansion, the effects of the hurricane are, if possible, still more striking. In a magnificent plantation of firs, several have been struck down or torn up; some of them being from 70 to 80 feet in length. Happily the mansion was not in the range of the storm; but the destruction exhibited facing the edifice affords a more striking proof of the power of the wind than even any thing we have yet narrated. About half-way between the mansion and the principal lodge were two beautiful clumps of trees, but they have entirely fallen. In one of those clumps, consisting of elms, there are three trees, each 10 feet in circumference, and at least 60 feet long, lying on each other. They were torn up by the roots, to which are attached many tons of earth, 15 feet in breadth. Near them stood a stately fir, nearly 11 feet in circumference: the stem has been broken off at about the height of 18 feet from the ground. To the stump are still attached, on one side, several large and graceful branches, which have a very picturesque appearance. The severed part has been blown to a distance of five or six yards from the foot of the tree, and the greater part of it is covered by the three fallen elms. A few yards to the west of this group stood a clump of firs, which now present nothing but a shapeless mass of splintered trunks, branches, and leaves. On the right of the mansion, and nearer to it than the clumps of which we have just spoken, are a greater number of trees closely planted. The outer trees have escaped, but several of those in the interior have suffered. A little in advance of that spot stands the residence of the Rev. Mr. Siddons, the catholic minister of the noble proprietor's household. It is embosomed in trees, but escaped uninjured, except that a pane or two of glass was broken by the flying splinters of trees. One splinter entered the bedroom of the

reverend gentleman. A few of the trees in the front of the building were damaged. There is an open space between this house and the thickly planted trees of which we have spoken, and by that the hurricane found a vent without any further very striking manifestation of its fury; but we understand that it did some little injury at the distance of a mile to the east of the park. It was also severely felt at Upminster, in the west, before it commenced its ravages on Lord Petre's demesne. We have endeavoured to compute the extent of mischief done in the park, but find it impossible, from the confused state in which the shattered and fallen timber at present lies; but we believe there cannot be less than 300 trees torn up, or so much shattered as to render it necessary that their remains should be felled. As to the partially injured timber, it is too extensive to be enumerated. This park, during the war, furnished some of the finest naval timber that could be procured in the kingdom, and it still presents a very large number of equally valuable trees. The pecuniary loss, on the present occasion, to Lord Petre will be very considerable, and it will take a century to repair the injury; but "it is an ill wind that blows nobody good," and the clearing away of the fallen trees, and converting them to useful purposes, will give employment to a considerable number of men for some time. It is a great consolation to his lordship that no human being received any personal injury from this tremendous war of the elements, the only living things that suffered being a pheasant and a crow. The hour of the evening and the state of the weather fortunately prevented any of the domestics being in the park. It is a little singular that the noise occasioned by the destruction was heard in the mansion, but was supposed to be thunder, and the real cause was not ascertained till next morning. The hurricane was immediately succeeded by a tremendous fall of rain.

ART. III. *Observations on the Iceland and Ger Falcons (Fálco islándicus), tending to show that these Birds are of two distinct Species.* By J. D. HOY, Esq.

Sir,

I AM fully aware, that, in the present day, the two species known by falconers as the Icelander and ger falcon, are considered, by authors who have written on the subject, to be the same species, only varying from age, sex, or climate. They are both now included under the term Fálco islándicus. I

have been induced to differ from authors in opinion, and will endeavour briefly to state my reasons for so doing.

I believe that no person who has described them has had the means of observing the habits of the two birds in a state of liberty: some may have seen the ger falcon of northern Europe, but may not have had the opportunity of becoming acquainted with the Iceland falcon. It appears to me that naturalists have formed their opinion on this subject from the examination of preserved specimens, or, at most, from birds in a state of confinement. I have had repeated opportunities of obtaining the opinion of several eminent falconers of the old school, who have invariably stoutly maintained the two birds to be perfectly distinct kinds.

The Iceland falcon rather exceeds the ger falcon of Norway in size, the tail is considerably shorter, the wings are, in proportion, longer, the relative length of wing and tail being much the same as in the peregrine falcon: the young of both species are much alike in their first plumage, but the Icelander is generally of a lighter cast; the old birds become nearly white on the head, neck, breast, and thighs, some birds have been known almost entirely of a white colour: the legs and talons are of a bluish colour, and larger than in the ger falcon. The head of the Icelander is larger, different blocks being used in making the hoods of the two kinds. The ger falcon, the male of which, in falconry, is called the gerkin, differs, in being less, in having a longer tail, and shorter wing, in proportion; the wings, when closed, reaching but little more than half the length of the tail: the plumage does not become so white as in the Icelander.

But we must not form our opinion from trifling variations of size or plumage, as we know that hawks of the same species vary greatly in both, but from the habits of the birds. How could we distinguish several species, which we well know to be distinct kinds, were it not for the voice and habits? and why may not the connecting link approach as nearly in the hawks as in some other genera? Late discoveries show that individuals of this class are met with extremely similar in outward appearance. The goshawk of North America, although but slightly varying in size and plumage from our European species, appears now to be considered a distinct kind by some, while others have doubts as to their identity.

In the days when falconry stood first on the list of sports (and I cannot here help regretting, that, in this land of sporting celebrity, this favourite amusement of our ancestors should be so universally neglected), the Icelander was considered a present worthy the acceptance of a king. The king of Den-

mark sent a vessel annually to Iceland, to bring all the hawks of this kind which it was possible to procure, for the use of his falconers, and to be sent as presents to the different princes on the Continent. They were even sent to the Barbary states, and into the Eastern countries; so much were they esteemed. An old falconer, lately dead, has assured me, that he has seen upwards of fifty Iceland falcons, at the same time, in the care of persons who were about to start with them as presents to the different courts of Europe. A falconer who was in the hawking establishment of Louis XVI. of France has informed me that they had several casts, or pairs, sent annually from Denmark.

The Icelander was greatly prized, not only on account of its superior powers of flight, but its tractable gentle disposition. It is not so difficult to reclaim and manage as the ger falcon: there is also a decided difference in their flight, and manner of striking their prey; the Icelander, in the language of falconry, flies more nobly, pouncing his prey with more lofty stoops. The flight of the hare with the female, the male being used for the heron, kite, and buzzards, was considered one of the finest sights the sport could afford. An open country is requisite to see this flight in perfection. The hare being started, the falcon was immediately thrown off the fist, and, instantly catching sight of its prey, mounted to a considerable height; a slow dog, well trained with the hawk, was used to keep the hare running, as it would otherwise squat on being once stooped at by the falcon. The falcon kills the hare, by repeated blows on the back and head, coming in an almost perpendicular direction upon it from a great height, and with wonderful velocity, the blow being almost imperceptibly given in passing, and the falcon again rising, or, as they term it, shooting up steeple high after every stoop: occasionally the victim is killed the first stoop, and driven several yards by the violence of it. In a good flight several lofty stoops are made. The ger falcon is also flown at the hare, but does not make such lofty stoops, for which the other was always so much valued, often seizing hold before the hare was killed. Again, in the air, the Icelander kills the crane, heron, or kite, by repeated blows; the great interest taken in the flight being to watch the exertions of the falcon to outsoar its prey, and then precipitating itself with closed wings and astonishing rapidity and force, its prey seldom reaching the ground without being mortally disabled; whereas the ger falcon will frequently take hold in stooping, and come to the ground with its game, keeping a fast hold with its talons. An instance has occurred in the

memory of a falconer yet living, of the male Icelander striking the head from the neck of a heron, by a single blow in the air.

At the period when Iceland falcons were annually obtained from Iceland, many falconers were in the yearly habit of sending persons to Norway and Sweden to catch ger falcons, of which kind they generally obtained a good supply: they had, therefore, abundant means of becoming acquainted with the two species. They have frequently flown individuals of both kinds, six, eight, or more years, so that every change of plumage might be well ascertained. The peregrine falcons, bred on the rocks of Scotland, do not differ, in habit, size, or plumage, from those reared on the shores of Norway. I think it very probable that the Iceland falcon will hereafter be found to inhabit the northern parts of the American continent, and will be recognised as a distinct species from the ger falcon of Europe.

By the decline of hawking we lose much in the history of this class of birds. With how many interesting facts and anecdotes might we become acquainted, were the sport more generally followed! I certainly must consider some deference due to the opinions of men whose almost sole attention has been devoted to hawks from their childhood. All the falconers whom I have questioned on the subject have decidedly given the same opinion, and have, at once, clearly pointed out the identity of the merlin and stone falcon (Fálco *Æsalon* and Lithofálco), also of the peregrine falcon and lanner (F. peregrinus and lanàrius), as commonly described by authors; at the same time showing themselves acquainted with the true lanner, which is described by Temminck in his *Manuel d'Ornithologie*. It was also called by falconers the Sacre and Bloyt, and was not frequently used, being found only in the south and south-eastern parts of Europe. The king of France, Louis XVI., had lanners sent annually from Malta, but they were brought from the Eastern countries. It exceeds the peregrine falcon in size, being intermediate between that and the ger falcon; was much esteemed for flying the kite, with which the peregrine is hardly able to contend.

Having thus stated my reasons for considering the Icelander distinct from the ger falcon, and assuring you that I must have stronger evidence than I have yet had, to shake my opinion on the subject,

I am, Sir, yours, &c.
J. D. Hoy.

Stoke Nayland, Suffolk,
Sept. 25. 1832.

ART. IV. *More about Birds.* By RUSTICUS of Godalming.

Sir,

NOTHING in literature is more exclusively a man's property than any feigned name under which it may be his whim or interest to write; and it would scarcely be a grosser imposition to publish a book with the name of some well-known author in its titlepage, instead of one's own unknown cognomen, than it is to pirate a pseudonym under which a writer has earned honest laurels. I find I have committed this offence, and I am heartily sorry for it, and that is all I can say; and I hope you will convey to that other Rusticus, whose name and whose contributions have often enriched your work, this message, "Please to excuse me, Mr. Rusticus; I did not do it on purpose, and I won't do so again." I never wrote you but two letters: they were published at p. 601. of Vol. V., and p. 25. of Vol. VI. I mention this, not that my double, the other Rusticus, will think them worth claiming; I am well aware they are worth no one's having; but lest he should suppose that I wish to obtain notice under a title which he has made known by his own excellent communications. I detest explanations of all kinds, pen or powder; but I thought common honesty required this. Should you think these notes, or any thing I may hereafter send, worth printers' ink, please to call me Rusticus of Godalming, and then "there can be no mistake."

It seems that in my last (p. 27.) I made a blunder in speaking of the great grey gull. I understand, from tip-top authority, that no gull is grey when arrived at years of discretion; that, unlike us men-people, their greyness is a sign of youth. May I ask at what period of its life a gull is supposed to become adult? I have known an instance of one of these great fellows strutting about a poultry-yard for three years, and he continued a great grey gull all the time, and died the same; and I have another fact of a great grey gull being shot, while sitting on four eggs, on Lundy Isle, in the Bristol Channel. Along the southern coast of England, at Hastings, Brighton, Bognor, &c., this bird is called the burgomaster. I once saw nearly a thousand of them on a shingly marsh near Little Hampton, on the west side of the river Arun, of which not a single individual had arrived at sufficient maturity to change his colour. If Mr. Swainson or Mr. Yarrell would explain this matter, I am sure your readers generally would be interested thereby, and none more than a Johnny Raw like myself, who has never had an opportunity of using but one pair of eyes, and those his own. [See p. 171.]

We have a bird common here, which, I fancy, is almost unknown in other districts, for I have scarcely ever seen it in collections; and, from the few remarks about it and sketches of it in natural histories, no correct idea can be formed. I mean,

The Dartford Warbler. Bewick had a bird before him, stuffed, half a century ago, by some barbarian who was a grade lower than our professional stuffers are now, and he had also the name Dartford warbler; and so he went to work and cut out a warbler. Later writers have "played at follow-the-leader," as some one, I forget who, deliciously observes; and, of course, we have Bewick's Dartford warbler at the present hour. Now, Sir, if you have ever watched a common wren (a kitty wren we call her), you must have observed that she cocked her tail bolt upright, strained her little beak at right angles, and her throat in the same fashion, to make the most of her fizgig of a song, and kept on jumping and jerking and frisking about, for all the world as though she was worked by steam: well, that's the precise character of the Dartford warbler, or, as we call it, the *furze wren*. When the leaves are off the trees, and the chill winter winds have driven the summer birds to the olive gardens of Spain, or across the Straits, the furze wren is in the height of his enjoyment. I have seen them by dozens skipping about the furze, lighting for a moment upon the very point of the sprigs, and instantly diving out of sight again, singing out their angry impatient ditty, for ever the same. Perched on the outside of a good tall nag, and riding quietly along the outside, while the fox-hounds have been drawing the furze fields, I have seen the tops of the furze quite alive with these birds. They are, however, very hard to shoot; darting down directly they see the flash, or hear the cap crack, I don't know which. I have seen excellent shots miss them, while rabbit-shooting with beagles. They prefer those places where the furze is very thick, high, and difficult to get in. The reason why naturalists know so little of this bird is because they don't go the right way to find it. Some of your London ornithologists, in May, go peeping about Battersea fields and the Jamaica market-gardens, or perhaps get as far this way as Cold Harbour Lane, and boast of "thinking they saw a Dartford warbler," just arrived from China, no doubt, with a lantern fly in his bill.

The Crossbill is by no means uncommon here in the winter. I have seen them of every hue, from bright yellow-green to bright red, and of all the intermediate shades between each of these and dull brown. Strange as it may seem, the bright

red ones seem to be the young birds, the yellow-green ones old hens, and the brown ones old cocks; at least this has been the case in those which I have had an opportunity of examining. The cry of the crossbill is very peculiar; it is sharper than that of the greenfinch, and louder and not so much of a *chuck* as that of the linnet: generally, while sitting, they are silent and very quiet birds, a number of them sitting in a Scotch pine, and remaining in it even a whole day, at any rate, if not disturbed, till every cone had been pried into, and the seeds taken out. They do not take the cone off; it may, perhaps, sometimes fall while being robbed, from over-ripeness. The holding of a cone in their claw, and extracting the seeds with their beak, must have been suggested by some wag to a credulous naturalist, and has been too "beautiful a fact" for compilers to let slip. After finishing the produce of one tree, they fly off in a jerking chuckling train, to some other. On the wing they always chuckle, as though talking, and, on settling again, give one or two loud notes, as the chaffinch does, as if to give notice of his arrival.

The Siskin [*Aberdevine*] is always a regular winter visiter with us, keeping company with the little redpoles, which abound wherever there are alders along the banks of the Wey: they are almost entirely females, at least in the proportion of fifty or sixty to one; in this respect resembling the chaffinch, so aptly and beautifully named by Linnæus cœlebs, or the bachelor; immense flocks of the females migrating, and leaving their mates during the winter. What a tact this great naturalist possessed of recording habit or peculiarity in a name!

The Mountain Finch occasionally visits us, but at no stated periods.

The Twite, a bird perfectly distinct from the linnet, is now and then shot on Munsted Heath.

The Blackcap is abundant with us: it comes on the 13th April, and stays and sings all the summer through. Nothing ever delights me more than the song of this bird. He has decidedly more compass and variety than any other English bird, except the nightingale: he begins with a soft low melodious whistle, like the voice of the nightingale heard afar off, or the whistle of a countryman at a distance, softened into melody by the surrounding hills; it comes nearer and nearer, it rises up, up, up, without any pause, louder, and louder, and louder, a continued series of varied, rich, liquid, and sonorous notes, till all at once you are astonished to find the little bird, from whose throat such surpassing melody is poured, is

sitting in a bush by your side, or on the stem of a tree close over your head.

The Nightingale accompanies the blackcap, or perhaps precedes it by a single day. I have seen or heard it on the 12th of April for many following years. The neighbourhood of Godalming has been called the valley of nightingales, and well it deserves the name: throughout the fine nights in May, there is a complete chorus of these birds; every coppice contains numbers, and every garden two or three pair: it is really glorious to listen to them in a moonlight midnight, after a showery day. There is a stile under Ockford coppice, at the back of the town, on which I have sat for hours, listening to the hundred-tongued harmony, interrupted now and then by the sharp cry of the screech owl, as on noiseless wing he wound his way along the meadows, mouse-hunting, or the harsh chatter of the sedge-bird, or the *craik, craik,* of the daker [gallinule] calling to his mate.

The Bittern is scarce here; but in one spot, a little reedy swamp near Eshing Bridge, two or three are shot every winter. It is a hard bird to put up, running excessively fast, and even standing to bay your spaniel, when overtaken; you are therefore sure of him when once on his trail, provided you are not prevented by the reeds from seeing him when he rises. The bittern is a light loose-feathered bird. A charge with which a mallard would fly away cleverly, and which a guillemot would laugh at, will rag a bittern to pieces. One reason of this may be, that he hates flying by day, and will not get up till you are close on him, and then flusters about this way and that, and seems to be uncertain what to do. I once saw one get up, a hundred and fifty yards from me, but, not seeing me, he came right over where I stood. I pulled, but missed him, after which he kept on soaring upwards, till he was completely lost in the clouds. I never heard the bittern boom; on rising, he usually gives a sharp harsh cry, like that of a grey-goose on the wing.

Imber Diver. A very fine specimen of the great imber goose, or diver, was shot, a few years back, on Old Pond: its power of diving, and the length of time it stayed under water, were wonderful: for this purpose, I find it is furnished with an immense bladder, extending the whole length of its neck, which it can inflate at pleasure, and, this being connected with the windpipe, is of course available as a reservoir of air.

The Hooper, or Wild Swan. On the same pond has been killed the hooper, or wild swan, whose grand trumpeting note I have heard while skaiting here by moonlight; and though I cannot say that in this sound there is any thing in the way

of a song, yet to me it is noble and pleasing. By the way, I would remark that I recollect nothing in Virgil, who is, and ever shall be, the poet of nature, that leads me to suppose that he considered the swan a bird of song. I will give one or two passages which occur to me at this moment, which, if not very precisely quoted, will certainly convey the poet's meaning: —

> " Ceu quondam nivei liquida inter nubila cycni,
> Cùm sese è pastu referunt, et longa canoros
> Dant per colla modos: sonat amnis et Asia longè
> Pulsa palus.
> Nec quisquam æratas acies ex agmine tanto
> Misceri putet, aëriam sed gurgite ab alto
> Urgeri volucrum raucarum ad litora nubem." *Æneid.* vii. 699.

Now, I grant the word *canoros*, by a critic disposed to make swans sing, might be translated *warbling*, *melodious*; but its true meaning is *loud*, *shrill*: but supposing the swan singers translate the word *warbling*, how, in the name of fortune, will such a translation agree with *volucrum raucarum? raucus* meaning *hoarse*, *harsh*, *jarring*, *unpleasant*.

Again, Sir, in the following passage: —

> " Haud secùs, atque alto in luco cùm fortè catervæ
> Consedêre avium; piscosove amne Padusæ
> Dant sonitum rauci per stagna loquacia cycni." *Æneid.* xi. 456.

The word *rauci* appears again, and now actually as the descriptive adjective to the substantive *cycni*. I recollect, however, one passage, which perhaps will be lugged in head and shoulders against me, if I do not first point out that it is nothing to the purpose. It is this: —

> " Namque ferunt, luctu Cycnum Phaëthontis amati,
> Populeas inter frondes umbramque sororum
> Dum canit, et mœstum musâ solatur amorem." *Æneid.* x. 189.

Here Cycnus certainly sings, but *Cycnus* is not a swan; he is a youth who was turned into a swan, because he mourned when Jupiter capsized Phaëthon, and soused him in the Po, and turned his sisters into poplar trees, as the sequel of the above quotation shows, and as is most ably set forth in the following beautiful lines of Ovid: —

> " Adfuit huic monstro proles Stheneleïa Cycnus,
> Qui tibi materno quamvis à sanguine junctus,
> Mente tamen, Phaëthon, propior fuit. Ille, relicto
> (Nam Ligurum populos, et magnas rexerat urbes)
> Imperio, ripas virides, amnemque querelis
> Eridanum implêrat, silvamque sororibus auctam:
> Cùm vox est tenuata viro: canæque capillos
> Dissimulant plumæ: collumque à pectore longum

Porrigitur, digitosque ligat junctura rubentes:
Penna latus vestit: tenet os sine acumine rostrum:
Fit nova Cycnus avis. Nec se cœloque, Jovique
Credit, ut injustè missi memor ignis ab illo.
Stagna petit, patulosque lacus: ignemque perosus,
Quæ colat, elegit contraria flumina flammis." *Met.* ii. 367.

All this is so truly ornithological, that I trust you will not object to its length; otherwise, perhaps, some of your more scientific readers might enter a *caveat* against so much *untechnical* Latin. I am, Sir, yours, &c.

Godalming, Jan. 3. 1833. RUSTICUS.

ART. V. *On the probable Number of Species of Insects in the Creation*; together with Descriptions of several minute Hymenóptera.* By J. O. WESTWOOD, Esq., F.L.S. &c.

ONE of the most evident proofs of the increased avidity with which the study of natural history has, within the last few years, been cultivated, is the great increase in works treating upon the various branches of that delightful science. An equally convincing proof (although, from its being seldom dwelt upon, it is at first sight less evident) is the immense influx of novelties which has been poured into our museums and cabinets since the days of Linnæus. It is amongst the smaller animals, however, especially in the insect tribes, that these additions have been of the greatest extent. A few remarks upon this subject may not, therefore, be deemed uninteresting, involving, as it does, the numerical extent of this department of nature.

Our great and pious naturalist John Ray ("le premier véritable naturaliste pour le règne animal," as the equally great Cuvier has styled him), in his *Wisdom of God in the Works of the Creation*, published at the close of the seventeenth century, tells us, respecting the number of British insects: — "The butterflies and beetles are such numerous tribes, that, I believe, in our own native country alone, the species of each kind may amount to 150 or more. The fly kind (if under that name we comprehend all the flying

* It must be borne in mind, that the following observations do not apply to the number of individuals, but to the different kinds or species of insects. Those who have observed "a swarme of gnats at eventide" (which, in general, consists of myriads of individuals of the same species), will at once perceive how impracticable it would be to attempt to decide the former question. The numerical variation, however, which exists in the different species of insects, opens very interesting views of nature, and is a question well worthy of the attention of the entomologist.

insects, as well such as have four as such as have but two wings, of both which kinds there are many subordinate genera) will be found in multitude of species to equal, if not exceed, both the forementioned kinds. The creeping insects that never come to be winged, though for number they may fall short of the flying or winged, yet are they also very numerous; as, by running over the several kinds, I could easily demonstrate. Supposing, then, there be a thousand several sorts of insects in this island and the sea near it, if the same proportion holds between the insects native of England and those of the rest of the world as doth between plants domestic and exotic (that is, as I guess, near decuple), the species of insects in the whole earth (land and water) will amount to 10,000: and I do believe they rather exceed than fall short of this sum." Subsequently, however, in consequence of having discovered a greater number of English moths and butterflies, he was induced to consider that the total number of British insects might be about 2000; and those of the whole earth 20,000.

Linnæus, in the 1761 edition of the *Fauna Suecicæ*, described 1700 species of insects, inhabitants of Sweden *; and, in the 12th edition of the *Systema Naturæ*, the whole number of these animals (Swedish and exotic) with which he had become acquainted amounted to about 3000.

Let us now look at the state of the science of entomology in the present day.

Mr. Stephens has given us a *Catalogue* of named British insects, amounting to 10,000; and, since the time of its publication, numerous additions have been made to the list. It was a curious coincidence, that our poet of nature, Thomson, should have hit upon this very number, in order to give some idea of the vast profusion of summer insects: and Mr. Stephens has happily adopted the lines printed below in italics as his motto: —

> " By myriads, forth at once,
> Swarming they pour; of all the varied hues
> Their beauty-beaming parent can disclose.
> Ten thousand forms! *ten thousand different tribes*
> *People the blaze.*"

Mr. MacLeay, whose general knowledge of the extent of modern collections cannot be questioned, stated, in the second part of his *Horæ Entomologicæ* (p. 469.), published in 1821, that there were certainly more than 100,000 of the annulose

* This was in his day considered so remarkable a fact, as to induce Reaumur to assert that Sweden was richer in the number of its insects than any other country in the world.

animals (nearly synonymous with the Linnæan insects) preserved in the various collections.

Messrs. Kirby and Spence, adopting a conjecture of Decandolle, that the number of species of plants may be somewhere between 110,000 and 120,000, observe, that, "as a vast number of phanerogamous plants and fungi are inhabited by several species (of insects), we may form some idea how immense must be the number of existing insects; and how beggarly does Ray's conjecture of 20,000 species, which in his time was reckoned a magnificent idea, appear in comparison!" After instituting a comparison between the numbers of British insects with that of British phanerogamous plants, whereby it appears that, on the average, there are more than six insects to each plant; these authors arrive at the conclusion that, "if we reckon the phanerogamous vegetables of the globe, in round numbers, at 100,000 species, the number of insects would amount to 600,000." If we say 400,000, we shall, perhaps, not be very wide of the truth.*

We will now, however, examine a few of the groups of insects in detail, commencing with the two Linnæan genera of the tiger beetles and predaceous ground beetles (*Cicindèla* and *Cárabus*), which are placed at the head of the Coleóptera by Latreille and his followers. In the *Systema Naturæ*, the former of these two genera comprised 14, and the latter 43, species. In the *Catalogue of Coleóptera* contained in the cabinet of the Baron Dejean, published in 1821, these two genera comprised 908 species; but, since that period, the baron has published the description of his own increased collection of these two groups, which occupy not less than six thick octavo volumes: and if we average these volumes to contain 350 species apiece (vol. i. contains 420; vol. iii., 266), we shall have more than 2000 species, or 40 times as many as were described by Linnæus seventy years ago.†

In the rove beetles (*Staphylìnus*), Linnæus described 26 species; whilst Mr. Stephens has enumerated, in his *Catalogue*, 750 British species.‡

In the lamellicorn beetles, composing the genus *Scarabæ`us*, Linnæus described 87 species: Mr. MacLeay, in 1819, stated that his father's collection comprised nearly 1800 species.

In the weevil genus (*Curcùlio*), Linnæus described 95 spe-

* I had intended to have introduced some observations upon the advantages and disadvantages resulting from the greatly increased extent of our collections; but I must defer them to another opportunity.

† Since the above was written I have received the 2d edition of the baron's *Catalogue*, just published, in which there are 2494 *Cicindélidæ* and *Carábidæ*.

‡ Dejean, *Cat.* 2d edit., gives 789 *Staphylínidæ* from various parts.

cies: Dejean, in his *Catalogue*, enumerates 1073; and Schonherr, who has devoted very great attention to this group, will shortly publish the description of the species, which will occupy three or four octavo volumes. I understand, the first volume of this work is now in the press, and that it will be published in Paris, under the superintendence of M. Boisduval. Mr. Stephens has described more than 500 British species.*

In the genus *Músca* of Linnæus, which comprises several very distinct modern families of two-winged flies, that author described 129 species. Of these modern families, I shall only refer to that of the *Múscidæ*, of which the house-fly is the type. Of this family, Meigen has described nearly 1700 European species, and about the same number (belonging, however, only to a portion of this family) have been described by Robineau Desvoidy, in his *Essai sur les Myodaires*, a quarto volume of 812 pages, many of which are extra-European. In England, there have been recorded about 700 species.

The only remaining Linnæan genus which I shall notice is the magazine-like one of *Ichneùmon*, comprising (like *Músca*) several modern families, all of which are parasitic upon other insects. In this genus, Linnæus described 77 species. Gravenhorst, in his *Ichneumonologia Europæa* (containing nearly 3000 octavo pages), describes nearly 1650 European species of genuine *Ichneumónidæ*; the majority of which will,

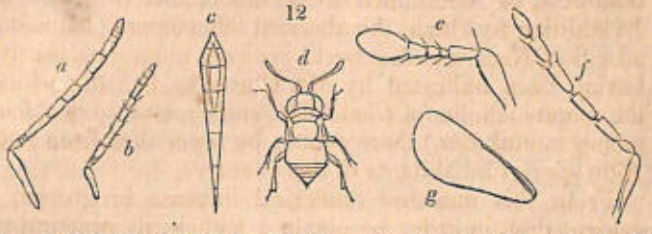
* With respect to the relative proportion of the different orders to each other, Messrs. Kirby and Spence state that the Coleóptera may be considered as forming at least 1 to 2 of our entire insect population. Now, however, that the same attention is bestowed upon the minuter Hymenóptera, Díptera, and Lepidóptera, as has been long given to the small Coleóptera, we find this calculation gives too great a share to the beetles. In Mr. Stephens's *Catalogue*, they barely reach one third of our native insects. If, therefore, we take the group of predaceous beetles (being the one which has been most recently investigated in the detail of its species with all possible advantages and assiduity by Dejean), we find that, although it did not bear, in the *Systema Naturæ*, a greater proportion to the whole order of beetles than 1 to 16, yet not only in Stephens's *Catalogue* of the English species, but also in the general *Catalogue* of Dejean, the proportion which it bears to the whole Coleóptera is about 1 to 16. And, as I have already stated that the number of species described by Dejean may be averaged at 2000, the whole number of beetles, at the above rate, would not exceed 16,000; and, by adding 4000 more for other known species, the number would not exceed 20,000: and yet Count Mannerheim, in his recent monograph upon the Staphylínidæ, states that Dejean had informed him in 1830 that he then possessed nearly 18,000 Coleóptera; and the baron himself informed me, two years ago, that he possessed between 20,000 and 21,000 Coleóptera. And by estimating the beetles, as above, at 1 to 3 of the insect tribes, we shall only obtain 60,000. What a wide field, therefore, remains to be investigated, before we shall become acquainted with the 600,000 or even 400,000 species supposed by Messrs. Kirby and Spence to exist; and how absurd does it seem to consider our systems, or rather system, as firmly established, whilst so little is comparatively known!

doubtless, be ascertained to be inhabitants of this country. In addition to which, the aberrant ichneumons (*Ichneùmones adsciti* of Nees von Esenbeck) are very numerous, nearly 200 having been indicated by Mr. Curtis as British; whilst, of the minute families of *Chalcídidæ* and Proctotrùpidæ (*Ichneùmones minùti Lin.*) there cannot be fewer than from 1000 to 1500 species inhabitants of this country.

From this immense numerical increase in groups, it is evident that, in order to obtain a sufficiently practical mode of studying them, it is essentiatl that very numerous divisions should be established, founded upon minor variations of structure; whereby the student may be saved the trouble of wading through the characters of some hundreds of species, by arriving at once at the inferior group to which his insect is referable: and it has been ascertained by practice, that it is much easier to recollect these minor groups when named, than when designated by stars, daggers, &c., after the old fashion.* It has, indeed, been objected, that, by this practice, every species was becoming a genus; but this is far from being the case: for, although many individual species exhibit such a diversity of structure as to warrant their establishment as distinct groups, yet many of these inferior groups are extremely numerous in species, some of them containing 30, 60, 100, or even 200 species (as in the restricted genus Cicindèla), the characters of which, as distinct sections, are not of higher value than those which distinguish the individual species forming distinct genera.

Fully coinciding, therefore, in the propriety and advantage of the establishment of these minor groups, I subjoin the characters of a few, founded upon different species of the very minute but highly beautiful tribe of parasitic Chalcídidæ. I have followed the general practice of giving the essential characters in Latin, in order that they may be recognised by foreign entomologists, who may be unacquainted with the English language. Some of our English authors have, indeed, lately thought fit to omit these Latin characters: a practice which appears to me to be attended with much inconvenience, inasmuch as its consequence will, in all probability, be, that our new species will be republished, by some Swedish or Russian naturalist who does not understand a word of English, with a different name; whereby still greater confusion than at present exists, will be created in specific nomenclature.

* It must be borne in mind, that I am here speaking of the practical, and not the natural, method of studying natural history.



Order, HYMENO'PTERA; Division, ABERRA'NTIA *Westw.*; Family, *Chalcídidæ* Westw.

GASTRACA'NTHUS* *Westw.*, Cleónymo Cheirópachoque affinis. Caput latum; abdomen ♀ thorace angustius, et illo fere triplo longius, ad apicem sensim acutissimum; oviductu paullo exserto (*fig.*12. *c*); antennæ ♀ tenues; articulis 3 et 4 annuliformibus; 5to quam 6to longiori, 6to—10mo brevioribus, tenuibus; articulis reliquis massam 4-annulatam formantibus, articulo priori vix majorem (*a*).

Head broad; abdomen ♀ narrower at the base than, and nearly three times as long as, the thorax, gradually narrowed to the tip, which is very acute; the ovipositor a little protruded; collar triangular; antennæ ♀ slender; 3d and 4th joints ring-shaped, the 5th longer than the 6th, which, as well as the 7th, 8th, 9th, and 10th, is shorter and slender; the remaining joints form a 4-annulated mass, which is a little longer, but not thicker, than the preceding joint.

Spec. 1. Gastr. pulchérrimus *West.* Capite cæruleo; thorace viridi-æneo; abdomine obscurè chalybæo viridique nitenti, segmento 2do subfulvo; pedibus rufis; alis anticis maculis 2 magnis fuscis.

Head blue; thorax brassy green; abdomen obscurely tinged with chalybeous and green, its second segment somewhat fulvous; legs red; each of the upper wings with two large brown spots; antennæ black, with the basal joint fulvous.

Coombe; Mr. Lewis. Length 4 lines; expansion of wings, 5 lines.

LAMPRO'TATUS† *West.*, Cheirópacho affinis. Corpus nitidissimum; caput mediocre; abdomen ♂ thorace brevius, convexum, ovatum, basi impressum; antennæ ♂ ut in Cheirópacho ♂, at longiores, filiformes, articulo 1mo multo breviori, et articulo 2do brevi (*b*); pedes omnes graciles, longitudine mediocres.

Body very shining; head of moderate size; abdomen ♂ shorter than the thorax, ovate, convex, and impressed above at the base; antennæ ♂ as in Cheirópachus ♂, except that they are somewhat longer, and not at all thickened at the tips; the first joint is much shorter, and the second is also short; all the legs in the male are slender, and of moderate length; collar transverse quadrate, narrower than the disc of the thorax.

Spec. 1. Lamp. splendens *Westw.* Aureo-viridis; antennis nigris; pedibus fulvis basi æneis.

Splendid golden-green; antennæ black; basal joint æneous; legs fulvous; femora æneous almost to the tips.

Surrey, Oxford, and Hertford. Length nearly 2 lines; expansion of wings 3½ lines.

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* Derived from the Greek, *gastēr*, the abdomen, and *akantha*, a spine; and referring to the acute abdomen.

† Derived from the Greek superlative of *lampros*, shining; from the splendour of the body.

AGONIONEU'RUS * *Westw.* Genus Encýrtum cum Eùlopho conjungens, e speciebus minutis saltatoriis formatum. An Aphelinus *Dalm.* cujus characteres non satis explicati?

Corpus breve, obtusum; alæ superiores nervo subcostali brevi, et, post conjunctionem ejus cum margine antico, breviter protenso, at in alæ discum non deflexo, sed in callositatem minutam terminato (*g*); antennæ incrassatæ, 6-articulatæ, articulo 2do quam 1mo dimidio breviore, 3tio minuto, 4to 5toque paullo longioribus, ultimo maximo ovato inarticulato (*e*); tarsi 5-articulati, pulvillis magnis; collare brevissimum.

Body short, broad, obtuse; upper wings with the subcostal nerve short, and, after its union with the front margin of the wing, running a short distance, and terminating in a small, indistinct, callous point; antennæ short and clavate, 6-jointed, the 2d joint half as long as the 1st; 3d, 4th, and 5th joints short, but gradually increasing in length; the 6th forming a large ovate inarticulate mass; tarsi 5-jointed, pulvilli large; collar very short; spur of the middle tibiæ longer than in the hind legs.

Spec. 1. Agon. basàlis *Westw.* Niger, facie abdominisque basi fulvis.

Black, with the face and basal joint of the abdomen fulvous; antennæ and legs of the latter colour; the former with the basal joint obscure in the middle; four posterior legs, with the tibiæ dusky near the base; abdomen beneath pitchy-fulvous; wings with the front margin yellow.

Oxfordshire. Length, three fourths of a line.

CHOREI'A † *Westw.* In pedum intermediorum calcaribus et antennarum articulorum numero Encýrto affinis. Corpus apterum, latum, subdepressum; caput lunatum, thoracis latitudine et margine ejus antico arcte applicatum; antennæ vix clavatæ; thorax exacte quadratus collare et scutum mesothoracium brevia transversa, scutellum mesothoracicum maximum fere quadratum, regionem totam posteriorem et centralem thoracis occupans; abdomen thoracis latitudine et longitudine, et ad basin illo arcte applicatum, inde per totam latitudinem sessile videtur, segmento 1mo maximo transverso; reliquis brevissimis, ad apicem acuminatis.

Body apterous, broad, and subdepressed; head lunate, as broad as, and closely applied to, the front margin of the thorax; antennæ slightly clavate; thorax square, of equal breadth with the base of the abdomen, which appears perfectly sessile; the first segment of which is half the length, with the sides parallel; the remaining segments are very short, and gradually becoming acute.

Spec. 1. Chor. nigro-æ'nea *Westw.* Nigro-ænea, antennis pedibusque piceis; tarsis pallidioribus (*d*).

Greenish-black, with the antennæ and legs pitchy; tarsi reddish.

Dorking; G. R. Waterhouse, Esq. Length, half a line (one twenty-fourth of an inch).

HEMIPTARSE'NUS ‡ *Westw.*, Eùlopho affinis. Differt antennis longis, in utroque sexu simplicibus et 7-articulatis; articulo 2do brevissimo, 3tio, 4to, et 5to, longitudine æqualibus, 6to quam 5to, et 7to quam 6to, paullo brevioribus, his ultimis tribus discretis et paullo crassioribus, ultimo, ut mihi videtur, inarticulato (*f*); abdomine ovato-depresso, apice acuminato; alis masculis abbreviatis, sc. vix magnitudine dimidii alarum fœminarium.

Differs from Eùlophus in the antennæ, which are longer and simple in

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* Derived from the Greek *a* privative, *gonios*, an angle, and *neuron*, a nerve; in allusion to the nerve of the wing not forming an angle at its extremity.

† From the Greek *choreia*, leaping; from the saltatory powers of the insect.

‡ Derived from the Greek *hēmisus*, half, *pteron*, a wing, and *arsēn*, male; from the small size of the wings in the males.

both sexes, and 7-jointed, the three terminal joints rather thicker than the preceding, and not soldered together; abdomen ovate-depressed, and gradually becoming acute to the tip; wings of the male not more than half the size of those of the female.

Spec. 1. Hem. fulvicóllis *Westw.* Viridis; collari et mesothorace fulvis (hujus scuto ad marginem posticum æneo); abdomine piceo-viridi, ad basin aureo-viridi, pedibus flavis, femoribus intermediis supra linea nigra, alis ♂ apice late fuscis, ♀ hyalinis, nubilâ semilunari centrali subfuscescenti.

Green; front of the thorax fulvous; abdomen pitchy tinged with green, golden green at the base, less yellow, the central tibiæ having a black line; wings of the male terminated by a large brown patch; those of the female hyaline, with an ill-defined, lunate, central, slightly dusky cloud.

Dorking; Mr. Waterhouse. Length, 1 line; expansion, ♂ 1 line, ♀ 1¾ line.

Spec. 2. Hem. Waterhoúsii Westw. ♂ obscure æneo-cupreus; abdomine obscuriori cupreo; pedibus anticis, tibiis intermediis, tarsisque intermediis et posticis, rufis; femoribus intermediis et posticis tibiisque posticis nigris; alis dimidio apicali fusco, superioribus fasciis 2-lunaribus et angustis pallidis.

Dark coppery æneous, the abdomen having a darker coppery tinge; anterior legs, intermediate tibiæ and tarsi, and posterior tarsi, red; intermediate femora, and posterior femora and tibiæ, pitchy black; wings ♂ with the terminal half dark brown, having two slender pale fasciæ running across the wings, near and parallel to the posterior margin.

Length 1¼ line; expansion ♂ 1¼ line.

I have named this conspicuous species after the indefatigable and zealous young entomologist above named, who captured it at Dorking. The antennæ are broken off at the third joint; but from the formation of the basal joints, and the shortness of the wings, I have no hesitation in uniting it in the same group with the preceding species, although differing in one or two minor particulars.

I am, Sir, yours, &c.

The Grove, Hammersmith,
Jan. 10. 1832.

J. O. Westwood.

Art. VI. *Illustrations in British Zoology.* By George Johnston, M.D., Fellow of the Royal College of Surgeons of Edinburgh.

9. Cirra'tulus Medu'sa. (*fig.* 13.)

Cl. Annélides, Ord. A'podes, Fam. Echiurées.

This singular worm is to be found abundantly in Berwick Bay. It lurks under stones, in a somewhat muddy soil, in which it forms burrows similar to those of the earthworm, and into which it retires slowly when disturbed. As yet it seems not to have been noticed on any other part of the British coast; but, when this department of natural history is more studied, it will probably be discovered to be common,

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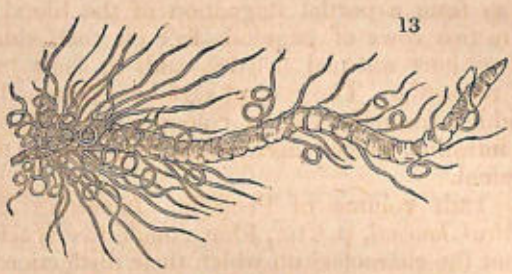


and generally distributed. Although nearly allied to the *Lumbricus cirrhatus* of Fabricius, and to the Terebella tentaculata of Montagu, I nevertheless consider it distinct from either; and a figure of it—the first which has appeared—may therefore be acceptable to helminthologists. [*Helmins, helminthos*, a worm; *logos*, a treatise.]

The body is worm-like, but it is remarkably distinguished by the numerous long filaments which rise more particularly from the anterior part, and curl around it like so many parasitical worms. These are the branchiæ, or organs through the medium of which the blood is exposed to the influence of the air, and fitted for the purposes of life.

The worm is represented of its natural size: it is about three inches long, rather less than a quill in calibre, and of a dirty brown or yellowish colour, much stained from the internal viscera. The body tapers a little towards each extremity, and is capable of extension. The mouth is naked, and terminal, placed under the first segment, which may properly be considered as the head of the animal, and which is marked on each side with a curved black line; but no eyes are perceptible. The two next rings bear neither filaments nor papillæ. From the anterior margin of the fourth, which becomes suddenly larger, arises on each side a bundle of filaments, generally more tortuous, and of a paler colour than the others, which arise from the sides of the following rings, down about one fifth of the length of the animal, and a few remote filaments are dispersed irregularly on the rest of the body. The filaments take their rise from near the back, some from the back itself, are about twenty in number on each side, worm-like, tortuous or extended, unequal in length, the shortest being placed anteriorly; but the gradation is not regular. They consist of a large central vessel carrying red blood, surrounded by a white gelatinous transparent membrane, and are consequently of a fine red colour; but this is liable to variation, for some, particularly the anterior bundles, are often quite white, and others, again, are occasionally

spotted, as from a partial stagnation of the blood in them. There are two rows of papulous feet on each side, armed with a few short unequal bristles, and, at least in a great measure, retractile. The ventral surface is flattened, marked in the middle, from the deeper colour apparently of a large vessel or intestine, which runs from one extremity to the other; anus terminal.

In the 13th volume of Professor Jameson's *Edinburgh Philosophical Journal*, p. 219., I have made two species of this worm; but the characters on which their distinction rests are obviously too slight even to constitute well marked varieties. I have therefore dropped the name of Cirrátulus fuscéscens and flavéscens, and have here adopted one which, it has been suggested, is more significant and more characteristic of an admirer of Linnæus.

Berwick upon Tweed, Sept. 18. 1832.

ART. VII. *Notice of a Lily Encrinite lately found in Mountain Limestone, brought from the Neighbourhood of Cork, Ireland.* By C. CONWAY, Esq.

Sir,

A FEW days back, a vessel brought into the port of Newport, from Cork, a quantity of limestone (mountain) as ballast; and, presuming there might be some fossils in it, I requested a mineral dealer, then in the neighbourhood, to cast his eye upon it as it was discharged, to see if there was not something in it worth preserving. In a day or two I had my attention amply rewarded by being furnished with a specimen of the lily encrinite; a drawing of which I herewith forward you, of the natural size. (*fig.* 14.) I am not certain whether I am right or wrong in my conjecture, when I fancy this to be a new acquisition. Perhaps you will have the goodness to inform me whether or not the lily encrinite has before been discovered in the British strata. Parkinson says (*Organic Remains*, vol. ii. p. 189.), "There is no part of the world in which this species has hitherto been known decidedly to exist, but in some of the states of Germany;" and in his *Outlines of Oryctology*, published ten years later than the former work (1830), he says, p. 96., "No remains of this species have been found in this island." In Conybeare and Phillips's *Outlines of the Geology of England and Wales*, I can find nothing satisfactory upon the subject. Not being in the neighbourhood of any scientific institution or public library,

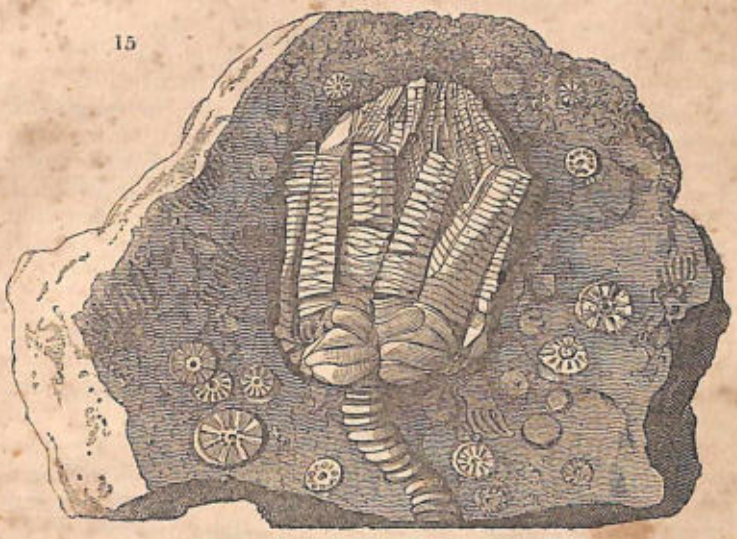
where I might be able to make further reference to other works for information *, I am induced to apply to you, from knowing your readiness to give me the requisite correction, if I am wrong in supposing it to be a new discovery, and your equal readiness to give publicity to my communication, if the discovery be novel.

Having disposed of this part of the subject, perhaps you will allow me to make a few observations on some peculiarities

* Some institutions will not permit a stranger to have access to their libraries; they will merely allow him to see their curiosities. This is the case with the Bristol Philosophical Institution; and I must confess, that, however much I have enjoyed an hour's lounge through their rooms, I have never entered the building without yearning for half an hour's inspection of some works in their library, to which I wished to refer.

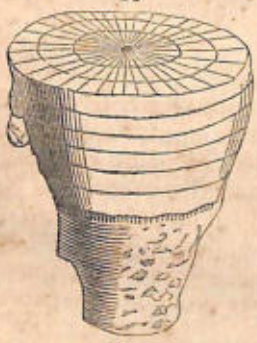
in the present specimen. In the lily encrinite, as figured by Parkinson (*fig.* 15.), the vertebral column is of the same

15



bulk throughout, without any alteration in its size as it approaches the point of attachment to the pelvis; but in the pear encrinite (*figs.* 16 and 17.), the vertebræ are seen gra-

16



17

dually increasing in diameter, until they are finally attached to the bones of the pelvis. In these specimens, however (as figured by Parkinson, and in several specimens in my own

possession, from the oolite), the division of the vertebral column into separate joints is distinctly visible, and each joint presents a uniformity of structure.*

I now beg to direct your attention to the accompanying sketch. The vertebral column, detached from the body of the animal, presents no unusual appearance. The bones of the pelvis, the scapula, the clavicle, the arms, and the fingers, present a uniformly solid and compact bony appearance: but, from the pelvis to the termination of the fossil, there is a gradually diminishing process, without any appearance of joint, and which presents a lamellar structure, quite different from the other parts. This difference of structure I have endeavoured to exhibit in the drawing. This portion of the animal appears as if formed of thin plates passing over each other, like scales on a fish, and which has suggested in my mind the idea that this portion was elastic. The tentacula are not visible in any connected form, but are thickly scattered over the stone.

The specimen has been somewhat injured in its transit; but, when we consider that the block from which it was hewn was first of all transported from the quarry to Cork, then thrust into the hold of a vessel as ballast, and lastly discharged (roughly enough, you may imagine) as useless lumber in the port of Newport, I am perfectly astonished that so fragile a body should have escaped so well; and, if I am right in supposing it to be the first discovered specimen of the lily encrinite in the British strata, I shall reckon myself singularly fortunate in having obtained possession of it.

I am, Sir, yours, &c.

Pontnewydd Works, near Newport, C. Conway.
Monmouthshire, Oct. 18. 1832.

An able geologist, to whose consideration we submitted Mr. Conway's communication, knows of no previous instance of the occurrence of the lily encrinite in the strata of Britain, nor does another geologist of eminence to whom we mentioned the fact. He consequently deems Mr. Conway's discovery of great interest to geologists, but earnestly advises us to procure a specimen of the "limestone." We have accordingly applied to Mr. Conway for one. — *Cond.*

* *Fig.*16. may appear, perhaps, to tell rather against the distinction I am endeavouring to point out. Parkinson says, "The granulated appearance at the inferior part of this specimen proceeds from the attachment of some coralloid body, which has become petrified with the encrinus." In my specimen there is no appearance of any extraneous body attached to it.

ART. VIII. *A Notice of the Fossils met with in a short Tour in Derbyshire.* By H. H. G.

By reading, in p. 51., "Brief Notices of Plants during a Tour through North Wales," I was reminded of my own short tour into Derbyshire, in the autumn of last year; during which, I was amused, and much gratified, with the opportunity of collecting many good, and some rare, fossils; and, perhaps, the notice of the localities may be useful to some of your readers who love the same pursuit; and also stimulate them to give, through the medium of your entertaining publication, similar information, in order to assist the geologist in his researches after the hidden treasures of former ages.

My first operations were commenced at Matlock, where, directly opposite to the High Tor, I found a small quantity of limestone recently quarried, and rich in organic remains; principally consisting of Prodúctæ, with a few Terebrátulæ; and, within a few yards, a lead mine, recently reopened, from which I obtained varieties of madreporal limestone, fluor spar, lead ore, &c. A little farther north, and on crossing the ferry, I met with another small quarry, called the Pig's Eye. This is but little worked, yet the scattered fragments yielded an abundant variety of Prodúctæ, some Spiríferæ, Terebrátulæ, Entrochi (oval); and, much to my surprise and satisfaction, a small tuberculated trilobite, differing from any I have seen figured, but resembling in shape that figured in this Magazine, Vol. III. p. 287. fig. 79. *a*. Farther on, through the village of Matlock, and after passing the church, the road had been recently altered, in doing which a stratum of limestone was cut through, yielding, in a small space, many specimens of Prodúctæ and Entrochi, with a few Spiríferæ and Terebrátulæ. In these three spots I collected nine varieties of Prodúctæ, some of which, separated from the matrix, had the appearance of complete bivalves; but, at the same time, leaving a large portion of the mantle on the stone, with a fine impression of the flat valve. Workmen, and others, who preserve fossils, to make a trifle by them, are too apt to be contented with the two valves, as separated from the matrix; and this seems to account for so many defective specimens of this genus being found in collections. The sizes of the Prodúctæ, at the Pig's Eye quarry, varied from half an inch to 7 in. in breadth.

There is a limestone quarry at Cromford; but few fossils are met with there, and chiefly Cyathophýllæ, with occasionally a Spírifer, a Terebrátula, a Naútilus, and a few Entrochi.

Upon the higher ground, at Middleton, are to be found,

amongst the debris of the leadworks, the screwstone, with Spiríferæ in chert, the latter fossil sometimes showing the internal spiral process; although I was not so fortunate as to meet with such a specimen: also, Prodúctæ, E'ntrochi, Madréporæ, Calamóporæ, Cyathophýllæ, lead ore, calamine, &c.

In the adjoining parish of Wirksworth are found some of the finest madreporal and encrinal limestones, and of the greatest variety, which are much used at Matlock, for polishing, and cutting into a great many beautiful ornaments. The quarries also abound with E'ntrochi, Prodúctæ, Spiríferæ, Cyathophýllæ, &c., detached from the limestone. Here I met with three specimens of an unfigured Prodúcta. Charles Hurt, Esq., of Wirksworth, has a good, although not an extensive, collection of fossils. This gentleman very politely showed me all his rarities, among which are many of the neighbourhood, including several fine specimens of Spirifer, with the internal spiral process well developed; also the Dudley fossil (trilobite) in great perfection, &c. &c.

From Matlock, I paid a visit to a quarry, at Darley Bridge. This abounds with E'ntrochi and Prodúctæ, and contains, also, some Spiríferæ. There I collected five species of Prodúctæ; also a single joint of a Pentacrinites, differing from any figured by either Parkinson or Goldfuss; and I would recommend this quarry to the attention of collectors. I also paid a visit to Mr. White Watson, at Bakewell, formerly much known as the coadjutor of Martin, and who still retains many specimens, from which Martin's figures were taken. Mr. Watson's collection is not extensive, but he has some rare Derbyshire fossils. I presented him with a small collection, from the more southern part of England; and he favoured me, in return, with a lump of chert, containing two Spiríferæ, with the spiral processes visible; and also, amongst other fossils, with a few specimens of Prodúcta hórrida, from Bolsover, in one of which the *hinge* is displayed. Chert is now being quarried at Bakewell for the Staffordshire potteries. The limestone, near Buxton, is extensively worked, but is so compact, that few of numerous fossils can be detached; they are chiefly Madréporæ, E'ntrochi, and a few Prodúctæ.

At Castleton, my time was too limited for personal research; I therefore contented myself with making collections in the shops, two of which contained many interesting specimens. The keeper of the one next to the church is an intelligent man; he knows the localities well, and I would recommend collectors to apply to him for information, in order to save time.

London, Jan. 14. 1833.

REVIEWS.

ART. I. *Catalogue of Works on Natural History, lately published, with some Notice of those considered the most interesting to British Naturalists.*

PASQUIER, Le Baron *M.*: Eloge de M. le Baron Georges Cuvier, prononcé à la Chambre des Pairs, par M. le Baron Pasquier, Président de la Chambre des Pairs, séance du 17 Décembre, 1832. Pamphlet, 8vo, of 55 pages.

Every British naturalist feels the most cordial respect for the memory of Cuvier, the indefatigable and matchless illustrator of the objects in creation. The sentiment of such respect is, in the feeling of Britons, the highest eulogy, and, we may say elegy, that can be accorded to any man; and when Britons, who are strongly imbued with national prepossessions, unreservedly and unanimously accord this respect to one of another country, as they do to M. Cuvier, it indicates that the merits of that individual transcend comparison and all detraction. As such is the feeling of Britons towards the memory of M. Cuvier, what must be that of his countrymen, the French? The mere title, as we have given it above, of a pamphlet which has been published in Paris, sufficiently answers this question.

Turner, Sharon, F.S.A.: The Sacred History of the World, as displayed in the Creation and subsequent Events to the Deluge, philosophically considered. 8vo, 554 pages. London, Longman.

The main object of this work is, "to exhibit the Divine Mind in connection with the production and preservation, and with the laws and agencies, of visible nature, and to lead the youthful enquirer to perceive the clear and universal distinction which prevails between the material and immaterial substances in our world, both in their phenomena and in their principles." This is a very laudable object; and it is truly delightful to see the happy combination of strict philosophical scrutiny with sincere religious feeling which the work presents. Of its object, therefore, no complaint is to be made, although, in the execution of that object, there are several points connected with natural history sufficiently faulty to require correction.

The above sentence is part of a review which has been sent us of this work, and which notice would occupy about six of our pages. We cannot allow more space for noticing the work than to thank H. S., the writer of the review, and to add, that he represents the author as failing, here and there, to preserve the course of his argument vigorous and clear, and as burdening his text with too many notes, so as, in effect, to bewilder the reader: he has not so written his book "that he who runs may read." H. S. complains that the author, in his natural history, "mistakes the relations of analogy for those of affinity," and that the structure, habits, and classification ascribed in the book to several animals are erroneous. H. S. notices that, in nomenclature, the author frequently puts the specific name before the generic, and cites p. 261, 262. in example. In geological speculation, H. S. differs considerably from the author; and takes occasion to describe an "interpretation of the Mosaic cosmogony," which he deems preferable to that of the author, or to any other with which H. S. is acquainted: for this we have not room. The last remark in H. S.'s review is, — "I must notice an error which could only have proceeded from inadvertency (p. 48.). 'It is inferred that from this mode of movement [that of the moon always keeping the same side towards the earth], one half of its residents never see the earth, *and the other half never behold the sun.*' The falsity of this last assertion is apparent to any one at all acquainted with astronomy."

Hodgson, Rev. *John*, M.R.S.L., Vicar of Whelpington, &c.: Memoirs of the Lives of Thomas Gibson, M.D.; Jonathan Harle, M.D.; John Horsley, M.A. F.R.S.; William Turner, M.D. 8vo, 147 pages. Newcastle, 1831.

The writer is the talented author of a *History of Northumberland*, and, consequently, addicted to antiquarian research. He has accumulated into this little volume facts and incidents appertaining to the biography of the above individuals, which all who have any curiosity respecting them will much appreciate. His memoirs of Dr. Turner (commemorated in the genus of plants Túrner*a*) will be welcome to botanists and to naturalists as well; for Dr. Turner wrote, more or less, on natural objects of every kind. He was described by Conrad Gesner as a man of the greatest learning, and deserving of the highest praise; and of him Pulteney says, "The true era of botany in England must commence with Dr. William Turner, who was unquestionably the earliest writer among us that discovered learning and critical judgment in the knowledge of plants." Of this little volume only one hundred copies have been printed.

White, Rev. *Gilbert*, A.M., &c.: The Natural History of Selborne; Observations on various Parts of Nature; and the Naturalist's Calendar. With Notes, by Captain Thomas Brown, F.L.S., M.K.S., President of the Royal Physical Society. Foolscap 8vo, 356 pages, with cuts, 3*s.*; or bound in green cloth, made to resemble Turkey morocco, and titled, 3*s.* 6*d.* Edinburgh, London, and Dublin, 1833.

This volume contains White's *Selborne* complete. It is the first of a series of uniform volumes prepared and under preparation, to be published, one a month, all at the same price, and denominated the *British Library*. The proprietors, in their prospectus, descant on the superiority of the time-tried authors, whose writings a long course of public approbation has rendered classic, over the more novel but usually more vapid productions which are now daily born into the world. Their series of volumes, accordingly, is to include only the writings of the "classic" authors of Great Britain. The volumes are to be "occasionally illustrated with plates and woodcuts." In their first volume, or White's *Selborne*, the cuts are twenty-two in number, and eight of them are respectably executed. On the writings of White, the subject-matter of the volume, we have not a word to offer, save to rejoice at this instance of their being published so cheaply as to be placed within the reach of those unable to purchase dearer editions. On the "Notes" subscribed by the editor, in illustration or amplification of the text, we have a little to say. A share of these are from original observation; but the majority of them are compiled from books. The *Magazine of Natural History* has been most liberally drawn on for the supply of a large proportion of them, and, in many instances, *without acknowledgment*. As the ground on which the *Magazine of Natural History* addresses itself to its contributors and subscribers for support is its usefulness, we deem it due to the just advocacy of its claim to regard, to neglect no opportunity to make its usefulness deservedly apparent. The present is a necessary opportunity, our appropriation of which may possibly be unwelcome to the party whose deficient sense of justice has supplied it to us. Notes, including facts derived from the *Magazine of Natural History*, and *acknowledged* to be thence derived, occur in the following pages of the volume: — 6. 26. 36, 37. 40, 41. 43, 44. second paragraph, 71. 73, 74. 121. 123. 131. 138. 153. 169. 177. 276. note †, 291. 322.: the last is quoted from Vol. IV. p. 542.; but is rendered worthless by a subsequent criticism in our Vol. V. p. 197. Facts and notices, many of them very

interesting ones, quoted from the *Magazine of Natural History without any mention of this work*, will be found included in the notes on the following pages. We couple with them, for the sake of identification, and the amusement of observant readers, the particular pages in the Magazine whence they have been derived: — 5. the last paragraph, iv. 30; 23., ii. 18, 19.; 29., iv. 165.; 41. Mr. Bree's fact, ii. 243.; 42. note †, v. 313.; 43. last paragraph, iii. 327.; 44. first paragraph, ii. 103.; 47. note *, i. 397., iii. 450.; 69., iv. 343.; 70., iv. 433.; 71. Mr. Marshall's fact, iii. 473.; 81., v. 277.; 89., i. 179.; 118., ii. 87.; 142., v. 735, 736.; 152., v. 286.; 153. first paragraph, iv. 146.; 163., iv. 337.; 164., i. 375.; 170. note *, v. 677.; 170. note †, v. 588.; 178. note †, iv. 167.; 182., iii. 456., &c.; 192, 193., v. 209—213.; 201., v. 569.; 222., iv. 558.; 223., iv. 558.; 224. note *, iii., 147.; 224. note †, iv. 147. 466.; 264. note †, iii. 376.; 267., iii. 377.; 275., iv. 480.; 276. note *, v. 90.; 284., v. 714.; 286. last paragraph but one, and on 287., iv. 145.; 288., iii. 237., iv. 433.; 306., iv. 436.; 313. note †, v. 482.; 257., i. 373.; 324., i. 379.; 328., v. 304. Besides these instances, we have blinked a few trifling ones.

Those whom this identification may amuse may also find it worth their while to compare some of the remaining notes subscribed "Ed." with those which Sir William Jardine has infused into his edition of White's *Selborne*, published in 1830.

While engaged in exploring the "notes" in Captain Brown's edition, for the recovery of our lost property, above indicated, we found it somewhat disparaged by the following minor errors. Some of our readers, who may purchase the work, will perhaps excuse our here giving them space, for the facility with which they will hence be able to correct them. The errors in the remaining notes we leave unnoticed. Page 6., vol. "i.," ii.; 26., "Mr. T. F. Loudon," T. F. of London; 26. and elsewhere, "Mr. Yarrel," Mr. Yarrell; 69., "Mr. Hog," Mr. Hoy; 73., "Rev. W. J. Bree," Rev. W. T. Bree; "Allesly," Allesley; 178., "polifolio," "polifolia; "Mr. Lees discovered the *I*ris tuberòsa near Cork," Mr. Bree did (see Vol. IV. p. 28. 438., and Vol. V. p. 197. 200.); "aralis," arabis; "polifolio," polifolia; "sascifraga," saxifraga; "aluoria," arenaria; "pinguicala," pinguicula; 182., "Mr. Bakewell," Mr. Blackwall; 220., "vidæ," viola; 267., "calendra," calendula; 275., "Allesly," Allesley; "felix, mas," filix-mas; 326., "the tuber cibarium genus of Linnæus," and the genus *T*ùber, and is the species cibarium of Linnæus; 327., "Mr. Dovanston," Mr. Dovaston, &c.

Rennie, James, M.A.A.L.S. (Professor of Zoology, King's College, London, Author of Insect Architecture, &c.) Editor: The Field Naturalist's Magazine, and Review of Animals, Plants, Minerals, the Structure of the Earth, and Appearances of the Sky. In monthly 8vo Numbers; each containing 48 pages, with cuts. London, 1833. 1*s.*

Of this work, only the second number, for February, has been sent us. The facts fresh from the "fields" which it contains occupy a much smaller portion of its space than does the information translated and transcribed into it from books. The quality and quantity of both kinds are, however, such as to render the number not dear at a shilling.

Gould, John, F.L.S.: The Birds of Europe; dedicated, by permission, to the President and Council of the Zoological Society of London. In Parts, imperial folio, each containing 20 plates. 2*l.* 10*s.* plain; 3*l.* 3*s.* coloured.

Parts 2. and 3. of Mr. Gould's *Birds of Europe* are now before us, and bear evident proof of increasing excellence as the numbers proceed. The first part of this work, which we noticed last year (Vol. V. p. 535.), gave promise of improvement from practice; and the author, and those associated with him in the different departments of the undertaking, have fully realised our expectations. The figures, beautiful and varied, are drawn with great truth and knowledge of the subjects, the colouring is natural, and the different landscapes, with their rocks, water, trees, and plants, are put in with good taste and great effect. Independently of the high pictorial merit this work exhibits, it is not less interesting and valuable to the admirer of the endless productions of nature for the novelties, European as well as British, with which each succeeding portion is enriched. The azure-winged magpie, figured with great delicacy and beauty, has been made known as a European bird by Wagler, but is not included in the *Manuel* of Temminck. This bird is found in Spain, where it frequents bushes and willow groves, and, like our own common species, is remarkable for its impudence and clamour. The blue-throated warbler and the white-bellied swift are recent additions to our British catalogue; and a new species of *Régulus*, lately discovered in Cambridgeshire by the Rev Mr. Jenyns, which very closely resembles our golden-crested wren, is also figured, and the differential characters rendered more obvious by the judicious placing of both birds on the same plate. The figures of the wagtails are excellent, exhibiting the characteristic elegance

of these birds; and a new European species, hitherto overlooked, has been clearly made out.

Among the most perfect representations we might characterise the bee-eater (a beautiful plate), the turtle dove, pintailed grouse, pine grosbeak, waxen chatterer, long-legged plover, and blackcap. The feathering of the little bustards is admirably portrayed; the gerfalcons have all the natural appearance of this type of the falcons; and the European sparrows exhibit the confidential familiarity of our metropolitan old acquaintances.

If we now mention what to us appears to detract in a slight degree from the general excellence of this work, we do so from a motive that we are sure the author will appreciate, and from a sincere desire to do him service. There is, occasionally, though rarely, a slight appearance of stiffness in the drawing of some of the figures, and the tone of colouring, in one or two instances, is too uniform. These are but slight blemishes in the general beauty of the work, and are only pointed out that they may be avoided.

The Birds of Europe may be truly considered as a national work, and deserves patronage of the highest order. It is produced under a combination of circumstances not likely to occur again. We doubt if this work will ever be equalled, and never expect to see it surpassed.

Anon.: A Systematic Catalogue of British Birds; intended as a Guide to the Ornithological Department of the Birmingham Museum of Natural History. 8vo. July, 1832.

We notice this pamphlet of seven pages for the sake of stating that it shows the rare species in the museum to be, of land birds, the osprey (Fálco *Haliæ*ètus), Tengmalm's owl (Strix Téngmalm*i*), golden oriole (Oriòlus Gálbula), rose-coloured pastor (Pástor ròseus), bee-eater (*Mè*rops Apiáster), wood shrike (Lànius rùfus), pine grosbeak (*P*yrrhùla enucleàtor), and the great bustard (*O*tis tárda). Of the water birds, the rarest in the collection are the ibis (*I*bis falcinéllus), the roseate tern (Stérna Dougálli), the burgomaster (*L*àrus glaúcus), and the little auk (*U*ria Alle). The catalogue "is arranged on the plan of M. Temminck's valuable *Manuel d'Ornithologie*, with the improvements suggested by Mr. Selby in his *Illustrations of British Ornithology*."

Audouin, M. *Victor*: Lettres pour servir de Matériaux à l'Histoire des Insectes. Première Lettre, contenant des Recherches sur quelques Araignées parasites des Genres Ptéropte, Caris, Argas, et Ixode; addressée à M. Léon

Dufour, Correspondant de l'Institut. Extracted from the *Annales des Sciences Naturelles.*

The pages of the French periodical *Annales des Sciences Naturelles*, have recently been enriched with numerous very valuable papers upon various annulose animals. Among these contributions the crustaceous memoirs of Audouin and Milne Edwards; the arachnidous descriptions of Léon Dufour, the orthopterous classification of Serville, and the admirable paper of Duges on the flea, are especially worthy of notice. M. Audouin, one of the editors, has also recently commenced the publication of a series of letters upon the Annulòsa, which promises to be of great interest, and of which the first has appeared with the above title, and which is very worthy of the great and well-known talents of its distinguished author.

In this memoir M. Audouin has collected the statements of various authors (including those of our countryman Baker) respecting the *Acari* which infest different bats: but, from the vague descriptions given by some of the authors cited, M. Audouin has not thought it prudent to attempt a scientific description of the different species without more precise information. They all, however, appear to be referable to the genus Pteróptus of Dufour, having eight legs.

M. Audouin then describes, with great precision, another acarideous parasite upon the *Vespertílio Pipistréllæ*, under the name of *Argas Pipistréllæ*, but which M. Latreille has more recently stated to belong to his genus *Càris*, having only six legs.

A similar detailed description is also given of the parasitic Ixòdes of the hedgehog, which M. Audouin erroneously considers to be new, naming it Ixòdes *Erinàcei*, but which Dr. Leach had long previously described in the *Linnæan Transactions*, under the name of Ixòdes hexagònus. Some interesting notes have been published upon this species, in the first number of the *Entomological Magazine*, by one of our most zealous young naturalists, W. Longman, Esq.

Two other species of the same genus are also described: Ixòdes trabeàtus *Aud.*, found upon grass; and a species which M. Audouin doubtingly considers to be the Ixòdes redùvius of De Geer, and which was also found upon grass.

The descriptions of these insects are made in the true spirit of one imbued with a love of the science of natural history for the sake of herself alone, and which is so widely different from that superficial style which has of late become too prevalent among us.

The memoir is illustrated by admirable magnified figures of the insects, and of their essential organs.— *J. O. W.*

Marshall, Henry (Deputy-Inspector General of Army Hospitals): Contribution to a Natural and Economical History of the Coco-Nut Tree. Pamphlet, 8vo, 30 pages. Carfrae, Edinburgh; Longman, London; 1832.

This is the most comprehensive and perfect history of that grand and so variously and extensively useful plant, the coco-nut tree, which has ever been published. The author modestly calls his book but a "contribution" to the history of this plant; but, after the occupation of thirty-three octavo pages in detailing matters of fact (except some philological speculations in p. 16. and 17.) appertaining to it, it is not easy to conceive that much more can remain to be to told respecting it that the world generally might wish to know.

ART. II. *Literary Notices.*

NATURALIST's Library: conducted by Sir William Jardine, Bart., F.R.S.E., F.L.S., &c. Vol. I. will appear early in March. Size of the Waverley Novels. Ornithology: — containing the Natural History of Humming-Birds, to form two volumes, with 35 plates in each, engraved on steel by W. H. Lizars, and coloured from nature in the most careful manner; with descriptions and numerous woodcuts, exhibiting the anatomy of the birds, peculiarities of structure, &c. The first volume will also contain a portrait and life of Linnæus, written expressly for the work; it being a part of the plan of the proprietors to give portraits and short biographical sketches of distinguished naturalists. By Sir William Jardine, Bart.

Introduction to Geology; by Robert Bakewell. 8vo; 4th edition, greatly enlarged; with numerous plates and cuts.

Geology of the South-East of England; by G. Mantell, Esq., F.R.S. L.S. G.S. &c. 8vo, with plates.

Dr. Arnott's Elements of Physics, or Natural Philosophy; written for universal use, in plain or non-technical language. 5th edition. Vol. I. and Vol. II. Part I.

Philosophical Conversations; in which are familiarly explained the effects and causes of many daily occurrences in natural phenomena. By F. C. Bakewell. 12mo.

SHORT COMMUNICATIONS.

BIRDS. — *The Kite, a Fishing Bird.* — Sir, As it has never come under my observation to witness, or, indeed, to have heard, that the habits of this bird so generally dispose it to take its prey from the water, as the under-mentioned facts will show, I have sent you my remarks on the subject. Since I have been a resident at this place, at different times, for several years past, I have remarked, from the windows of the hotel which I inhabit, and which look directly on the river Loire, birds of the kite kind constantly, daily I may almost say, coming from the opposite forest, to fish in the river. This they seem to do with much success, seldom appearing to miss their prey, in plunging into the water, as almost universally they go off towards the forest after having done so. The river being wide, and as they generally keep to the forest side of it, I cannot always see the kind of prey which they take; but, when the river is low, and the sand-banks appear in it, I have then often seen them settle thereon, devouring the fish they have taken. Mr. Waterton's remarks (Vol. V. p. 239.) upon the error of those who suppose that birds of prey usually soar aloft, when looking out for their prey, is most forcibly just with respect to these birds, which, when looking out for prey in the river, never fly high, but quite the contrary; though, at other times, when amusing themselves in their playful or amatory flights, and over the river, they soar so high, as to appear scarcely larger than swallows. I shall finish these remarks with saying, that they are not the observations of a single day, or more, but made at various times, during several years' residence at this place. — *H. B. Blois, June* 1. 1832.

P. S. I have said, at the beginning of this paper, that I constantly see kites coming from the forest to fish in the river. I ought to say a kite. I never saw more than a single bird fronting my windows; but, lower down, I have remarked another doing the same thing; and so on. — *H. B.*

One word more. The ash-coloured falcon, a very common bird here, hunts for its prey at not more than a foot or two from the ground. I see them constantly at it. — *H. B.*

The Pride of Colour in Swans. — Some years since, I visited Malmaison, the delightful retreat of the Empress Josephine. I sat in the homely arm-chair, at the still more homely table

on which Napoleon wrote the decrees on which depended the fate of empires; the slightest object possessed a secret charm, even the notches cut in the edge of the table with a penknife, where the arbiter of Continental Europe debated within himself the "to be or not to be;" the destiny of a kingdom; the fate of hundreds of thousands of his fellow-men. I will not describe the grounds of this little paradise, nor the botanical amphitheatre where Josephine listened with delight to the lectures on vegetable physiology by M. Mirbel, and the other professors attached to her service. The saloon, long untenanted, already bore the vestiges of the ravages of time: the plants testified that the vivifying spirit of their mistress was no more. On the canal sailed, in sullen isolated pride, the majestic black swan, the "rara avis" of Juvenal. He had lost his mate; his offspring had been transported to Munich. It had been attempted to console him, by presenting him with the most beautiful white female swan that could be procured, but he would not be comforted: her embraces revolted his pride, he considered it would be a *mésalliance* to consort with a being on whom nature had not lavished the beauty of sable plumes. The gardener informed me that he would not suffer her even to approach him, or come into his sight; and, in fact, we found her on the turn of the canal, at the distance of two hundred yards from the mate who despised her snowy charms. I visited Malmaison some time afterward, and found the sable monarch still a widower, faithful to his first love, and still refusing the consolation of beauty, because her colour varied from his own. What a lesson for man! — *J. Byerley. London, April* 29. 1832.

Nests of Bantam Fowls in the Holes of Walls. — In the old and ivy-mantled walls near my house, within the grounds of the once magnificent abbey of Bury St. Edmunds, are several deep holes, in which my fowls lay, and hatch their young. This appears somewhat remarkable, as they were supplied with every accommodation in a snug hen-house, near the spot, and their nests are now upwards of 15 ft. or more from the ground. I should observe that they are fleet on the wing, and of the sort generally called the partridge bantam fowl, of a ginger colour, and without feathers on their legs; and are preferred in Norfolk to hatch and bring up young partridges during the mowing season. I could, by encouragement, induce the tame pigeon to breed in similar situations, but deem this not desirable, as the loss of old mortar, of which they partake to digest their food, or might displace to accommodate their nests, would contribute to expedite the destruction of these ancient

relics. Yours, &c. — *N. S. Hodson. Bury St. Edmunds, May* 8. 1832.

Eggs.—It appears, from official statements, that the eggs imported from France amount to about 60,000,000 a year; and supposing them to cost, at an average, 4*d.* per dozen, it follows, that the people of the metropolis and Brighton (for it is into these ports they are almost all imported) pay the French above 83,000*l.* a year for eggs: and, supposing that the freight, importers' and retailers' profit, duty, &c., raise their price to 10*d.* per dozen, their total cost will be 213,000*l.* The duty, in 1829, amounted to 22,189*l.* (*M'Culloch's Dictionary of Commerce*, p. 515.)

Little Bustard (*Otis Tètrax* L.). — A specimen of this rare bird was shot on Berry Down, in the parish of Lanreath, among the heath, Sept. 23. 1831. Its weight was 1 lb. 14 oz.: length from bill to tail, 18 in.; to the toes, 19½ in.: expanse of wings, 2 ft. 11 in. The plumage was such as is figured by Bewick, and described as that of the female, having no black, or band of white, about the neck; yet, on dissection, it proved to be a male. As a remark similar to this has been made before, it becomes a question whether, in fact, the male, after moulting, does not assume the plumage of the female? — *J. Couch. Polperro, Cornwall, July*, 1832.

A Pair of Ferruginous Ducks (*Anas rùtila* L.), by far the rarest of the British genus *Anas*, out of a flock of five, was shot on Otmoor Common, a few miles from Oxford, in March last, by Mr. Forrest of the High Street. Of this bird, Latham says, "One was killed in Lincolnshire; and Mr. Pennant has received it from Denmark." Linnæus, in his *Fauna Suecica*, says, it is sometimes, but seldom, met with in Sweden; and Temminck informs us that it is found in the eastern parts of Europe, in Persia, India, and also in Africa. He adds that it builds its nest, in Russia, in the holes of rocks, sometimes in the hollows of trees, or in the deserted holes of otters and other animals, along the banks of rivers, and lays eight or nine white eggs; and this is, I believe, all that has ever been known respecting it. The following is the description taken of the male specimen by Mr. Forrest and myself, the morning after it was shot. I have sent it because that of Bewick and Montagu is confessedly imperfect: — Length, 19⅜ in.: head, neck, cheeks, throat, and flanks, of a bright ferruginous chestnut; on the chin was a spot of dirty white: belly, under tail coverts, speculum or beauty-spot, whitish: back, scapulars of a dark-brown finely speckled with ferruginous, and slightly tinged with olive; tertials, dark olive green; tail, cuneiform; tail feathers, 14 in

number, dark-brown; rump, dusky ferruginous; the outer shafts of the first four primaries, brown; inner shafts, dirty white; remaining primaries, white; the outer shafts tipped with dark brown; secondaries, white tipped with dark brown; greater wing coverts dark olive-brown; lesser wing coverts, light ferruginous; irides, yellow; bill and feet, dark lead-grey: in shape and size closely resembles the Garganey duck (*Anas Querquédula L.*). The female is somewhat smaller than the male, and her plumage is of a duller cast. — *Perceval Hunter. Oxford, July* 2. 1832.

Services of the Rook (*Córvus frugílegus* L.) *to Man, and a Notice of the Prejudice prevailing against it.* — A strong prejudice is felt by many persons against rooks, on account of their destroying grain and potatoes; and so far is this carried, that I know persons who offer a reward for every rook that is killed on their land; yet so mistaken do I deem them, as to consider that no living creature is so serviceable to the farmer, except the live stock he keeps on his farm, as the rook. In the neighbourhood of my native place is a rookery belonging to Wm. Vavasour, Esq., of Weston, in Wharfdale, in which it is estimated there are ten thousand rooks, that 1lb. of food a week is a very moderate allowance for each bird, and that nine tenths of their food consist of worms, insects, and their larvæ; for, although they do considerable damage to the fields for a few weeks in seedtime and a few weeks in harvest, particularly in backward seasons, yet a very large proportion of their food, even at these seasons, consists of insects and worms, which (if we except a few acorns [and walnuts] in autumn) form at all other times the whole of their subsistence. Here, then, if my data be correct, there is the enormous quantity of 468,000lbs., or 209 tons, of worms, insects, and their larvæ destroyed by the birds of a single rookery; and to every one who knows how very destructive to vegetation are the larvæ of the tribes of insects (as well as worms) fed upon by rooks, some slight idea may be formed of the devastation which rooks are the means of preventing. I have understood that in Suffolk, and in some of the southern counties, the larvæ of the cockchafer are so exceedingly abundant that the crops of corn are almost destroyed by them, and that their ravages do not cease even when they have attained to a winged state. Various plans have been proposed to put a stop to their depredations; but I have little doubt that their abundance is to be attributed to the scarcity of rooks, as I have somewhere seen an account that rooks in those counties (I have not been in them) are not numerous, either from the trees

being felled in which they nestled, or that they had been destroyed by the prejudiced farmers. I am the more inclined to be of this opinion, because we have many rooks in this neighbourhood, where the cockchafer is not known as a destructive insect; and I know that insects of that class and their larvæ are the most favourite food of the rook.

I will mention another proof of the utility of the rook, which occurred in this neighbourhood many years ago: — A flight of locusts visited Craven, and they were so numerous as to create considerable alarm among the farmers of the district. They were, however, soon relieved from their anxiety; for the rooks flocked in from all quarters by thousands and tens of thousands, and devoured them so greedily that they were all destroyed in a short time. Such, at least, is the account which is given; and I have heard it repeatedly mentioned as the reason why the late Lord Ribblesdale was so partial to rooks. But I have no means of ascertaining how far this is true, except general report.

It was stated in the newspapers, a year or two back, that there was such an enormous quantity of caterpillars upon Skiddaw, that they devoured all the vegetation on the mountain, and people were apprehensive they would attack the crops in the enclosed lands; but the rooks (which are fond of high ground in the summer), having discovered them, in a very short time put a stop to their ravages. — *T. G. Clitheroe, Lancashire. June* 30. 1832.

Mr. Waterton, in his valuable essay "on the supposed pouch under the bill of the rook" (Vol. V. p. 512.), incidentally shows that the rook is a very extensive destroyer of insects; and he would doubtless greatly gratify our readers would he purposely express his opinion on the merits and demerits of this bird. An extract from the *Essex Herald* newspaper has long lain by (the date of the year has not been preserved, but was probably 1827), which expresses sentiments so apposite to those of T. G., that we have no doubt of their being deemed worthy of the space they will occupy. — *J. D.*

Utility of preserving Birds on Farms and in Orchards. — An extensive experiment appears to have been made in some of the agricultural districts on the Continent, the result of which has been the opinion that farmers do wrong in destroying rooks, jays, sparrows, and indeed birds in general, on their farms, particularly where there are orchards. That birds do mischief occasionally among ripe corn there can be no doubt; but the harm they do in autumn is amply compensated by the good they do in spring, by the destructive havoc they make among the insect tribes. The quantity of

grubs destroyed by rooks, and of caterpillars and their grubs by the various small birds, must be annually immense. Other tribes of birds, which feed on the wing, as swallows, swifts, and martins, destroy millions of winged insects, which would otherwise infest the air, and become insupportably troublesome. Even the titmouse and bullfinch, usually supposed to be so mischievous in gardens, have actually been proved only to destroy those buds which contain a destructive insect. Ornithologists have of late determined these facts to be true; and parish officers would do well to consider them, before they waste the public money in paying rewards to idle boys and girls for the heads of dead birds, which only encourages children and other idle persons in the mischievous employment of fowling, instead of minding their work or their schooling. But to return to the experiment alluded to: on some very large farms in Devonshire, the proprietors determined, a few summers ago, to try the result of offering a great reward for the heads of rooks; but the issue proved destructive to the farms, for nearly the whole of the crops failed for three succeeding years, and they have since been forced to import rooks and other birds to re-stock their farms with.

Of late years the extensive destruction of the foliage and young fruit in orchards by a species of caterpillar, has excited the attention of the naturalist, and it has been found to have arisen from the habit of destroying those small birds about orchards which, if left unmolested, would have destroyed or kept down these voracious insects.

The splendid orchards of Mr. Curtis [proprietor of the celebrated *Botanical Magazine*] of Glazenwood, near Coggeshall, in Essex, were last summer almost desolated by vermin of this sort. There was, indeed, in June, scarcely one leaf left on five or six hundred apple trees, so great was the destruction; it was really quite a lamentable object to see such fine fruit trees so destroyed. Mr. Curtis observed that he was so convinced of the utility of preserving the birds, from past experience and enquiry, that he would not permit one of his servants so much as to scare them away.

If facts be considered, they will point out the propriety of only scaring sparrows, &c., from corn when they are actually eating it when ripe, and of preserving birds through the winter, rather than destroying them. Of all birds, game is perhaps the most destructive to ripe crops; but even some sorts of game destroy grubs in other seasons. (*Essex Herald*, Nov. 18.)

Our correspondent, Mr. Main, remarks, in the *Gardener's*

Magazine, Vol. VIII. p. 498., that "turnips and other plants of the cabbage tribe, are subject to excrescences at their root part, called anbury, and fingers and toes. These arise from the punctures of an insect called Nédyus contráctor. I have often seen partridges, magpies, crows, and, if I mistake not, even rooks, doing the useful service of preying on the larva of this insect." — *J. M.*

A tame Godwit destroyed by a wild Raven. — In the late botanic garden, at Bayswater, of the deceased Comtesse de Vandes, a godwit was kept, which ran about at will among the growing plants in the open garden. On May 14. 1832, a raven from off the trees in Kensington Gardens, close by, descended into the garden, and killed the godwit. After it had pecked a hole into the side of the bird's body, near to the junction of the neck with the body, it was observed, and frightened off. It subsequently made several attempts, but very cautious ones, to resume its meal; but unsuccessfully, through the vigilance of one of the gardeners, armed with a gun, who sought to wreak vengeance on the raven. — *J. D.*

Reasoning in Birds. (p. 68. 81.) — J. D.'s mention (p. 68.) of the name of Ralph calls to my recollection a raven and a sea-gull, both of which were gifted with the name of Ralph. The former I became acquainted with at an inn in Hedon, Yorkshire, to which it was an *attaché*; and the latter was a frequent and constant guest at the George Hotel at Castleton, Isle of Man, then kept by a landlord of the name of Downes.

Ralph the Raven, at the White Hart Inn at Hedon, was a curious bird. I never heard such an excellent mimic of the voice of humanity, even among parrots and starlings. Poor Ralph could call the "ostler" as distinctly as any stable-boy. Among his mimicry may be mentioned his own name, of which, if frequent repetition were a proof, Ralph was not ashamed. Then Ralph could call "a coach," whether it were wanted or not. The note of the cuckoo was admirable, but it seemed to be a considerable effort; more so, apparently, than all the rest besides: but so well was that note imitated, that I have been frequently deceived, although aware of Ralph's powers of imitation. Let it not be imagined, however, that Ralph's attainments in learning went no farther than monosyllables, or a conjunction of two now and then: he could say, moreover, "What's the matter with you?" as plainly as I could repeat it: and, though it must be confessed that Ralph generally repeated the lesson he had learned, as schoolboys do, merely for the sake of repetition, our raven's observation on one occasion was very apposite. A baker had been plaguing poor Ralph, and, for this annoyance, Ralph

retaliated by biting the baker's finger, and that so sharply that a copious flow of blood followed; and, while the baker danced about with pain, Ralph seemed to chuckle over his triumph, and, as if in derision, frequently exclaimed, "What's the matter with you?" In some mad freak, the ostler gilded poor Ralph's beak, and the bird, not relishing the painful reflection, in his endeavours to scratch off the gilding, so injured his eyes that blindness ensued. Before this event, Ralph would take an occasional excursion to his wild companions, and as constantly return, sometimes accompanied with one or two others, whom he had invited to his domicile at the inn. Poor Ralph, like Æsop's raven, was not without his share of vanity, as he seemed to take pleasure in displaying his oratorical powers before strangers.

The history of Ralph the Gull, though he could not speak with human voice, is not less interesting as an ornithological anecdote. It is now many years since I saw this bird. Downes told me he had been a regular visitant for fourteen years. To him, Ralph was tame, but wild to the rest of the family. The return of the bird for his periodical meals, received from the hand of the landlord, was as measured in point of time as if Ralph had kept a chronometer, and this diurnal visit would be maintained, *con amore* [friendlily], for months together. Sometimes this gull would be an absentee for weeks at intervals; and, at these periods, he was discovered to be on a visit to an individual who occupied a small farm on that off-set islet called the Calf of Man. I have frequently seen Ralph adventure himself into the inn to be fed by Downes, and then return to his oceanic feathered friends. The subject of our narrative, however, was a monopolist, as he always returned singly; or, perhaps, his representations were not believed, or not relished, by his companions. If Mr. Downes were absent from his house, Ralph, after repairing to the inn and reconnoitring, would fly off to the landlord's garden, at a small distance from Castleton, and the situation of which he was perfectly acquainted with. Occasionally, Ralph's excursions in pursuit of his master were predatory, as he did not scruple to pounce upon and chuckle up an unfledged chicken now and then, by the way, unmindful of the maledictions of some frugal housewife. The interview between Downes and his feathered friend, on his return after an occasional absence of some days (for Ralph the Gull was a voyager), was really amusing. Ralph would suffer himself to be caressed on the plumage, and then clap his wings by way of rejoicing. Downes would begin the apparent conversation with "Now,

Ralph, tell me your adventures:" then the obedient bird would bend his head "askance," and make a confused noise with his bill, as if recounting his travels, while Downes would stoop as if to listen. A stranger once asked "mine host" what the gull was saying to him: Downes answered, that "he had just arrived from Whitehaven, and brought him a message." Whether believed or not, I cannot pretend to say. The House of Keys (the legislative assembly of the Isle of Man) passed an act which entailed a penalty of *5l.* on the destruction of a gull, lest poor Ralph might fall an indiscriminate victim. — *J. Murray. Jan.* 20. [See the next page.]

Ralph the Raven's ejaculation of "What's the matter with you?" to the baker he had wounded and made to bleed, reminds me of a parrot kept, perhaps ten years ago, by the Rev. G. R. Leathes, at Shropham Hall, Norfolk. Poll the parrot was out of its cage, and recreating on the lawn, when a playful puppy belonging to the house came in contact with it. An abundance of sallyings and dallyings and conflicts took place between them, to the diversion of all who observed them, till the parrot had become tired of the exhaustless sportiveness of its more youthful playmate, the puppy. The parrot, to free itself from farther assailance, flew to the top of its cage, or upon a window sill, and then and there, in most complaisant pity, exclaimed, "Poor old dog!" a remark sufficiently apposite to induce the idea that the parrot's utterance of this sentence, at this time, was the result of a degree of reasoning. I did not witness this fact myself: it was told me by one who did, Mr. George Woolsey. — *J. D.*

Common Sea-Gull. — I have often been struck with the familiar and playful habits of the sea-gull. It will bear confinement in gardens without attempting to escape, although at full liberty to do so, returning from its occasional flights to its place of imprisonment. There are several specimens in the Zoological Garden in the Regent's Park; and, on a fine summer's day, these gentlemen may be seen very gravely amusing themselves in picking up the pebbles and dropping them on each other's toes! This I have frequently observed. Coleridge somewhere, in his wild and magical "Rime of the Antient Mariner" says of the albatross, whom he introduces as a bird of omen, —

> "At length did cross an albatross,
> Thorough the fog it came;
> As if it had been a Christian soul,
> We hail'd it in God's name.
>
> "It ate the food it ne'er had eat,
> And round and round it flew;

The ice did split with a thunder-fit,
The helmsman steer'd us through.

" And a good south wind sprang up behind,
The albatross did follow;
And every day, for food or play,
Came to the mariner's hollo."

Had this albatross been a sea-gull, the above might have been fact as well as fancy. During the heavy gale which blew from the eastward in the end of January, 1831, I crossed from the coast of Flanders to Dover. About mid-channel, three gulls made their appearance, and kept constantly with us till we reached the roads. One of the passengers wished to shoot at them; but the captain of the packet objected, and said " they wanted to be fed, and came on purpose." Accordingly, much to the annoyance of his companions, we sent one of the ship-boys to the cook for some meat, and, throwing portions of the fat to the birds, were much pleased to see that every morsel was taken, sometimes while passing through the air, and sometimes on the surface of the water, very near to the paddle-wheels of the steamer. Neither the noise of the engine, nor the rushing of the water, nor the presence of the people on board, alarmed the birds; but they kept pace with our progress, and constantly flew within a few feet of the vessel, till a snow squall came on, and, it blowing tremendously hard, we parted company nearly under the land.

In the Isle of Man the gull is looked on as sacred; and there used to be, so late as 1820, when I remember an instance of the kind, a fine of 10*s.* levied on all who killed one. This veneration for the bird arose from self-interest; for, as herrings are the staple commodity of the island, the sea-gulls, who are the pilots of the herring fleet, are properly protected. The gulls invariably hover over a shoal of herrings, and so direct the fishermen where to cast their nets. But I must add no more, lest your readers may think I intend to *gull* them. — *W. B. Clarke. East Bergholt, Suffolk, March 5.* 1831.

Sandpipers breed about Clitheroe, Lancashire. — Sandpipers breed with us; and I this year started an old one from her nest, at the root of a fir tree. She screamed out, and rolled about in such a manner, and seemed so completely disabled, that, although perfectly aware that her intention was to allure me from her nest, I could not resist my inclination to pursue her, and, in consequence, I had great difficulty in finding the nest again. It was built of a few dried leaves of the Weymouth pine (*Pinus Strobus L.*), and contained three young

ones, just hatched, and an egg, through which the bill of the young one was just making its way; yet, young as they were, on my taking out the egg to examine it, the little things, which could not have been out of their shells more than an hour or two, set off out of the nest with as much celerity as if they had been running about a fortnight. As I thought the old one would abandon the egg if the young ones left the nest, I caught them again, and covering them up with my hand for some time, they settled down again. Next day all four had disappeared.

Montagu says, "It is probable many of the sandpipers are capable of swimming, if by accident they wade out of their depth. Having shot and winged one of this species as it was flying across a piece of water, it fell, and floated towards the verge, and as we reached to take it up, the bird instantly dived, and we never saw it rise again to the surface: possibly it got entangled in the weeds, and was drowned." I quote this remark, because the same thing has happened to myself. I winged a sandpiper; and, on going to take it up, it fluttered into the water, and dived, but never rose again to the surface that I could perceive, although I watched long and attentively for it. In this instance, the sandpiper could not have been entangled by weeds, inasmuch as the bottom of the river was covered with gravel, and not a weed was growing there. Whether the bird laid hold of the gravel at the bottom with its feet, or how it managed, I cannot tell; nor have I ever been able to account for it. — *T. G. Clitheroe, Lancashire, June* 30. 1832.

Green Sandpiper (Tótanus *óchropus*). — Is the green sandpiper a resident in Great Britain, or only a periodical visitant? With us it is only found in July, August, September, and, I believe, October. It has been shot in May at Newcastle, and I have observed it at Capel Curig in June. It seems by no means rare there: there were at least two pair constantly about the lake, near the inn, and I saw others near the entrance to the Pass of Llanberris: doubtless they breed there, though I was unable to find their nest. Dr. Fleming tells us they are found from August to April. If this be true, they are resident here; but as I have never heard of an authenticated instance of their being found here between October and May, I am disposed to consider them as summer visitants, breeding in the mountainous parts of the country, and descending to the lower parts at the period of their autumnal migration, or remaining there a few days on their first arrival. Have any of your correspondents ever observed this bird here in winter, or rather between September and May? If no one

has, it will confirm my opinion; if they have, what Dr. Fleming says of it is erroneous. How odd it is for us not to know whether so conspicuous a bird be a summer or winter visitant, or a resident here! I should particularly value the opinion and observations of one whom I admire, as the author of the *Wanderings in America.* — *E. Doubleday. Epping, Sept.* 29.

Locality for the Kingfisher. — One of the habitats of this bird is Cauford, Dorset, on the banks of the Stour, where it may be frequently seen in the autumn. — *W. B. Clarke. Parkstone, Feb.* 4. 1833.

The Rose-coloured Ouzel, the Hoopoe, and the Great Bustard, in Suffolk, in 1832. — A rose-coloured ouzel (Pástor ròseus *Tem.*), was shot in a garden at Woodbridge, in this country, during the month of July; and two hoopoes (*Upupa Epops L.*) were killed near Harwich about the middle of September. A nest of the great bustard (*Otis tárda L.*) was discovered this season on an extensive warren, in the neighbourhood of Thetford: the female, I have much pleasure in stating, took her young off in safety; and on the same heath a male bird and two females have been seen together very recently. — *J. D. Hoy. Stoke Nayland, Suffolk, Nov.* 20. 1832.

I have previously heard of the greater bustard's occasionally breeding in corn fields at Icklingham, Suffolk, on an estate belonging to some one branch of the family of ——— Gwilt, Esq., of that place. I believe there is a good stuffed specimen of a greater bustard in the collection of George Creed, Esq., surgeon, Bury St. Edmunds; but I know not of which sex, nor from what locality obtained. — *J. D.*

The Short-eared Owl (*Strix brachyòtus* Lath.) *breeds in the County of Norfolk.* — This bird has, I believe, been long known to breed sparingly in the north of Scotland and its islands; and the northern counties of England have been considered the most southern limit of its summer residence. I am acquainted with two localities in the south-western part of Norfolk where pairs of it breed; and I have known several instances of their eggs and young being found. One situation is on a dry heathy soil, the nest placed on the ground amongst high heath; the other in low fenny ground, among sedge and rushes: two species of the falcon family, the harrier hawk and moor buzzard, breed in the same fen. A friend of mine procured some eggs from the latter situation during the last summer. The short-eared owl is pretty common in many parts of Norfolk during the autumn and winter, the great majority of them retiring northwards in the spring, only leaving a few scattered pairs to breed in this district.

A pied flycatcher (Muscícapa luctuòsa) was shot, in the parish of Stoke Nayland, on the 7th of September. It was in company with several of the spotted species. I know several instances of its being met with in the same vicinity, both spring and autumn; but never heard of its remaining to breed. — *J. D. Hoy. Stoke Nayland, Suffolk, Nov.* 20. 1832.

The Cirl Bunting (*Emberìza* Cirlus *L.*) at East Garston in Berkshire. I have observed several of them here, where my attention had been first drawn to them by their peculiar note; and I was fortunate enough to procure a pair of them, together with their nest and two eggs, one of which I have since presented to Constantine Strickland, Esq., of Lincoln College, Oxford. — *Francis Orpen Morris. Charmouth, Dorset, Sept.* 1832.

The Whinchat (*Saxícola Rubètra* Bechstein) *at Killaloe in Ireland.* — Montagu, in his *Ornithological Dictionary*, mentions that the whinchat is scarce in the west of England; and from that circumstance imagines that, in their migrations, they enter by the east of England. There are, however, a good many whinchats here still farther west. — *T. K. Killaloe, Sept.* 21. 1832.

Notices on a few rarer Birds observed about the Vale of Alford, Aberdeenshire. — The Siskin or Aberdevine (Carduèlis Spìnus *Cuvier*) is generally considered one of our irregular winter visiters, and rather rare in Britain. Many were seen here during the last breeding season. A gentlemen in the neighbourhood observed some about the middle of May; the first that I noticed was on the 27th: it was picking seeds of grass on the edge of the road, and was not at all shy; I saw others afterwards, at different times and places, till the end of June. The siskin, I believe, has not been before seen in this quarter. [See p. 113.]

A Pair of Redstarts (Sýlvia Phœnicùrus *Latham*) bred here this summer, and brought up five or six young ones. The redstart had, I believe, not been before seen in this quarter.

Dottrels (Charàdrius Morinéllus *L.*) breed on our hills. I do not state this fact on my own knowledge, but I disturbed a pair on Menaway, in the parish of Keig, on the 26th of June, that from their distress evidently had their nest near.

The Oyster-catcher or Sea-pie (Hæmátopus ostrálegus *L.*), Montagu says "is common on our shores, but never quits the sea-coast." We have them, here, however. During summer some may always be seen along the Don, from twenty-five to thirty miles from the sea; and I have been told that they breed about Kildrummy, a few miles higher up. I have never seen

the sea-pie voluntarily take the water; but, as noticed in Rennie's *Montagu*, it swims well. On the coast, one stormy day, I winged one, which fell into the water, and I expected would be cast ashore; but, to my surprise, it swam vigorously through a heavy surf, and got clear out to sea. — *A Subscriber. Vale of Alford, Aberdeenshire, Sept.* 28. 1832.

A puzzling Specimen of the Oyster-catcher (*Hæmátopus ostrálegus* L.). — A bird was lately shot in the vicinity of Downton Castle, county of Hereford, the seat of T. A. Knight, Esq., by the gamekeeper, of a kind which, we believe, has not been described by any ornithologist as a British species. The size is that of the curlew, and its weight about two pounds; the beak, in length and form, similar to that of a woodcock, but a little stronger, the colour at the base being bright orange, and gradually appearing paler or more dusky to the point; the head and neck black, with a white stripe under each eye, and many white feathers, mixed with a few black, under the throat; wings black, with the exception of the middle and lowest feathers, which are white; feathers of the body as white as snow, with the exception of those of the tail, which are tipped with black; legs similar to those of the bustard, having three toes only, and those pointing forward. (*Hereford Journal.*)

The foregoing, with a slight alteration (not connected with the description of the bird), was copied from the *Hereford Journal* of Dec. 5. 1832. In a letter addressed to me on the subject, by T. A. Knight, Esq., he observes "that the bird appears to have been an overgrown individual of the Hæmátopus ostrálegus *L.*; though its beak bears little resemblance to that given in Bewick's plate, and is extremely ill calculated for the purpose to which he supposes it to be applied: it terminates like that of the woodcock. In genus, this bird appears to me to be allied, almost in an equal degree, to those of *Scólopax*, *Tringa*, and *Charàdrius*. It is an extremely expert diver."

I forward this for insertion, in the hope that some correspondent may be enabled to distinguish whether it is a new species of bird, or one already known to naturalists. — *John Evans. Grove Place, Tything, Worcester, Jan.* 26. 1833.

The bird here described is, as stated, the oyster-catcher, Hæmátopus *ostrálegus*, though the weight is greater than that usually assigned to the species. The beak, from a side view, has the appearance of being blunt at the point, but is so compressed laterally as to be but little thicker than an ivory paper-cutter, admirably adapted for being pushed in between the shells of muscles, oysters, and other bivalves, the soft animals of which are the principal food of this species.

Bewick's plate represents this bird in its summer plumage, at which time it does not exhibit the white mark under the throat. However little adapted to water its plover-like legs and feet may appear, its powers of swimming and diving have been recorded by writers generally.—*S. T. P.*

The Virginian Partridge.—J. C., of Staffordshire, describes (in Vol. IV. p. 16—18.) his unsuccessful endeavours to increase this bird, and there states, that, out of his first and only stock of two pairs, the hen of each pair had died. He adds, too (p. 18.), "I know that a quantity were turned down upon the large demesne of Edward John Littleton, Esq., M.P., at Teddesley, in Staffordshire, and that they did not breed at all, but straggled away; and some of them were shot ten or fifteen miles from his estate." Captain Brown, in one of his notes (p. 14.) to his edition of White's *Selborne* (noticed in the present Number, p. 133.), says: — The Virginian partridge has been successfully introduced into Staffordshire, and has become abundant, and spread over part of the adjoining counties. Will J. C. please to state if he is aware of this? —*J. D.*

Pertinacious Perseverance in the Martin (*Hirúndo úrbica* L.) *in renewing its Nest in one Place.*—Last year (1832) a pair of martins (*H*irúndo úrbica) had built their nest in a window at the usual time. On the morning of the 5th of June there happened to be a very heavy shower, during which it almost entirely fell, and the eggs which were in it were broken by having fallen out. On the next day, they commenced to rebuild it, and had finished it on the 10th. On the 21st, however, it again fell, and whatever eggs were in it were broken this time also. Having begun to rebuild it on the next day, they had it completed on the 27th. On the 8th of July it fell for the third time; but, as far as I could discover, there were no eggs in it. The next day they began to rebuild it, and finished it on the 16th. On the 13th of August it fell a fourth time, and the eggs were broken. After this, they seem to have given up all hopes, as I never saw them attempt to rebuild it.—*R. Y. Edinburgh, Feb.* 1833.

Fungus on the Bill of a Hedge Sparrow (*Accéntor modulàris* Cuvier).—On Sunday morning, Nov. 1. 1829 (when resident at East Bergholt, Suffolk), a hedge sparrow was brought to me, which had taken shelter during the previous extremely cold night in an outhouse, and had there been made prisoner. On examination, it was found that his extreme indifference to resist being taken by the hand arose from incapacity. On the upper mandible there was a large fungus, which had com-

pletely closed the nostrils, and the lower mandible was also enveloped in the folds of a still larger excrescence of the kind. I send you a drawing of the head (as I had the little creature stuffed by Bull of Leadenhall-street, and it now hangs over my study fireplace), by which you will more readily comprehend my description. When first taken, he seized at some crumbs of bread with great avidity: we put him into a cage, and attempted to nourish him, but he was quite incapable of feeding himself, and was too weak to rest upon a perch. He remained on the floor of his prison all night in a state of stupor, and in the morning he was found with his feathers erected and ruffled, as if suffering from cold, which foretold his death. He died in the course of the day; and his weight, when dead, was exactly half an ounce. — *W. B. Clarke. Parkstone, near Poole, Dorset, Dec.* 21. 1832.

It will suffice that we remark that the drawing exhibits the excrescence on the upper mandible, of the size of a small pea, and that on the lower mandible of the size of a small horse-bean. In Mr. Couch's manuscript catalogue of the birds of Cornwall, with observations on them, which has long lain by us, it is observed of the hedge sparrow: — "Common through the year. Large excrescences are often observed on the bill and legs." This last remark led us to judge a figure unnecessary. This bird's liability to these excrescences is not noticed in Rennie's *Montagu's Ornithological Dictionary.* — *J. D.*

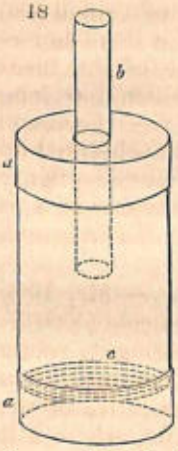
A Bird's Nest in the Skull of an Esquimaux. — Mr. Bree recalls (p. 32.) the narration, by Scólopax Rustícola (Vol. V. p. 289.), of a tomtit's building its nest and rearing its young in the mouth of Tom Otter, the murderer. For a parallel to this fact, I would refer your readers to the narrative of the Arctic voyages, by Parry, or Lyon, or Franklin, where it is recorded that a bird's nest was found in the skull of an Esquimaux, upon the shore of some island. I have lost my memorandum of the volume, and have none of these works with me here; otherwise I would give a precise reference to the statement. — *W. B. Clarke. Parkstone, Jan.* 9. 1833.

Insects. — *Device for entrapping Insects.* — In entomology, I think every student must feel the want of contrivances to entrap the objects of his search. This deficiency probably arises from the nature of many species not being thoroughly understood, and consequently it is almost impossible to invent any stratagem certain to capture them, when they follow their natural habits. A plan which I adopt for procuring insects inhabiting wood or other substances is very simple, and no doubt would be of as much advantage to others as it has been

to myself. When I meet with a tree that has a hollow passage bored in it, and I suspect the residence of an insect therein, I fit to it a Florence flask or bottle, the mouth of which is sufficiently wide to completely cover the entrance. The insect, upon coming out, finds no difficulty in its exit, but readily slips into the bulb of the flask, and will seldom crawl back again, owing to the steepness and smoothness of the sides. In this manner I have several times succeeded in entrapping beetles, caterpillars, and sometimes moths. Should the tree have many holes, it should be endeavoured to cover all, or as many as possible, as some insects have several exits. I may remark, that the shape of the Florence flask is preferable, as the steepness and smoothness of the instrument are the two points upon which the success depends. — *James Fennell. Nov.* 1832.

Device for securing captured Insects. — *Fig.* 18. represents a small tin box, which I have found very convenient in collecting insects, particularly the larger species of Hymenóptera and Díptera: it consists of a tin bottle, having movable covers (*a a*), fitting tight, both on the top and bottom; the upper one having a tube (*b*) let into it. A short distance from the lower end there is a false bottom (*c*), pierced with very minute holes. In using this I place a small piece of sponge, saturated with *liquor ammoniæ fortis*, below the false bottom, the fumes rising from which kill any insects which may be placed in the box. Insects with very bright colours should not be put in, as they are liable to be injured by the ammonia. It is manifest that, by leaving out the ammonia, the box may be used as a common collecting bottle. The figure is half of the size which I have found most convenient. — *Charles C. Babington.*

18



A cheap and easily practicable Method of providing Cases for the Reception of preserved Insects. — Sir, I have been agreeably led to the study of natural history, by perusing your valuable Magazine. When I commenced making a collection of butterflies, moths, &c., I was entirely at a loss in what portable shape to preserve them; for the museums and private collections which I have seen have their specimens preserved in bulky glass cases, which method I had no chance of following, for want of room. I therefore invented the following:—

I cut a sheet of milled board into a folio size, squared it round the edges, and covered one side, for the back, with neat coloured paper; and the other side being to lay the specimens

on, I covered with a paper to correspond with the ground colour of the insects to be preserved. I then cut some boards into slips, about half an inch wide, and of a thickness to correspond with the body of the insects, covered them with leather, and glued them round the edge of the other board, which, when done, formed a sort of drawer. Having made as many of these drawers, of an equal size, as I thought would be convenient to be put together, I strung them at the back with whip-cord, and bound them with an open back similar to a book. On gumming on my specimens, I found the above plan afforded an additional advantage, and one of great use, that of having figures of the caterpillar and chrysalis placed against many of the specimens, which I accomplished by drawing and colouring them from nature, on card-board, cutting them out with the scissors, and gumming them near the specimens. As I have found the above of great use, perhaps it may be of use to some of your numerous readers and correspondents. I am, Sir, yours, &c. — *B. Faucett. Driffield, Jan.* 26. 1833.

Coleopterous Insects taken in 1832, *in the Neighbourhood of Manchester.* — In the month of May I collected the following species on the banks of the river Irwell, at about three miles below Manchester:—Bembídium paludòsum, pállipes; Brádytus fúlvus, apricàrius; Clivìna fóssor, collàris; Pátrobus rúfipes, Helòbia Gyllenhàlii, Cárabus monìlis; A'gonum marginàtum, víduum; Blèmus mìcros; Péryphus decòrus, nitìdulus; Stènus bipustulàtus, Dyschírius æ'neus. June 3d, I collected, in the woods near Chorlton, Helòdes beccabúngæ Curt., Chrysomèla cochleàriæ, Clỳtus arìetis, Melándrya caraböìdes; Clonus scrophulàriæ, bipustulàtus. June 8th, near the river Irwell, I captured Chrysomèla aúcta and Epáphius secàlis.

Bembídium paludòsum, Helòdes beccabúngæ, and Chrysomèla cochleàriæ, have been very plentiful. I, last year, took in great plenty Blèmus díscus, but it has not yet, this year, made its appearance; neither has Hóplia pulverulénta, although I took it, last year, in great plenty in the middle of June. On April 29, this year (1832), I took Hýphydrus ovàtus and Hydróporus Davísii at Coterill Clough, Cheshire. — *W. H. June* 18. 1832.

Lepidopterous Insects taken in the Neighbourhood of Manchester last Year (1831). — Their names are those of Curtis's *Guide*. Charæ'as gráminis; A'grotis ségetum (vallígera at Southport in Lancashire). Graphíphora brúnnea, festìva, plécta, bàja; common. Orthòsia lòta, litùra, hebràica; Glæ'a satellítia, rubricòsa; Triphæ'na Janthìna, interjécta, fímbria;

Apamèa Æthiops, strígilis, rufúncula, latrúncula, Hawórthii; Misèlia aprilìna, oxyacánthæ; Tràchea chì, pròtea; common. Acronýcta áceris, sálicis, rùmicis; Pòlia nebulòsa, Phlogóphora lucípara, Thyatìra Bàtis; Plùsia festùcæ, interrogatiònis; Hadèna capsíncola, plebèia.

I have taken, this season, Hybérnia leucophæària var. nigricària. On April 29. 1832, I captured Bombýlius màjor in Coterill Clough, Cheshire. — *W. H. June* 18. 1832.

A Singularity in the Larva of Tenthrèdo amerìnæ. — A friend of mine found the larva of Tenthrèdo amerìnæ, and upon his touching it for the purpose of disengaging it from the hawthorn branch upon which it rested, we (for I was a witness of the fact) were somewhat surprised to observe a white liquid spirted from its body in thin fountain-like columns. This it repeated at each successive touch; but it became totally exhausted of the fluid after it had ejected it seven or eight times. This liquid was not forced out through any particular aperture, but was ejected through the pores of the body, apparently by a sudden contraction of the skin. This fact resembles what is related of the larva of Cerùra Vínula, and perhaps answers similar purposes. Shaw tells us that the larva of that moth possesses the power of ejecting from its mouth, for a considerable distance, an acrimonious reddish fluid, which it uses as a defence, as it produces an irritating pain if it gets into the eyes of the spectator. The fact I communicate, regarding the insect in question, if it be its general habit, appears to me to have slipped the notice of all entomological writers. — *James Fennell. Nov.* 1832.

Meteorology. — *Mildness of the Present Season, at Parkstone, near Poole, Dorsetshire.* — As a proof of the extreme mildness of the present winter, I may mention that we have, up to this date, seen no snow in our vicinity; and that, saving two or three days' frost, which have not been at all severe, no particular indication of the season has been perceived. The prevalent winds have been from the south and south-west; and there has been abundance of warm rain, frequently preceded by meteors, some of them very extraordinary in their appearance. The birds are beginning to sing cheerily; and the gardens are rapidly putting on the livery of spring. We have had stocks and strawberries in blossom all the winter. This evening I destroyed four toads, who were "barking" under the windows, to some friends at a distance, whose well-known salutation was distinctly heard across the fields. Though this country swarms with toads, and every house and cottage has its pets, which are familiar to the inhabitants, so early an

awakening is most unusual, and deserves to be recorded. — *W. B. Clarke. Parkstone, Dorset, Feb. 5.* 1833.

We may venture to add, from the private note of our valued correspondent, the following supplementary remark: — "The mildness of this air is most extraordinary. We have the climate of a southern latitude, sheltered by lofty hills, and on the shore of the sea."— In the night of December 30. 1832, snow fell, to the depth of an inch, in some places more, in Suffolk and Cambridgeshire. On December 31., I passed, on foot, from Bury St. Edmunds to Waterbeach, near Cambridge. The snow was commonly less than an inch in depth, but in some places more; much of it was melted by the close of the same day. The morning had the very aspect of winter. The herbage beside the road was hidden from sight, but countless thousands of the flower and seed stems, surmounted by their heads of seed (of Cynosùrus cristàtus, *P*hlèum pratense mìnus, &c.; and, on Newmarket Heath, *P*otèrium Sanguisórba, &c.,) stood erect and lance-like through the snow, and looked pleasing. Blackbirds and thrushes were breakfasting off the haws in the hedges; chaffinches were picking their "nauseous dole" from horsedung fallen on the road; partridges were calling to each other in the turnip fields; the rooks, and many small birds, were hovering about stacks of corn, formed and left in the fields; the skylarks, in flocks, were picking portions of herbage, &c., here and there left peeping out, or changing their ground, by flitting from point to point, with soft short calls, through the air; and (and this much pleased me) the snow had fallen off the wheels of a waggon, which had passed before me, and was quite evenly and prettily stratified, in the manner of the coats of an onion, each stratum being well defined, by the yellowness which every layer of snow had, on the side next the ground, derived from the material, or (as the phrase is) "metal," of the road. As, perhaps, more congenial to Mr. Clarke's notices, I may mention that my father, at Waterbeach, had reserved the crop of apples, on one tree, ungathered. The apple is of a good size, hardy, green, and, in nature, crab-like; its name I know not. These apples, in quantity above a bushel, were gathered on January 1. 1833, when they were found unhurt by the very few night frosts that had, in the course of the winter, occurred, and were then, from their nature, very hard and firm. This tree will, veritably, bear two crops in one year. — *J. D.*

MISCELLANEOUS INTELLIGENCE.

ART. I. *Retrospective Criticism.*

CORRECTIONS. — In Vol. V. p. 753. line 15. from bottom, for "1800," read "1830."

In Vol. VI. p. 76. line 15. and p. 77. line 1. for "October," read "September." — *W. B. C.*

On Birds dressing their Feathers with Oil from a Gland. (Vol. V. p. 412. 588.) — Mr. Waterton doubts (Vol. V. p. 413.) if the small nipple on the rump of birds is an oil gland, or that birds ever oil their feathers with matters obtained from it; and he asks if any naturalist will say that he has ever witnessed this process; and, if so, how it is that the bird contrives to take this oil in its bill, and how it manages to oil its head and neck? I beg to state what I *think* I have witnessed, and trust to Mr. Waterton's forbearance if I am in error: yet I cannot help suspecting that Mr. Waterton's queries are (like those of Charles the Second's to the Royal Society) more for the purpose of laughing at our ignorance, than from any wish he has to obtain information; for I can scarcely suppose that so acute an observer can have failed to perceive every thing perceptible on the point at issue. I have just witnessed a Muscovy duck perform the operation of pruning and dressing its feathers; and it certainly appears obvious enough to me that this bird uses the gland on the rump for the purpose for which birds are generally supposed to use it. The duck erected the feathers on the rump so as to exhibit the gland very distinctly, and then, after pressing it with the bill, rubbed the under mandible and chin, down to the throat, upon it; and then, after drawing some of the feathers through the bill, rubbed the lower mandible and chin upon the back and scapulars, apparently to apply the oil which adhered to them; and then, turning its head back, it rubbed the crown and sides of the head and the neck upon those parts which it had previously rubbed with the chin and under mandible. By this rubbing of the head and neck, it is easy to perceive how birds can oil these parts, if it be allowed that birds oil themselves at all. I cannot see how we can explain this action in birds in

relation to any other object. It certainly does not seem calculated to expel or disturb the vermin that may lodge there; and I remarked that it never occurred except when the bird had been applying its bill to the gland, as above mentioned. However, Mr. Waterton and any one who doubts this oiling may readily judge for themselves. Let them take a common duck, and shut it up for two or three days, so that it can have no access to water, except for the purpose of drinking, and, at the end of that time, let them turn it out, and allow it to go to a brook or pond: it will give itself a thorough ablution, — ducking, diving, and splashing with its wings, — and, on coming out, will begin to dress and arrange its feathers, very frequently applying its bill to the gland on its rump. If this application is not for the purpose of procuring a supply of oil, perhaps Mr. Waterton will have the goodness to inform us what it is for, and what end this gland answers in the economy of the feathered tribe, if not that which has hitherto been supposed. — *T. G. Clitheroe, Lancashire, June* 30. 1832.

On Birds using Oil from Glands. (Vol. V. p. 412.)— Sir, I am, as you well know, no ornithologist, although I feel an interest in the discussion (when personalities are excluded) and decision (when good humour is the order of the day both with pros and cons) of any *quæstio vexata* [contested question] in any branch of natural history. Perceiving, therefore, that that interesting traveller, Mr. Waterton, has endeavoured, in Vol. V. p. 412., by several apparently conclusive arguments, to disprove the fact of birds using oil obtained from glands for the purpose of lubricating the surface of their plumage, I have thought it worth while to send you a notice of a fact connected with the subject, which I accidentally met with on looking over a torn leaf from one of the volumes of the *Linnæan Transactions*, during a spare minute*, while waiting for the keys of Sir Joseph Banks's cabinet of insects, collected during Captain Cook's voyages, and now deposited in the Linnæan Society's house, in Soho Square. It will be seen that part of the statement appears to oppose Mr. Waterton's argument.

"Nov. 21. 1820.— Dr. Leach communicated to the meeting of the Linnæan Society an extract from a letter addressed to him by Robert Scarth, Esq., containing some observations on the economy of the Procellària pelágica, or

* Dr. Franklin says, "Take care of the pence, and the pounds will take care of themselves;" a truth as applicable to the employment of time as to treasure or talent; the three *ts* requisite to form a thorough naturalist.

stormy petrel. Mr. Scarth states, that, in passing over a tract of peat moss near the shore, in a small uninhabited island in Orkney, one evening in the month of August last, he was surprised to hear a low purring noise, somewhat resembling the sound of a spinning-wheel in motion; and, on enquiry, he was informed by one of the boatmen who accompanied him, that it was the noise commonly emitted by the alimonty * (the Orkney name for the stormy petrel) that frequented the island when hatching.

"On examining a small hole in the ground, he found the bird and its nest, which was very simple, being little more than a few fragments of shells laid on the bare turf. It contained two round pure white eggs, which were very large in comparison with the size of the bird. When he seized the bird, she squirted out of her mouth an oily substance, of a very rancid smell. He took her home, and, having put her into a cage, he offered her various kinds of worms to eat; but, as far as he could observe, she ate nothing till after the expiration of four days, when he observed that she occasionally drew the feathers of her breast singly across, or rather through, her bill, and appeared to suck an oily substance from them. This induced him to smear her breast with common train oil; and, observing that she greedily sucked the feathers, he repeated the smearing two or three times in each day for about a week. He then placed a saucer containing oil in the cage; and he observed that she regularly extracted the oil by dipping her breast in the vessel, and then sucked the feathers as before. In this way he kept her for three months. After feeding, she sat quietly at the bottom of the cage, sometimes making the same purring noise that first attracted his notice, and sometimes whistling very shrilly."

It will be seen, on comparing the above statement with that of Mr. Salmon (Vol. V. p. 421.), that two of the species of Procellària, the P. pelágica and P. *Puffinus*, vary not only in the situation of their nests, but also, which is more important in a physiological point of view, in the structure of the eggs. — *J. O. Westwood. The Grove, Hammersmith, June* 1832.

A comparison of Mr. Scarth's statement above, with that of Mr. Drosier (Vol. III. p. 325.) will show that the stormy petrel incubates in apparently very distinct situations. Mr. Scarth found the nest ("which was very simple, being little more than a few fragments of shells laid on the bare turf") on a peat moss, near the shore (of a small uninhabited island

* "Allamotti" and "Allamoth" are the words in Rennie's *Montagu's Ornithological Dictionary.* — *J. D.*

in Orkney). Mr. Drosier found the nest of this species, Procellària pelágica *L.* (as well as that of the Manks puffin, Procellària *Puffinus*, L.) in the fissures, high up, of "one of the most magnificent and stupendous cliffs, or faces of rock, — estimated to be about 1500 feet above the level of the sea" — he had ever beheld: this was on the southern side of the Island of Foula. For Mr. Drosier's clear contradistinctive description of the eggs and nests of these two species (which he found in the same situation), see Vol. III. p. 325, 326. After all, the remarks in Vol. V. p. 589. naturally suggest the question, is it not possible that Mr. Scarth's and Mr. Drosier's "stormy petrels" may have been of distinct species? — *J. D.*

On Birds lubricating their Plumage from an Oil Gland. (p. 588.) — Sir, Mr. H. Henslow doubts the truth of Mr. Waterton's assertions with regard to birds lubricating their plumage from an oil gland. In support of his doubts, he brings forward a tame turtle dove, of whose actions he gives a short description, but by no means a satisfactory one. I do not think that there is any sufficient authority for saying that, when the bird moved its head and neck about in the manner he describes, it did so in order to allow the substance procured to spread into all parts of the bill. He confesses, however, that he was not able to tell what that substance was; and it is very evident that his "remarks" on Colúmba *Túrtur* prove nothing at all. Perhaps Mr. Henslow will allow that the kestrel (Falco *Tinnúnculus L.*) approximates much nearer to the bird of Washington eagle than a turtle dove does. If it be so, I possess two. One of these is about a year and a half old, the other a young bird of the present season. The oldest is a male; and, though both frequently dress and arrange their plumage with their powerful bill, I never could observe them apply it to their rump at all, much less exhibit those extraordinary gestures which he describes. I may add, that the jackdaw (Córvus *Monédula L.*), whose habits resemble those of the whole order to which it belongs, is another bird which uses no oil. I am, Sir, yours, &c. — *William G. Barker. East Witton, July* 23. 1832.

The Means by which the Turkey Buzzard (*Vúltur Aúra* L.) *traces its Food.* (p. 83.) — Sir, I feel that Mr. P. Hunter (p. 83.) is much too complimentary. In answer to this gentleman's remark, that my account of the habits of the *V*últur Aúra is at variance with the observations of Wilson, Humboldt, and Azara, I beg to inform him, that I pronounced the *V*últur Aúra of Guiana to be *not gregarious*, after the closest attention to its habits, for a long series of years; and

I am still of decided opinion that this bird ought not to be considered gregarious.

Wilson was never in Guiana. As for Humboldt, I cannot think of submitting to his testimony, in matters of ornithology, for one single moment. The avocations of this traveller were of too multiplied a nature to enable him to be a correct practical ornithologist. Azara is totally unknown to me.

I have read Mr. Audubon's paper very attentively, " and upon taking the length, breadth, height, and depth of it, and trying them at home, upon an exact scale," 'tis out, my lord, in every one of its dimensions. — *Charles Waterton. Walton Hall, Jan.* 9. 1833.

Remarks on Mr. Audubon's " Account of the Habits of the Turkey Buzzard (Vúltur Aúra), particularly with the View of exploding the Opinion generally entertained of its extraordinary Powers of Smelling. (See Jameson's *Philosophical Journal* for October and December, 1826.) — After some preliminary observations, the author says, " When I visited the Southern States, and had lived, as it were, amongst these vultures for several years, and discovered, thousands of times, that they did not smell me when I approached them covered by a tree, until within a few feet; and that, when, so near, or at a greater distance, I showed myself to them, they instantly flew away much frightened, the idea evaporated, and I assiduously engaged in a series of experiments to prove, to myself at least, how far the acuteness of smell existed, if it existed at all."

Here the author wishes to prove to us, through the medium of his own *immediate person*, that the vulture is but poorly off for nose; but he has left the matter short, on two essential points. First, he has told us nothing of the absolute state of his own person, at the actual time he approached the vultures; and, secondly, he is silent as to the precise position of his own person, with regard to the wind. This neglect renders his experiment unsatisfactory. If, on his drawing near to the birds, no particular effluvium or strong smell proceeded from his person, it is not to be expected that they could smell him. *De nihilo nihilum, in nihilum nil posse reverti* [nothing can come from nothing, nor can anything be changed into nothing], as the old saying is. If, again, he had a smell about him, and he happened to be to *leeward* as he approached the vultures, their olfactory nerves could not possibly have been roused to action by it, although he had been Gorgonius himself (*Gorgonius hircum*), for every particle of smell from his person would have been carried down the gale, in a contrary direction to the birds.

I will now proceed to examine the author's first experiment. "I procured," says he, "a skin of our common deer, entire to the hoofs, and stuffed it carefully with dried grass until filled, rather above the natural size, — suffered the whole to become perfectly dry, and hard as leather, — took it to the middle of a large open field, laid it down on its back, with its legs up and apart, as if the animal was dead and putrid. I then retired about a few hundred yards; and in the lapse of some minutes a vulture, coursing round the field, tolerably high, espied the skin, sailed directly towards it, and alighted within a few yards of it. I ran immediately, covered by a large tree, until within about forty yards; and from that place could spy the bird with ease. He approached the skin, looked at it without apparent suspicion, jumped on it, &c. — then, approaching the eyes, that were here solid globes of hard dried and painted clay, attacked first one and then the other, with, however, no further advantage than that of disarranging them. This part was abandoned; the bird walked to the other extremity of the pretended animal, and there, with much exertion, tore the stitches apart, until much fodder and dry hay was pulled out, but no flesh could the bird find or smell; he was intent on discovering some where none existed; and, after reiterated efforts, all useless, he took flight, coursed about the field, when, suddenly rounding and falling, I saw him kill a small garter snake, and swallow it in an instant. The vulture rose again, sailed about, and passed several times quite low over my stuffed deerskin, as if loth to abandon so good-looking a prey." The author continues: — "Judge of my feelings when I plainly saw that the vulture, which could not discover, *through its extraordinary sense of smell*, that no flesh, either fresh or putrid, existed about the skin, could, at a glance, see a snake, scarcely as large as a man's finger, alive, and destitute of odour, hundreds of yards distant."

In this first experiment, we are left in such uncertainty, with regard to the actual distance of the vulture from the author, at the time the vulture killed the snake, that I cannot, for the life of me, come to any satisfactory conclusion. It appears, that there was a tree about forty yards from the stuffed deerskin. Under covert of the tree, the author watched the predatory attack of the vulture on the skin. The disappointed bird took flight, and coursed about the field, which the author tells us is large and open. While coursing round this field, the vulture, suddenly rounding and falling, killed a garter snake, scarcely as large as a man's finger. The author tells us, he plainly saw that the vulture could see this snake hundreds of yards distant. I am not

surprised that the *vulture* saw the snake hundreds of yards distant, as I am fully aware of the keen sight of all birds; but what really astonishes me is, that the *author* could see the snake, and know it to be a garter snake; for, upon the face of the statement, I am led to conclude, that he himself, as well as the vulture, was hundreds of yards distant from the snake. It were much to be wished that the author had said something positive with regard to the actual distance of the snake from the tree under which he had taken his stand. Again, the author tells us, in the beginning of this experiment, that he retired about a few hundred yards from the spot where he had placed the deerskin, in the middle of the large open field; and that a vulture, in the lapse of some minutes, alighted within a few yards of the skin. The author ran immediately, covered by a large tree, till within about forty yards of the skin. Now, quickness of sight in the vulture being the very essence of our author's paper in *Jameson's Journal*, I am at a loss to conceive how our author contrived to run over the few hundred yards unseen by the vulture. To be sure, a large tree intervened; but then the vulture happened to be about forty yards on the other side of it; and this distance of the vulture from the tree would be all in its favour for descrying a man coming up, in an opposite direction, through the open space of a few hundred yards, which, to judge by this vague expression, might be a quarter of a mile, more or less. Had the bird seen him, there is no doubt but that it would have flown away; because the author tells us, in the beginning of his paper, that "when he showed himself to the vultures, they instantly flew away frightened."

"In one part of this experiment, at least, our author proves, beyond the shadow of a doubt, that his vulture was totally deficient in scent; and he has the very best of all reasons, — no smell existed in his deerskin. "No flesh could the bird find, or smell. He was intent on discovering some, where none existed." Still, methinks, the vulture was right in ripping up the pretended animal; and there was method in his prosecuting his excavation through the regions of dried hay. No lapse of time could have completely subdued the smell which would arise from the ears, the hoofs, the lips, and the very skin itself of the deer. This smell must have been the thing that instigated the bird to look narrowly into the skin, and detained him so long at the place. I have a better opinion of the vulture's sagacity, than to suppose that he would have spent so much of his precious time upon the rudely stuffed mockery of an animal, unless his nose had given him information that some nutriment

existed in that which his keen and piercing eye would soon have told him was an absolute cheat.

Second Experiment. The author says, "I had a large dead hog hauled some distance from the house, and put into a ravine, about twenty feet deeper than the surface of the earth around it, narrow and winding, much filled with briars and high cane. In this I made the negroes conceal the hog, by binding cane over it, until I thought it would puzzle either the buzzards, carrion crows, or any other birds to see it, and left it for two days. This was early in the month of July, when in this latitude it becomes putrid and extremely fetid in a short time. I saw, from time to time, many vultures in search of food sail over the field and ravine in all directions, but none discovered the carcass, although during this time several dogs had visited it, and fed plentifully on it. I tried to go near it, but the smell was so insufferable, when within thirty yards, that I abandoned it; and the remains were entirely destroyed at last, through natural decay."

Here the author positively and distinctly tells us, that he saw *many* vultures, in search of food, sail over the field and ravine, *in all directions*, but none discovered the carcass; although, *during this time*, several dogs had visited it, and fed plentifully on it.

Pray, when the dogs were at dinner on the carcass, and the vultures at the same time were flying over the ravine where the hog lay, what prevented these keen-eyed birds from seeing the hog? The author positively says that none discovered the carcass. Could, then, several dogs devour the hams of swine, and riot on pig's liver, in such amazing secrecy and silence as not to be observed in the act by the lynx-eyed vultures above? Were there no squabbles amongst the dogs for possession of the pig's cheeks? no snarling for the flitch? no pulling the body this way, or that way? no displacing the materials with which the negroes had covered the hog? In a word, was there no movement on the part of the dogs, by which the passing vultures might receive a hint that there was something in the ravine below "calculated to glut their voracious appetite?" Fear, certainly, could not have kept them away; because the author tells us, in another part of his account, that he has seen vultures feeding at one extremity of a carcass, and dogs at another.

This second experiment, like the story of the "bear and fiddle," was broken off in the middle. The author tried to go near the carcass, but the smell was so insufferable that he abandoned it when he had got within thirty yards of it. He tells us, the remains were entirely destroyed at last, through

natural decay. How did he learn this? At the time that he abandoned the carcass to its fate, the insufferable smell clearly proved that there was plenty of carrion still on the bones; but, as the author's own olfactory nerves prevented him from watching it any longer, I will take upon myself to make up the *hiatus valde deflendus* [omission much to be regretted], which his sudden retreat occasioned, by a conjecture of my own; namely, that the dogs and vultures, like the devil and the king, in "Sir Balaam," divided the prize. It would have taken a lapse of weeks to have destroyed the smell putrescent which came from the remains of so large an animal; and even granted that the vultures had been too dull of nose to have smelled it, still it could not have failed to have attracted other dogs, or the same dogs when their stomachs had become empty; and they themselves would have gnawed off all the flesh, and squandered the bones, without allowing "natural decay" to consume that which was so palatable to them. Be this as it may, the author immediately returned, and commenced a new operation *about the same place.* This fortifies me in my conjecture that the carcass must have had some greedy customers after the author's departure, otherwise the insufferable smell must have been still there; and then the author, by his own account, would have been ill able to stand the attack on his nasal feelings during the new operation.

He says, "I then took a young pig, put a knife through its neck, and made it bleed on the earth and grass about the same place, and, having covered it closely with leaves, also watched the result. The vultures saw the fresh blood, alighted about it, followed it down into the ravine, discovered by the blood, the pig, and devoured it when yet quite fresh, within my sight." I must here own I am astonished that the vultures could see this, and still have seen nothing of the large hog while several dogs were feeding on it. However, I request the reader to ruminate for a while on these two experiments with the large hog and the little pig; and then he will be able to draw his own conclusion as to the blindness of the vultures during the first experiment, and their keenness of vision during the second.

I will now take a peep at the vultures marshalled in aerial columns.

The author tells us, "a flock of twenty may easily survey an area of two miles, as they go turning in large circles, often intersecting each other in their lines, as if forming a vast chain of rounded links; some are high, whilst others are low; not a spot is passed over unseen; and, consequently, the

moment a prey is discovered, the favoured bird rounds to, and, by the impetuosity of its movements, gives notice to its nearest companion, who immediately follows him, and is successively attended by all the rest. Thus the farthest from the discoverer, being at a considerable distance, sails in a direct line towards the spot indicated to him by the flight of the others, who have all gone in a straight course before him, with the appearance of being impelled by this extraordinary power of smelling, so erroneously granted them." Here I break the quotation, to ask the question, how are the hindermost vultures, which are successively attending to the notice given by the *favoured bird*, in order to profit by it, to know whether the *favoured bird* has alighted upon some large carrion, or a diminutive garter snake? The leader vulture, according to our author's former experiment, would be equally liable to fall down upon the one as upon the other; and though *he* might get a mouthful, the *rest* would be sorely disappointed. Again, suppose the leader were to round to and fall upon a stuffed deerskin, and dilly dally his time away in reconnoitring it, would not the rest, on coming up, have just reason to be much out of temper? Our author continues, "If the object discovered is large, lately dead, and covered with a skin too tough to be ate and torn asunder" (cart before the horse), "and afford free scope to their appetite, they remain about it, and in the neighbourhood. Perched on high dead limbs, in such conspicuous positions, they are easily seen by other vultures, who through habit know the meaning of such stoppages, and join the first flock, going also directly, and affording further evidence, to those who are satisfied with appearances only. In this manner I have seen several hundreds of vultures and carrion crows assembled near a dead ox, at the dusk of evening, that had only two or three in the morning; when some of the latter comers had probably travelled hundreds of miles, searching diligently themselves for food, and probably would have had to go much farther had they not espied this association." A little after this, having described the manner in which the "famished cannibals" satisfied their hunger, the author says, "The repast finished, each bird gradually rises to the highest branches of the nearest trees, and remains there, until the digestion of all the food they" (instead of it) "have" (has) "swallowed is completed."

Here we have, perched on high trees, flocks of vultures waiting till their dinner be sufficiently tender; and also flocks of vultures waiting on the highest branches of trees till their dinner be sufficiently digested. The author tells us that the

first " are easily seen by other vultures, who, through habit, know the meaning of such stoppages." I wish the author had told us how he became informed of this knowledge, which the " other vultures" had acquired of these stoppages. Let us suppose for an instant that the latter comers, after travelling " hundreds of miles" had unluckily mistaken the group of vultures perched on high trees; and, in lieu of arriving at the tree under which dinner was waiting for them, they had got to the tree under which all the dinner had been eaten up. Pray, what were the hungry scavengers to do? Were they to proceed " hundreds of miles" farther, upon an empty stomach, in quest of more stoppages? or were they to wait in patience, with the vultures perched on high dead limbs of trees, till those stomach-filled birds should have digested their food, and were ready to start afresh? The author assures us that " vultures perched on high dead limbs, in such conspicuous positions, are easily seen by other vultures, who through habit know the meaning of such stoppages:" but then we have only his bare word for this extraordinary circumstance; and, notwithstanding what he has said, my opinion is, that the coming-up vultures would just as often have the bad luck to find themselves arrived at the tree under which the dinner had been all eaten up, as the good luck to get to the tree under which dinner was to be found too tough to be eaten immediately.

Towards the end of the account, our author tells us, that " the power given to them (the vultures) by nature of discerning the approaching death of a wounded animal is truly remarkable." By way of exemplification, he continues, " a poor emaciated horse, or ox, the deer mired in the margin of the lake, where the timid animal had resorted to escape flies and mosquitoes, so fatiguing in summer, is seen in distress with exultation by the buzzard. He immediately alights, and, if the animal does not extricate itself, waits, and gorges in peace on as much of the flesh as the nature of the spot will allow."

Here the author at once invalidates his assertion of the remarkable power given by nature to the vulture, by the insertion of the unfortunate little remark, *if it does not extricate itself*. The vulture alights, ready to feed on the flesh of the deer, if it does not extricate itself. Now, the expression, *if it does not extricate itself*, gives us to suppose that it *may* extricate itself; and, if it does extricate itself, then off it goes, and of course escapes from the vulture. Wherefore, in this instance, nature would have given false information to the vulture.

In closing his account, our author says, "what I have said of their killing and devouring young animals are" (instead of is) "sufficient proofs" (proof) "of this; but it frequently happens that these birds are forced to wait until the hide of their prey will give way to their bills."

In order to substantiate this, our author produces an alligator. "I have seen," says he, "a large dead alligator, surrounded by vultures and carrion crows, of which nearly the whole of the flesh was so completely decomposed, before these birds could perforate the tough skin of the monster, that, when at last it took place," (what took place?) "their disappointment was apparent, and the matter, in an almost fluid state, abandoned by the vultures."

Here we have the singular phenomenon of vultures surrounding their own dinner, without being able to touch it, for want, I may say, of suitable carving knives; and at last they are forced to depart on an empty stomach, bearing marks on their countenances of apparent disappointment. I ask, what became of the enormous mass of flesh in the alligator's tail? was *it*, too, in an almost fluid state, similar to that of the contents of the abdomen? Had, then, the first stage of putrefaction done nothing towards the softening of the skin, which, in the tail of this animal, is by no means so thick as in the dorsal and abdominal regions? Were his vultures so green in the art of perforation as not to have learned that, as soon as putrefaction takes place, the skin of the tail may be easily perforated at the different joints? If the vultures, only for a minute, had but bethought themselves of applying their "very powerful bills" to the skin at these joints, it would undoubtedly have yielded to their efforts; and then they could easily have worked their way forward to the other parts of the alligator. Had but our little carrion crow been there, he could soon have taught them how to carve, and shown the lubberly birds where lay the soft parts. Again, I ask, were the vultures, whose daily occupation ought to give them a pretty correct notion of the general structure of animals, ignorant that there are certain parts in those animals admirably adapted for contraction and expansion? and, of course, that those parts are invariably softer than the other parts of the bodies of scaly quadrupeds. Did his birds not know, or had they forgot on that occasion, that these parts are to be found, on each side of the alligator, betwixt the nearly impenetrable scaly armour on the back, and the equally impenetrable armour of the under parts? In a word, I am positive, if his vultures had but been well versed in the nature of the parts *without*, they would soon have introduced

themselves to the delicious banquet *within*, in lieu of surrounding the carcass from day to day, in hope deferred; till at last solids were almost turned into fluids, and the disappointed boobies found themselves under the heart-rending necessity of abandoning the alligator without breaking their fast, and of going in quest of firmer carrion in some other quarter.

If our author's statement be correct, viz., that the skin of a large alligator is too tough to be perforated by the bills of vultures, until time shall have rendered the carcass of the dead animal too fluid to be of any use to them in the way of food; then it follows that no large dead alligator can ever become the food of vultures. The birds may certainly see it at a great distance, and wing their way to it, and stop at it; and other vultures, miles behind them, may even fancy "that they know the meaning of such stoppages:" still, I am prone to opine that their labours would be ill requited. In lieu of dropping down upon a good dinner, disappointment would be their lot; and they would be regaled with nothing of a more solid nature than transient puffs of highly tainted vapour. But here I will stop: I have been too long on carrion, — "neque enim tolerare vaporem Ulterius potui." (*Ovid. Met.*, ii. 801.) — *Charles Waterton.*

The Mention, by Rusticus of Godalming, of "the Great Grey Seamews or Gulls." (p. 27.)— Sir, I fear I shall be thought almost guilty of heresy, if I venture to write one line in disapprobation of the exquisite letter by Rusticus, which appeared in your last; but my desire to instruct your readers leads me to risk their indignation. I will observe, then, that Rusticus has made a mistake in speaking (p. 27.) of the grey gull or mew as a distinct species. No gull is grey when arrived at its full plumage, although I have known these gulls remain grey until the fourth year from the egg. The gull alluded to by Rusticus must have been the great burgomaster (*Lárus glaúcus*), a bird which, when in full feather, is white below, and darkish grey above. Allow me to add, that I never read more interesting, more accurate, or more genuine observations, than those by Rusticus, which have lately been published in your own and the *Entomological Magazine*. — *Philo-Rusticus. Zoological Gardens, Jan.* 16.

Rusticus of Godalming has partially anticipated the above objection, in p. 111. of the present Number. — *J. D.*

Preserving Egg-shells for Cabinets. — Your accomplished correspondent, Mr. Waterton, expresses (Vol. V. p. 515.) the difficulty he felt in expelling the contents of such birds' eggs as he wished to preserve. Allow me to state, for his consideration, that the air-pump supplies the more simple and

effectual means for this purpose. If the small end of the egg be punctured, and the egg inverted in a ring attached to a support, by the action of the air-pump, the contents will be completely expelled, from the expansion of the bubble of air at the great end; and it is obvious a dozen or more introduced under the receiver may be thus effectively treated at the same time. — *J. Murray. Jan.* 20. 1833.

Luminous Appearance on the Ears of a Horse. (Vol. V. p. 763.) — This luminous appearance has been long and familiarly known. The phenomenon is entirely *electrical*, and has nothing to do with the Scolopéndra eléctrica, or the glow-worm, or insect life in any shape or form. — *J. Murray. Jan.* 20. 1833.

Structure of the Nest of the Common Brown Wren. — It is not my fault if your correspondent, T. G. of Clitheroe, trusting to his memory, neglecting to refer to the proper document, chooses to assert (Vol. V. p. 738.) that I say "wrens do not line their nests with any thing but moss." What I do say (*Ornithologia*, p. 18.) is, that "the wren's nest is very often made of green moss both within and without." Nor is it my fault if your correspondent choose to say that I think "Montagu is in error when he says they are lined with feathers." I say no such thing; but I say, not doubting for a moment that Montagu's own observation justified *his* statement, "although its usual structure is green moss, yet, if it build against the side of a hayrick, it is composed of hay; if against a tree covered with white moss, it is made of the same material. This is not, however, an invariable habit; for I have known a wren's nest constructed at the edge of the *thatch* of a house, the colour of which was very different from the nest itself; something doubtless depends upon the ease or difficulty with which materials can be obtained. Montagu says that the lining is invariably feathers: this is not, I think, correct; I believe, when made with green moss, its lining is generally of the same material." (*Ornithologia*, p. 243.) Judge, therefore, whether either of the statements attributed to me by T. G. are correct or not. I do not wish to enlarge on these misstatements, although I may be permitted to lament their publication, inasmuch as they deter me, and, I doubt not, others, from making known that experience in natural history by which the science may be improved. I am, nevertheless, extremely thankful to be reminded of my errors or mistakes; but wilful or careless misrepresentation is extremely offensive; and for this reason chiefly it is that I have avoided for some time past to communicate any thing to your Magazine.

Concerning *cock-nests*, upon which your correspondent T. G. (I wish he would give us his name: *anonymous* statements against known and responsible names are always attended with suspicion) seems to rely as a sort of discovery in natural history, I have nothing to say, further than that my own experience in Somersetshire does not warrant the conclusion which he has drawn concerning them. It is true that I have occasionally there found incomplete nests; but I have generally considered them as being abandoned in consequence of being in too public a situation, or their being found by the birds otherwise ill chosen. I beg, however, distinctly to say, that I do not mean to controvert the statements concerning cock-nests by T. G., nor the structure of the wren's nests as found by T. G.; but I do trust that my statements, from actual observation as well as his, are entitled to the same respect. "We must not be in haste to condemn what we have not ourselves witnessed:" a good natural historian should always remember this.

One word more on the wren's nest. When it is made wholly of *green moss*, and I have seen many so made, it is much more neat and compact, and the entrance to it more neatly and exactly defined, than when made of any other material: this, of course, is *my* experience. — *James Jennings.* 14. *Goswell Road, Nov.* 14. 1832.

Mistaken Allusions to Objects in Natural History, committed by Writers on General Subjects. — In a very amusing little volume, called *Observations on some of the Dialects of the West of England*, &c., by James Jennings, there is, at p. 91., a note, which is so incorrect, that it makes me lament that natural history should be so much neglected amongst men of talent. The passage and note are as follows:—

(*Passage.*) "When tha dumbledores hummin, craup out o' tha cob-wâll,
An, shakin ther whings, thâ vleed vooäth an awâ."

(*Note.*) "This fact, in natural history, is well known to those acquainted with mud-walled houses. The humble bee, *B*ombýlius màjor, or dumbledore, as it is called, makes holes very commonly in these walls, in which it deposits a kind of farina; but it never, in such holes, as far as I have observed, deposits honey: in this bee will be found, nevertheless, on dissection, a considerable portion of that delicious sweet."

If Mr. Jennings had contented himself with the facts of the dumbledove, all would have been well; but by entering into detail he has committed himself; for the humble bee (Bómbus) is a hymenopterous insect, with four wings, while *B*ombýlius is a dipterous insect, with two wings only; the former

is the insect alluded to, and probably the Bómbus lapidàrius of Linnæus. I am not sufficiently acquainted with the dialect of Somersetshire to be positive as to the humble bee being there called a dumbledore; but it is certainly incorrect, as it is the Geotrùpes, and is supposed to be a corruption of tumble-dung, a name derived from its economy.

Again, in Lander's *Discovery of the Termination of the Niger* (Vol. I. p. 248.), in a note, we read, "It [Mr. Curtis has not particularised the object spoken of] is deemed as odious by the natives as the toad in England, or the tarantula in Italy, which is also a kind of lizard." I had always believed the tarantula to be a kind of spider: even our dictionaries say that it is a species of insect; I need scarcely observe that a lizard is not.

I have always been an advocate, for many reasons, of making natural history a necessary part of education: and such errors as we often meet with in those who write to instruct being no slight proofs of the general ignorance of literary men in such matters, the utility that must be derived from natural history being taught in our schools becomes evident to every one who can detect the nonsense often thus circulated. I am, Sir, yours, — *J. Curtis. Grove Place, Lisson Grove, Sept.* 29. 1832.

Sir James Edward Smith, in the preface to his *Introduction to Botany*, pleads for a popular adoption of the study of natural history, and adds:—"In Sweden, natural history is the study of the schools, by which men rise to preferment; and there are no men with more acute or better-regulated minds than the Swedes." The amiable and excellent Dr. Drummond, in his *Letters to a Young Naturalist*, strongly expresses a similar feeling. "I would like," says he, "that a lecture-room, a museum, and a library, should be attached even to every village, as regularly as its church or chapel; and that part of some set day or days should be appropriated to the demonstration and teaching of the works and wisdom of God, in the great subjects of natural theology." See an extract from this author's valuable little book, given in our brief notice of it, Vol. IV. p. 421.

Dr. Grant is now delivering, every Tuesday and Thursday evening, a course of lectures "on the Structure and Classification of Animals," to the members, and their friends, of the Zoological Society, at the Society's rooms in Bruton Street. It has been our pleasure and our profit to attend some of these lectures; and no one can attend them, and witness the beautiful adaptation of the structure of the animals to the offices they are appointed to perform in the economy of creation, which the accomplished lecturer so

delights to instance, without being gratified in feeling and improved in understanding.

To Mr. Curtis's instances of erroneous notices of objects of natural history, in works on general subjects, may be quoted, from *Johnson's* 8*vo Dictionary*, the definition of a weasel. "Weasel. A small animal that eats corn and kills mice." The weasel is wholly carnivorous. Other like errors may be found in this and similar works. Writers on general subjects must frequently be at fault on particular ones. Naturalists must watch them, and, by critical vigilance, obtain justice for their science. — *J. D.*

An Identification of some of the Varieties of P*apiliónidæ, lately figured in this Magazine.* — Sir, In a letter lately received from my friend, A. H. Haworth, Esq., on the subject of certain varieties of *P*apiliónidæ lately figured in your Magazine, my correspondent observes as follows: — "The black variety of Limenìtis Camílla (Vol. V. p. 667.) I have seen, and described, in the collection of the late General Davis, at Blackheath. It was caught in Hanging Wood, Charlton, and is well figured in Ernst's *Pap. d'Europe*, vol. i. tab. 11. fig 13. f. and 13. e. The variety of Argýnnis Aglàia (Vol. V. p. 750.) is almost precisely the same as Dr. Abbot's, Mr. Sowerby's (figured on tab. 1. of his *British Miscellany*), and my own Charlótta (*Lep. Brit.*, p. 32.); so that there are four specimens, all found in different years, and agreeing as exactly as four specimens of any other species (if Charlótta be a species) usually do. But the most interesting one you figure is that which you call a variety of Melitæ*a* Selène, (Vol. V. p. 751.), which I take to be the *P.* Dìa of Hübner (*Schmet.*, tab. 6. fig. 31—33.), a species not hitherto announced as British by any modern writer; and I think it will prove (judging merely by your published figure) to be the supposed and long lost *P.* Lathònia, of Gamlingay Wood, Cambridgeshire, and of *Lep. Brit.* preface, p. 28., but not of p. 33. which is the true *P.* Lathònia. At all events, my references, on the last-named page, to Petiver's figures, there called bad (as supposed to represent *P.* Lathònia), should now be expunged, because they more probably belong to the *P.* Dìa of Hübner, and to your neat figure 124. of Loudon's very useful *Magazine of Natural History*, Vol. V. p. 751., above referred to. The Himalayan species (Vol. V. p. 752.) is very like a hybrid between Atalánta and cárdui, and is the Atalánta índica of Jablonsky's *Papil.*, tab. 180. figs. 1. 2. I have it from China direct; and from Nepal, by the favour of my friend, Major-General Hardwicke. It is assuredly a distinct species. Your queried variety of *P*apílio Adíppe, at

fig. 122., requires no query, and is represented, or some other variety extremely like it, in Ernst's *Pap. d'Europe*, vol. i. tab. 13. fig. 16. e. and 16. f." The above remarks of my friend, Mr. Haworth, are, I think, worthy of a place in the Retrospective Criticism of one of your future Numbers. Yours, &c. — *W. T. Bree. Allesley Rectory, Dec.* 20. 1832.

Póntia Chariclèa, seen on the Wing, Feb. 10. 1831. — Mr. Bree says (p. 88.): — "I never knew an instance of Póntia Chariclèa appearing so early (Feb. 10.) in the season. Might not Sigma probably have mistaken the female of Gonépteryx rhámni, for P. Chariclèa? Why, also, is P. Chariclèa styled the *early* white butterfly, when there are at least two other species, viz., P. ràpæ and P. nàpi, which invariably appear before it?" It is possible that I might have mistaken the species of Póntia for some others, as it was on the wing, but I think it could not have been P. ràpæ, from its size; and am nearly certain, from the whiteness of its plumage, it was not P. nàpi; its earliness precluded (as I think) its being P. brássicæ; and the form of its wings prevented my mistaking it for Gonépteryx rhámni, as well as the colour, which is different, even in the female, to any of the white butterflies. Mr. Rennie, or his authority, Mr. Stephens, must bear the blame, if any there be, of P. Chariclèa being designated "early" white butterfly, as (in Vol. II. p. 226.) he has so called it, and this is the only answer I can give to the latter of Mr. Bree's queries. Supposing, however, I was correct as to the kind of butterfly, it will now fairly have earned the distinction of "early white." I ought, perhaps, to say, though the day was in February, as to temperature it was really an April day, the thermometer having ranged the day before from 50° to 59°, and this day (10th) from 48° to 58°; thus inviting the appearance of many other insects.

*Vanéssa I`o caught, Jan.* 5. 1833. Mr. Bree remarks, also, that he has seen "Vanéssa urtìcæ so early as January 8th (1805), in the Isle of Wight." Although our neighbourhood is by no means warm in the winter, yet on the fifth of the present month (Jan. 1833) a boy brought me a specimen of Vanéssa I`o, which he had caught in the town, and which I should think is a very unusual occurrence.

In the last sentence of my communication in Vol. V. p. 753. "1800," is a misprint for "1830."—*Sigma. Saffron Walden, Jan.* 21. 1833.

The poisonous Properties of the Seeds of the Laburnum (*Cýtisus Labúrnum*). (p. 74.) — As to the poisonous properties of seeds of the laburnum, I recollect that when I was a boy, some one in the family had been told that the pods of the

tree when boiled constituted no bad substitute for French beans. Accordingly, a dish of the green pods, that is, the seed-vessels containing the unripe seeds, was prepared and served up at table. Of course the whole of our family party (consisting of two grown persons and two children), were it only out of curiosity, tasted of the new-fashioned culinary vegetable; but, as it proved, by unanimous consent, harsh, stringy, and ill-flavoured, no one, if I remember right, swallowed more than a small portion of it. No bad effect, however, ensued from the experiment. — *W. T. Bree. Allesley Rectory, Jan.* 10. 1833.

The Leaves and glandulated Hairs of the Drósera rotundifòlia do possess Irritability. (Vol. IV. p. 135., Vol. V. p. 26. 491. 755.) — When we discover that we have fallen into an error, we cannot acknowledge it too speedily, both for the ease of our own consciences, and the satisfaction of others. Alas ! how often have we to retract opinions conceived, perhaps, in too great haste, too hastily uttered, and of which our after observation shows us the fallacy. But I am not about to write a moral essay, and therefore will not trouble the readers of this Magazine with any farther reflections. What I have now to say relates to the opinion a short time since expressed by me (Vol. V. p. 755.), that the leaves of Drósera rotundifòlia possess no claims to irritability; and I must own this opinion to have been advanced upon too short an investigation. Farther study of the plant has induced me to coincide with J. E. L. (Vol. V. p. 757.) in his views on the subject: and, to me, what both himself and Mr. Thomson (Vol. V. p. 756.) have said touching the habits of the sundew appears perfectly just, and in accordance with the fact. When an unfortunate insect has entangled itself in the clammy juice of a fresh and before unsullied leaf of sundew, the hairs gradually close upon their victim, and the edges of the leaf itself curl inwards, remaining so, long after their luckless captive has ceased to exist. Slowly unclosing at length, they discover the miserable remains of the poor insect, looking, indeed (to borrow a lively simile from Mr. Waterton and his donkey, Vol. V. p. 679.), like "misery steeped in vinegar." The leaf itself does not appear to come off without detriment from the struggle, as it loses much of its healthful appearance, which it is some time ere it completely resumes. I have witnessed, with some surprise, a fly, nearly resembling in size and form the common housefly, captured by one of these little leaves, and held fast until the relaxing hairs disclosed a slimy and blackened thing, bearing small likeness to the creature they had imprisoned. — *C. P. Surrey, Oct.* 4. 1832.

The Leaves of Drósera are devoid of Irritability. — I have frequently examined the leaves of Drósera, and am convinced that, as J. D. suggests (Vol. V. p. 491.), they do not possess any irritability; but that the appearance of it is caused by the fly's drawing towards it, in its struggles, the hairs and edges of the leaf, by means of their viscous matter, by which it is caught. — *W. C. Trevelyan. Wallington, Newcastle upon Tyne, Sept.* 22. 1832.

The Flowers of Drósera rotundifòlia expanded. (Vol. V. p. 110. 758.) — To J. E. L. my thanks are due for his kind attention (Vol. V. p. 758.) to my question (Vol. V. p. 110.) concerning the opening of the sundew flowers; and I have pleasure in being able now to corroborate his observations, as well as those of Linnæus, by my own, unworthy though I feel them to be placed in such company. Early in the summer of the present year, before the sundew yet showed its little scape of flowers, I transferred several plants, surrounded by their native Sphágnum, into a flower-pot; and, in order to observe them constantly, and at all hours, placed them at my chamber window. The window had a south-eastern aspect; and one morning, between the hours of eight and nine, when the sun shone forth clearly and steadily, I was rewarded by the sight of an expanded blossom. Before twelve o'clock the flower closed, and it never opened again. Afterwards, at the same hour, and on similar brilliant mornings, other flowers unclosed, throwing widely open their little petals, as if in enjoyment of the sunshine; but never more than one or two blossoms opened at one time on the same raceme; and never did a flower, once closed, ever again unfurl itself. To me it appeared, that if a flower was ready to bloom, and was not then exposed to the influence of a powerful sun, the work of nature was carried on without its expansion, as it followed the example of those flowers that had opened and closed in assuming an erect position; but whether, in such a case, the seeds attained perfection, I cannot pretend to determine. For the sake of clearness, I may add that the portion of the cluster which bears the unexpanded blossoms droops or is revolute; and that the flowers are erected, as they are successively expanded, and with them the stalk of the cluster itself, in the manner of a circinate inflorescence. — *C. P. Surrey, Oct.* 4. 1832.

The Identity or Distinctness of Anagállis arvénsis L. *and* A. *cærùlea* Schreber, *as Species* (Vol. V. p. 493., and in previous pages there indicated). I think the experiments on this subject by no means satisfactory, as sufficient care does not seem to have been taken to prevent the possibility of any seeds being previously in the mould in which the seeds on trial have been sown. Here *A.* arvénsis is common, but *A.*

cærùlea is never seen, except occasionally on the ballast hills on the banks of the Tyne, whither it has been imported. Let the experiments be repeated with proper precautions, and with seeds of each of the plants, and I suspect it will be found that they are decidedly distinct species. — *W. C. Trevelyan. Wallington, Newcastle upon Tyne, Sept.* 22. 1832.

Respecting Anagállis arvénsis and cærùlea I may remark, that I have never met with any other kind in this neighbourhood [near Hazlemere, Surrey], but *A.* arvénsis; nor, I think, with this in any situation, but where the soil was a stiff clay. Had I any of the seeds of *A.* cærùlea, I would try them in the same soil; and if the plants which might spring from them bore blue flowers, would it not seem that the species must be distinct? if red, that to soil they owe their change of appearance? But, perhaps, even then, I might be deceived by the seeds of *A.* cærùlea never springing up, and those of the scarlet doing so spontaneously. — *C. P. Surrey, June* 7. 1832.

Specific Distinctness of Anagállis arvénsis and cærùlea. — Sir, Alluding, on a former occasion (Vol. IV. p. 79.), to Professor Henslow's paper "on the specific identity of *Anagállis* arvénsis and cærùlea" (Vol. III. p. 537.), I stated that I had introduced the blue variety into the garden, where it propagated itself by seed for many years, and at length degenerated into the common sort; at least the blue ceased to make its appearance, while the red came up copiously. I do not recollect the exact time when the blue disappeared from my garden; but it must be, at the very least, three or four years ago, and I think more. This year, however, in the same bed where it formerly grew, many plants of the blue variety have come up again; as many, I think, as of the red. It is not probable that the seed of *Anagállis* cærùlea should have been accidentally introduced into the garden from its native habitat, because it is not met with, at least to my knowledge, in this neighbourhood; the nearest place where I have observed it, Bidford, being between twenty and thirty miles distant. We must either suppose, therefore, that the seed of the blue pimpernel had been lying for years dormant and inactive in the soil of the garden (which, we know, is no unusual occurrence), or else, that the blue specimens which have appeared this season must have been the produce of the common or red sort; thus proving, in the latter case, the one to be only a variety of the other. The above facts may not be very important, as I am aware that nothing like any certain inference can be drawn from them. Such as they are, however, I have put them on record, chiefly in consequence of seeing another communication from Professor Henslow on

this subject, in Vol. V. p. 493., and agreeing with that gentleman, that "there is, perhaps, no question in botany, which, at this moment, it is more desirable to settle on the sure basis of experiment, than the law which limits the variation of species." What botanist has not been sorely perplexed in deciding satisfactorily whether this or that plant is a variety of some other, or a distinct species? And, I may add, what strange work has been sometimes made by splitting species *ad infinitum!* Facts and remarks, apparently the most trifling, often serve to throw light on a difficult question; and this circumstance I beg to plead as my apology for troubling you and your readers with the present communication. Yours, —*B. Coventry, June* 14.

Singular Subsidence in the Chalk. (Vol. V. p. 446.) — Mr. Moggridge of Woodfield has published, in Vol. V. p. 446., a "singular instance of subsidence portrayed" in an "annexed sketch," which he states himself to "have become acquainted with during his late researches in France." His researches in France must indeed be *late*, and almost as *singular* as the instance portrayed; for the plate is copied, and with the slightest possible variation, from the original, in Cuvier and Brongniart's *Description Géologique des Environs de Paris*, published so *early* as 1822. The plate in that work is pl. 1. fig. 3. The "*explanations*" are translated from p. 327. of the text, but incorrectly, as I beg to show. The bed marked *c**, in Mr. Moggridge's "sketch," and c in Cuvier's, is not a "calcareous marl, impure, but friable," which is nonsense; but a "marly chalk, that is impure and friable;" the bed *d* (D), not "chalk, compact and in small fragments, wrapped in yellow clay," but "altered fragmentary chalk, or in small almond-like masses, united or surrounded by yellow clay;" *e* (E), not "a stratum of compact marl, approaching chalk, in large masses," but "a bed composed of great masses of marly chalk;" *f* (F), not "chalk with its ordinary accompaniment of flints," but "common white chalk, with its beds of kidney-shaped flints." These corrections are positively necessary to the truth of the facts stated; for, to say nothing of the difference between "calcareous marl" and "marly chalk," or of "compact chalk and fragmentary chalk," or of "compact marl approaching chalk" and "masses of marly chalk," it is quite clear that Mr. Moggridge does not understand the nature of the beds described. The word "ordinaire," by him Englished into "ordinary," in connection with the *flints*, instead of being translated *common*, as

* The small letter refers to Mr. Moggridge's sketch; the large letter to M. Cuvier's.

connected with the *chalk*, clearly proves this; for that word, as used by the learned authors of the *Description Géologique* shows where the beds of true unaltered white upper chalk commence, and so distinguishes the line of demarcation between the diluvially altered beds above and the regular undisturbed strata below. The bed *d* (D) is more interesting than at first appears; for it is decidedly coincident with the diluvial beds that cover a great portion of Norfolk, Suffolk, and Essex, and are there locally termed "rubble," consisting of yellow clay, containing egg-like portions of chalk, of which I possess numerous memoranda, some of them deserving of publication. The bed *e* (E) is the upper surface of the chalk, as changed and discoloured by the infiltration, &c., from above; and numerous examples of this nearly superficial chalk may be found all over the chalk district of this country, as well as of France, where, I trust, Mr. Moggridge's researches have been in general more successful than in this "*singular* instance." Mr. Lyell (*Geological Transactions*, vol. ii. new series, p. 84.) has these words, in speaking of the junction of the plastic clay beds and the chalk at the Old Harry rocks, in Studland Bay, Dorsetshire (about three miles *directly* from the spot in which I write):—"the *chalk for two feet is a soft marl*, and minutely striated with *yellow* and white lines, occasioned, perhaps, by stains derived from the breccia," which lies next to it; a parallel case to that of some of the beds above alluded to. In *The Outlines of the Geology of England and Wales*, by Conybeare and Phillips (p. 62.), there is a reference to the surface of the chalk at the locality in question, namely, at *Lower Meudon*, near Paris, the *Meredon** of Mr. Moggridge; and at p. 63. (note), instances are quoted from England. Mr. Moggridge does not say where the other instances are which he met with in his late researches; but they are probably those alluded to by Cuvier and Brongniart, and treated of by them at p. 134. 137. 141. of their work. (Vide *Description Géologique*, p. 327.)

Mr. Moggridge would have rendered "*his* sketch" and "explanation" more worthy of notice, had he reproduced the observations of the authors from whom he borrowed, namely, that the stag's horn was not discovered in the chalk, but in a cavity in the chalk filled with the chalky breccia (or rubble), washed in thither before the vegetable soil *b* (B) was de-

* This change of Meudon to Meredon is wholly our deed. The manuscript had been singed (in truth, a little burnt) where this word occurred, and by the tops and bottoms of the letters left remaining we determined the word to be Meredon, as it now appears erroneously, as it should have been Meudon.—*J. D.*

posited; an "explanation" which not only *explains* the fact itself, but explains away the incorrect description of a "*subsidence.*" Cuvier and Brongniart state (p. 328.) that they saw and copied the circumstance, as it was discovered by M. Langlois, whilst digging a well in the garden of Madame Fourcroy; and that the workmen ceased labour till they could arrive at the spot. But I very much doubt whether they discontinued working altogether, in order for Mr. Moggridge to commence his "late researches" ten years afterwards; and whether he ever became acquainted with this "*singular instance of subsidence!*" except in the pages of his predecessors. If so, this instance is very singular indeed, and his "late researches" quite remarkable! — *W. B. Clarke. Parkstone, near Poole, Dec.* 22. 1832.

The Rain Gauge or Pluviometer (Vol. V. p. 769.), *and Rain Gauges generally.*— An objection to the rain gauge proposed Vol. V. p. 769., and to all *rain gauges with floats*, is, that they do not measure the rain which is balancing the weight of the float and rod. It is obvious, on looking at the figure [we repeat the cut *fig.* 19.], that a good deal of rain will fall before the float and rod are raised from the bottom of the gauge. Of course, in *graduating the rod*, an allowance might be made for this; but, nevertheless, if only a small quantity fell after each emptying of the gauge, insufficient to raise the float, it would not be indicated at all by the proposed gauge. I should prefer to dispense with the float and rod, and measure the rain into a glass jar or tube, graduated into cubic inches and tenths, and divide the amount by the area of the funnel, which will give the rain on each square inch of its surface. The funnel should have a raised edge, or, in high winds, part of the rain may be blown out of it.

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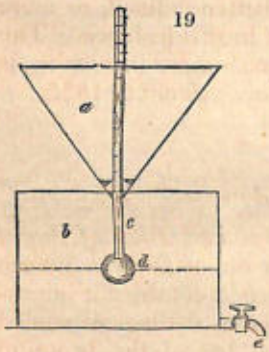
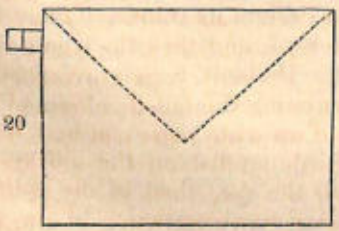


The stopcock may be left out, and a good cork substituted, and the whole constructed like *fig.* 20. which is a box with top 10 in. square, the funnel about 1 in. below its edge, and on the side a short tube for removing the water, with cork or stopcock. Suppose you have found 17·8 in. of rain in the gauge, the area

20



being 100 square in., the amount, per inch, is 0·178 in., which leaves nothing to desire on the score of minuteness. A graduated jar may be procured from any seller of chemical apparatus. The above is particularly adapted for daily or weekly observations. The water being removed at every observation, the effects of evaporation on the results will be diminished. — *E.*

See also Newton's *Journal*, vol. i. p. 48. A figure and description of a self-registering pluviometer, the invention of a Mr. Crosley, are given in Vol. I. p. 71. — *J. D.*

Magnifying Power of a dense Atmosphere. (Vol. V. p. 494.) — I can certainly verify the fact of the magnifying power of the atmospheric medium, under similar circumstances to those adverted to by Sir John Byerley. (Vol. V. p. 494.) When at Bristol, about two years ago, I distinctly perceived, with the naked eye, the spots on the sun's disc, and communicated the circumstance to Mr. John Braham, optician, of that city. The sun had not risen far above the horizon, and the dense medium tempered the solar blaze. I never saw, with the telescope, the spots on the sun's disc better defined, or more distinct, or of greater diameter, than in this instance. The phenomenon of the horizontal moon, on similar principles, is a problem of easy solution. — *J. Murray. Jan.* 20. 1833.

Art. II. *Queries and Answers.*

Preserving the Colour of the Legs and Bills of stuffed Birds. (p. 92.) — Sir, I take an early opportunity to inform your correspondent, T. K. (p. 92.), that I consider it impossible to preserve the colours unimpaired in the legs of stuffed birds. I have seen the lake-coloured leg of the beautiful yawarraciri of Guiana lose every particle of the red; and I have found that no external application can preserve the fine colours in the legs of the scarlet curlew, the trumpeter, the water-hen of Guiana, and many other birds too numerous to mention.

Under the outward scale of the leg, in the living bird, are substances from which the leg derives its colour. They fade in time after the death of the bird, and then the whole complexion of the leg is changed. Perhaps your correspondent might partially succeed in renewing the faded colours of the leg, by means of paint mixed up with water: at best it is a bad business. The legs of birds stuffed on the old system are so shrunk and hideous to the eye, that, in my opinion, their colour is a mere secondary consideration. In the bills of birds, the colours are either produced from internal sub-

stances, as in the base of the lower mandible of the toucan; or inherent in the horn or bone itself, as in the cassique. In either case, dissection is absolutely necessary, if your correspondent wishes to have the beauty of the bill retained or renewed.—*Charles Waterton. Walton Hall, Jan.* 9. 1833.

What Relation do the Colour and Markings of any Egg bear to the Bird hatched from such Egg?—Is it not possible that the variations of colour and markings on the eggs of various species of birds may have some connection with the bird to be hatched? It must be well known to those who have attended to oology, that there is a great dissimilarity in the colour and spots on the eggs of the blackbird, magpie, starling, canary, &c. Such variations, it appears to me, cannot arise from accident; therefore, by patient observation, perhaps, some cause for it may be found.—*C. Birmingham, June* 6. 1832.

Eggs of the Common Fowl remarkably spotted.—Sir, I send you a sketch (*fig.* 21.) of two hen's eggs, which have recently

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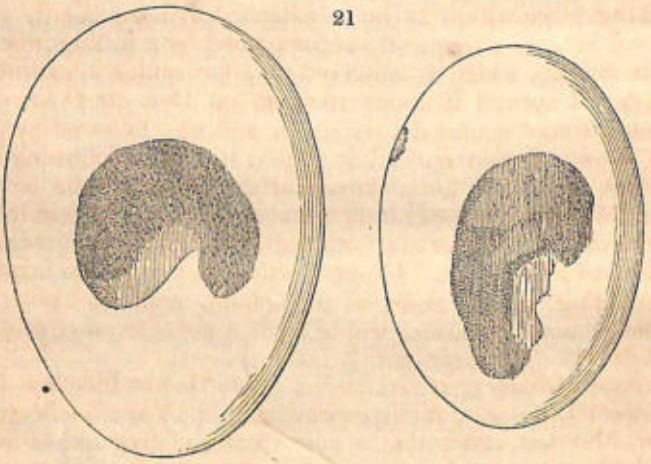


come under my notice; and, as some doubts are entertained whether or not the spots are natural, I shall be obliged to some of your correspondents to state, through the medium of the Magazine, if such have ever been observed by them. The colour of the spots is as nearly represented as was possible, and there were no marks on any other part of the eggs.—*Daniel Stock. Bungay, July* 2. 1832.

Does the Willow Wren (*Sylvia Trochilus* Lath.) *sip the Nectar of the Flowers of the Crown Imperial* (*Fritillaria imperialis* L.)?—In the tenth edition of Priscilla Wakefield's *Introduction to Botany* (p. 18.), after describing the nectary

of the Fritillària imperiàlis, it is stated, "the willow wren creeps up the stems of this plant, and sips the drops of honey as they hang from the petals." I very much doubt if the willow wren can effect this, if it be inclined. I have watched a great many plants at different times, and never could detect a wren on or near them. If any of your correspondents have seen them performing the above act, and will inform us, they would particularly oblige. Yours, &c.—*H. Turner. Bury St. Edmunds, April* 30. 1832.

The "Bird whose nightly Note foretells approaching Weather" (p. 93.) may, I think, be referred to the *tinnitus aurium*, that peculiar singing in the ears which often precedes a change of weather; and is caused by the alteration in the weight of the atmosphere, and the diseased state of the auditory nerve. I have heard it in almost every variation of sound, from a very low note to the shrillest piping imaginable, and I have noticed that the very high notes usually prognosticate rainy weather, the change, in every instance, taking place within 24 hours after it had been heard. The lower notes are frequently accompanied by a feeling precisely like to that which is observed on approaching a wall in the dark. I noticed it about 10 P. M., on Dec. 30. 1832: it in that instance sounded very shrill, and was followed by a fall of snow. I also noticed it at 8 A. M. of the following day; it was then in a lower key, and so faint as to be but just audible: the thaw began here about 11 A. M. These indications of the weather are noticed in Forster's *Encyclopædia of Natural Phenomena*. I conceive that they might be arranged according to the notes of the gamut, and, by having the change noted opposite, would form a novel weather table.—*B. B. W. Norwich, Jan.* 7. 1833.

Some Account of the Natterjack (*Bufo Rubeta* Fleming, *Rana Rubeta* L.).—Sir, A correspondent in the *Imperial Magazine* for May last states that a new species of frog exists in the neighbourhood of Lewisham, in Kent, and was peculiar to that part of the country. As I have nearly ready for the press a Monograph on the Zoology and Comparative Anatomy of the genus *Rana*, and of the *R.* temporaria in particular, I shall feel thankful for any information on this subject which any correspondent may please to favour me with. On perusing the paragraph in the magazine alluded to, I wrote to some scientific friends at Lewisham and its neighbourhood, but can obtain no information respecting any new species. Professor Rennie, in answer to a note I addressed to him on this subject, informs me, that he has heard that the natterjack (the *Rana Rubeta*) has been found at Blackheath: but he doubts; it at

least, he never has met with it. — *H. W. Dewhurst. Aug.* 6. 1832.

We join our correspondent in asking information on the kind, whether variety or species, of *Rana* which has been noticed at Lewisham; and, until some kind friend supplies it, we may, in the interim, refer Mr. Dewhurst to the following extracts on the subject of the natterjack of Pennant: —

Reports of the Proceedings of the Committee of Science and Correspondence of the Zoological Society of London. Part I. 1831, p. 61. *April* 26. "Mr. Gray exhibited several living specimens of the natterjack of Pennant; a reptile intermediate, in form and habits, between the toad and the frog. He stated, that this animal, the indigenous existence of which has frequently been doubted, is found abundantly on Blackheath, and on other commons in the neighbourhood of London."

The best account of the habits and characters of the natterjack that we are acquainted with is from the pen of the Rev. Leonard Jenyns, and published in the *Transactions of the Cambridge Philosophical Society*, 1830; and thence we copy Mr. Jenyns's description of the animal: —

"The general outward appearance is similar to that of the common toad: nevertheless, the following description will serve to discriminate it from that species. Upper part of the body yellowish brown, clouded here and there with shades of a darker colour, and covered with porous warts and pimples of various sizes, which are generally black, enclosing a red spot. A bright golden yellow line runs down the back, extending from the top of the head to the anus, and is very characteristic of the species. Over each shoulder, behind the eyes, is a slight dash of brick red. The under parts are thickly covered with warts of a whitish hue, which are larger and more scattered towards the posterior, smaller and more crowded towards the anterior, extremity; besides these, the whole of the abdomen, the sides, and, in some instances, the breast and throat, are thinly spotted with black. Chin white; eyes somewhat elevated, and projecting; tongue connected with the lower jaw as far as the lip, from whence it extends into a kind of spatula, which is folded back upon itself when not in use. Feet spotted with black; the spots, in some instances, uniting to form transverse bands. The anterior pair with four divided toes of nearly equal length; the posterior with five perfectly formed, a little webbed, and the rudiment of a sixth*; of these, the fifth is more than double the length

* "In the common toad the sixth toe on the posterior pair of feet is much more developed than in the natterjack. The toes are also more webbed." — *Jenyns.*

of any of the others. Extremities of all the toes black. The general colour of this animal varies in different individuals; in some approaching to yellow, in others almost to black. In such as were sickly, the black had a lurid dingy appearance; the colours lost their brightness, and the yellow dorsal line became nearly obsolete. All the specimens which have as yet fallen under my notice have been small, and considerably under size. Pennant states the following to be the dimensions of this reptile: — Length of the body two inches and a quarter; the breadth, one inch and a quarter; the length of the forelegs, one inch and one sixth; of the hind legs, two inches."

Mr. Jenyns, besides enumerating these characteristics of the form of the animal, gives a very pleasing account of its habits. "Its great distinguishing habit," he remarks, "is its mode of progression. Unlike the frog, which advances by regular leaps; and the toad, whose pace is seldom exerted beyond that of a slow crawl; the natterjack has a kind of shuffling run, which is seen to most advantage when it is following its prey, and by which means it is enabled, when in full health and activity, to get over its ground with considerable quickness." Mr. Jenyns is of opinion that this species does not spawn so early in the year as either the common toad or frog.

We have now quoted far enough to enable our readers to distinguish the animal, which, notwithstanding the previously existing doubts to the contrary, probably exists in every county of the empire; and we hope, through the research of our correspondents, to have the pleasure to record, before this time next year, various localities for it. We would request from them, with the notices of localities, facts on the habits of the animal; for the latter is the more interesting kind of information. That they may be aware what points in its history are not already known, and how to keep the animal in confinement for convenient everyday examination (should any one desire it), we shall now farther transcribe from Mr. Jenyns's paper his account of his mode of keeping it, and of the manners he observed in it while kept. We should hesitate to trespass thus much, did we not feel assured that Mr. Jenyns's devotion to natural history will readily permit us the use of his remarks. Mr. Jenyns met with the natterjack in bogs, on a (Gamlingay) heath, in considerable abundance; but, as two solitary specimens were afterwards met with in two other and distant places, he deems it not so local as was formerly supposed; but that, from its general resemblance to

the common toad, it has been often overlooked. Living specimens brought from the bogs on the heath were kept alive nearly two months in a cage, in which was always kept a sod of turf. For the first fortnight of their confinement they ate nothing, yet continued plump and active; afterwards they became more reconciled to their condition, and readily devoured flies and other insects, if given to them alive: they would never touch their prey till it began to move, and to show signs of preparing to escape. When an insect was thrown down into the cage, the first individual that saw it immediately pricked up its head, turned quickly round, and ran towards it till it got within a certain distance, when it would stop, crouch down upon its belly with its hind legs stretched out, and gaze at it with all the silent eagerness of a staunch pointer, and remain in this position till its prey began to move, when, just as the victim was about to make its escape, it would suddenly dart out its tongue, and lick it up, with a rapidity too quick for the eye to follow. The food they seemed to relish most were the smaller species of dipterous and hymenopterous insects: occasionally they would take woodlice, and even centipedes. They also ate large quantities of a small red maggot, which is generally abundant in decayed *Bolèti*, and any of the lesser coleopterous insects which might happen to stray into their cage. One of them, in a single instance, attacked an ant; but it was no sooner conveyed to its mouth, than rejected with great haste and trepidation, probably in consequence of the strong acid which is secreted by these insects: they, however, repeatedly swallowed the smaller bees and ichneumons, without appearing to suffer from their stings. "The natterjack is a much more lively animal than the common toad, and, when in search of food, or following its prey, shows great alertness. When full fed, or from other causes inactive, the above individuals would conceal themselves in the sod of turf which was always kept in their cage. They also occasionally delighted much in a pan of water, in which they would float motionless for half an hour together, having all their legs stretched out, and no part of the body, except the head, above the surface."

Turton's statement (*Syst. Nat.*, vol. i. p. 649.) of the habits of the natterjack is:—"It inhabits dry sandy places of Europe: appears in the evening, especially after showers, and is the species which has been supposed to have been rained down; is of a quicker motion than the toad." Mr. Jenyns's meeting with the animal in bogs, and the pleasure his specimens manifested in swimming in a pan of water, seem to render some quali-

fication necessary, in reference to the statement quoted above, that it inhabits "dry sandy heaths." Pennant, in the last (fourth) edition of his *British Zoology*, vol. iii. p. 24. pl. 2., gives a figure of the natterjack; and Shaw also gives one in his *Zoology*, vol. iii. p. 149. tab. 43.

The natterjack was found by Sir Joseph Banks in Lincolnshire, afterwards by Pennant on Putney Common. It appears to be by no means rare at Blackheath, or in the fens of Cambridgeshire; and in a collection to which we have access are specimens from Suffolk and Dorsetshire. — *S. T. P.*

Is a Monastery, or the Site of one, to be found contiguous to every Piece of Water in which Graylings abound? — Sir H. Davy remarks, in his *Salmonia*, that the grayling (*Sálmo thymállus L.*) is principally found in rivers near which any great monastery formerly stood; and he gives as the reason for this, that it was under the patronage of the monks, from being the favourite fish of St. Ambrose, bishop of Milan. To the instances here given, I may add, that it is plentifully found in the river Ure, near the site of Jervaulx Abbey. I should be obliged to any of your correspondents who could either confirm or contradict this idea. Probably Linnæus applied the epithet thymállus to this species, from its peculiar odour when first caught, somewhat resembling that of wild thyme (*Thymus Serpyllum*). I may here remark, that, notwithstanding the declaration of Walton (vol. i. p. 219.), that this fish "lurks close all winter, but is very pleasant and jolly after mid April, and in May, and in the hot months," the grayling is decidedly a winter fish, being in perfection in December, and going off in April, when it spawns. — *M. P. Sept.* 8. 1832.

Thècla quércus, the Purple Hairstreak retires into the Earth previously to its assuming the Pupa State; a very extraordinary mode of proceeding for one of the diurnal lepidoptera: yet such was the case with several caterpillars of this insect taken in the neighbourhood of Plymouth this season, all of which retreated below the surface of the earth placed in the bottom of the breeding-cage for the reception of other pupæ of its class, and have since produced the imago. Mr. Stephens has observed a difference of form and habit in Thècla rùbi from its British congeners; but neither himself nor Miss Jermyn has mentioned this singular transformation of T. quércus. Has he ever reared the species, which is not an uncommon one in many parts of England? or, do individuals of this genus occasionally deviate from their ordinary mode of undergoing their last metamorphosis? If so, the fact is very remarkable, and ought not to be omitted in systematic

description. Sepp, in his exquisite work on Dutch *Lepidoptera* (vol. iii. part iii. tab. xlv.), has figured and described our species, and says, his caterpillars spun up between two leaves, when the imago appeared on the 5th of July, corresponding exactly to the time when my friend's specimens were developed. Albin (pl. 52.), although he figures the purple hairstreak, says nothing to the purpose on its final transformation, nor does any thing occur on the subject in the European work of Madame Merian. Sepp (vol. ii. pl. xv.) has described and depicted an onisciform larva, strikingly like that of our Thècl*a*, which he calls Limacòdes, feeding on the oak, and which is remarkable for having only the three anterior pair of feet; the want of the usual complement being supplied by a slimy matter, and the contractile segments of the abdomen, to aid locomotion. On first hearing of the larva having retired under ground to change, I imagined they were the same as those figured by Sepp; but the subsequent appearance of the imago soon undeceived me. Besides, the vast difference in structure between the larva of Limacòdes, which is a nocturnal species or moth, and those of Thècl*a*, the former are developed much later, and the pupa is folliculated, and does not change beneath the ground. — *William Arnold Bromfield. Plymouth, July* 15. 1832.

The Mazarine Blue Butterfly. (p. 96.) — From X.'s description (p. 96.), I have no doubt that the butterfly which he took, and supposes to be the mazarine blue, is *P*apĭlio Cỳmo*n* of Haworth, Lewin, and Miss Jermyn, and Polyómmatus A`ci*s* of Stephens. The English names of insects, it should be remembered, are unfortunately but vague and uncertain; at least, they are oftentimes vaguely applied. The insect in question has been called the dark blue by Lewin, and more generally by others the mazarine blue; and as *P.* Cỳmo*n* of Haworth (or Cìmo*n* of Lewin) is one and the same thing with P. A`ci*s* of Stephens, the English name "mazarine blue" belongs, of course, to both. As to the treatise referred to by X. (Constable's *Miscellany*, lxxv.), in which *P.* Ario*n* is given for the mazarine blue, it is probably a work of no great authority: the plates, I can confidently say, are worse than bad, insomuch that a very transient glimpse at them prevented my looking further into the accompanying letterpress. *P.* Ario*n*, from its size, ought to be distinguished, as it usually is, by the English appellation "large blue." *P.* Cỳmo*n*, or A`ci*s* (whichever of the two may be the more correct name), was at one time considered an insect of very great rarity. In 1803, when the first part of Haworth's *Lepidóptera Británnica* was published, that able entomologist, than whom no

one was more competent to give judgment in such a case, spoke of it as the rarest, perhaps, of our British blues (*rarissima ferè omnium nostratum cæruleorum*), and as having been then lately sent to him, by two different friends, out of Yorkshire and Norfolk. Since that period, the species has (to use the collector's phrase) *turned up* in a variety of situations. Cambridgeshire, Dorsetshire, Hampshire, and Surrey are mentioned among its localities; and Lewin had previously taken it near Bath. In 1804, June 28., I took a single specimen in an open plantation by the side of Coleshill Park; and on July 15. 1812, another in a woody situation, near Hinckley, Leicestershire, in a very worn and faded condition: both were females. I have an example, also, of the same sex captured by a village shoemaker, in another part of Warwickshire, I believe in the vicinity of Birmingham; and a collector at Coventry has several specimens, which he took some years since in the neighbourhood of that city, without at the time distinguishing them from the common blue. A male specimen, likewise, was taken, about thirty years ago by a friend of mine, near Dudley. The species, in short, though by no means common, appears to be widely distributed: nor is it peculiar to chalk districts; but seems to delight in woody situations abounding in grass. Probably it may be sometimes overlooked on the wing, and passed by for P. I*c*arus. The azure blue (P. Argiolus), of which X. demands a description, has already been figured (both sexes) in Vol. IV. p. 477. Without adverting again to its dissimilar habits (see Vol. V. p. 490–1.), I may just observe, that it cannot well be confounded with any other British species, being the only one that is blue on both surfaces of the wings. The under side is of a delicate grey silvery blue, sparingly ornamented with irregular black spots, in which latter respect it resembles the corresponding surface of *P.* Cỳmo*n* or A'ci*s* of the authors above quoted. Should this reply not prove satisfactory to X., nothing remains for it but an inspection of his specimens; a method which, after all, would perhaps be the most desirable. — Yours, *W. T. Bree. Allesley Rectory, Jan.* 9. 1833.

Is Pitchstone found in Scotland? — Phillips, in his excellent *Outlines of Mineralogy and Geology* (p. 168.), speaking of the pitchstone, says, "It abounds in some districts of volcanic origin, but in Britain is found only in veins, occasionally, as in Ireland, traversing primitive rocks." Now, Sir, I possess a good-sized (more than two inches thick) specimen of pitchstone from the Isle of Arran, knocked off, as I was told, from a large block; and the man of whom I purchased it assured me that pitchstone is found in the islands of Arran and Skye,

disposed in large masses. Will some one of your geological or mineralogical correspondents, who has visited the Scottish isles have the kindness to inform me which is right? — *W. Perceval Hunter.*

The remark of Phillips is truly Irish. Pitchstone *is* found in Scotland, in the isles of Arran, Skye, Lamlash, Canna, and Mull. Pitchstone is generally found in dikes; and when in veins, as in Arran, where it interlaces sandstone, the veins are decidedly intrusive. In Lamlash, off Arran, there is a dike, the centre of which is basalt, the sides pitchstone; and Dr. Macculloch states that, where basalt ramifies into slender filaments, it becomes pitchstone. Vide Daubeny *on Volcanoes*, p. 422. See also Macculloch *on the Western Islands*; Poulett Scrope *on the Ponza Isles, Geological Transactions*, 2d series, vol. ii. p. 195—236.; Messrs. Lyell and Murchison, on the excavation of valleys, as illustrated by the volcanic rocks of central France, in the *Edinburgh New Philosophical Journal*, for 1829 (p. 15. of that memoir); Scrope's *Memoir on the Geology of Central France*; A. Brongniart, *Tableau des Terrains*, &c., p. 357.; Bakewell's *Geology*, p. 376, &c. These references will throw some light on the nature and formation of pitchstone. Phillips (*Introduction to Mineralogy*, 3d edit. p. 131.) gives as localities, Cairngorm and Arran, in granite; Skye, Canna, and Mull, in trap; and Leonhard (*Handbuch der Oryktonosie*, p. 182.) adds Eskdalemuir in Dumfriesshire, and Ardnamurchan in Argyleshire. The author of this note possesses several specimens of pitchstone (in addition to many from Auvergne, the Cantal, St. Helena, the Isle of Ascension, Iceland, Hungary, and Italy) from Arran, where the dikes and veins are considerable, and the removed "blocks" comparatively large; as well as from Newry, in Downshire; which proves that Phillips is correct, as well as "the man" from whom Mr. Hunter purchased his specimen. For the illustration of the Irish localities, see Fitton's *Mineralogy of Dublin*, p. 53. On the subject of dikes, see Lyell's *Geology*, i. 342., ii. 303.; De la Beche's *Manual*, p. 128.; Buckland and Conybeare, *G. T.* vol. iii. — *W. B. C. Feb.* 2. 1833.

The Second Volume of Fleming's British Animals.—Is this to be published, and when? — *Robert Ranking. Hastings, Dec.* 12. 1832.

Has a List of the Plants of Lincolnshire ever been published? If one has, how lately, in what work, and by what bookseller? — *B.*

THE MAGAZINE

OF

NATURAL HISTORY.

MAY, 1833.

ORIGINAL COMMUNICATIONS.

ART. I. *Notices on Natural Objects observed in a Ramble on St. Valentine's Day.* By RUSTICUS of Godalming.

Sir,

YESTERDAY was St. Valentine's day. I had the good luck to meet with a companion as idle as myself, and as fond of the smell of the fresh air; and, without horse, dog, or gun, we wandered up the sandy lane leading to Eshing. Near the top of the lane we observed a whole family of

The Long-tailed Tit threading the branches of an elm tree, in search of insects. These little fellows are all fluff and feather; they seem to have no body at all, but to consist of a lump of down, nearly round, with one long feather stuck in the middle of it for a tail: their cry is weak, peevish, and often repeated, and when frightened away from one tree they go off to another in regular order, all in a line, jerking up and down, and holding out their long tails in a straight line behind them: in this party were fifteen, no doubt the hatch of a single pair last year.

[*Dràba vérna.*] On the old bridge at Eshing we were delighted to see a whole colony of that lovely little flower, *D*ràba vérna. Although it was the first time I had seen this beautiful forerunner of spring, it seemed, from the quantity in flower, to have been blooming for two or three weeks. I brought home several plants of it; one is now before me growing and flourishing with plenty of earth on a sixpence: it had nineteen leaves, and five full-blown flowers, yet no part of it extends to the circumference of the sixpence. Is not this the smallest flowering plant known? It has long been a

favourite of mine, and year after year the first plant I find of it is brought home, and commonly killed with kindness.

[*The Little Grebe.*] On the river bank we saw a little grebe. Why it should have got ashore I cannot tell; I never saw one out of water before. When I observed it first, it was standing bolt upright; but, the moment it espied us, it dropped down on its breast, and tumbled head over heels into the river.

[*The Hare.*] As we wound our way up a steep field by Milden's Wood, I was within a tittle of stepping on the back of a hare. She had scratched out just enough of the sandy soil to bring her back level with the surface; one forefoot was stuck straight out before her, and on this rested her head; her ears fell on her neck on each side, and touched the ground: her eyes, large, bright, and black, were fixed intently on me; and the instant that my own eye caught hers, I saw a slight movement; the nose had slid off her foot to the ground, and the other foot had been stretched out: this movement had lowered her head, which was now but a fraction above the level of the hill-side; and so exactly was she the colour of the surrounding soil, that but for the lustrous eye I could not have persuaded myself there was a living creature there. I pointed her out to my friend, who, in his eagerness, had as nearly stepped on her as I had. There we stood, about two yards apart, and puss motionless as a stone between us. "I'll trouble you to move, madam," said I, at the same time applying my toe very gently *à posteriori*: puss took no notice; and my friend pounced on her, seized her, and held her up by the ears singing out the "*who-oop*" at the top of his voice, she kicking with all her might, and crying the same plaintive and piteous "aunt, aunt, aunt," which has often moved my compassion for these harmless creatures when the hounds have once taken their fatal hold of them. However, I sued for her liberty, and he put her down: away she went, scampering up the hill like a mad thing. Hares never run down hill if they can help it; and if there is no possibility of running up, they take the hill-side at a slant. When at the top, we turned round to gaze on that lovely valley; yes! lovely, even in the bleak dreariness of February. The clumps of gloomy pines, the never-ending twinings and twistings of the silvery Wey, and the thousand hills, small but beautiful, peeping one over the other till overtopped by the blue undulating outline of Hindhead, all tend to make this a view, to me at least, of unceasing interest. We lighted our cigars with a lucifer match, and, talking of the affairs of the nation, reached Northbrook.

"Doctor," said my friend, applying the two fore fingers of his left hand to remove the fag end of his cigar from between his lips, and sending forth a continuous stream of smoke in a right line at least eighteen inches beyond his nose, at the end of which journey it turned at a right angle like the triangular shot at Antwerp;—"Doctor," said he, a name by which he always calls me, although I am neither D.D. nor LL.D.: "Doctor, who is this Rusticus who writes for Loudon?" No reply. "About shooting in the Isle of Wight, you know: have you any idea who it can be?" I was very busy picking to pieces a sham moss rose, of last summer, which I had just found in the hedge: my silence seemed to excite his suspicion: he turned sharply round,—we were sitting on a stile at Northbrook. "Doctor, you don't know Rusticus?" "No, not I," I replied, much relieved by the question; for I'm sure I don't know myself. My friend replaced his cigar. "I heard," said I, "at Stedman's, the other evening, that it was———." "Not likely," was the reply, followed by a vigorous attempt to draw the cigar into life again; it was of no use; it had expired, leaving about an eighth of an inch unconsumed.

[*Habits of the Weasel.*] At this moment a very large rat came bustling down the hedge just before us, bringing with him a lot of loose earth: my friend was just jumping down for a stone to whirl at him, when a little bit of a weasel followed the rat down the bank, holding his head well up, like a fox-hound running breast-high. The rat had crossed the path, and got into a little low bank on the other side of the footpath, over which he scrambled, and came out among some Swede turnips in the adjoining field, at the very moment the weasel went into the low bank hunting him. The turnips were so small, and so far apart, that we did not once lose sight of the rat. He ran in and out among them, continually crossing his own track, and then, making a little circle, he came to the bank a good way from where we sat, and, climbing over it, got into the footpath about a hundred yards from us; he then ran towards us with all his might, straight along the middle of the path, and passed under the stile on which we were perched, motionless, yet happy, as the statues of Tam o'Shanter and Souter Johnny, and about ten yards behind us he went into the thick bank, and was lost to us. The weasel hunted well in the little low bank, and seemed a good deal puzzled, staying there much longer than the rat; at last he seemed to have found out that the game had taken to the turnips: here he pursued him with great earnestness; but, finding the trick that had been played to

puzzle him, he, like a reasoning creature, made a large circle, going completely outside all the trail: by this scheme he gained on the rat by recovering the scent just where he had gone over the little bank the last time. In a few moments he was in the footpath, and came galloping towards us in fine style, his back arched, his head up, and his tail in a straight line behind him. He passed under us, and in his eagerness overshot the spot where the rat had gone into the bank: it was only for a moment, he came back, quartered the ground, found the trail, and was in the bank in no time. A blackthorn overhung the path; we saw something move in it; it was the rat; the weasel was going up the stem; he was close after him; he evidently viewed him; he gained on him; the rat dropped himself into the footpath, the weasel did the same, and followed him up the bank within a foot: we heard a shrill cry, first long, then short, shorter, then all was still; we went quietly to the place; the weasel left his prey, hissing at us like an angry cat; the brain of the rat was laid completely bare, but his little heart continued beating for nearly a minute as I held him in my hand. "Doctor," said my friend, "that is the way of the world." "Exactly," I replied; "set thief to catch thief." My friend was silent; I fancied he did not relish my proverb. We walked on: the pathway leads through the garden at Northbrook.

A Thrush was shouting out his sonorous vespers from the topmost twig of an old elm tree, which, black, drear, leafless, and budless, offered no token of the spring, which the sweet bird on its summit seemed so blithely to herald; but it was St. Valentine's day, and he was inspired by love.

[*Additional Facts on the Weasel.*] When I got home I sat down and made these notes for you, and as they do not fill my paper, I will add one or two *mems.* about the weasel, which have for a long time been standing by to be let go: — The weasel is a very awkward-looking animal when running on level ground; his great length and slenderness of body, and the shortness of his legs, are very much against speed; but in climbing trees, or threading the long and narrow galleries of field-mice, this seeming disproportion is of the greatest use to him. I have seen him coursing along the boughs of a tree, winding himself round, above or below, just as suited his purpose, with all the ease and agility of a squirrel. I have watched him enter a wheat-rick at the bottom, and in less than a minute seen him peeping out under the thatch: but in mentioning this I am on dangerous

ground; I fear I shall neither make you nor your readers believe that wheat-ricks are very often a complete honeycomb, with the galleries made in them by mice and rats extending from the very crown to the faggots on which they are built; and that hundreds of these vermin are frequently found in one rick. However, where there are many rats there are few mice, and where there are many mice there are few rats; because the rats, being strongest, expel the mice. To return to the weasel: his usual habitation is the gallery of a field mouse on whom he has served a writ of ejectment, and he usually chooses one in a bank in which the roots of bushes are tolerably plentiful and strong, as he well knows that these will effectually prevent his being dug out by any evil-disposed person or persons: he also invariably takes the precaution to select a burrow with two openings; so that, if one is besieged, he makes his exit at the other. I recollect very well seeing a weasel go into a little round hole, scarcely bigger than the hole of a wasp's nest; I immediately put my foot on it, and a lad who was with me I despatched for a spade, determined to take the little fellow alive. The spade came, we dug away, cut through roots, pulled down the bank, and did no end of mischief; and, after two hours' labour, found that the hole went right through the bank, and came out on the other side.

The weasel has an excellent nose, as I think I have pretty clearly shown above; but it is not exercised on the trail of rats only. I have, on two occasions, seen rabbits pursued by him, run down, and killed: one was on Munsted Heath, the other on Highdown Ball. In both instances, the rabbit seemed stupefied or fascinated by fright; in one instance running round and round, and not taking the right precaution for escape; in the other, starting, stopping, and, as I fancied, trembling with fear. When its prey is taken, the weasel only eats the brain. Every book on natural history (since the flood at least) charges him with sucking blood: this is not the case, though its contradiction is of little consequence; I only mention it to show how they all copy from one another. If the first writer about the weasel had denied him a tail, I would venture any thing that no subsequent author would have contradicted it; and why? because your smoke-dried bookmakers on natural history, or any thing else, trust to others' eyesight in preference to their own.

[On the *Mustèlæ* tracking their prey by smelling, see also Vol. V. p. 721., Vol. VI. p. 268.: and, on their habits generally, the mentions indicated in p. 208.]

[*Vernal Appearances in the Neighbourhood of Godalming.*] I wrote the above on the 15th of February; the following on the 13th of March: —

The thermometer has sunk 27° since this time last month, when I began this epistle, and the snow has nearly blinded me to-day in a gallop along the Hog's Back: but never mind; "a cold and dry March, and a crop of wheat," is an old and a very true proverb; we shall have a cheap loaf. The crocuses have remained for three weeks precisely *in statu quo*, and the hedgerows are still as black as on St. Valentine's day, except where a warm nook has allowed them sun, and has protected them from the keen wind. In such situations, the whitethorn is beginning to be gemmed with green, and the palm willow displays its velvety catkins looking as though they would gladly return to the winter coverings which they have lost. In the park the giant aspens have put forth their catkins in unusual quantities, so that the ground below is strewed with those which the fierce wind has carried away from their moorings on the twigs; none of them have shed their pollen, and, as they lie on the ground, they look more like great red caterpillars than any thing vegetable. The female blossoms of the hazel, which a month back, under the influence of a mild south-wester, were fresh and clear, and bright red as the happy and innocent lips of a young laughing beauty, have turned dark and withery as that beauty may hereafter turn under the destroying influence of the bitter blast, unrequited love. Even now the wind is whistling under the door of my little room, in spite of a leathern binding, and heaving up my carpet into the most unseemly convexities; while the feathery snow is driving in horizontal lines past my window; yet at this moment I hear the harsh loud song of the missel-thrush, bravely defying wind and weather. I am, Sir, yours, &c.

Godalming, March 13. 1833. RUSTICUS.

ART. II. *Notes, on Butterflies, and other Natural Objects; made in Cumberland, through the Month of May*, 1832. By G. W.

LOW HALL, near Whitehaven, May 1. 1832. — The "genial" month of May has commenced in a most un-May-like way, the day being extremely cold.

10th. The weather hitherto has been bitter cold and piercing, with occasional chilling showers from the north and east. Of the continued cold, in my own person, I feel the

effects severely. The severity must be keenly felt by the insect tribe, which the slightest changes affect, and which, if narrowly watched, would prognosticate those changes with as much nicety as the thermometer. Notwithstanding the state of the weather, I heard

The Corncrake, Landrail, or Daker Hen of Bewick (Rállus *Crex L.*), calling in the meadows not far from Whitehaven. White, in his *Natural History of Selborne*, says it arrives about the latter end of April. Considering our northern latitude, and the unusual coldness of the season, this may be deemed a not late appearance. From my own observation, corncrakes may usually be met with as soon as the grass has grown sufficiently to shelter them; and the time of meeting with them varies with the varying forwardness or backwardness of the season.

15th. [*Insects.*] The weather still chilly. A large white butterfly was flying about on a bank with a southern exposure. For some days past neither a Vanéss*a* urtìcæ nor a V. I*o* have been visible; and in the order Coleóptera but few insects are to be found, even on hedges exposed to the sun for the greater part of the day, and sheltered from the northern blasts at night; which may be owing to the rawness and cold of the night.

17th. Somewhat warmer. A friend informed me the orange tip (Póntia cardámines) had been seen several days ago: I saw this day, for the first time, several in meadows lying low and warm; and along with them a few of the veined white butterfly were flitting sluggishly about.

18th. A sensible change for the warmer. I saw, for the first time,

The Swift, Black Martin, or Deviling of Bewick (*H*irúndo *A*pus *L.*). White says they come about the middle of April, but this is late even for us: I had been on the look out for them for some time, so that I expect this is amongst the first that has been seen hereabouts. Between ten and eleven at night, there being no moon,

The Cuckoo (Cùculus canòrus L.). was calling continuously, along with innumerable corncrakes, which utter their harsh notes, crake crake, almost incessantly after sunset. The cuckoo, I believe, is a bird that sings by day only; at least I do not recollect ever having heard its note after sunset*, and

* Mr. Murray attests (Vol. IV. p. 147.) his once hearing the cuckoo singing even "at the witching hour of night;" and Mr. W. H. White gives evidence (Vol. IV. p. 466.) of another instance. The poet Campbell, by a line in his exquisite *Pleasures of Hope*, seems to have been also acquainted with the fact. The passage containing the line is so congenial to the feelings of every naturalist, that we hope to be forgiven introducing

I fancy its singing so late is a singular circumstance, to be attributed to the change in the atmosphere from severe cold to warmth and mildness. For the last three weeks the weather has been invariably very cold during the day, and frosty at night; and at noon this day, for the first time, I felt something like summer heat. Weather more unpropitious for the entomologist could not have been.

19th. The cuckoo was heard again about the same hour as last night. The large white butterfly, in considerable numbers, is now lively on the wing. A magnificent peacock butterfly was floating about; the first I had seen for some time past.

21st. Change of residence: going farther into the country, to a situation pleasantly situated in a valley, and well adapted to entomological researches.

24th. Walked along the valley to the sea beach at St. Bees. Gathered a few shells of the soldier crab [*Pagùrus*], of various sizes, some large, and others very small. I saw on the beach a Royston crow *Bewick* (*Córvus Córnix L.*, hooded crow *Fleming*, *Córnix cinèrea Willughby*); migratory, and said to be common in these parts, which it may have been formerly, but is not so now, for I remember having seen but three or four; one of them several years ago, near the large rookery at Isel Hall, a seat of Sir Wilfred Lawson, on the banks of the Derwent, and almost at the foot of the celebrated Skiddaw. To a wall fronting the sea beach, and exposed to the sea breeze, there were attached innumerable quantities of the common garden snail.

it entire. G. W.'s remarks, under May 25., seem to increase its appropriateness here. — *J. D.*

" Remote from busy Life's bewilder'd way,
O'er all his heart shall Taste and Beauty sway!
Free on the sunny slope, or winding shore,
With hermit steps to wander and adore!
There shall he love, when genial morn appears,
Like pensive beauty smiling in her tears,
To watch the bright'ning roses of the sky,
And muse on Nature with a poet's eye! —
And when the sun's last splendour lights the deep,
The woods and waves and murm'ring winds asleep;
When fairy harps the Hesperian planet hail,
And the lone cuckoo sighs along the vale;
His path shall be where streamy mountains swell
Their shadowy grandeur o'er the narrow dell,
Where mouldering piles and forests intervene,
Mingling with darker tints the living green;
No circling hills his ravish'd eye to bound,
Heaven, Earth, and Ocean blazing all around."

Part II. l. 91—108.

25th. A walk on the sea brows at Fluwick. These sea brows, as they are called, are immense perpendicular crags of red freestone overhanging the shore, and in many parts covered with ling, whins, and innumerable species of wild plants; affording a fine field for the botanist, as well as for his next-door neighbour the collector of insects; and, for number and variety of both plants and insects, perhaps it is the best spot in the county, with which I am acquainted at least. Here also may the admirer of the beauties of nature, on the large scale, be gratified by the magnificence of the scenery; having before him a noble expanse of sea, the Isle of Man, and the blue hills of Scotland, on the one hand; and, on the other, an extensive view of the mountainous district of the south-west of Cumberland. That beautiful insect, Cicindèla campéstris, which some of your correspondents have called the tiger of insects, was very numerous; I captured half a dozen pairs, male and female in nearly equal numbers. They were not all of the same colour, some being of a bright golden green, and some of a brownish green; the golden spots being in some bright, in others brown and dull: many pairs were *in coitu*. I am altogether at a loss to assign names to several of the Coleóptera which I took. I observed, for the first time, several specimens of common copper (Lycæ`n*a* Phlæ`as), which, in the *Butterfly Collector's Vade Mecum*, is stated to appear in April: they were lively, and shy of approach. Not a single blue was to be seen; though Samouelle, I see, assigns their appearance two months earlier than this. In these cold and high northern latitudes, as the "loons o' the south" deem us Cumbrians to be placed, confounding us with our next neighbours, the Scots, it is in a mild and genial spring only that the blues show themselves early in May; and, as I have already stated, the spring of this year (1832) has been singularly unfavourable. Although I picked up several cocoons, and caterpillars of the six-spot burnet moth (Zygæ`na filipéndulæ *S.*), I did not meet with an imago.

27th. A caterpillar of Odenèsis potatòria (drinker moth), which feeds on grass, changed into the chrysalis state since yesterday.

28th. Caught a brimstone moth (Geómetra cratægària); the first I captured, though I fancied I saw several some days before. As I was procuring minnows for a bait, in a small rivulet, I observed an unusual number of the loach (Cóbitis barbátula), bearded loach *Fleming*: they were very small, and in greater numbers than those before noticed.

29th. The caterpillars of the tiger moth (A'rctia Càj*a* S.), are uncommonly numerous: I have a great number; a friend

told me he could have picked them up in pints on the sea coast, northwards of Whitehaven. They are the most voracious animals of the kind I have ever seen: they will feed on a variety of weeds, as dandelion, groundsel, docking, and foxglove (Digitàlis), seeming to like variety. I found one feeding on the red-flowered foxglove, and in trying those I had confined with its leaves, I found they fed as freely on it as on dandelion or docking.

31st. A caterpillar of A'rctia Càja has formed its silken nest; but it progresses slowly to the chrysalis state.

In this county, two thirds of this month have been adverse to the entomologist, and the latter part only has been any thing like favourable.

ART. III. *On the Habits and Food of the British Species of the Genus Mustèla.* By W. L. of Selkirkshire.

THE *Mustèla vulgàris, Whittret, or Common Weasel*, is (as shown p. 175.) oddly defined by Dr. Johnson to be "a small animal that eats corn and kills mice." * The common weasel lives almost altogether on the smaller species of mice, with, at times, it may be, a small bird, or eggs in the season. It often clears the corn stacks of mice, but he would make a queer sort of farmer who could believe it eats corn.

The Stoat, or Black-tailed Weasel (*Mustèla erminea*) preys upon birds of all kinds and of every size, and on hares, rabbits, and indeed every thing it can master; and there are strange instances of its boldness, address, and activity. An old man, of observing habits, told me, that one Sunday, while reading in the fields, he observed a hare pass swiftly, and

* Johnson, learned as he was, seldom ventured deep into etymology: probably he had little time to spare, and was not likely to be tempted in this case. He derives the name from the ancient Saxon, or from the Dutch. J. M., whose unlucky mistakes in Vol. V. p. 77. made such a *row* in Vol. V. p. 294—297., gets into another error in Vol. V. p. 78., and derives it from *white rat*. The creature called a whittret is not at all like a rat, neither is it white. Your Morayshire correspondent Γ (Vol. V. p. 295.) seems pleased to quote his countryman, Dr. Jamieson, for a better etymon. My old and learned friend has here (may I be allowed with all deference to say so) been led away from the point by his fondness seemingly for the original root of our mother tongue, to go to the old Norse to seek for it; showing, in this instance, a greater leaning to books than to nature. Had he consulted the latter first, I make no doubt that his natural good sense and sagacity would have led him at once to see that *whittret* was merely the change of the original descriptive name, *whitethroat*; for the coat and colours of the weasel, or whittret, do not change like those of the stoat: it is always of a chestnut brown, with a white breast and throat.

some time after she passed again in the contrary direction, as if pursued and somewhat wearied. This roused his attention; and, after a minute or two, he observed a large weasel, or stoat, following the hare, with its head to the ground like a hound. The hare and the weasel passed and repassed several times, and every time the poor hare seemed more exhausted, until at last he heard her scream, and, running to the place, he found the hare lying struggling, and nearly dead, and the stoat running off. He found her enemy had seized her between the ears, and bit her into the brain; the way in which it is said in this country that they always kill hares and rabbits, and in which ferrets, when not muzzled, kill the latter.

The Marten (*Mustèla* foína) is likewise a general depredator, and a ruthless bird's-nester, as he climbs trees with any bare-headed ragamuffin that ever shammed headach in the blithe month of June, that he might leave school for the woods. Sometimes, in the Highlands, where it is common, it takes to killing lambs, and makes sad havoc. It is there called *tuggin*, for what reason I do not know, as the word is Gaelic. Luckily it is now nearly rooted out in the south of Scotland; but it may probably return, as roes are doing, since the country began to be more covered with woods.

Its first Cousin, the Polecat, or Foumart (*Mustèla Putòrius*), is a fisher at times, and somewhat of a Frenchman in his tastes; and seems above all things to prefer frogs. But to put this beyond dispute, I must, with your leave, tell another story or two, if I may not be thought garrulous. Yet I am encouraged by the great interest that your correspondents evidently take in whatever relates to this genus.

It was, no matter how many years ago, that I observed, one winter morning, the track of a foumart among the snow, about the side of the burn that passed close by the house. Being thoroughly acquainted with the footprints of all wild animals, and fond of tracking them, I waited until one of my father's shepherds came home for his "parritch," and we started in pursuit, determined to track the foumart to his hole, wherever that might be, for it was a glorious day for the purpose, dead calm, with a clear sky, and just "a grymin o' a new fa'n snow." The creature doubled here and there, backwards and forwards, along the banks of the stream, sometimes ascending one of the boggy rills to its source, and returning by another to the main stream. We well knew we had no way of threading the mazes of the indefatigable creature's track, but by carefully observing when he left the sides of the burn, and then following it. In this way we had

been repeatedly led to a distance and back to the stream again, until we were near its source. At last we saw that he had entered below the ice on a little pool, and, emerging at another place, took his way to the hill with longer springs than he had hitherto done while hunting for frogs. By this time an hour or two had passed, and my companion began to speak about his *hirsel*, hinting that he ought to return. I well knew that this was only "from the teeth forward," as in such a calm day the sheep needed none of his care. Well, I noticed that at every bound of the foumart, adjoining to the footprints there was an extra-mark upon the light snow, which I made him observe, and said that the animal had assuredly caught a frog in some lateral hole under the bank of the pool we had seen him enter, and that, as he was now taking a direct line to his hole with the frog in his mouth, we were sure to have him. We had along with us, besides the shepherd's two dogs, and a sheep-dog of my own, a capital fox terrier, well tried in many a mossy hole in the range of mountains between Selkirkshire and Tweeddale, and a greyhound from which fox or hare had rarely made an escape. The latter was allowed to follow us partly to indulge him, for he knew well what we were after, and partly in case the track of a hare might cross our way upon our return home*; for there is no coursing so interesting and exciting as tracking the hares in a light snow, as then they never sit close, and it requires much caution; and they run at least as well, and are better seen. So on we went. The smell of the polecat is powerful and permanent, and we had much plague in keeping the dogs behind us, that in their eagerness they might not trample upon and obliterate the track; for one and all seemed to think we were nearing our prey. The creature had taken a straight course eastward for the ridge of a mountain whose side we were ascending. We knew there were peat mosses (that is, peat bogs, where the peat is cut from) on the summit; and we expected that our now tedious pursuit would end there; but we reached the summit of the ridge and the peat moss, yet the foumart held on his way. His forelegs being rather of the shortest, and the snow here somewhat deeper, the unfortunate paddock, which its enemy evidently carried by a limb, made a full mark with its body at every spring.

We could not so well guess now the termination of our hunt; so we stopped to breathe, and look around us. The sun

* "An' hunger'd maukin ta'en her way
To kailyards green,
While faithless snaws ilk step betray
Whare she has been." *Burns.* — *J. D.*

now shone bright upon the snowy hills. Our elevation was considerable, yet the most common sounds, such was the stillness of the air, were audible from the farm-steading in the narrow valley far below; we heard the regular thump of the barnman's flail, the crowing of the cock, the cry of the disturbed geese, and the sound of human voices. Up the larger glen, to the westward, the mountains had a greyish tinge from the peering heath on their brows, where here and there were parcels of sheep spreading themselves to feed. St. Mary's Lake was some miles to the southward, like a dark mirror among that singular group of smooth and pure white hills. Around us were countless thousands of

Snow-flakes (Emberiza nivàlis) flickering from stalk to stalk as they fed upon the seeds of the wire-bent (*Júncus squarròsus*). Sometimes as one of the dogs, through curiosity or playfulness, ran amongst them, they would rise all at once into the air, forming a flock of incredible extent, wheeling around with great velocity, and a noise, from their immense numbers, like loud and distant thunder. The silvery white under side of their wings, as they turned suddenly under the blue sky to settle again after their leaders upon the ground, threw forth a broad and glorious flash of splendour. It reminded me of the rush and roar of a huge wave upon a flat beach, as it breaks into foam; or "the sable cloud" that

"Turns forth her silver lining on the night;"

only it was day; and these beautiful birds being many of them almost pure white, the immense flocks that they form can hardly be well called even grey. We felt and enjoyed the exhilarating scene, and were even somewhat sensible to the splendid circumstances; but our business was "of the earth, earthly," and we turned to our pursuit. We followed the track of the foumart for a mile farther; so that, after catching his frog, he had gone in a direct line, at least two miles to his den, which we found under a bank overhanging a small brook on the other side of the hill, and, after digging him out (I need hardly add, and worrying him), we presumed to think that he might have lodged himself as well, and more snugly, a few yards from where he had got his paddock; but it seemed he had thought otherwise, and doubtless had his own reasons for his opinion.

I have little doubt that the polecat (*M.* Putòrius), like his congener the stoat (*M.* erminea), by no means refuses a field mouse any time it may come in his way, or a bird either; but I had once the good fortune to fall in with a full

and decided proof that the food it trusts to is frogs. I was at this time angling in the higher part of the Ettrick, where it winds for some miles through luxuriant meadows. It was in the month of June, before they were cut. I noticed a track leading from the foot of the hills, through the rank grass, towards the river's bank, narrow, like the nightly path of a hare from her form; but I instantly knew, from characters that could hardly be well described, that it was the track of a different animal. In such districts hares keep to the hills during summer, and find their food every where, and do not travel evening and morning to seek for it. For the same reasons they make no form. In short, I soon concluded that it was the morning path of a foumart, and soon found the hole without the aid of a terrier that followed me. The dog instantly barked, and with unusual fury began to dig with his feet, and tear up large mouthfuls of the turf. But I was aware that for all this the creature, in such deep alluvial soil, might be lodged beyond his efforts; and the more, that I had concluded, from the appearance of the path, and the singular fury of the dog, that it was that of a female to her young. So I went to the nearest farm-house for a spade.

I soon dug them out; *five young polecats*, nearly half-grown, sleek and clean, and well fed, and really pretty innocent-looking things; and I saved them all but one from the dog. They were comfortably embedded in dry withered grass; and where they were lodged all things were tight and snug to a wonder: but in a side hole, of proper dimensions for such a larder, I poked out, and counted most carefully, forty large frogs and two toads. But the most singular thing was this, that they were all and every one of them alive, but merely so; capable of sprawling a little, and that was all. For the mother, with a prudence and care for the comfort of her family highly creditable, and guided by some instinct to a surgical knowledge and skill that has ever since appeared to me most unaccountable, had contrived to strike them all with palsy. They were, as I said, merely capable of sprawling, but not of moving away, or into the nest, which would doubtless have been very nasty and inconvenient, as any one may easily suppose. On examination, I found that the whole number of paddocks, toads and all, were purposely and dexterously bitten through the brain. Whether the wounds were all given in one particular part of the brain, I cannot say, not having at that time such a knowledge of comparative anatomy as the foumart displayed; but, except it belong to that tribe of reptiles to survive being shot through

the head at random, I am greatly inclined to think so. There was nought else provided; neither mole nor mouse, nor young birds; any of which could at that season have been easily procured. There was nought but only the two score of frogs, and the two toads. It would be a curious question, how many days' provision was here laid up, and might lead to interesting speculations as to the check upon the population of paddocks. Allowing the toads to be given for medicine, which is highly probable; there was in store an allowance of six frogs apiece: but how long these were to last is the question.

After the young ones and their provisions had been taken out of the hole, I began to consider what the head of the family had made of herself; knowing that a polecat lies in her hole all day, and prowls only during the night. The terrier seemed hardly to regard the young after he had killed the first he got hold of; but, springing into the hole again after they were all removed, he dug away, with as great fury as ever, against what seemed to be the solid and unbroken earth; clearly intimating by this sign, and a casual look to me, that he was sure the *old one* was there yet. By my assistance with the spade, she was soon dug out too, and worried of course. It was evident, as there was no communication from where the young were, that she had, at the first serious alarm, barricaded herself with earth, so hard pressed that it could not be known by the eye from the unbroken ground. This, to be sure, was hardly very generous in Mistress Foumart, as it was clearly devoting her family to save herself; but, like all ungenerous conduct, it served her little. She, no doubt, was in a great rage: and, therefore, could not help giving to the earth so much of her own abominable smell, that it guided the dog to where she had concealed herself.

The usual prey of Foxes is moles, field mice, and rabbits, where they can get them. It is seldom now that they take to killing sheep, or even lambs; but, when they do begin, they never leave off. An instinct, probably, of the same kind, namely, a consciousness that the domestic animals belong to man, and an awe of those that he takes care of, seems generally to deter both the stoat and the polecat from attacking poultry; but, when once they get over their first fear and awe, their slaughter has almost no bounds. I have known a single polecat kill *fifteen* turkeys in one night: there could be no mistake, for he was taken almost with the *red hand*. He had dragged them all in beneath a large stack of firewood,

where, with his killed prey lying around him, he was put to death the next morning. W. L.

For notices on the weasel, see Vol. III. p. 234., Vol. IV. p. 337., Vol. V. p. 77. 295. 722., Vol. VI. p. 195, 196. 268.; on the stoat, Vol. III. p. 145., Vol. IV. p. 146., Vol. V. p. 77. 294. 393. 718.; on the polecat, Vol. IV. p. 10. —*J. D.*

Art. IV. *The Habits of the Carrion Crow.*
By Charles Waterton, Esq.

" Inter aves albas, vetuit consistere corvum." *Ovid. Met.*

The crow was order'd not to hold a place
'Mid whiter favourites of the feather'd race.

This warrior bird is always held up to public execration. The very word carrion, attached to his name, carries something disgusting along with it; and no one ever shows him any kindness. Though he certainly has his vices, still he has his virtues too: and it would be a pity if the general odium in which he is held should be the means, one day or other, of blotting out his name from the page of our British ornithology. With great propriety he might be styled the lesser raven in our catalogue of native birds; for, to all appearance, he is a raven; and I should wish to see his name changed, were I not devoutly attached to the nomenclature established by the wisdom of our ancestors.

The carrion crow is a very early riser; and, long before the rook is on the wing, you hear this bird announcing the approach of morn, with his loud hollow croaking, from the oak to which he had resorted the night before. He retires to rest later than the rook: indeed, as far as I have been able to observe his motions, I consider him the first bird on wing in the morning, and the last at night, of all our non-migrating diurnal British birds.

When the genial voice of spring calls upon him to prepare for the continuation of his species, the carrion crow, which, up to this period, has been wary, shy, and cautious, now, all of a sudden, seems to lose these qualities; and, regardless of personal danger, sometimes makes his nest within a hundred yards of the habitation of man, upon a tree, at once the most conspicuous and exposed. To us, who know so little of the economy of birds, this seems a strange phenomenon; nor can any penetration of which we may be possessed enable us to comprehend the true meaning of this change from timidity

to boldness, from distance to proximity, from wariness to heedlessness, in so many different species of birds. One would suppose that they would be more shy and distant at this interesting period; and, in imitation of the cat, the rabbit, and the fox, conceal as much as possible the place of their retirement. The rook will sometimes build a poor and slovenly nest, but this is never the case with the carrion crow: this bird invariably makes its nest firm and compact. A writer, who signs himself A. B. C., in Vol. V. p. 590., tells us that "some of the nests have such deep beds of wool, moss, and cows' hair, that the eggs seemed quite lost; and might have given the professor his erroneous idea of their being covered with those substances to keep them warm." O, fie! How is it possible that the eggs should seem quite lost, when the lining on which they lie is so perfectly smooth that they appear as though they were in a basin. Not a single particle of the lining of the nest is ever seen betwixt the eggs and the eye of him who has ascended the tree to take a view of them. I challenge any naturalist to bring proof positive which can invalidate this assertion. Verily, when the professor climbs up to crows' nests this ensuing spring, he will agree with Ovid, that "Causa patrocinio, non bona, pejor erit." [The advocate's cause was not good; it will be worse.]

The carrion crow never covers its eggs on leaving the nest; they are generally from three to five, and sometimes even six, in number; wonderfully irregular in size and shape and colour. This irregularity is so very apparent, that, on examining the nests of some carrion crows with eggs in them, you might fancy to yourself that the rook had been there, to add one of hers to those already laid by the original owner.

This bird never builds its nest in hedges, but will construct it in any of our forest trees; and, with me, it seems to give the preference, in general, to the oak, the spruce fir, and the Scotch pine. The young are hatched naked and blind, and remain blind for some days.

Our ancestors, no doubt, bestowed the epithet "carrion" upon this bird, in order to make a clear and decided distinction between it (whose flesh, they probably supposed, was rank and bad) and the rook, the flesh of which was well known to be good and wholesome food. Perhaps, too, in those days of plenty, and of less trade, the carrion crow had more opportunities of tasting flesh than it has in these our enviable times of divers kinds of improvement. Were a carrion crow of the present day to depend upon the finding of a dead cow or horse for its dinner, it would soon become an adept in the art of fasting by actual experiment; for, no

sooner is one of these animals, in our neighbourhood, struck by the hand of death, than its hide is sent to the tan-pit, and its remains either made into soup for the hunt, or carefully buried in the dunghill, to increase the farmer's tillage. The poor crow, in the meantime, despised and persecuted for having an inclination to feed upon that of which, by the by, the occupier of the soil takes good care that he shall scarcely have a transient view, is obliged to look out for other kinds of food. Hence you see it regularly examining the meadows, the pastures, and the corn fields, with an assiduity not even surpassed by that of the rook itself.

We labour under a mistake in supposing that the flesh of the young carrion crow is rank and unpalatable. It is fully as good as that of the rook; and, I believe that nobody who is accustomed to eat rook-pie will deny that rook-pie is nearly, if not quite, as good as pigeon-pie. Having fully satisfied myself of the delicacy of the flesh of young carrion crows, I once caused a pie of these birds to be served up to two convalescent friends, whose stomachs would have yearned spasmodically had they known the nature of the dish. I had the satisfaction of seeing them make a hearty meal upon what they considered pigeon-pie.

The carrion crow will feed voraciously on ripe cherries; and, in the autumn, he will be seen in the walnut trees, carrying off, from time to time, a few of the nuts. With the exception of these two petty acts of depredation, he does very little injury to man during nine or ten months of the year; and if, in this period, he is to be called over the coals for occasionally throttling an unprotected leveret or a stray partridge, he may fairly meet the accusation by a set-off against it in his account of millions of noxious insects destroyed by him. However, in the spring of the year, when he has a nest full of young to provide for, and when those young begin to give him broad hints that their stomachs would like something of a more solid and substantial nature than mere worms and caterpillars, his attention to game and poultry is enough to alarm the stoutest-hearted squire and henwife. These personages have long sworn an eternal enmity to him; and he now, in his turn, visits, to their sorrow, the rising hopes of the manor with ominous aspect; and assaults the broods of the duck-pond, in revenge, as it were, for the many attempts which both squire and henwife have made to rob and strangle him.

In 1815, I fully satisfied myself of his inordinate partiality for young aquatic poultry. The cook had in her custody a brood of ten ducklings, which had been hatched about a

fortnight. Unobserved by any body, I put the old duck and her young ones in a pond, nearly three hundred yards from a high fir tree in which a carrion crow had built its nest: it contained five young ones almost fledged. I took my station on the bridge, about one hundred yards from the tree. Nine times the parent crows flew to the pond, and brought back a duckling each time to their young. I saved a tenth victim by timely interference. When a young brood is attacked by an enemy, the old duck does nothing to defend it. In lieu of putting herself betwixt it and danger, as the dunghill fowl would do, she opens her mouth, and shoots obliquely through the water, beating it with her wings. During these useless movements, the invader secures his prey with impunity.

I would recommend all henwives, in early spring, to place their ducks' eggs under a hen. At that time of the year there are no weeds on ponds sufficiently high to afford shelter to the young, when they are led on to the water by their real mother. If the first sitting of eggs be taken from a duck, she will generally lay a second time; and that will be at a period when the water abounds with weeds, amongst which the young brood can skulk, and screen itself from the watchful eye of an enemy.

From what I have written, the reader may be able to form a pretty correct idea of the habits of the carrion crow; and he will perceive that, for nearly ten months of the year, this bird, far from being considered an enemy, ought to be pronounced the friend of man.

Let us now examine if the attacks of this bird on domestic poultry cannot be easily counteracted; and whether its assiduous attention to the nests of pheasants and of partridges is of so alarming and so important a nature as to call for its utter extermination from the land. For my own part, I acknowledge that I should lament his final absence from our meadows and our woods. His loud and varied notes at early dawn, and again at latest eve, are extremely grateful to me: and many an hour of delight do I experience, when, having mounted up to the top of a favourite aged oak which grows on the border of a swamp, I see him chasing the heron and the windhover through the liquid void, till they are lost in the distance. Then, again, how eager is his pursuit! — how loud his croaking! — how inveterate his hostility! — when he has espied a fox stealing away from the hounds, under the covert of some friendly hedge. His compact and well-built figure, too, and the fine jet black of his plumage, are, in my eye, beautifully ornamental to the surrounding sylvan scenery.

A very small share of precaution, on the part of the hen-wife, would effectually preserve her chickens and her ducklings from the dreaded grasp of the carrion crow. Let her but attend to the suggestion of setting her early ducks' eggs under a hen, and let her keep that hen from rambling, and she will find her best hopes realised. As for the game, I verily believe that, in most cases, the main cause of the destruction of its eggs may be brought home to the game-keeper himself. This unrelenting butcher of our finest and rarest British birds goes, forsooth, and makes a boast to his master that he has a matter of five hen pheasants hatching in such a wood, and as many partridges in the adjacent meadows. This man probably never reflects that, in his rambles to find the nests of these birds, he has made a track, which will often be followed up by the cat, the fox, and the weasel, to the direful cost of the sitting birds; and, moreover, that by his own obtrusive and unexpected presence in a place which ought to be free from every kind of inspection, whether of man or beast, he has driven the bird precipitately from her nest, by which means the eggs are left uncovered. Now, the carrion crow, sweeping up and down in quest of food, takes advantage of this forced absence of the bird from her uncovered eggs, and pounces down upon them. He carries them off, not in his bill, but on the point of it, having thrust his upper mandible through the shell. Had there been no officious prying on the part of the keeper, it is very probable that the game would have hatched its brood in safety, even in the immediate vicinity of the carrion crow's nest; for instinct never fails to teach the sitting bird what to do. Thus, in the wild state, when wearied nature calls for relaxation, the pheasant first covers her eggs, and then takes wing directly, without running from the nest. I once witnessed this, and concluded that it was a general thing. From my sitting-room, in the attic story of the house, I saw a pheasant fly from her nest in the grass; and, on her return, she kept on wing till she dropped down upon it. By this instinctive precaution of rising immediately from the nest on the bird's departure, and its dropping on it at its return, there is neither scent produced, nor track made, in the immediate neighbourhood, by which an enemy might have a clew to find it out, and rob it of its treasure. These little wiles are the very safety of the nest; and I suspect that they are put in practice by most birds which have their nest on the ground. To these wiles, in part (before gangs of forty or fifty nocturnal poachers desolated this district), I attributed the great increase of my pheasants, though they were surrounded by hawks, jays,

crows, and magpies, which had all large families to maintain and bring up in the immediate neighbourhood.

Keepers may boast of their prowess in setting traps (and, in testimony of their success, they may nail up the mutilated bodies of carrion crows against the kennel wall), but I am of opinion, that, if the squire could ever get to know the real number of pheasants and hares which have been killed or mutilated in those traps, he would soon perceive that he had been duped by the gamekeeper; and that henceforth he would forbid him to enter the covers in the breeding season, for the purpose of destroying the carrion crows. The frequent discharge, too, of the keeper's gun, though it may now and then kill or wound a carrion crow, still will infallibly drive away the game in the end, and oblige it to seek some more favoured and sequestered spot. As to the setting of poison, a practice so common with these worthless destroyers of crows, hawks, magpies, jays, and ravens, which they are pleased to style feathered vermin, it is a well known fact that foxes, ducks, dogs, hogs, and pheasants are all liable to fall a prey to the noxious bait. Often has the disappointed vulpine sportsman to mark down a blank day in his calendar, on account of his quarry having supped upon what was laid to kill the carrion crow; and I have reason to believe that the fox sometimes loses his life, by feeding on carrion crows which have died by poison.

If we were to sum up, on one side, the probable number of pheasants and partridges destroyed during one season by the carrion crow; and, on the other, reckon up how many times the keeper has disturbed the game by going in search of this bird, and thus exposed the nests of partridges and pheasants to certain destruction by vermin of all kinds; and, then, if we take into the account the many heads of game which the keeper has killed in his steel traps and rabbit-snares; we should conclude, I think, that, in the long run, the game actually suffers more from the keeper, in his attempts to destroy the crow, than it really does from the crow itself, while catering for its young. Indeed, I have made out the account myself; and, finding the balance to be against the keeper, I have renewed the order which I gave to his predecessor, never, upon any score, to persecute what is commonly called flying vermin. Thus, the partridges and pheasants here, during the time of incubation, are abandoned to their own discretion: and I judge, from what I have seen, that old Dame Nature, without any interference on my part, will kindly continue to point out to these birds proper places where to lay their eggs and rear their young; and, moreover,

I am confident she will teach them, by her own admirable and secret process, how to elude the prying scrutiny of the carrion crow. Should, however, the country squire, whose eye is seldom quite closed to the advantages derived from a well-stored autumnal larder; should he, I say, not have sufficient faith in the dame's protecting care, it will be some consolation to him to be informed that, when birds of the game species lose their first eggs, they seldom fail to have a second hatch, which will be sure to find ample security from its enemies, in the abundant growth of summer grass and corn.

The carrion crow is evidently gregarious at times, in the autumnal and winter months: I have sometimes counted fifty of them together. Unlike the rook, these birds never become bare of feathers at the base of the bill.

The vulgar remark, that a carrion crow can smell gunpowder, ought to be received with explanation. The natural wariness of this bird at most seasons of the year, and the perpetual persecution it has to undergo from man, are the causes of its keeping a very sharp look-out; and it takes flight at the earliest approach of the gunner: hence the surmise that he smells the powder (which might certainly be smelled after the discharge of the gun, provided the crow were to leeward); but, then, the loud report would cause it to take instant flight, and it would be far away long before the scent from the burnt gunpowder could have any chance of reaching its olfactory nerves, though they were (and, for aught I know, they are) as sensible as those of the vulture.

I turn loose on the public, from my park, about threescore carrion crows per annum; which, no doubt, are considered as a dangerous knot of rascals by the good folks of this neighbourhood.

I beg to say that I have written this paper expressly to calm the fears of sportsmen, who may imagine that I do an evil deed in befriending a tribe of birds hitherto considered, by common consent, in no other light than that of plundering rogues and vagabonds. If they will do me the honour to read this little history of my warrior bird, I trust they will be satisfied that he is not such a desperate thief as he is generally imagined to be; and, furthermore, upon due consideration, they will agree with me that, when the keeper is abroad with his gun, his poison, and his traps, their game may be said, with great truth, to be exposed to much worse company than that of the carrion crow.

I am, Sir, yours, &c.

CHARLES WATERTON.

Walton Hall, Jan. 17. 1833.

ART. V. *On the "Biography of Birds" of J. J. Audubon.* By CHARLES WATERTON, Esq.

"Quis novus hic nostris successit sedibus hospes?" *Virgil.*

Say who advances to our door,
With face unknown, from foreign shore?

MR. P. HUNTER having requested (p. 83.) that the works of Mr. Audubon may be allowed to speak for themselves; and Professor Rennie, in his "Plan of Study," having desired the public to read those works; I beg permission to say a word or two on the light in which I see them.

The professor never would have recommended the works of this foreigner to the British reader, — he never would have classed them with those of our worthies, such as Ray and White, — unless he had entertained a very exalted notion of their excellence. Indeed, a gentleman of his never-ceasing application to books cannot fail to be a competent judge of literary merit. Still, I own that I do not see Mr. Audubon's merit as a writer exactly in the same light as that in which the professor sees it; and, if I have drawn my conclusions from false premises, I trust that either the professor, or some one from the extensive circle of Mr. Audubon's admiring friends, will kindly show me where my error lies.

Without leaving behind him in America any public reputation as a naturalist, Mr. Audubon comes to England, and he is immediately pointed out to us as an ornithological luminary of the first magnitude. Strange it is, that he, who had been under such a dense cloud of obscurity in his own western latitude, should have broken out so suddenly into such dazzling radiance, the moment he approached our eastern island. I ask, what production of Mr. Audubon's is it that has called forth such rapturous applauses from our naturalists, who, not content with their own prostration, would fain persuade the public to bow submissive to the stranger? His drawings are out of the question, they being solely a work of art. Can it be his paper on the habits of the *Vúltur Aúra*, which was written to prove that this bird has hitherto been allowed sadly too much nose? No: that production is lamentably faulty at almost every point. Its grammar is bad; its composition poor; and its statements are so unsatisfactory, that, in my opinion, any person who reads the paper with any moderate share of attention will feel inclined to condemn it to the same kind of fate as that to which the curate and the barber condemned the greater part of Don Quixote's library.

Then it must be his *Biography of Birds* which has raised the stranger so high in the estimation of Mr. Bull? No doubt whatever: and were the *Biography of Birds* really the production of Mr. Audubon's own pen, I should not be tardy in praising its *literary* merit, notwithstanding its *ornithological* faults. But, having compared the style of the *Biography of Birds* with that of the article on the habits of the *V*últur Aúra, I came to the conclusion that these two productions could not have been written by the same person, though they both have the name of Audubon attached to them. The first is that of a finished scholar; the second that of a very moderately-educated man.

Mr. Audubon, to be sure, tells us, in his introductory address, that a friend *aided* him; not, says he, in writing the book, but in completing the scientific details, and in smoothing down the asperities of his ornithological biographies. I confess that I cannot exactly understand how he could have been *aided* in the scientific details, and in smoothing down the asperities of the ornithological biographies, and still not be considered to have been *aided* in writing the *very book* which contains those details, and which had those asperities. Certainly his acknowledgment of such important aid, and his avowal of such humiliating corrections (the latter so totally unnecessary if Mr. Audubon were really a scholar), tend to put his claim both to ornithology and to literature in a somewhat dubious point of view, and cause me to take Professor Rennie's recommendation to "read the works of Audubon" *cum grano salis.*

In one part of the introductory address, Mr. Audubon seems to wish to impress his readers with an idea of his extreme abhorrence of those who put their names to works which they never wrote. He says, "There are persons whose desire of obtaining celebrity induces them to suppress the knowledge of the assistance which they have received in the composition of their works. In many cases, in fact, the real author of the drawings, or the descriptions, in books on natural history is not so much as mentioned, while the pretended author assumes to himself all the merit which the world is willing to allow him. This want of candour (continues Mr. Audubon) I could never endure." Now, I possess undeniable proof that, when Mr. Audubon was in England, he did actually apply to a gentleman to write his history of the birds for him. The gentleman at first consented to write it; but the agreement subsequently fell to the ground, on account of Mr. Audubon insisting that *his own name*

should be given to the world as the *author of the work*. To this the gentleman would by no means listen, having probably in mind the old verse, which would have suited his case admirably, with a trifling alteration: —

> Has volucrum vitas scripsi, " tulit alter honores."
>
> 'Twas I who put these birds in story;
> Another wears my wreath of glory.

Mr. Audubon's application to this gentleman clearly shows the consciousness of his own inability to write the work which now bears his name. Indeed, had this proof been wanting, his ill-written paper on the *V*últur Aúra tells us, in language not to be mistaken, what a sorry biography of birds we should have had, if Mr. Audubon had not taken the wise precaution to get it done by proxy. He acknowledges that his book received aid from a friend; but where, I ask, are the amended parts? In what quarter of the *Biography of Birds* can the reader trace the friendly tutor's hand? Throughout the whole of the work, I am unable to detect the presence of any interpolation of good amongst bad. From the beginning of the first page to the end of the last, there is the decided appearance of the same masterly hand at composition; and I defy the keenest eye to discover how much of the work Mr. Audubon has written, or how many asperities his friend has rasped away. Again; while Mr. Audubon acknowledges to have received assistance in *the scientific details*, and in smoothing down the asperities of his *ornithological biographies*, he says not one single word of aid afforded in his *numerous episodes;* for example, that of the Ohio, &c. Now, the style of writing — the very same style of writing — which appears in those, appears equally in these. Pray, how are we to account for this?

In fine, the whole work, from beginning to end, bears evident and undeniable marks of being the produce of one pen. One hand alone has directed that pen. Has this hand been that of the reputed author? — No. His former application to get his book written for him shows how fearfully he must have mistrusted his own way of writing; while the faulty paper on the *V*últur Aúra proves its worthlessness. I request the English reader to weigh well in his own mind what I have stated; and I flatter myself that he will agree with me, when I affirm that the correct and elegant style of composition which appears throughout the *whole* of the *Biography of Birds* cannot possibly be that of him whose

name it bears; we have undoubted facts to prove that it is far beyond the reach of Audubon.

> " Magna petis Phaëthon, et quæ nec viribus istis,
> Munera conveniant."
>
> You gaze too high; the prize you seek
> Cannot be found by sight so weak.

CHARLES WATERTON.

Walton Hall, Feb. 20. 1833.

ART. VI. *On the Migration of a Species of Thrush.* By W. L. of Selkirkshire.

" And thou, mellow mavis, that hail'st the night-fa'." *Burns.*

FOR these many years I have been forced to conclude that we have an additional species of thrush not generally noticed by naturalists. Being in the Island of Harris, somewhat more than twenty years ago, in the early part of June, I was greatly surprised to hear the heathy and rocky shores every where resounding with the unintermitting notes of, I may say, thousands of thrushes. It was impossible to take for granted that these "were all the same" as our own south-country mavises that sung in our hawthorn and hazel banks; yet the song was much like, if it was not more mellow.

Mr. M'Gillivray has not long since made the same observation, and, moreover, almost ascertained that they subsisted upon whelks and small shell-fish, of which I have no doubt. Some years after my seeing these in the Lewis, I observed a pair, as I thought, of the same kind of thrush, on the top of Braidhills, near Edinburgh. They seemed to have their nest among some whin bushes, and the cock sung with great glee, sitting upon the top of one of them. As I was well aware that the thrushes in Lewis and Harris, and thereabouts, came all away in winter, notwithstanding the mildness of the climate, I made no doubt that those I saw on Braidhills, were a pair that had somehow fallen behind, in the great spring migration.

Four years ago, coming down the Yarrow one morning in the month of April, I was much interested, as I rode along, to see every grass field within my observation from the road, in a manner occupied with thrushes. It was curious to observe that, like sheep grazing, there were seldom two of them together, although there might, perhaps, be at the rate of fifty or more in every ten-acre field. As a thrush, like a tiger, is a predaceous creature, of course they look for their

prey singly. Here every field seemed to be alive by the constant "bob forward" that perhaps one half at least, were making at the same time, as they either sprang upon, or looked for, a worm. This motion, which is compounded of three jumps, is peculiar to all the genus that I have seen, and, when at such a distance as not to be discovered otherwise, they may be known by it.

It occurred to me, that the extraordinary irruption of these birds (for the whole valley was possessed by them, for more than nine miles in length; and of this fact I was a witness) was nothing else but a part of the immense flock that annually take their journey to the shores of the lochs on the west of Ross and Sutherland, Harris, Lewes, and probably the Orkney and Shetland Isles. They are evidently different from our common mavis, being considerably less, darker in the plumage, and less conspicuously mottled on the breast.

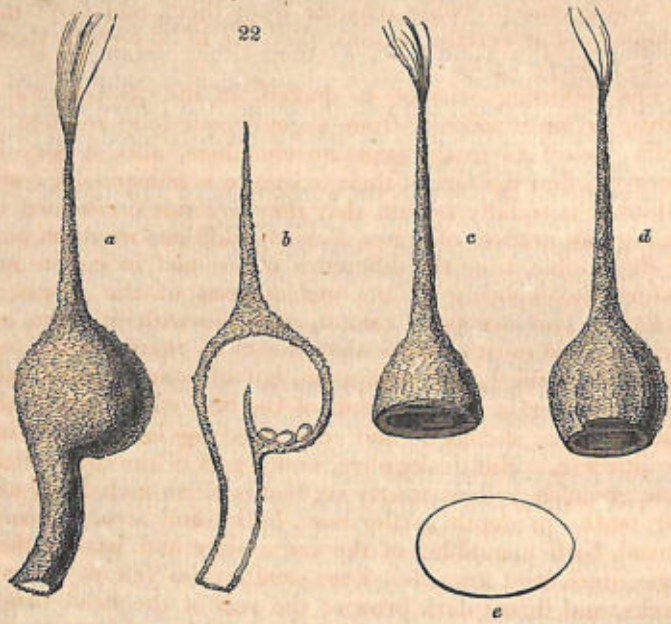
I have every year since observed these birds resting and feeding on their way, but never in such numbers as in 1829. In 1831, they passed the junction of the Ettrick with the Tweed about the middle of March; as on the 14th I find that small flocks of them were seen feeding in the parks at Abbotsford.* Several observations made from year to year have convinced me of the regularity of this migration, and that the bird will turn out a distinct species. I suspect that they fly during the night only, and rest and feed during the day.

February, 1833.

ART. VII. *On the pendulous Nests of the Indian Baya Bird (Lóxia philippìna* L.). By A SUBSCRIBER.

As the descriptions, even in modern publications, of the pendulous nest of the Indian baya (Lóxia philippìna *L.*) give no very definite idea of its form, I send a rough sketch (*fig.* 22. *a*) of one of the most perfect I ever happened to notice, with a section (*b*) to show its interior arrangement; and sketches (*c*, *d*), from recollection, of one in progress of being built: the figures are one tenth of the natural size, the extreme length being 15 in. The materials are usually fibres of the fronds of the palmyra (Borássus flabellifórmis *L.*), cocoa nut palm (*Còcos* nucífera *L.*), and wild date of India (*Elate* sylvéstris *L.*), sometimes mixed with grass, and occasionally made entirely of grass where palms are not to be found: these are neatly interlaced, and form a texture of

* The fieldfares did not pass until a month after.



extraordinary strength. The nest is suspended as represented in the sketch: if from a palm, from the tip of a frond; and, if from any other tree, from the extremity of a slender branch, those overhanging water being always preferred. It will be seen by the section (*b*) that it consists of only one chamber, with a long tubular passage leading to it; and I am at a loss to imagine what could have given rise to the idea of two or three separate apartments, unless, indeed, it may have been a hasty glance at the half-finished nests: new ones are never added to the old. I have often heard, from natives of India, of the baya's lighting up its nest with fire-flies, but never myself had an opportunity of noticing it. The pipe forming the entrance is seldom so long as here represented: it often does not pass the bottom of the nest more than three or four inches, and the mouth, or extremity, is always left in an apparently unfinished state. The baya lays from four to six white eggs (*e*, natural size). For what reason I know not, many nests are always left unfinished, as in *c* and *d*. Bayas seem to be of a very social disposition; numbers build on the same tree, or on neighbouring trees, and sing in concert during the breeding season, with a very pleasing effect, though there is no variety in their notes. The nests do not seem to

be entirely deserted by the old birds at any part of the year; the young ones probably separate from them, and form new colonies, as, at certain seasons, they are to be seen by themselves in large flocks.

The following passage is quoted, in the *Architecture of Birds*, as an "account from a gentleman long resident in India:" — "As to the separate chambers, also, it may be observed, that the fact of their existence is indisputable; and I think it is equally certain that they are not occasioned by adding new nests to old ones, as such additions would at once be discernible, from the difference occasioned in colour and texture by exposure to the inclemencies of the weather." P. 252. This account I cannot reconcile with my own experience, and must suppose that the nests there noticed are not those of the Lóxia philippìna, but of some other Lóxia. The following is a description of the bird which builds the nest I have sketched and described: — Length $5\frac{3}{4}$ in., breadth 9 in. Bill dusky olive, under part of the lower mandible greenish yellow, nearly six tenths of an inch long, and four tenths in depth at the base, bulky and strong, nearly conical, both mandibles of the same size, and having their edges much bent inwards. Eyes small, irides yellow. Lores, cheeks, and throat dark brown; the rest of the head bright yellow. Feathers of the neck and shoulders yellow tinged with olive (of the sides of the neck tinged with reddish), with a dark brown dash down the middle of each. Wings dark brown, the quills having narrow, the prime coverts broad, and the secondary coverts heart-shaped, yellow edges. The lower part of the throat and the breast are bright yellow, passing into very pale dull reddish on the belly and tibiæ. The rump and vent are dull light reddish mixed with dashes of brown. Tail brown, rounded, about $1\frac{1}{4}$ in. long; the closed wing passes its base a little. Feet and claws pale brownish; the latter long, rather slender, and much bent. The third and fourth quills are equal and longest.

The specimen described was a male in full plumage; but scarcely any two are exactly alike; most of them are plainer and duller in their colours, and many of the females and young birds have little or no yellow on the head or breast.

The baya is very docile, easily tamed, and taught to fly off the finger and return again at a signal; to dart after a ring or small coin dropped into a deep well, and catch it before it reaches the water; to fetch and carry; and to perform other similar tricks.

Vale of Alford, Aberdeenshire, Sept. 28. 1832. A Subscriber.

ART. VIII. *Familiarities effected with Butterflies, Bómbyces, and Sphínx stellatàrum.* By F. C. LUKIS, Esq.

Sir,

THE familiar disposition of Vanéss*a* Atalánt*a* induces me to think that many of these insects might undergo a sort of domestication, or friendly intercourse with man. This would afford additional gratification, and increase the pleasures of the naturalist beyond that which he already derives in observing their rich hues and singular habits, or classing them in his cabinet.

Some years ago, whilst employed in making additions to the list of the island Lepidóptera, I approached a plum tree (green gage), where several individuals of Vanéss*a* Atalánt*a* were busily employed in feeding on the rich juice of the ripest fruit. As an unusual tameness prevailed among these airy visitants, I was for a moment arrested in my purpose; and, whilst watching their motions, I perceived several wasps and flies (*M*úsca tènax) hovering about the fruit, and attempting to alight on it. This was no sooner done than they were driven away by the butterfly. Any resistance manifested by the wasp exasperated the butterfly; which would boldly approach the intruder, flap its wing at it, and again become the sole possessor of the fruit: the action of the butterfly was very similar to the flapping of the pigeon's wing when feeding in company with others of its kind. The V. Atalánt*a*, when driven away, only took a short flight, and soon returned to its dainty repast.

After observing this interesting struggle for some time, I approached near the tree, placed my finger gently on the fruit, and immediately received several sharp flappings from its wings, which were repeated, with evident excitement, in quick succession.

Slowly persisting in my purpose, I moved my finger nearer to the spot from which it was extracting the juice: this was again prevented by the insect turning its body round, and expanding its wings over the fruit, to keep my finger away. I then touched its back and wings, until I was enabled to close them, lift it from the spot, and replace it again. I next applied a feather in the same way, smoothed its soft plumes, and continued this operation for some time, without alarm or fear being manifested. The next day I visited the tree again, and felt much pleased to find the same individuals at work. A greater intimacy now ensued between us; and I was enabled to exhibit these familiar feats before several friends, who smiled at hearing I had tame butterflies in my garden.

Since the above period, I have pursued the same amusement with my "nymph-like friends," with equal success. Last autumn, one of these, which I easily recognised, allowed itself to be taken from a flower, and be placed on my face; walked over it, inserted its tongue between my lips, flew away, and returned on my face or clothes.

I found a calm sultry day, at noon, the best time for this amusement; and, if the season continued mild and fine, the same individuals would daily visit the same spot. V. Atalánta appeared to possess this docile disposition rather more than others. Cýnthia cárdui was more vigilant and shy. Vanéssa Polychlòros and V. urtìcæ showed a familiar disposition after a few attempts; and, by a trial made on Còlias Edùsa, I think it might prove equally docile. Vanéssa Ìo is scarce in this island, I have seen it only once; but this specimen allowed me to touch it, and close its wings, several times in one day.

Some of the *Bómbyces*, by being kept in a room, and fed on sugar and water, became accustomed to the hand, and lost much of their usual cautiousness. Scoliópteryx libàtrix, in particular, became extremely tame.

I shall add one attempt more on a bold and unruly subject, *Sphínx* stellatàrum, whose rapid and irregular motions are so remarkable. Having observed the periodical visit of two individuals of this sphinx to a bush of the everlasting pea [*Láthyrus latifòlius L.*], I placed myself so as to watch their actions. My presence quickly attracted their notice; and, after a few flittings among the blossoms, they disappeared: in a few minutes' time they returned, and, on perceiving me, they again left the bush for another about fifty yards distant. I then quietly pursued them from bush to bush, until they became less uneasy and shy. After some perseverance in this manner, they became familiarised with my figure; and, at last, allowed me to place my hand and face close to the flowers they were engaged in robbing. Though these insects could not be touched in their flights, they evidently lost much of their timidity, and allowed me to place light leaves or feathers so near them as to be violently affected by the vibration of their wings, the sound of which is particularly loud when the ear is brought near them.

Mr. Couch's notice (Vol. V. p. 291.) of similar habits observed by himself in Vanéssa Atalánta have induced me to transcribe these remarks from my note-book, in which they had been written previously to my seeing Mr. Couch's communication.

I am, Sir, yours, &c.

Guernsey, Feb. 16. 1833. F. C. Lukis.

ART. IX. *Sketches of the Natural History of my Neighbourhood.* By C. CONWAY, Esq., of Pontnewydd Works, Monmouthshire.

No. I. BUTTERFLIES.

1. *GONE'PTERYX rhámni, Brimstone.*—This insect is abundant here, as I presume it is in most other localities. I am, however, doubtful whether it be double-brooded or not. The female is said to be greenish white, and this is the fact; but are all the early ones females? for I do not recollect a single instance of my spring captures of this fly that was not of this colour. There is another observation which I have always made on these early flies, and which, I presume, has not before attracted attention, for I never saw any record of it. When butterflies repose, their wings are closed vertically, and the inferior wings overlap the superior. In examining the early captured specimens of the G. rhámni, I have always found that portion of the superior wing which has thus been covered to be of a much deeper tinge than the other parts. From these facts I would enquire, are not the early specimens of G. rhámni individuals which have outlived the winter? The pale portions of the wings I take to arise from exposure to atmospheric influence, and that portion which is of a deeper hue, I conclude, has retained its original colour, by being protected from the effect of the atmosphere by the overlapping of the inferior wings.

2. *Còlias Edùsa, Clouded Sulphur.* — This fly is rare in my locality. I have never captured it myself, but I have a pair which were taken some years ago, by a neighbour.

3. *Pìeris cratæ`gi, Black-veined White.* — This fine fly is, in general, plentiful in this neighbourhood: owing, however, to the unfavourableness of the last season (the beginning of June), my captures were not so numerous as usual.

4. *Póntia brássicæ, Cabbage;* 5. *P. ràpæ, Small white;* 6. *P. ràpi, Green-veined white;* 7. *P. cardámines, Orange tip.*—All these are very common. Perhaps the present is as good an opportunity as I can have for making a few observations on female butterflies. Professor Rennie says (*Insect Miscellanies*, p. 215.), speaking of the orange-tip butterfly, "while every meadow is swarming with males, we seldom see more than one or two females in a whole year, and those which are observed are seldom on the wing." The professor again (*Alphabet of Insects*, p. 82.) observes, "unlike snails and worms, among which there is no distinction between the males and females, insects [of course, including butterflies] have the two sexes as distinct as the larger animals, and in many respects are similar to birds, as far as pairing is con-

cerned, that is, a single male associates with a single female." It is difficult for a tyro to put himself into opposition to a professor; indeed, fault-finding is not a pleasant business, nevertheless, when truth is at stake, it would ill become the merest tyro to bow at the shrine of acknowledged superiority, when the facts before his eyes are opposed to the principles propounded: besides, it is only by an investigation of facts, as observed by different persons in different localities, that we can hope to arrive at the full truth in natural history. I have not found the female of Póntia cardámines to be rarer than the females of other Papiliónidæ (with the exception of Polyómmatus A'rgus, of which by and by). I have captured many of the females of Póntia cardámines, and might, if I were so inclined, have captured many more; but I do not recollect that I ever captured a single specimen but on the wing. If the other position (of pairing) be true, it appears almost an improvident provision (if I may so speak) of nature, to have produced so many males to no purpose. The intention of the sexes is, I think, self-evident,—reproduction; and, consequently, at least amongst the higher order of beings, they generally bear a near equality to each other in point of number; but if, "while every meadow is swarming with males," no more than "one or two females" are "to be seen in a season;"—if, in other words, the females are to the males as one to several thousands, and yet if they "pair, that is, a single male associates with a single female;" it appears to me there is a great waste of creative power for no end. In Polyómmatus A'rgus, to which I have before referred, the males and females which are to be captured bear a much nearer proportion to each other than in any other species; and I have frequently seen the males sporting and toying from one female to another, without showing any signs of attachment to any particular individual.

8. *Melitæa Euphrósyne, Pearl-bordered fritillary*; 9. *M. Dictýnna, Pearl-bordered likeness*; 10. *M. A'rtemis, Greasy fritillary.*—The M. Euphrósyne I have met with in much greater abundance some seasons than in others; the M. Dictýnna I have always found in a bog, at a considerable elevation on the mountain side, and in no other place; and the A'rtemis, which, I believe, is generally reckoned rare, so abounds in this neighbourhood, that almost any quantity might be captured during the season. If, however, the fly be not taken almost immediately upon its quitting the chrysalis, its beauty will be found to be considerably tarnished. Some of your readers appear, occasionally, to be displeased with the catalogues of natural productions which have, from time to

time, been published in your pages. For my own part, I think nothing can be more interesting than to have the localities of such productions clearly ascertained. Some of the butterflies which my list contains, and which are reckoned as rare, are the very commonest in my neighbourhood; whilst others, which are counted common, are here exceedingly scarce. In pointing out what is to be had in my neighbourhood, and comparing it with the lists of other neighbourhoods; in fact, in acting the part of pioneer, I save the time of, and spare useless labour to, the naturalist, who, without such guides, might be led to explore a neighbourhood in expectation of finding productions which it did not possess.

11. *Argýnnis Páphia, Silver-washed fritillary*; 12. *A. Aglàia, Dark green fritillary*; 13. *A. Adippe, High brown fritillary*.—The Argýnnes are, in this neighbourhood, almost entirely confined to the mountain side, and are very abundant. A. Pàphia I have generally found resting on the blossom of the common blackberry, and have often admired his fine flight, as he has taken his circuitous progress, sweeping the area of several fields, and then returning and settling upon the same blossom again. His flight appears to be taken almost without effort, and is effected with the greatest leisure and coolness imaginable; but, if once disturbed, he darts off with the impetuosity of the swiftest hawk. A. Aglàia and A. Adippe, I have found only in one little mountain glen; the former sporting about the unmown hay, and the latter on the fern which clothed the precipitous sides of the dingle, or unceasingly threading the mazes of a little mountain rill, which winds through its bottom.

14. *Cýnthia cárdui, Painted lady*.—I have never seen this fly living, but I have a few specimens in my possession which were captured in this neighbourhood a few years back; and a friend informs me that he has taken a few specimens, during the past season, not many miles from my abode.

15. *Vanéssa Atalánta, Red admiral*; 16. *V. Io, Peacock*; 17. *V. urticæ, Small tortoisehell*; 18. *V. c. álbum, Comma*.—The above-named vanessas generally abound. During the last season, however, the V. Atalánta and V. c. álbum were scarce: indeed, I took no more than two or three specimens of either; but I saw the former on the wing so late as the 25th of November. I think, generally speaking, the spring brood of the V. c. álbum furnishes the finest specimens; but, in the early captures of all the vanessas, there are many specimens taken, which, by their weatherbeaten appearance, bear evident proofs of their having outlived the winter.

19. *Hippárchia Hyperánthus, Ringlet*; 20. *H. Pámphylus*,

Small heath; 21. *H. Galathèa*, *Marbled white*; 22. *H. Megæ`ra*, *Wall*; 23. *H. Ægèria*, *Speckled wood*; 24. *H. Janìra*, *Meadow brown*; 25. *H. Tithònus*, *Large heath*.— These hipparchias are, generally, very numerous; indeed, no fly is more common than the somewhat rare H. Galathèa. Of H. Janìra I have a very pale variety: had it not been captured early in the season, I should have supposed it to have been weatherworn, as we generally find them to be late in the autumn; but the specimen to which I allude is more uniformly pale than those which may thus be taken when they are about to disappear, and was the only pale one to be found when all its congeners were in the full bloom of beauty.

26. *Thècla bétulæ*, *Brown hairstreak*; 27. *T. quércus*, *Purple hairstreak*. — These are the only two theclas which I have detected in the neighbourhood. Thècla quércus abounds, and the individuals present a very beautiful sight, whilst sporting about the tops of the oaks, just at sunset, their wings catching the light as they fly, and then the whole instantaneously disappearing among the foliage. I have found some with the upper surface of the primary wings almost entirely of a deep blue, when held in a proper position to catch the light; whilst others presented only the two blue spots (usually described), but with great brilliancy. Thècla bétulæ is a rare and a very beautiful fly. Whilst speaking of Thècla quércus, I may remark that I have not been a little surprised that Apatùra Ì`ris has never been found in this locality, which is almost entirely overrun with oak; but I have never seen the fly: what can be the cause?

28. *Lycæ`na Phlæ`as*, *Common copper*. — Very common.

29. *Polyómmatus Argus*, *Silver-studded blue*; 30. *P. Argìolus*, *Azure blue*; 31. *P. Cỳmon*? *Mazarine blue*? — Regarding some observations which have been made on P. Argìolus [Vol. IV. p. 477. 558., Vol. V. p. 109. 205. 490. 496. 768.], I would observe that it certainly is not a double-brooded fly with us. It is one of the earliest flies which I capture, and I have never seen it after the spring season. Respecting P. Cỳmon, I must refer to a former communication upon the subject (p. 96.). Whatever the fly may be, it is scarce, and very local. I have never captured it but in one meadow. [See Mr. Bree's reply, p. 190. 191.]

32. *Hespèria comma*, *Pale spotted skipper*; 33. *H. línea*, *Small skipper*; 34. *H. Tàges*, *Dingy skipper*; 35. *H. málvæ*, *Grizzled skipper*. — All these, with the exception of H. málvæ, are common; but of that fly I have never taken but one specimen.

I would now make a few concluding observations. Howit, in his *Book of the Seasons*, p. 164., says: "Of the twenty-five species of *P*apiliònes enumerated in the list of this month, eight only are known to inhabit this county." Out of these twenty-five, I find but eleven in my list. In comparing the above list with the lists of *P*apiliónidæ occurring in the vicinity of Dover (Vol. V. p. 330.) I find, that, whilst my list counts but thirty-five, the Dover list reckons forty-six. In the Dover list I find fifteen species not included in mine; whilst mine exhibits ten species not included in the Dover list. Mr. Bree, however, as an experienced entomologist, and assisted by an assiduous collector, had decidedly the advantage over me, an unassisted and inexperienced tyro: I therefore think that it is very possible, nay, very probable, that my neighbourhood will, upon closer investigation, furnish some additions to the above list. Standing in one given point, and from thence describing a circle whose diameter shall be about one mile, within that circle I have captured specimens of every fly which I have enumerated, with the exception of Argýnnis Aglàia and Argýnnis Adíppe.

February 21. 1833. C. Conway.

P. S.—I have already seen Gonépteryx rhámni and Vanéssa urticæ. Of the former, several were seen sporting in the sunshine on the 7th; of the latter, one solitary instance on the 9th.—C. C.

Art. X. *On the connecting Links between the Geocorìsæ and Hydrocorìsæ of Latreille, or the Land and Water Bug Tribes.* By J. O. Westwood, F.L.S. &c.

If the investigation of the habits, characters, and structures of those creatures amongst the higher ranks of the creation, which establish a passage between the inhabitants of different elements, be deemed highly interesting, no one will deny that the same interest ought to attach, in a philosophical point of view, to those animals in the inferior ranks of nature which can be proved to possess a similar claim to our notice. It appears to me that such is the case with the following insects, which seem most satisfactorily to form the transition from the land to the water Cimícidæ, or bug tribes. In fine weather, a small lively cimicideous insect may often be observed running about the margins of ponds, streams, &c., of a black colour, with paler spots on the wing cases, and of a nearly rounded flattened form. This insect is the Acánthia saltatòria;

and, on examining it more closely, it will be found to have moderately long 4-jointed antennæ, slender legs, formed for running, and a long rostrum. In the French genus Pelógonus, for an authentic specimen of which I am indebted to the late celebrated Latreille, the legs are slender, for running, and the rostrum long, as in the preceding insect; its habits also are similar, but the antennæ are reduced to a very minute size, and are almost hidden under the eyes. In both the foregoing instances, the wing-cases entirely cover the abdomen. In the very common British insect, Naúcoris cimicoïdes, we find a still greater departure from the previous characters. This insect is found in the water, swimming about with rapidity, by means of its fringed hind legs; and seizing its prey with its fore legs, which are short, thick, and hooked; its antennæ are very minute, and concealed beneath the eyes; its rostrum short, thick, and bent, and the margins of the abdomen not covered by the wing-covers.

It will be perceived that the passage between the two great groups is not clearly established by the preceding insects; a link being wanted which shall possess the slender legs, and long rostrum of Acánthia and *Pelógonus*, with the swimming habits, fringed hind legs, and exposed abdominal margins of Naúcoris.

This link is found in the genus which I now propose, under the name of Aphelocheirus*, with the following characters: —

Corpus ovato-depressum; antennæ breves, sub oculis fere absconditæ. Rostrum elongatum. Pedes omnes tenues, antici simplices, postici 4 ciliati natatorii. Hemelytra abdominis margines non tegentia.

Body ovate, depressed; antennæ short, nearly concealed beneath the eyes. Rostrum long, formed as in Acánthia. All the legs slender, the fore pair simple, not raptorial, the two hind pairs fringed, and formed for swimming. Wing cases not covering the margins of the abdomen.

The type of this genus is the Naúcoris æstivàlis of Fabricius (figured by Coquebert, tab. x. f. 4.), which I have much pleasure in announcing, for the first time, as an inhabitant of our country, having captured a specimen in the river Evenlode, near Ensham, Oxon: I have also received specimens from the neighbourhood of Oxford; and from Sutton Park, in Warwickshire; and, through the liberality of the administrators of the Jardin des Plantes, I likewise possess one of the two original specimens, described by Fabricius, from the collection of M. Bosc.

J. O. Westwood.

The Grove, Hammersmith, April 10. 1833.

* Derived from the Greek, in allusion to the simple fore legs.

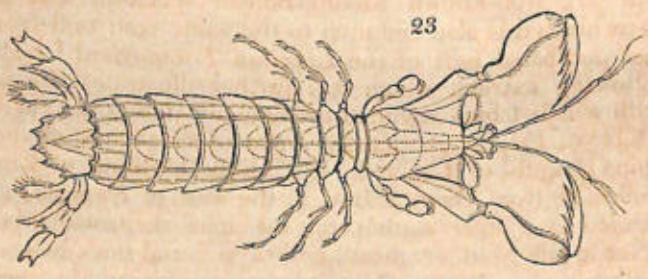
ART. XI. *Notice of the Occurrence of Squílla Desmarésti*i *on the British Shores.* By WILLIAM YARRELL, Esq. F.L.S.

WHEN Dr. Leach commenced his work, *Malacostraca Podophthalmata Britanniæ*, or descriptions of those British species of the Linnæan genus *Cáncer* which have their eyes elevated on footstalks, he felt assured that many new species would be discovered during its progress, and therefore requested that the plates and descriptions might be so numbered, but not paged, as to admit the interposition of any new subjects that might occur, without interfering with the systematic arrangement intended to be pursued.

Several genera remain yet to be figured, to complete this work, some of which contain species not at that time known to belong to this country; and were not therefore included in the original manuscript.

I am indebted to the kindness of Mr. Couch of Polperro, Cornwall, for the possession of a specimen, and also for permission to send to this Magazine a notice of the capture of two examples of Desmarest's *Squílla* on the Cornish coast, where they were found among sea-weed.

This species, which is not uncommon in the Mediterranean, was named and described by M. Risso, in his *Histoire Naturelle des principales Productions de l'Europe Méridionale; et particulièrement de celles des Environs de Nice, et des Alpes Maritimes.*



STOMAPO'DIA.

SQUI'LLA DESMARE'STII Risso, Desmarest's Squilla.

S. corpore fusco, dorso lævi; lineis utrinque duabus lateralibus longitudinalibus elevatis; pollicibus quinque dentatis.

Fig. 23. is the exact size of the specimen taken, and measures 2 in. 4 lines in length. The general colour is yellowish brown; the antennæ rather long, formed of three filaments, supported on an articulated peduncle of three pieces, of which the first is the shortest; the eyes mottled; the corslet

grooved; anterior extremities large, armed with five pointed spines disposed in a line; the abdominal segments furnished, on each side, with two elevated longitudinal ridges above the recurved marginal edge, which appears like a third ridge, on each side; the last segment but one has four such ridges on each side the centre; the caudal segment is carinated in the middle, the keel ending in a point above the surface, the posterior edge divided by six strong projecting points, three on each side, with denticulated intervening spaces; attached to the under surface of this portion are lateral articulated processes, flattened, oval, and ciliated.

The species of *Squílla* are remarkable for their form, particularly for the comb-like appearance of the extremities of the first pair of limbs; and, according to M. Risso the present species is subject to some variation in colour. They live principally in deep water; but the females resort to the rocks in March and August, to deposit their ova, which are of a yellow brown colour. The present species, named by M. Risso after M. Desmarest, is more plentiful in the Mediterranean than *Squílla Mántis*.

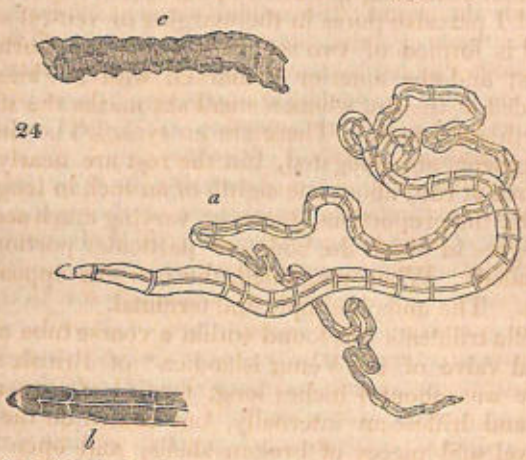
Their external covering, though thin, is firm; and their mode of swimming and general progression is similar to that of the lobster. In their nature they are timid, and endeavour to escape whenever they are pursued. Their flesh is said to be very good, and is eaten almost daily.

Of the several fishes lately added to our British catalogue, four are well-known Mediterranean species. The *Squílla* here noticed is also common to the same sea; and from the last published part of the *Linnæan Transactions* I make the following extract, which still further illustrates the subject with which I had intended to conclude this notice: — "Mr. Dillwyn, F.L.S., exhibited a series of specimens of the Iánthina frágilis of Lamarck, the Hèlix Iánthina of Linnæus, collected from Oxwich Bay, to the west of Swansea, accompanied by a letter stating that the same shell, which is abundant in the Mediterranean, had been found once before there in some abundance. Mr. Dillwyn considered the recording such facts of importance, as being likely to throw some light on the under-currents of the ocean." (*Linn. Trans.* vol. xvi. p. 751.) Dr. Grant found specimens of the same shell, with the animals alive, on the coast of Cornwall, in the month of September last.

Considerable additions to the catalogue of British Crustácea have recently been made, several of which have been recorded; but I am not aware that any notice of the occurrence of a species of true *Squílla* has been published hitherto.

ART. XII. *Illustrations in British Zoology.* By GEORGE JOHNSTON, M.D., Fellow of the Royal College of Surgeons of Edinburgh.

10. CARINE'LLA TRILINEA'TA. (*fig.* 24.)



a, Represents Carinélla trilineàta of the natural size, and in a state of quiescence; *b*, the head slightly magnified, and shaded, to show the lateral pale lines; *c*, a small portion of the tube.

THE subject of the present illustration has no very obvious relation to any annelide with which I am acquainted, so that I feel myself under the necessity of coining for it a new name; and I trust the one adopted will be found sufficiently euphonical, although the scholar may in vain puzzle himself from what, and whence, it is derived. "Indeed," says Mr. Lindley, and there is much sense in the saying, "so impossible is it to construct generic names that will express the peculiarities of the species they represent, that I quite agree with those who think a good, well-sounding, *unmeaning* name, by far the best that can be contrived."

Carinélla trilineàta has, among worms, considerable pretensions to superior beauty. It is of a hyacinth-red colour, marked with three very distinct pure white longitudinal lines, one running down the middle, and one along each side; and crossed with numerous lines, of the same colour, which encircle the body, and mark the number of its segments. Besides these more obvious lines, a fainter one is usually observable across the middle of the segments; and the greater portion of the worm is speckled on the sides with white dots, too small to be seen unless with a magnifier. The ventral surface is of the same red colour as the dorsal, but wants the white line down the middle. The body is soft, vermiform,

flattened, gradually narrowed, posteriorly distinctly annulose, about a foot in length, and one eighth of an inch in breadth, when at rest; but capable of being drawn out to three times this length, when, of course, it becomes proportionally attenuated. It has neither tentacula, nor bristles, nor feet of any sort; neither could I perceive pores in the margins or ventral surface. The head is formed of two segments which are shorter than the others; and the anterior is marked with a white band, and rounded at the tip, where a small slit marks the situation of its toothless mouth. There are no eyes. The third and fourth segments are elongated, but the rest are nearly equal, being, when at rest, about one eighth of an inch in length, and in breadth; the proportions, however, varying much according to the degree in which the body, or particular portions of it, are extended. When magnified, the margins appear finely crenulate. The anus is simple and terminal.

Carinélla trilineàta was found within a coarse tube attached to an old valve of the Vènus islándica * of British authors. The tube was about 4 inches long, formed of a membrane, smooth, and iridescent internally, but coated on the outside with gravel and pieces of broken shells, and open at both ends. I have found a very different worm in a similar tube; so that a doubt may, perhaps, be entertained, whether the Carinélla fabricates it of himself, or is merely a tenant at will. From the body being distinctly annular, the worm is brought in contact with the Annélides; but its softness, the want of feet or bristles, the apparent simplicity of its structure, and its resemblance to the tapeworms, and more especially to the Líneus longíssimus of Sowerby, favour its claim to be placed among the *V*érmes. Indeed, at the end of the first order of intestinal worms in the *Règne Animal* of Cuvier, I find two genera indicated; the Tubulaires of Renieri, and the Ophiocéphales of Quoy and Gaimard, to which our worm is evidently nearly allied, and to the latter of which I might have referred it, had any notice been taken of the annulations of the body.

11. Siphu'nculus Denta'lii *Gray*. (*fig.* 25.)
(*Spicilegia Zoologica*, part i. p. 8.)

After his description of the Dentàlium entàlis, the Rev. Dr. Fleming adds: — "The shell, inhabited by a Siphúnculus, the characters of which have not been determined, is frequently found entangled in the skate lines in the estuary of the Forth." (*Edinburgh Philosophical Journal*, vol. xii. p. 239. 1825.) The worm here so cursorily alluded to has

* Cýprina islándica *Fleming*, Cýprina vulgàris *Sowerby*.

a, Outline figure of S. Dentàlii, removed from the shell, and the proboscis extruded; natural size. *b*, The same, magnified. *c*, The apex of the proboscis, more highly magnified, to show the retroverted prickles, and its globular shape. *d*, A minute portion of the skin, magnified, to show the form of the suckers.

been since fully described, from specimens communicated by Mr. Clift, from Yorkshire, in the *Spicilegia Zoologica* of Mr. Gray; a naturalist, for the extent and accuracy of his knowledge in zoology, second to none; and whose kind and encouraging attentions I, as a learner, have so often experienced, that I willingly avail myself of this opportunity to acknowledge them.

Although I can add nothing of value to Mr. Gray's description, yet I may render it more clear and impressive to your readers by the aid of a figure, which the worm seems to merit, not so much on account of rarity or beauty, as from certain peculiarities in its habits. It is found, and I believe only found, in old shells of Dentàlium entàlis which it enters, and afterwards seals up with a strong and immovable plug of cemented sand, leaving a small circular hole on one side through which to protrude the long proboscis in search of prey, and yet doubtless too narrow to permit the entrance of a foe. Is it not to be admired that a helpless worm should find prepared for it a residence and stronghold adapted to its wants, yet fabricated by another creature of very different structure and habits?

Siphúnculus Dentàlii is of frequent occurrence in Berwick Bay. When the proboscis is retracted, the body is about three quarters of an inch long, subcylindrical, white, opaque, obtuse at both ends; and to the unaided eye little further is apparent. The magnifier shows it to be slightly wrinkled, or annulated, covered all over with minute close-set tubercles, and furnished towards the middle with a broad belt of larger

tubercles, pointing apparently to the mouth. From this aperture a cylindrical tough proboscis may be extruded, nearly equal to the body in length, swelling towards the apex into a bulb, armed behind with retroverted spinules, and the aperture itself encircled with numerous short and thickish tentacula. When the body is compressed between plates of glass, the alimentary canal is seen proceeding straight to near the middle, where it forms a considerable flexure, and thence it has a convoluted course towards the posterior extremity, when it returns upon itself, and opens outwardly at the base of the proboscis. No trace of any other organ is visible. There are three small anomalous appendages at the posterior end, the nature of which I do not understand.

When the larger tubercles that encircle the central part of the body are magnified (*d*), they seem to be suckers or cups, not unlike the cups which are placed along the arms of the cuttlefish, but the shape is probably somewhat altered by the pressure to which they were subjected between the glasses.

The greater number of systematic authors have placed the Siphúnculus amongst the radiated animals near the genus Holothùria; but De Blainville has removed it from that class, to place it among the true worms. The propriety of this, if I may be permitted to give an opinion, is very doubtful, for the existence of the tentacular circle at the oral aperture seems to indicate some kindred to the radiated tribes; and its affinity to the Holothùria will be made still more apparent, if my observation, that the seeming tubercles are in reality suckers, is confirmed.

Berwick upon Tweed, February 23. 1833.

ART. XIII. *An Introduction to the Natural History of Molluscous Animals.* In a Series of Letters. By G. J.

Letter 11. *On their Organs of Respiration.*

THE respiratory organs of the Mollúsca have peculiar claims to the attention of the conchologist, not solely because of their function, which, indeed, is one of chief importance, but because they have furnished the principal characters on which modern systematists have proceeded to subdivide the class into orders and families. Cuvier, of whom, among recent naturalists, it may most truly be said that he was

> "Ordain'd to light with intellectual day
> The mazy wheels of Nature as they play,"

was the first to perceive their utility in this respect; and when it is considered that their position mainly determines the arrangement of the other viscera, and must consequently exert a powerful influence over the habits of the animals, you will feel disposed to admit that a happier choice could not have been made, the more particularly as the organs in question are in general easy to detect, and exhibit sufficient variety in location and form for every systematic purpose.

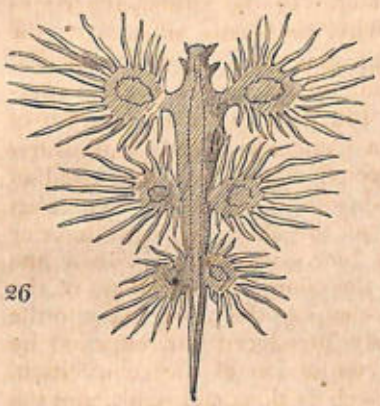
Molluscous animals are either *Pulmoniferous*, and breathe atmospheric air only, or they are *Branchiferous*, and respire it through the medium of water. In the former, the respiratory organ is a simple cavity, commonly situated on the anterior part of the back; but sometimes, as in Testacélla, near the tail. The air is admitted by a small circular aperture that opens outwards on the neck under the margin of the cloak, and which the animal opens and shuts at pleasure. Externally the cavity is protected either by a thick fold of the cloak, often strengthened with a horny or calcareous plate, or by the body-whorl of the shell; while its interior walls, and more especially its floor, are covered with a fine vascular network, formed by the minute ramifications of the pulmonary vessels, which thus expose the blood freely to the influence of the air, alternately introduced and expelled by the alternate dilatation and contraction of the cavity itself. All the terrestrial Mollúsca, such as slugs and snails, and the great bulk of the Gasterópoda that inhabit fresh water, possess a respiratory apparatus of this kind; and, since these aquatic Pulmonífera (Lýmneus, Planórbis, and Ancýllus may be quoted as examples) are necessitated, from time to time, to inhale the fresh and uncombined air, so they will be found uniformly to be the denizens of shallow waters, and to spend a large portion of their lives at the surface.

The *Branchiferous* Mollúsca have the aerating organs greatly more diversified in every respect; and, to countervail the disadvantages of breathing a medium little impregnated with air, they are likewise of greater extent and complexity. When placed within the body, the branchiæ, if distinct, are divided into multiplied lobes and leaflets; or, if a mere cavity, the surfaces are folded into innumerable plaits, all calculated to afford ampler space for the display and meanderings of their blood-vessels, and to expose a wider surface to the contact of the water: but, if the branchiæ are external and exposed, they are, it may be, less complicated, only because complexity seems unnecessary where fresh doses of unbreathed fluid are continually brought into momentary

contact with them, and without any effort on the creature's part.

The Mollúsca which have their branchiæ entirely exposed belong to two sub-classes, the Pterópoda and Gasterópoda. In some of these, the branchiæ are actually blended with the locomotive organs, as in Clìo, a member of the former sub-class, whose fin-like expansions are supposed to perform the office, not of progression only, but also of ventilating the blood as it circulates through the fine regular network with which their surfaces are covered. The Glaúcus (*fig.* 26.) affords another example of the same union of functions. This is one of the most remarkable and most beautiful of the Gasterópoda. The body glows with a fine cærulean blue colour, which deepens in hue towards the ends of the fringes of its ptero-branchiæ; the centre of the back is of pearly whiteness, bordered with a line of deep blue; and the sides are adorned with an interrupted series of fan-like laciniated gills, by aid of which, as I have said, it swims reversed at the surface of the Mediterranean Sea, in numerous swarms.

26



Glaúcus hexapterýgius, copied from Cuvier.

But, generally, the external branchiæ are distinct and independent organs. Of the Pterópoda, almost each genus presents them under some new modification in form, or structure, or position, "as Nature in them strove to show variety." Thus, in the Pneumodérma (*fig.* 27.), they are placed nearly on the posterior extremity of the body, which is naked, and resemble two Cs placed back to back in this manner, ↄC, united by a little transverse bar across the middle, or at each end, the lines being garnished with a number of regular prominent leaflets of minute size. In the Hỳales (*fig.* 28.), again, the branchiæ are pectinated, and lie concealed in a space between the lobes of the cloak, to which the water gains admission by certain fissures on the sides of the shell; while, to make, as it were the dissimilarity perfect, they appear, in the genus Cuvièr*a* of Rang (*fig.* 29.), in the form of two small equal and symmetrical processes, exsertile

27

Pneumodérma, copied from Cuvier.

28

Hyale, copied from Rang.

29

Cuvièra, copied from Rang.

beyond the shell when the animal is in motion, but at other times retracted, and fixed upon a common stalk by a point a little removed from one of the ends.*

The Gasterópoda which arrange themselves under this division form a very natural and interesting order, appropriately named by Cuvier the Nudibránchiæ. These are naked snail-like Mollúsca which live only in the sea; and they would scarcely attract our notice amid the myriads of curious creatures that are around them, were it not for the ornament and singularity of their branchial appendages. Their position is always on some part of the back, either ranged in one or more series along its margins, as in Glaúcus, Eolídia, and the Tritonìadæ, or clustered on a point of the medial line near the hinder extremity, as in the Dòris and its allies, which have the power of concealing them within the body when danger threatens from without. In shape they vary more than in position: they are simple filaments in Eolídia; in Glaúcus they are fan-shaped fins; in Melibæ`a clubbed processes, covered with little hispid tubercles, or, as in Scýllea, with little tufted bouquets of very delicate filaments; and in the Tritonìadæ and Dòris they assume a more or less perfectly plumóse or arborescent appearance.

There are other Gasterópoda in which, although not so fully exposed as in the preceding order, the gills are still only slightly concealed by some lap or fold of the cloak. The genera Patélla †, as now restricted, and Chìton afford examples where the branchiæ, in form of a cord composed of pyramidal processes, or of close-set and parallel transverse

* Rang's *Manuel de l'Histoire Naturelle des Mollusques*, p. 38. tab. 2. fig. 4. An excellent work, which I regret I had not the assistance of in the compilation of the preceding letters.

† Blainville, however, maintains that Patélla is pulmoniferous. (*Manuel*, p. 125.)

leaflets, encircle the body more or less completely, lying in a furrow between the foot and cloak, and merely covered by the prominent margin of the latter. In an order which Cuvier calls Inferobránchiæ, these organs occupy a similar position, but limited often to one side of the body; while, in the Tectibránchiæ, an order of which Aplýsia may be selected as the type, the gills, almost free, and like some miniature arbuscle, occupy a position on the back, where they lie, scarcely hidden, under a movable corneous lid that sits in the centre of a hollow formed by the large and muscular dorsal fin, intended apparently to collect the water as in a crater, that it may not pass away too rapidly, and until it has thoroughly penetrated the intricacies of the branchial apparatus.

The Mollúsca with internal branchiæ are more numerous than the preceding; for some Pterópoda, the greater number of the Gasterópoda, all the Cephalópoda, and all the acephalous tribes * are thus circumstanced. The various modifications of them in the remaining Gasterópoda I will not now dwell upon; for it will be necessary to describe them hereafter, when I explain to you the Cuvierian system: but there is one family which, because of its greatness, may not be passed over in this place, this is the Pectinibránchiæ; an order that includes almost all the marine turreted and convolute † shells, and a few which are found in fresh water. In it the branchial cavity has a position similar to that in the Pulmonífera, on the upper and fore part of the back; to wit, where it is protected by the body of the shell: but its walls are not smooth and even, like those of the pulmonary cavity, but folded into neat and regular plaits or ridges, that lie parallel to one another, like the teeth of a comb (whence the name Pectinibránchiæ), and often part on each side from a central stalk formed by the trunks of the blood-vessels, in the same manner that the barbs of the web of a quill depart from the shaft. The water obtains ingress to this cavity, in such Pectinibránchiæ as inhabit shells with entire apertures, by a large slit on the side above the collar; and, in shells with interrupted or beaked apertures, by an imperfect siphon that

* Lamarck considers the branchiæ of bivalves (Conchíferæ) as properly external (*Hist. Nat.*, vol. v. p. 417.); and this view of their position is plausible, more particularly when the cloak is open in front.

† Sir E. Home asserts that the lobes of the mantle which cover the shells of the cones and cowries are the respiratory organs of the animal (*Comp. Anat.*, vol. i. p. 55.); but this is a mistake: they are true Pectinibránchiæ.

lies in the canal or emargination, and that is formed by a prolongation and duplicature of the cloak.

The gills of the Cephalópoda are placed, one on each side, within the sac, to which they are attached by a thick broad fleshy riband. Each gill is composed of two series of branchial leaves connected on one side to the fleshy riband just mentioned by short pedicles, and on the other uniting with the leaves of the opposite row; and, as the leaves of the one series are not opposed to, but alternate with, those of the other, each of them unites two leaves of its antagonist series; and they are in this manner all joined together at the margin farthest from the fleshy riband, and along which the branchial vein runs. Each leaf is itself garnished with little cross leaflets, and these are similarly divided (Cuvier, *Mém. sur les Mollusques*, vol. i. p. 20.); the structure, on the whole, reminding one of the mechanism of the gills in fishes.

The branchiæ of the bivalved Mollúsca are always placed between the body and its cloak, the folds of which, being, in many of them, altogether separate in front, admit the circumfluent water very freely; but when these folds are soldered together at the edges, as they often are, the water is imbibed through a siphonal tube formed by an elongation of the cloak, and extruded at the posterior end of the shell; and the effete fluid is expelled again through the common excrementitious tube, which is altogether like the other, and occupies the same position. In the Branchiópoda, a small order of this class, the branchiæ are arranged in a pèctinated form on the inner surface of each lobe of the cloak; but the other tribes have free gills in the form of large semilunar leaves that embrace the sides of the body. There is a pair of these, often of unequal size, on each side, and each leaf is joined to that which corresponds to it on the opposite side at the dorsal margin; but in front they are usually separate: they are broad and lamelliform, are finely and regularly striated across, and sometimes appear punctulated in the intervals of the striæ. * Each leaf, according to Blainville, is itself formed of two layers which leave between them a free space, divided by numerous triangular partitions into a great number of vertical cells open to the dorsal margin. These layers are constituted by two series of parallel vertical vessels united by others which cross them; one of the series

* These striæ appear to be formed of a small number of tubes, bound together. They may be compared to the nervures of the wings of insects; for they seem partly intended to keep the branchiæ even, and prevent them being rumpled. They are parallel to one another, and connected by cross tubes, that divide the interspaces into small regular squares.

being formed by the ramifications of the branchial artery, and the other by those of the vein. These minute ramifications can be ultimately traced to two great trunks which run along the back of the branchial leaf, one (the arterial) trends away to the auricle of its own side, to pour into it the renovated blood, while the other is the large vein from which the venous branchlets have departed.*

The naked acephalous Mollúsca (Tunicàta *Lam.*) have two, and only two, orificeś in their outer tunic, which very often open on the tips of two tubular projections, or papillæ, placed near one another. By one of these †, which is usually the highest, and encircled within its rim with one or two rows of slender tentacular filaments, or furnished with a valve, the water necessary to respiration flows into a large visceral sac, which, while it seems in part to perform the functions of a crop, affords ample space for the display of the aerating blood-vessels. The water, after being breathed, is in general expelled at the same orifice by which it was sucked in; and, notwithstanding that the observations of several naturalists seemed to prove the contrary, Cuvier was nevertheless inclined to conclude, from his anatomical investigations, that it could not possibly be expelled from the other, which is the anus. But the conclusion was erroneous; for, since attention was more particularly directed to the point, the water has been seen to be propelled simultaneously from both apertures,

* Manuel, p. 128. Such of our readers as are interested in the structure of molluscous animals will not be displeased at the length of the following extract from Carus: — "It is to be remarked, farther, of the large branchial laminæ of the freshwater muscle, that both pairs consist of an intertexture of vessels, arranged in a rectangular latticework, and covered by a delicate membrane, whilst the two external are distinguished by a structure which merits a particular description. Above each external lamina of the gills is a duct proceeding from the posterior part of the foot towards the anal tube, long ago described as an oviduct by Oken, and having on its lower surface a long row of openings placed transversely, and forming the entrances to the cells, or compartments, of the gills themselves. These compartments are all arranged vertically in the gill, and separated from each other by partitions: they appear as though they originated from the mutual recession of the two membranous surfaces of the gill, which remain connected only by the vertically disposed vessels that give rise to the septa: they serve for the reception of the ova, which, coming from the ovary placed within the foot, and not by any means formed in the gill itself, are, however, lodged there; and there receive their farther developement, as in a uterus. This is a remarkable instance of the connection between the sexual and respiratory functions." (*Comp. Anat.*, vol. ii. p. 148, 149. trans.)

† In all the compound Mollúsca, the branchial orifice of the component individuals tends always to approach to the circumference of the system, as the anus does as invariably to the centre. (*Savigny.*)

by more than one competent observer; and if I may not rank myself among these, yet have I witnessed the fact in the Ascídia prùnum. You will not dispute the claim of our friend Dr. Coldstream to be numbered among them. "It has been doubted," he says, "whether the Ascídiæ, in contracting their tunics, expel the water through their anal as well as through their branchial orifices. I have distinctly seen this species (Ascídia prùnum), as well as others (in particular the A. intestinàlis), propel currents of water through both orifices at every contraction of the tunics; that from the anal orifice being almost as strong as the one from the mouth of the branchial sac." (*Edin. Phil. Journ.*, October 1830, p. 240.) But, indeed, long before this, and even previously to the publication of Cuvier's memoir, Carus had detected "a lateral opening furnished with valves," in the sac, by which the water might have egression, and which, says this most ingenious anatomist, satisfactorily explained how these animals have "the power of rejecting the respired water not only through the mouth, but also through the anus." (*Comp. Anat.*, vol. ii. p. 146. trans.)

The branchial cavity itself is a large flattened sac, which varies greatly in respect of extent, depth, and form. Sometimes, as in Ascídia clavàta, it occupies only a small portion of the length of the body; oftener, as in Ascidia microcósmus, it occupies all the length and the breadth of one of the sides, and the rest of the viscera occupies the other side: then its form is oblong, oval, or rectangular. Sometimes, as in Ascídia mammillàta and monàchus, after having descended even to the bottom of the outer tunic, it bends upwards until its base is at the middle of its length, and looks towards the entrance. In the latter case, the parietes have the greatest extent. In general these are smooth, and without plaits; but in some species, and, as it would appear, in all those which have a coriaceous outer cloak, they are creased into deep and regular folds, the first vestiges of the four branchial leaves of bivalves.*

* So says Cuvier, and there is no man whose opinions I so much value and respect; yet I must acknowledge that there appears to me to be no relationship whatever, either in this or any other genus, between the branchial sac of the Mollúsca tunicàta and the gills of the bivalves. In the former, the water enters the sac by an orifice common to it and the stomach; in the latter, it reaches the gills by a large fissure, or by a tube always distinct from the mouth: in the former, the aerating vessels are spread on the sides of a portion of the alimentary canal; in the latter, they form free and independent organs: in the one, they are strictly internal; in the other, they are properly exterior to the body. Lamarck even considers

Whatever may be, however, the shape and general disposition of the sac, the texture of its inner parietes remains essentially the same, and is so very remarkable that several authors, who knew not its purport, have expressed astonishment at its beauty. It consists of an infinity of little vessels which cross one another at right angles, and thus weave a network, with quadrangular meshes (*fig.* 30.), that are again subdivided by vessels of such tenuity that they elude the unaided vision, and require the microscope for their discovery. With a little attention it may be perceived that the vertical vessels come from the transverse vessels, and that these are connected by their two extremities to two great trunks, also vertical, which occupy one of the sides, or rather the edges, of the sac; and it is natural to conclude that one of these trunks is the artery, and the other the branchial vein. (Cuvier, *Memoirs*, xx. p. 11, 12.).

30

Phallûsia sulcàta of Savigny, opened.

The meshes of this branchial network are generally, as I have said, nearly square and uniform, yet in the different genera there is exhibited a considerable variety of patterns, some of which

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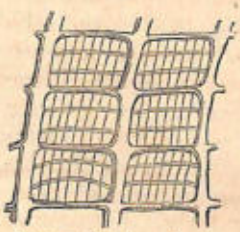

Pattern of the branchiæ in Ascidia pedunculàta.

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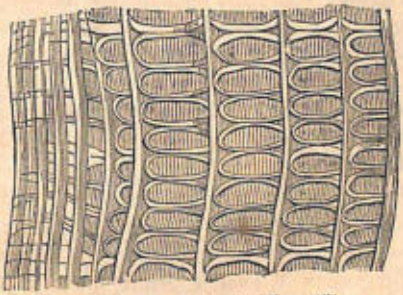
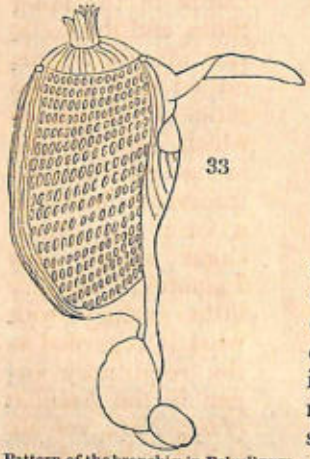


Pattern of the branchiæ in Ascidia mytiligera.

it as a point still undetermined, whether the network of the tunicàta is vascular or not: he thinks it *may* be formed of muscular fibres. (*Hist. Nat.*, vol. iii. p. 86.)

you have here copied from the beautiful plates of Savigny. *Fig.* 31. exhibits a small portion of the branchial surface of the Ascídia pedunculàta (Boltèn*ia* ovífera *Sav.*), highly magnified, and is an example of its usual and least ornamental conformation; in the Ascídia (Cýnthi*a* Sav.) *m*ytilígera the meshes are elliptical (*fig.* 32.); and they have the same form in many other species, more particularly in the compound families, or those in which a great number of individuals are united together in a common system. (*fig.* 33.) Again, in



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Pattern of the branchiæ in Polyclinum hespèrium.

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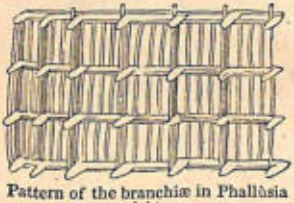

Pattern of the branchiæ in Phallùsia sulcàta.

some genera, of which the Phallùsia of Savigny is one, there is a small conical process at each angle of every little square (*fig.* 34.); but it is in the Cýnthi*a* Diòn*e* that the most remarkable modification of this structure appears. Here the branchial tissue is not continuous upon the folds of the sac, but interrupted, at equal distances, in a manner to resemble a series of very regular festoons. Each fold has a second at its base, which is not free like itself, and of which the points of fixture correspond to the intervals which separate the festoons. The whole of the plaits are twenty-eight, fourteen on each side, and they are margined by an equal number of great longitudinal vessels. The vessels which compose the tissue are excessively fine; the transverse, however, less delicate than the others, and not so closely set, accommodate themselves very well by their curvature to the outline of the festoons. This description, I feel, needs the aid of Savigny's figure, of which I gladly avail myself, and I am certain that in few other creatures will you find a structure more wonderfully fashioned. (*fig.* 35.) (*Mém. sur les Animaux sans Vertèbres*, 2de partie, passim).

Although the branchial tissue apparently covers the whole inner surface of the sac with a continuous network, yet it is

really divided into two halves by a furrow in which the trunks of the blood-vessels lie; and this structure becomes obvious in some families where, as in Pyrosòma, the interspace is considerable; and is still more remarkably obvious in the Sálpæ, in which, in fact, the branchial vessels are not disposed on the walls of the sac, but occupy the margin of two narrow linear leaflets of very unequal lengths that lie across the cavity. These are formed by a duplicature of the inner tunic, and the superior margin is garnished with a close series of little vessels which run parallel to one another in a transverse direction; a form and disposition which, says Lamarck, has very little analogy with what is regarded as the respiratory organ in the Ascídiæ (*Hist. Nat.*, vol. iii. p. 114.); but which, on the contrary, Carus seems to think is just the link that connects these with the bivalves, "appearing to constitute the transition from the Ascídiæ to the Terédines, where there are two elongated branchial laminæ above the intestine and within the tubular cloak, to which the water has access and egress by means of two tubes placed at the posterior extremity of the body." (*Comp. Anat.*, vol. ii. p. 147. trans.)

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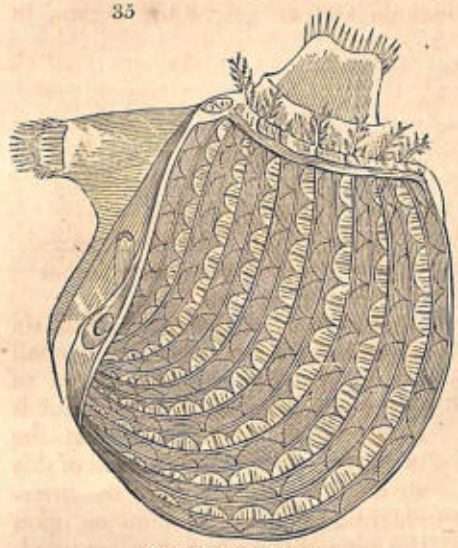

Cynthia Dione Savigny.

Let us, before proceeding, reflect a moment on that wonderful diversity in the structure of the same organ here exhibited to us in one class of animated beings: it is a fine example, among many, of that variety in which the Creator of all has seen good to indulge in the production of his works, as if, to use the words of a favourite author, He "willed to show those whose delight it is to investigate his works, by how many varying processes he can accomplish the same end." I see in it also a proof, that neither external and physical circumstances, nor self-born desires, have that great and

almost creative influence in framing or modifying animal structures which many imagine they have; for here are before us a crowd of animals whose soft bodies, it will be allowed, are as susceptible of changes, or of being moulded to one type, as any animals can be, and the uniformity of whose nervous system seems to prove that their faculties and desires are much on a par; yet, if we select any large family from among them, we shall find them living in the same seas, and in the same depths, and in the same latitudes, and on the same food, and all breathing the same air; but, so far from showing a perfect agreement in their exterior organs, on which these causes are said to operate so efficiently, we find all is diverse, whether we look to the position, the form, or the structure of the organs. These are now, my friend, such as they were when the creatures came into existence from Infinite Wisdom, perfect, and complete, and immutable, and, notwithstanding all their variations, ever suited with special adaptation to the element and the place they were foreordained to inhabit. "Their forms are His special invention and construction, and their principle of life is also His special and communicated gift," is the just conclusion of a historian eminently distinguished for his learning, his good sense, and his piety.*

Now, the distinction which has been drawn between the Mollúsca with lungs and gills, however anatomically correct, is not always physiologically true; for although I am not cognisant of any pulmoniferous species that can breathe water, or ever does so voluntarily, yet there are many branchiferous ones that can and do respire the uncombined air. A great number of bivalves are alternately submerged and exposed to the air, according to the fluctuations of the tide; but then the concavity of the lower valve enables the animal always to retain some moisture around its gills, and I believe they do not open their shells freely unless when covered with water. The Octòpi of the cuttlefish tribe are said to come ashore frequently, and live among the rocks for days together; and the Pterópoda and the naked Gasterópoda in general love to swim at the surface in calm weather, particularly at the time of sunset, apparently to enjoy the respiration of a lighter and more oxygenated medium. There are other Gasterópoda with gills which pass so large a portion of their term of life

* Mr. Sharon Turner. His *Sacred History of the World*, from which the quotation is taken, I earnestly recommend to the attentive perusal of students of natural history.

completely out of the water, that they seem to merit the appellation of amphibious. Of these the Patéllæ and the Littorìnæ (Túrbo *Lin.*) are remarkable examples. Our common species of the latter genus (Túrbo littòreus and *Ner*ìta littoràlis of British conchologists) seem indeed to prefer spots where they can be covered only at high water, and I have seen myriads of them, when young, clustered in hollows of rocks that were many feet above the highest tides. Still, their respiratory organs are, as they ever have been, branchial; nor does it seem easy, on the Lamarckian hypothesis, to account for their non-improvability: why these shell-fish, so fond of air, have not acquired, by their residence in it, the lungs of the snail, and betaken themselves to the land; why their shells have not become lighter, to enable them to move with more alacrity; and why their eyes have not risen to a higher elevation than the base of the tentacula, that they might scan the landscape, and avoid its perils. The habits of the Chitónidæ are similar to those of the Littorìnæ. "Those animals," says the Rev. Mr. Guilding, "frequent the rocks and stones of the sea-coast, and are distributed nearly over the whole globe. Many of the species are constantly under water, while others ascend above low or even high water mark, spending the day exposed to the hottest sun, or selecting a resting-place which is only occasionally moistened by the rude and restless surf. In Chitonéllus and Cryptocónchus there are certain minute organs on the zone, which bear a strong resemblance to the spiracula of the annulose animals. From their habit of quitting the watery element, like many of the Turbínidæ, I once supposed that the organs for the aeration of the circulating fluid might be of a compound nature (pulmòno-branchiàti). It is, however, far more probable (as in the case of some crustaceous genera which I am now investigating) that this process is capable of a diurnal or a temporary interruption, or that the branchiæ, so long as they are kept moist, and shielded from atmospheric influence, may perform their functions, though much more slowly." (*Zool. Journ.*, vol. v. p. 29.)

I shall continue this subject in my next.

G. J.

April 23.

ART. XIV. *On the Distinctions between the Linnæan Genera Potentílla and Tormentílla.* By CHARLES C. BABINGTON, B.A. F.L.S. &c.

THE genera Potentílla and Tormentílla are allowed by Linné to differ only in number *, and it has long appeared to me that those botanists who consider them as forming parts of one and the same genus conform more exactly to the Linnæan rules † (which are also those of nature) than he did himself. The genera must be admitted to be extremely close in habit, and the only other difference consists in the number of the petals and sepals, Potentílla having 10 sepals and 5 petals, and Tormentílla 8 sepals and 4 petals.‡ Number alone, therefore, being depended upon in this instance, the following tables, drawn up from the examination of 2794 specimens of Tormentílla officinàlis of Smith, cannot but be interesting. The specimens were gathered, at the latter end of last August, in Needwood Forest, Staffordshire.

The calyx in the genera now under consideration appears to consist of two whorls of sepals, alternating with each other, of which one (the outer?) has generally much smaller sepals than the other. I have, therefore, in the tables, distinguished them as "large" and "small." The large whorl, which is alternate with the petals, does not appear to vary much in

* Linné says, under Potentílla, in his *Genera Plantarum*, ed. of 1767, "Deme unicam quintam partem numero in omnibus partibus fructificationis, et habebis Tormentillam." [Take away from the number of the parts of fructification in Potentílla a fifth part, and you will have the genus Tormentílla.] He also says, under Tormentílla, in the same work, "Tormentilla solo numero differt a Potentilla, hinc possent ambo genera combinari." [The genus Tormentílla differs from Potentílla in number alone, and hence these two genera may be united.]

† The rules to which I refer are the following, which he strongly impresses on all botanical students: — "Scias characterem non constituere genus, sed genus characterem; characterem fluere e genere, non genus e charactere; characterem non esse, ut genus fiat, sed ut genus noscatur." (*Lin. Philosophia Botanica*, p. 119.) [You should know that a character does not constitute a genus, but a genus a character; that a character proceeds from a genus, not a genus from a character; a character is not formed that a genus may be constituted, but that a genus may be known.]

‡ I append the essential generic character, copied from *Lin. Systema Naturæ*, ed. 12. p. 350. and 352.: — "Potentilla, cal. 10-fidus, pet. 5; sem. subrotunda, nuda, receptaculo parvo exsucco affixa." [Calyx 10-cleft, petals 5; seeds roundish, naked, affixed to a small dry receptacle.] "Tormentilla, cal. 8-fidus, pet. 4.; sem. subrotunda, nuda, receptaculo parvo exsucco affixa." [Calyx 8-cleft, petals 4; seeds roundish, naked, affixed to a small dry receptacle.] The characters given by Sir J. E. Smith and Dr. Withering, although not exactly in the same words, do not at all differ in sense. Dr. Withering says that he keeps them distinct, as "more favourable for investigation:" see his *Botanical Arrangement*, ed. 3. vol. ii. p. 476.

size or shape; but in the smaller one I have noticed the sepals so large as to equal the others, and so small as to be hardly visible: their shape also is generally ovate-lanceolate, but I have seen them both linear and broadly ovate.

TABLE I. — Showing the condition and number of each of 15 distinct varieties found in the examination of 2794 specimens. The fractional parts refer to those cases in which one or more of the sepals is notched more or less deeply at the extremity: $\frac{1}{2}$ means that one sepal was notched; $\frac{2}{2}$ that the notch occurred in two of the sepals in the same flower; $\frac{3}{2}$ that it was so in three.

Variety.	Sepals.		Petals.	Number of each variety.	Variety.	Sepals.		Petals.	Number of each variety.
	Large.	Small.				Large.	Small.		
1	4	4	4	2569	7	4	6	5	2
	4*	4	4	2	8	4	6	6	1
	4	$4\frac{1}{2}$	4	60	9	5	4	5	3
	4	$4\frac{2}{2}$	4	9	10	5	4†	6	1
	4	$4\frac{3}{2}$	4	3	11	5	5	4	2
2	4*	4	5	1	12	5	5	5	67
	4	$4\frac{1}{2}$	5	2		5	5	5‡	3
	4	$4\frac{2}{2}$	5	1		5	$5\frac{1}{2}$	5	8
	4	$4\frac{1}{2}$	9	1	13	5	6	5	9
3	4	5	4	24		5	$6\frac{1}{2}$	5	1
	4	$5\frac{1}{2}$	4	3	14	6	4	6	1
4	4	5	5	12	15	6	6	6	4
5	4*	5	6	1					
6	4	6	4	3					
	4	6	$4\frac{1}{2}$	1					

TABLE II. — Stating the number of times that the several variations in each whorl occurs in the whole number of specimens.

Number of parts.		4	5	6	9
Sepals	Large - -	2695	94	5	0
	Small - -	2653	120	21	0
Petals	- - -	2676	109	8	1

It appears to me that the result to be deduced from the above is, that those botanists are in the right who, with De Candolle, consider Tormentilla officinalis as a species of the genus Potentilla under the name of Potentilla Tormentilla.

CHARLES C. BABINGTON.

* In this variety one sepal was half converted into a petal.
† This had one sepal lower than the others.
‡ These varieties had two bracteas just below the flower.

An attentive inspection and comparison of plates 862, 863, and 864. of *English Botany* will much elucidate the above communication; in the absence of dried specimens, which are better, or living ones, which are better still, of the plants there depicted: they are these: — On plate 862. Potentílla réptans *L.*, where the back view of a flower merits attention; on plate 863., Tormentílla officinàlis *Smith*; and on plate 864., Tormentílla réptans *L.*

The question proposed is: — Are not the tormentils rather potentillas usually possessed of only four fifths of their sepals and petals? or, in other words, should the genus Tormentílla be preserved, or abolished and its species transferred to the genus Potentílla? Contributive to the answering of this question, Mr. Babington has provided the amplest list of instances of the condition of the flowers of Tormentílla officinàlis *Smith* ever before published; and worthy of admiration is the zeal which led him to collect so many, and the skill with which he has arranged and adapted them in relevance of the question. Besides the value of these instances in this relation, they, and those of the floral variations of Pàris quadrifòlia *L.*, communicated by Professor Henslow (Vol. V. p. 429. 755.), have a universal and permanent value in their subservience to arguments on every analogous condition of other plants and genera. Farther than this, we think the facts themselves, extensively detailed though they be, very interesting; for who that loves plants can possibly be wearied with the minutest incident in the, as it were, personal biography of any one of them. Dilated premises too, enable the student to canvass and analyse the conclusions deduced, and, if dissatisfied with them, to draw others for himself. We neither presume nor profess to place ourselves in this latter relation to Mr. Babington's conclusion, but beg to attach some quotations and remarks which more or less oppose it, or otherwise relate to it. Smith, in his *English Flora*, vol. ii. p. 426., contends for the due distinctness of the genus Tormentílla from the genus Potentílla, and presents a clearly drawn view of, and most pertinent remarks on, their relations: these merit the attention of the reader. We select two remarks: — First, "The distinction between Tormentílla and Potentílla certainly depends upon number; but the difference is obvious, and as constant as in any other similar instance, of which there are several universally adopted." (p. 426.) Secondly, in the detailed descriptions of Tormentílla officinàlis (in p. 427.): — "The flowers have, very rarely indeed, 5 petals, and consequently 10 segments [sepals], to the calyx; an accident not uncommon in several [species of]

plants." The strong expression "very rarely indeed," may be tested by comparing it with the proportion borne (in the totals in Mr. Babington's second table) by 109 (or, as some may prefer, 118) to 2676; and the "consequently," with the relation of 109 to 107, as this last number is the mean of 94 and 120 added together.

M. Seringe, the individual who elaborates the potentillas in De Candolle's *Prodromus* (pars ii. p. 571—586.) and there appears to follow Nestler, Schranck, Lehmann, and the younger Haller (but not De Candolle, as far as we can perceive), in referring the tormentils to the genus Potentílla, appends to the description of his and their Potentílla Tormentílla, which is the Tormentílla officinàlis of Smith, the qualifying remark, "variat calyce 4-fido aut rarius 5-fido, petalis 4 aut rarius 5." [it varies, with a calyx 4-cleft, or more rarely 5-cleft, and petals 4, or more rarely 5.] The younger Haller's name for Tormentílla officinàlis *Smith* is Potentílla tetrapétala.

Mr. Babington sent two dried specimens along with his communication; one in which the smaller sepals were 5 in number, the larger sepals 5, and the petals 5; in the other, these parts were severally 6 in number. In both specimens all these parts were symmetrically placed, that is, according to the rule of alternation; so that the supernumerary petals were clearly not derived from the casual expansion of a stamen into a petal, which is known to be no rare occurrence in flowers whose stamens are numerous, as well as an occasional one in flowers whose stamens are few. To give instances, we name the genera *R*anúnculus, Ficària, Camél*lia*, *R*òsa, *A*lthæ'a (*r*òsea, the hollyhock), Diánthus, &c. &c., and, we think, may fairly add, Tormentílla officinàlis itself; for says Smith, in his *English Flora*, vol. ii. p. 427.: — "The late Miss Johnes of Hafod gathered the tormentil in Cardiganshire with double blossoms like little yellow roses;" and it is highly probable that in this case the supernumerary petals were derived from transmuted stamens. The thought arises that the variety gathered by Mr. Babington with 9 petals might, possibly, be an approach to the same condition.

Tormentílla réptans L., the larger British tormentil.—On this species Smith observes (*E. F.*, ii. 428.) "The lowermost flowers have occasionally 5 petals and 10 segments to the calyx, as in the T. officinàlis:" to which remark we may append the question, Does it vary as frequently, and as widely, as Mr. Babington's tables have shown the T. officinàlis *Smith* to do? A question that can only be answered by an

examination as extensive and strict as that which Mr. Babington has applied to T. officinàlis. This examination we hope Mr. Babington, or some one, will give it. The species probably occurs in sufficient plenty for this purpose in the sandy soils of Norfolk; we once met with plants of it in the parish of Shropham, in Norfolk. It is worthy of remark, that Nestler denominates the Tormentílla réptans *L.* Potentílla nemoràlis, and that Seringe deems it but a variety of the smaller tormentil, and gives as his name for it Potentílla Tormentílla var. (*) nemoràlis; this fact suggests that whoever may be pleased to investigate the floral variations of Tormentílla réptans *L.*, should also canvass its specific distinctions in relation to the Tormentílla officinàlis *Smith.*

Potentílla réptans L.—In the nursery of Mr. Dennis, and that of Mr. Knight, both of Chelsea, we have seen cultivated a double-flowered variety of Potentílla réptans *L.* The time at which it was first introduced into cultivation is, we believe, three or four years ago; but where found wild we do not know. Like its parent, the P. réptans itself, it increases rapidly, and may be multiplied to any number, as every joint of its many-jointed, numerous, decumbent stems will emit roots from the side next the earth, and form a separable plant: again, like P. réptans, it is very tenacious of life, and will grow in almost all soils and situations. The plant is very eligible and has been used for decorating rockwork, over which its trailing stems, garnished with 5-fingered leaves, and abundant in stalked, axillary, rich yellow blossoms, pleasingly display themselves. — *J. D.*

ART. XV. *The Weather at Florence.* By W. SPENCE, Esq.

Sir,

HAVING sent you the summary of my diary of the weather for the last three winters in Italy [Vol. III. p. 374., Vol. IV. p. 263., Vol. V. p. 353.], it was not my intention to occupy your pages farther with the subject; but the season just ended has been so very remarkable for its dryness, rain having been twice publicly prayed for, once in November, and again in January, that I have thought it might interest some of your readers to see such particulars respecting it as I have noted; which, therefore, I now transcribe; confining my remarks chiefly to the drought, and omitting all such as would be nearly a repetition of those formerly given.

I am, Sir, yours, &c.

Florence, April 3. 1833. W. SPENCE.

	1832.			1833.		
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
Mean height of Fahrenheit's thermometer at 8 A. M.	57°	48°	36°	32°	44°	46°
Days of uninterrupted sunshine	21	11	22	14	9	14
partially sunny and fair	4	1	—	1	3	2
cloudy and fair	3	5	6	10	6	1
more or less rainy	3	13	3	6	10	14

Wind. — Chiefly from the south and south-west, and north, but more frequently from the last quarter than from any other; and though the rain has almost invariably fallen with a south or south-west wind, these have not unfrequently prevailed for several days without any rain accompanying them.

Drought. — The summer of 1832 was very dry over the greater part, if not the whole, of Italy. In the north, at Milan, where we spent from June to August, scarcely a shower fell during those three months; and in the surrounding district, except where irrigation was practicable, the Indian corn and other crops were burnt up, and produced nothing. Frequent rain fell, in the month of September, in this part of Italy, in the neighbourhood of the Lakes of Como, Iseo, and Garda, during a tour we made in this delicious region; but on our arrival at Florence, at the latter end of the month, we found complaints of the want of rain almost as loud as those heard previously to our quitting Milan. Many of the wells at Florence, and in the neighbourhood, were without water; and a friend, who has resided there several years, told us that he never had witnessed any previous summer at all approaching this in dryness, and that, on digging a hole in his garden, to ascertain the depth to which the drought had extended, he found the earth, for full four feet, destitute of all moisture. In some rocky districts the olives and other trees had perished. In October, rain fell on but three days, and in such small quantity that it would have been useless to commit the seed wheat to soil which was mere dust. Public prayers for rain were now offered up in the cathedral for three days, viz. on the 3d, 4th, and 5th of November, on which last day some showers fell, and were followed by others, so as to admit of sowing the wheat, which soon sprang up, and looked healthy. The rain, however, which fell more or less on thirteen days of November, was rarely heavy or long continued, and merely penetrated the soil a few inches deep; and as December and the greater part of January were as dry as October, no rain occurring in seven weeks but on six days, and then slightly; the young wheat and garden crops were in imminent danger of perishing, and the Archbishop of Florence again ordered public

prayers to be offered up on the 27th, 28th, and 29th of January. Rain followed in sufficient quantity to dissipate all fear for the wheat and herbaceous crops, but by no means to moisten the earth to any great depth; and, though rain fell on ten days of February, it was so scanty in quantity that serious apprehensions began to be felt that the whole spring might pass without any moisture reaching the lower roots of the vines, olives, and other trees. At length, however, on the 11th of March, the peasants were gladdened by the grateful sight, for the first time in ten months, of twenty hours of pouring and unceasing rain, and frequent and heavy showers, continued, with some interruptions, for nearly ten days; at last once more filling the bed of the Arno (which had been a mere brook till the middle of February, and then only increased so as to be barely navigable) with a broad and rapid stream, and soaking the powdery soil for a considerable depth, though perhaps still not completely; for, even on the 20th of March, a peasant said that a full foot of the dry earth still remained to be moistened.

Effect of the Drought on Grass Turf.—Among the numerous errors repeated in books respecting the Continent, of which a visit thither enables one to detect the fallacy, is that of the impracticability of having there even tolerable grass plots, on account of the dryness of the summers. Of the incorrectness of this opinion I have seen in the last four years proofs innumerable, but none so striking as that now exhibited (March 25th) at Florence, in the Cascine (or public garden), where the extensive pastures, and especially that used for the English races, present, though after having been just exposed to a ten months' drought (during the first five of which, a friend assures me, it did not rain, in the whole, twenty-five hours), one uninterrupted surface of fine green and short turf, without the slightest appearance of bald patches; thus showing that, with suitable subsoil and species of grass, and the same attention in mowing and rolling, it would be possible to have grass plots on the Continent very little inferior to those of England, except temporarily during the greatest heats of summer, when they may look more brown and burnt; but which defect, if they were well managed, would be repaired after the first rains.

General Remarks. — No snow during the whole winter. Three periods of sharp and continued frost; viz., from the 10th to the 18th, and from the 23d to the 29th of December, and from the 19th to the 26th of January; during which, sometimes, the thermometer as low as 24°. Two thunder showers on the 16th and 18th of March. Blackthorn in blossom 20th of March. First swallow observed 26th of March.

REVIEWS.

ART. I. *Catalogue of Works on Natural History, lately published, with some Notice of those considered the most interesting to British Naturalists.*

Fairholme, George: A General View of the Geology of Scripture, &c. 8vo, 500 pages. London, 1833. 14*s*.

WHEN science, forsaking the vague hypotheses and theories of the schools, began to rest on experiment and observation, the progress of discovery was rapid, until the ignorant and the interested, who had long kept the human mind in bondage, became alarmed for their authority. Galileo was confined in the prisons of the Inquisition, for maintaining the motion of the earth; and, at a still later period, the doctrines supported by Sir Isaac Newton, in his *Principia*, were pronounced by the Jesuits to be false and heretical, and directly opposed to the records of revelation. These bigots did not or would not perceive that the great object of the sacred historians was the moral and religious improvement of mankind, and not to teach systems of natural philosophy. Had Moses spoken to the Israelites of the earth moving round its axis, it would have appeared so contrary to their own experience of its stability, that he would have been regarded as a fool or a madman, and no attention whatever would have been paid to his doctrines. Moses, therefore, described the earth, and natural phenomena, as they appeared to the senses of a rude, "stiff-necked, and hard-hearted people;" for such he frequently calls them. In the literal language of Scripture, the earth is an extended plane, "stretching out to the furthermost ends thereof, and resting on foundations that shall never be moved." Heaven is situated above the clouds, and the abode of the departed beneath the surface of the earth. That such is the literal exposition of Scripture, no one can deny; and yet, we believe, in the present age, no advocate could be found who would be hardy enough so say that the astronomer is compelled to receive this as the true system of the world.

But, while a liberal code of interpretation is allowed to the astronomer, there are persons who would compel the geologist to receive the sacred text literally, and to mould his system upon it, in defiance of the most convincing proofs that such

a union cannot take place in geology, any more than in astronomy. We were in hopes that the severe castigation which the Rev. A. Sedgwick, Woodwardian professor of Cambridge, had given to those who thus endeavoured to clog the progress of discovery with their own crude notions of the sacred writings had, for some time at least, put an end to any further attempts of this kind: in this we have been disappointed. We cannot forbear, however, quoting the following passage from his address: —"Laws for the government of intellectual beings, and laws by which material things are held together, have not one common element to connect them; and to seek for an exposition of the phenomena of the natural world among the records of the moral destinies of mankind, would be as unwise as to look for rules of moral government among the laws of chemical combination.... No opinion can be heretical but that which is not true." (*Address to the Geological Society*, 1830.) Most of the writers who have attempted this unnatural combination have possessed little real knowledge of geology, and the author of the work we are about to notice is not an exception: his chief authorities are quotations from the *Edinburgh Encyclopædia*, written by some one who appears to have as little practical acquaintance with the science as himself. The argument has been spread out by these writers over a vast space, and connected with a variety of subjects: they may be truly said, with Job, "to darken counsel by words without knowledge." We trust, however, we can spare the time of our readers, and present them with the main bearings of the question at issue in a small compass. Mr. Fairholme lays down as an axiom, that we are bound to consider *the sacred Scriptures as infallible in every point.* He then asserts that the world was created in six literal days, of twenty-four hours' length. Here, however, the literal scriptural geologists encounter a difficulty. The secondary and tertiary strata, to the depth of 20,000 ft. in the aggregate, contain remains of myriads of animals of different orders and species, some of which evidently lived and died where their remains are found. It does not therefore appear probable that all these numerous tribes of animals could have lived and perished in six literal days. To explain this, Mr. Fairholme and other writers of the same school assert that, at the time of the Noachian deluge, the old continent on which Noah and the antediluvians lived sunk under the ocean; and the ancient bed of the ocean was raised up, and became dry land. The strata of this new land are supposed by them to have been filled with the organic remains deposited in the ancient sea between the epoch of creation and that of the deluge. There

is a fact directly opposed to this theory. Many of the secondary strata were not deposited under the sea, but in fresh-water lakes, or estuaries: this was undoubtedly the case with the Wealden beds of Sussex and Kent, and with the greater part of the coal formation. Some of the lower beds of coal are intermixed with marine fossils; but there are at least upper and middle coal strata, 1000 ft. in thickness, and several hundred square miles in extent, without a vestige of marine remains. In some of the secondary strata you discover where the plants have grown; but their growth could not have taken place under the ocean. We are not, however, obliged to resort to geological facts to overturn Mr. Fairholme's assertions; we can demonstrate the fallacy of his principles by his own words. Mr. Fairholme tells us that the continent on which Noah descended from the ark was not the old continent on which he had before lived. The sacred historian, however, expressly tells us it was the same continent, and not a new one. In naming the rivers of Paradise, the sacred writer enters into rather a minute geographical description of the countries through which the Euphrates and the other rivers run; showing that he clearly intended to describe the old continent as the same which was inhabited after the flood. How does Mr. Fairholme reconcile this with his theory, and with his first principle, that the sacred Scriptures are *infallible in every point*, and are to be literally interpreted? The reader will be utterly astonished when he finds that Mr. Fairholme rejects the whole passage as an interpolation, though he had not the slightest evidence for this whatever, except that the passage disagrees with his own theory; he even admits that he has no authority for rejecting the passage; but he says there have been interpolations of the New Testament. Few readers are so ignorant as not to know this; but no sound biblical critic ever thought himself justified in rejecting or altering a text, unless he was supported by some ancient copy. Mr. Fairholme tells us that Mr. Granville Penn discovered an interpolation in the Gospel of St. John, about the water of Bethsaida; we are hence left to infer that Mr. Fairholme may safely reject a passage relating to the waters of Paradise! It is passing strange that Mr. Fairholme can allow himself such liberty with sacred Scriptures, infallible in *every point*, and that he will not allow the geologist to substitute the word age, or epoch, for day, though it is by these terms that the days of creation are expressly described in writings of the most ancient Eastern nations. The axiom of Mr. Fairholme, that the Scriptures are infallible in every point, is placed at the beginning of his volume, p. 24.; the part in which he rudely

tears away a page from what he has declared to be infallible, occurs at p. 436. He has done wisely to place the passages so far apart: had they been placed in juxtaposition, we apprehend few of his readers would have taken the trouble to proceed farther.

We cannot avoid the reflection, that there appears to us a want of good taste, if not of good faith, in the party that call themselves scriptural geologists: they know very well that Moses was addressing a rude and obstinate people, and was obliged to accommodate his language to meet the grossness of their notions: he not only did this, but, by far higher authority than that of Moses, we are assured he also accommodated his doctrines, in some degree, to the grossness of their habits and feelings. "Moses, because of the hardness of your hearts, suffered you to put away your wives." (*Matthew*, xix. 8.) Knowing thus, from the most sacred authority, that the language and doctrines of Moses were partly accommodated to suit the rude notions and feelings of the Israelites; yet the *soi-disant* scriptural geologists would force the admission of every word relating to geology, in its literal sense, while at the same time they allow a free interpretation of the words of Scripture relating to astronomy; and, what is still more inconsistent, they *allow themselves* the free use of tearing away whole passages that happen to interfere with their own crude notions of geology.

Jameson, Professor, Conductor. The Edinburgh New Philosophical Journal; exhibiting a View of the Progressive Discoveries and Improvements in the Sciences and the Arts. 8vo, in quarterly numbers. London and Edinburgh. Price 7*s.* 6*d.*

In the number published, April, 1833, Mr. Blackwall has an interesting communication, twenty pages in length, on the instinctive actions of birds. It appears to be there republished from the fifth volume of the second series of the *Memoirs of the Literary and Philosophical Society of Manchester*. The number is rich in information on geology, and supplies some on botany. Hewitt C. Watson, Esq., author of *Outlines of the Geographical Distribution of British Plants*, communicates an elaborate paper, entitled "Observations made, during the Summer of 1832, on the Temperature and Vegetation of the Scottish Highland Mountains, in connection with their height above the Sea." M. De Candolle contributes an affectionate eulogy on his deceased friend, Cuvier; and in another part of the number is commenced a translation of the *éloge* pronounced in the Chamber of Peers by Baron Pasquier, and afterwards published, as noticed in our Magazine, p. 131.

Anon.: The Zoological Magazine, or Journal of Natural History. Published on the first of every month. 8vo, 32 pages with cuts. Price 6*d.*

From a sight of numbers i. ii. and iii., we can say this is a respectable work, and very cheap.

Professor Dewhurst, F.W.S. F.L.V.S., &c., and *Henry Braddon*, Esq.: The Veterinary Examiner, or Monthly Record of Physiology, Pathology, Agriculture, and Natural History. Published monthly; each number price 1*s.*, and containing 40 octavo pages, and occasional engravings.

Of this work three numbers are published, and we have seen the first and third. The anatomy of animals seems its leading feature, and it includes the anatomy of other animals besides the horse, and those of agriculture. We are too unfamiliar with anatomy to opine on the merits of the work; but deem it likely enough to be useful to many of our readers, to justify our here giving its title, to apprize them of its existence.

Jardine, Sir *Wm.:* The Natural History of Humming-Birds, Vol. I., with 35 Plates, engraved on steel by W. H. Lizars; and coloured from Nature in the most careful Manner; with Descriptions, and numerous Woodcuts, exhibiting the Anatomy of the Birds, their Peculiarities of Structure, &c. To the volume are prefixed a portrait of Linnæus, and a sketch of his life, written expressly for the work. Foolscap 8vo. London and Edinburgh, 1833. 6*s.*

Welcome, indeed, should be every attempt to teach us something of the charms, the habits, and the history of these most beautiful of all the beautiful beings with which our goodly dwelling-place, the earth, is bedecked and adorned. Perilous, however, must be the attempt to do this, in any person who has not lived, and moved, and had his being amongst these sprightly children of the air, in their native places of resort and action. This is not our case; and we, in consequence, will not pretend to take the height, breadth, and depth of the author's book in this relation. We may say that the notices are expressed with an ease and amiableness of feeling which very well comport with the sprightly graceful creatures spoken on. The pictures are said to make the book cheap at its price. Excessively difficult, however, yea, even impossible, must it be to exhibit, by human art, the brilliant blaze of metallic lustre which these birds display, and this in various colours: to use the words of Mr. Waterton (Vol. V. p. 475.), "now a ruby, now a topaz, now an emerald,

now all burnished gold;" and now, we may add, as though, in the words of that real naturalist, the poet Cunningham,

> "Burnish'd by the setting sun,
> When he sets behind the hill,
> Sinking from a golden sky;
> Can the pencil's mimic skill
> Copy the refulgent dye?"

We are pleased with the woodcuts exhibiting the structure of the bill, beak, and tongue, &c., of the humming-birds. We are, however, displeased with the sparseness of the letter-press, which is made to ramble over a needless number of pages.

The sketch of the life of Linnæus is very pleasingly written; and the portrait of him in his youth, and in a Lapland dress, very striking to eyes accustomed to his likeness when, in the amplitude of senility, "he wore his blooming honours thick upon him." It is part of the plan of these volumes — for know, reader, Sir William Jardine designs to edit a series of volumes on several families of animals — to give a series of biographical sketches, with portraits, in the course of them, of distinguished naturalists. In our expectancy we set down Ray and White, and hope, ere long, to scan their histories, and read it in their faces.

Lesson, R. P.: Les Trochilides, ou les Colibris et les Oiseaux-mouches, suivis d'un Index général, dans lequel sont décrites et classés méthodiquement toutes les Races et Espèces du Genre Trochilus. Ouvrage orné des Planches dessinées et gravées par les meilleurs Artistes. Large 8vo. Paris, Bertrand.

These words indicate a work similar in scope to the English one just named; and on this account we present the title, which is all we know of the work, save that six numbers, at least, of it are published; that Baillière, in Regent Street, has them; and that the motto they bear is "Splendet ut sol."

Various Contributors. The Entomological Magazine, published in quarterly numbers, each 3*s.* 6*d.*, and containing 104 octavo pages.

Number ii., published January 1833, contains 8 pages extra. The greater half of the contributions are on systematic entomology, mainly on the Notióphili, Chálcides, and Díptera. The Chálcides are treated on by F. Walker, Esq., in a "Monographia Chalcidum," continued from the first number. In the present portion of it, 61 species of Callimòme are described, besides other genera and species. A friend,

an entomologist, has remarked to us, that "this paper is a laborious one, although not much clogged with synonymes; but 61 species of Callimòme ought at this time of day to have been rendered intelligible by at least half a dozen sections."

The papers which treat on the habits of insects, and will more interest those who have only an outline, or an incipient knowledge, of entomology, have the following titles: —"On the wants of analogy between the sensations of insects and ourselves, by the Rev. C. S. Bird." The author once cut "a pretty beetle, Malàchius æ`neus, in two, at the junction of the thorax and abdomen. The head continued to run about, and the body to clear and spread its wings, the one for about 12 hours, and the other for 16 hours; their energies gradually decaying, till they appeared to perish, or rather to sleep." The author infers that this "divisibility [of insects] into parts having separate independent consciousness, establishes a line of demarcation between them and the higher orders of animals, almost as broad as that which already confessedly exists between them and vegetables."—"Observations on the blights of the apple tree, by Rusticus" of Godalming. Delightful, and very useful to orchardists and gardeners. We wish the editor had supplied the systematic names of the insects. —"Entomological Tour in South Devon, by Messrs. Chant and Bentley." Interesting in the insects captured, and the incidental notices of other objects of nature. Enough is said about the weather, but probably not a whit too much, as capturing insects must be much influenced by weather. —"A notice of the habits of Charæ`as gráminis, by George Wailes, Esq." We hope this gentleman will proceed to narrate the habits of other insects; we admire this communication greatly. —"Varieties." A chapter of detached paragraphs (widely enough detached as to typography), each imparting some interesting facts. A plate, bearing coloured figures of caterpillars, is prefixed to number ii. The figures are explained in

Number iii., published April 1833, which we deem a very valuable number: the majority of its contents are very interesting even to ourselves, whose knowledge of entomology, as Hamlet reports of his ambition, may be "crammed into a nutshell." We shall name the titles of this class of contributions first. —"Observations on Blights, by Rusticus" of Godalming; admirable, and delightfully long; 7 pages. A`phis hùmuli, the blight of the hop plant, is the main theme in this letter. —"Observations on the circulation of the blood in insects, by James Bowerbank, Esq." The observations are made in

relation to the larva of a species of *E*phémera, or May-fly, and of the larva a figure is given, so magnified as to fill a quarto plate, in which the vessels and actions spoken on are pointed out. — "Observations on the Enióceri, by G. Wailes, Esq." A rich cluster of facts on their habits. — "Abstract of M. Straus-Durckheim's 'Considérations générales sur l'Anatomie comparée des Animaux articulés,' by Edward Doubleday, Esq." The past and now proceeding lectures, by Dr. Grant, before the Zoological Society, "On the structure and classification of animals," have enabled us to enjoy this. — "Observations upon the saltatorial powers of insects, and upon the British coleopterous genus Chorăgus, by J. O. Westwood, Esq." The first portion of the communication enumerates the insects remarkable for leaping, and describes their mode of performing it: this is very interesting. — "On the existence of natural genera, by A. W. Griesbach, Esq." A clever essay. We know not if the following remark by Smith, in botany, will be deemed relevant to the question in insects: we think it may: — "While *R*ŏsa, *R*ŭbus, *Q*uércus, *S*ălix, *F*icus, Cypripèdium, *E*pimèdium, and Begŏn*ia* exist, it will be vain to deny that generic distinctions are founded in nature, though botanists may, as yet, be very far indeed from having discovered them all correctly." — "Varieties," which include short notices, variously interesting. The last page is occupied by a poem "On the death of Latreille." Would that we had space to republish it! It is of a very superior order; superior in its sentiment of affectionate veneration for this great man, and superior in its poetry: we cannot enough commend it. The contributions to systematic entomology have these titles: — "Opinions on Mr. Newman's *Sphinx vespiformis*." — "Observations on the British species of Sépsidæ, by F. Walker, Esq." — "An essay on the classification of the parasitic Hymenóptera of Britain, which correspond with the *I*chneúmones minŭti of Linnæus, by A. H. Haliday, Esq." "Entomological notes, by E. Newman, Esq." — "Monographia Hydrænarum Angliæ, by G. R. Waterhouse, Esq." — "Notice of works on entomology," in which the scope or contents of 15 works are indicated.

Riley, Dr.: Thirteen Lectures on Erpetology, or the Structure, Classification, Habits, and History of Reptiles; delivered before the Bristol Institution, in April and May, 1832: to which is affixed, Bory de St. Vincent's Analytical Table of the Class, Orders, Families, and Genera of Reptiles. Bristol. 15 pages folio. 2*s*.

These lectures succinctly comprise a very interesting stock

of facts on this peculiar and remarkable class of animals. Copies of these lectures seem only purchasable at the Bristol Institution: this is to be regretted, as naturalists remote from that neighbourhood might wish to possess them, were they acquirable without difficulty.

Williams, Charles: The Vegetable World. (Author of "Art in Nature, and Science anticipated.") 18mo, 288 pages, in cloth, and with an elegantly engraved frontispiece. London, 1832. 4*s*.

This is a compiled enumeration and description of the beauties and riches of the more popularly interesting or useful plants of the world. It is the very best one we have ever seen. It is filled with most interesting facts, in such abundance as to testify the very extensive reading and great diligence of the writer; while they are adapted both with judgment and taste. The device used for determining the order of succession of the numerous facts, many of which have little or no relation to each other, are conversations between a father and mother, and their son and daughter. We know not what better plan could have been adopted, although of necessity the parents speak nought but pearls, and the children question and animadvert very sagaciously. This conversational plot has, however, one advantage: it admits, without opposing the object of the book, which is simply to instruct and delight the youthful, here and there a good deal of discursive prattle on subjects that have an incidental relation to the plants spoken on. Thus, to the descriptive notices of the cotton tree are attached much information on the mode and extent of cotton-spinning as now practised; to the account of the mahogany tree, notices on the artificial applications of its wood, the process of cutting veneers with circular saws driven by steam; and so on in many other instances. In short, although the book is not positively faultless, we much approve it; and parents, we are sure, will approve it too. The writer has a religious tincture of feeling, which is occasionally, but never forcefully, induced. There is a blunder in the quotation from Dr. Arbuthnot, p. 49., worth noticing:—"I call it not mine, but me," should be, "I call it mine, not me." It may be well for the writer to correct this error in one of his future volumes; for, it appears, he is engaged in producing a series of volumes on popular subjects, adapted for youth: the next is to be on "The Treasures of the Earth."

Hooker, W. J., LL.D. &c. &c.: King's Professor of Botany in the University of Glasgow. The English Flora of Sir

J. E. Smith, Vol. V., containing the British Plants of the 24th class, Cryptogamia, except the Ferns given in Vol. IV.: or Vol. II. of Dr. Hooker's British Flora; Part I. comprising the Mosses, Hepaticæ, Lichens, Characeæ, and Algæ. 8vo, 432 pages. London, 1833. 12*s.* in boards.

This clew to an acquaintance with the less easily distinguishable forms of British vegetation has been wanted for years. It is true that very much of the information supplied in the present half-volume, or "part," has been extant in the world for some time, but scattered through a diversity of volumes, and some of them so expensive, that none but wealthy persons could procure them: part of them, too, were written in Latin; and were, consequently, no facility to those who, however desirous to inform themselves on the cryptogamous plants of Britain, happened to be unacquainted with that language. All these inconveniences are now removed; and, in the "part" whose scope is given in the title above, we have a transcript of the essence of all that has been published on the objects within that scope, accompanied by a useful intermixture of original information derived from the knowledge of the learned editor, and the observation of his coadjutors and friends. "The obligations," says Dr. Hooker, "I lie under to those friends are invariably mentioned in the respective pages which owe so much to them; but it behoves me, in an especial manner, to express my grateful acknowledgments to Mrs. Griffiths [to whom Dr. Hooker dedicates the book], and to Messrs. Borrer, Greville, Arnott, Wilson, and Harvey. The papers of the late Capt. Carmichael have also been an invaluable help to me." This quotation is from the preface, which is throughout replete with amiable feeling.

"Another part, containing the second portion of the volume, will embrace the only remaining order, the *Fungi*, and will be published with all the speed consistent with careful execution."

Hooker, W. J.: The Botanical Miscellany; containing Figures and Descriptions of such Plants as recommend themselves by their Novelty, Rarity, or History, or by the Uses to which they are applied. 8vo. London. In quarterly parts, 10*s.* 6*d.* each.

Part IX. was published early in April, and contains an interesting and complete account of the *Tanghinia* veneníflua *Bojer*, the poisonous seed of which is used as an ordeal in Emirna, a province of Madagascar, for ascertaining the innocence or guilt of persons accused of crimes. Dr. Wright describes some genera and species of Indian plants, of which

coloured and admirable figures are supplied. Messrs. Hooker and Arnott have continued their "Contribution towards a Flora of South America and the Islands of the Pacific," to the extent of sixty-four pages. 653 species in this and the preceding number are described, or identified with others previously known. Mr. Bentham contributes "An Account of Indian Labiàtæ in the Collection of J. F. Royle, Esq., Director of the Hon. East India Company's Botanic Garden at Saharampur." These are the more important papers. The number contains nine plates, and completes the third volume.

Watson, Hewett Cottrell: Outlines of the Geographical Distribution of British Plants, belonging to the Division Vasculàres, or Cotylédones. 8vo, 334 pages. Edinburgh. Printed for private distribution.

As this work is not to be purchased, it may to some readers seem unjust to occupy space in pointing it out to them: but not so; for, to our botanical readers, no book more interesting on British plants has ever been published; and it is, to the best of our knowledge, the most interesting book, in relation to them, which has been published these twenty years.

After we have premised that the names only, not the characters, of the British genera and species, each and all of which are severally spoken on, are given, and that these are arranged according to the natural orders, we shall give the scope of the work in the words of the author: —

"The chief differences between this and other works on British plants will be found in the giving of measured altitudes for several species, and the comparative (zonal) altitude of nearly all; in the substitution of definite and explained divisions of the country, for indicating their topographical extension, in lieu of *north*, *south*, *east*, *west*, with vague and *varying* signification; in the condensing into a small space the information on this topic, which was scattered through various works; in the adoption of a comparative scale for expressing the rarity or prevalence of species; and by the addition of their general geographical extension, thereby, in a great measure, indicating the range of climate for each..... The connections evidently existing between the vegetation and physical geography of Britain are in great part reserved for a future edition, the *mere facts* being here the main object; since it is necessary to learn the latter accurately, before attempting to connect them in the relations of cause and effect. Neglect of this precaution has caused many blemishes in the writings of some who have been among the most prone to tax botanists with neglecting the former."

We now state that the author publishes his address, which is "Newport Hill House, near Barnstaple, Devon," to the end of inviting contributions from every one whose attention to British plants has possessed them of facts likely to promote the ends he has in view: these he thus distinctly details: —

"The author is anxious to obtain all information that he can, in order to insure accuracy in the charts, tables, &c., intended to be given in the proposed future edition, for the purpose of illustrating the distribution of British plants both at home and abroad. [See, in Hooker's *Botanical Miscellany*, parts viii. and ix., a notice of several species of British plants found in South America.] He has it also in contemplation shortly to publish a separate work, somewhat after the plan of the useful *Botanist's Guide* by Turner and Dillwyn. Any communications in furtherance of these designs will be carefully acknowledged when used; and, several of his botanical friends or correspondents having signified their readiness to aid him by local information, the author subjoins the topics in regard to which he most desires this.

"Corrections of any errors, and supplying of any omissions, in the present *Outlines*.

"Lists of species, native and naturalised, in any county or smaller district, of which a local Flora has not been published since the last century. To facilitate this, he will send printed catalogues of the British species to any one willing to oblige him with such a list; so that nothing more will be necessary than attaching a mark to the names.

"Unpublished stations for any of the species not indigenous in all the six districts subsequently mentioned, with confirmations of those resting on the authority of former botanists.

"The highest and lowest elevations at which any species has been observed.

"Information as to the zone (as afterwards explained) in which any town, hamlet, residence, lake, mountain summit, &c., is situate.

"Unpublished (or here omitted) altitudes of towns, hills, lakes, &c. &c. As also, results of observations on the temperature of the air, earth, or springs; and the quantities of rain in different situations.

"Facts in regard to the apparent influence of soil and subjacent rocks on vegetation.

"The author is desirous of procuring specimens of species not extending into all the six districts, from various stations, and particularly those near their terminal limits. For such, he will be glad to return the rarer British species, which may be *desiderata* to any botanist favouring him with the former.

"He is also anxious to have plants, or lists of plants, from the summits of hills exceeding 1500 feet; and this whether the plants are in flower or not."

The names of several British botanists who have already aided the author are honoured with a place in his volume: and we hope our readers will cause this list to be much lengthened in a second edition. If an extensive and intimate acquaintance with British plants were always accompanied by leisure to communicate one's knowledge of facts appertaining to them, we should see, in the next list, the following names: — Rev. G. R. Leathes, Shropham, Norfolk; J. Notcutt, Esq., St. Peter's, Ipswich; Rev. W. T. Bree, Allesley Rectory, Warwickshire; A. H. Haworth, Esq., Queen's Elm, Chelsea; Edwin Lees, Esq., Worcester.

ART. II. *Literary Notices.*

DR. JOHNSTON of Berwick has, in a state of forwardness for the press, a work to be entitled *Zoophyta Britannica*, or the Natural History of the Zoophytes of Great Britain and Ireland. It will be illustrated, as far as possible, with original figures of the species.

Of the *Entomologist's Useful Compendium*, a second edition is on the eve of being published: besides the entomological information, it will contain descriptions of some crustaceous animals, and is to be enriched with new matter and new plates.

The Entomology of Australia, in a series of monographs. By George Robert Gray. Part I. containing the genus Phásma, in 4to, with eight plates (plain and coloured) and descriptive letterpress, will appear June 1.

A Memoir of the Ichthyosaúri and Plesiosaúri, with several lithographic prints of specimens in the collection of the author, T. Hawkins, Esq. F.G.S., is about to be published by subscription, in a folio volume, price two guineas.

Botanical Magazine. — On the 1st of April was published, containing four coloured plates with descriptions, price 1*s.*, No. I. of a new and improved edition of Curtis's Botanical Magazine; or, Flower Garden displayed; with amended characters of the species: the whole arranged according to the Natural Orders. By Dr. Hooker. To which is added the most approved method of culture, by Samuel Curtis, F.L.S. The first number is a satisfactory shilling's worth.

Mr. Stephens has a second edition of his *Nomenclature of British Insects* in the press. (*Ent. Mag.*)

Mr. Wood has a work on British Lepidóptera nearly ready. (*Ent. Mag.*)

SHORT COMMUNICATIONS.

MAMMA'LIA. — *The Weasel* (*Mustèla vulgàris* L.) *traces its Prey by the Faculty of Scent.* (Vol. V. p. 721.) — Sir, In corroboration of the remark by Zoophilus, in Vol. V. p. 721., that "the stoat and its congeners trace their prey by the faculty of scent," I would relate, that, several years ago, I had an excellent opportunity of witnessing the exercise of this faculty in a weasel, while standing on a ladder on the outside of a garden wall. About twenty yards from the wall there was a thick yew hedge: the ground betwixt it and where I stood was occupied with asparagus, just beginning to cover the ground, and quite free from weeds. I observed a mouse coming from the hedge, in a peculiarly hurried manner; and, from my elevated situation, on the top of the ladder, I had an excellent opportunity of watching it through the various doublings which it made among the asparagus beds: it appeared to be in search of a hole to escape into, and disappeared, at last, amongst some bushes at the end of the wall. At about the same instant, a weasel made its appearance from the same spot in the hedge from which the mouse had started, and followed all the various windings it had taken, exactly in the manner of a dog "on scent," and disappeared at the same spot. I am, Sir, yours, &c. — *Thomas Blair. Stamford Hill, Jan.* 4. 1833.

For a consideration in philology appertaining to the weasel, see p. 175. 202.; and for notices on its habits see p. 195., and the pages referred to in p. 208. — *J. D.*

The Hare of Ireland distinct in Species from the Hare of England. — At the meeting of the Linnæan Society, held March 5., Lord Stanley, the president, sent for exhibition a specimen of the hare of Ireland, which, by comparison with an English hare, also placed on the table, appeared to be very different, although hitherto unnoticed by zoologists as distinct. The ears, by measure, are full an inch shorter than those of the common hare, and the markings and general colour, as well as the quality of the fur, are decidedly different. — *R. D.*

BIRDS. — *Method of rearing the Species of the Genus Sylvia, or Family of Warblers.* — Sir, Mr. Sweet's little publication (*British Warblers*, noticed Vol. I. p. 57., Vol. II. p. 50.) on this

elegant and interesting genus of birds, first awakened my wish to be better acquainted with these little sylvan cherubs; and although many disappointments ensued, yet occasional partial success gave a zest to the undertaking, and encouraged perseverance to endeavour to surmount the difficulty. After obtaining a nest full of delicate little warblers, and bestowing every possible care and attention to rear them, it has often grieved me to find, in the morning, the poor little darlings stretched out in silence on a mossy bier. Perhaps the rearing of these little birds has never been considered of sufficient importance to call forth serious consideration; but I have often thought it extraordinary that, in the boundless field of chemistry, some succedaneum could not be found out for a maggot or a fly; and, after trying various experiments, I have succeeded without the aid of chemistry. In the summer of 1832, I obtained a nest of young willow wrens (Sýlvia *Tróchilus*), and, after feeding them a few days with bread and milk and bruised hemp-seed, I perceived they were going the way of most favourites, and hastening rapidly to an end, when a thought struck me, and I resolved to try it. In partaking of some vermicelli soup (and being constantly on the prowl for my little favourites) I remarked how very similar the vermicelli was to delicate worms or maggots; and the idea crossed me to let my little wrens have a taste, and try if they could be restored. I accordingly steeped some fresh vermicelli in water, and gave the little yellow-throats; when, behold! an almost instant resuscitation took place, and, from extreme debility, they became sprightly and twittering in a few hours, and nothing could be more healthy for a few days. But, alas! I lost my darlings for want of experience; for the food they were fed with at first was too aperient, and this was in the contrary extreme, and glued up every avenue, and stuck the feathers together like birdlime; and death closed the experiment. However, not to be daunted by this failure, I obtained a nest of young chiff-chaffs (Sýlvia hippolàis) late in the season, and prepared the vermicelli by boiling (instead of steeping) it about ten minutes in water. Here, then, the secret lay; and with this food alone, unmixed with any other, the little birds were fed the first week; and afterwards hemp-seed bruised, bread and milk, and boiled vermicelli formed their principal food; and they were reared with perfect ease, and grew rapidly, with a further addition of raw meat mixed with this food. Candour, however, obliges me to acknowledge that none of my little chiff-chaffs are living. Out of four of them, two met with untimely ends by the remorseless jaws of bloody grimalkin; a third was so hurt and frightened

that it never *looked up afterwards*, but in a few weeks drooped and died. Nothing, however, could be more lively than the survivor of the four: active, elegant, and sprightly, with an eye quick as thought, this little charmer flitted about his cage like a tiny winged mouse, almost too quick for the eye to follow: but, alas! although he survived the tumults, insults, and civil buffetings of the elections of 1832, he made his peaceful exit previously to the first assemblage of the first reformed parliament, in 1833. As indications of his decline, he began to neglect his person, and omitted several mornings to wash himself in his usual sprightly manner; his feathers became dishevelled, his limbs paralysed, and he drooped and died, in spite of every means used to save him, although in a moderately warm room, and the weather temperate. Thus ended my first experiment: but, if permitted, I will, another season, endeavour to prove the efficacy of vermicelli; and I have no doubt it will be found completely efficient in rearing young partridges, pheasants, &c., and supersede the necessity and difficulty of obtaining ants' eggs, flies, maggots, &c.

Thus, Sir, I consider myself the sole inventor of this new succedaneum for rearing and maintaining the British Sylviæ; and I have no doubt J. G., of Stoke Newington (Vol. V. p. 309.), would have reared his young reed-warblers had he known of such a receipt; and future aviaries will now be furnished easily with these little sylvan minstrels, and we may look forward to the probability of the Zoological Gardens possessing specimens of the whole of our British soft-billed summer birds of passage, whose history and emigrations are wrapped in considerable mystery and confusion.

Swallow (*Hirúndo rústica*). — I caught an old cock-bird of this species, and, after some pains, taught him to eat the vermicelli, mixed with bread and milk and hemp-seed; and no alderman of gormandising notoriety could have gulped down with more gust his green fat, than did this feathered epicure his dainty dish set fresh before him every morning. He stuffed voraciously, washed frequently, flew about the aviary, twittered and warbled with as much *éclat* as if in his original ethereal dominions, and scorned to eat a fly, preferring the composition already mentioned. He sang, and washed, and enjoyed himself till the end of November, but did not moult; but at the end of that month began to droop, and ceased to fly upon his perch, yet ate his food with seeming relish; but eventually became paralysed, and towards the end of December died. Surely it must be climate which killed him; for the food seemed highly palatable and gratifying.

Another season I think that, with the aviary heated with

warm air or water, I shall be likely to succeed in preserving the health of the summer birds of passage. — *J. C.*

Spiders. — *Spiders feed on Grapes.* — Sir, The whole extensive genus *Arànea* has been always considered to be carnivorous, I believe, without any exception. As a fact deviating from this general rule has lately come under my notice, I beg to make it known.

Whilst employed in examining the habits of the *Acari*, or red spiders, which so frequently infest the vinery, I accidentally threw a small portion of a grape-berry in the web of a spider which had spun its network across the window of my hot-house; to my surprise, I perceived the wily inhabitant instantly dart from its hiding-place, seize the grape, and remain for a considerable time, fixed on it, sucking the juice with apparent avidity and delight. As I attached some consequence to this novel scene, I repeated the trial with equal success. I then searched for more spiders, and in a short space of time had about a dozen visiters regaling themselves on the rich nectar of the ripe black Hamburg grape. I know not if others have made the like observation before, but I doubt not that it will prove interesting to many. The spider in question, by the form of its web, belongs to the class Orbiculària of Walckenaer, and is closely allied to the *A.* diadèma of Geoffroy. I continued from the latter end of August to the beginning of November occasionally to regale them with this food. They evinced a decided preference to black grapes, and their time for feeding was usually towards evening. I also found that if the piece of grape was too large, they seemed afraid to approach it, and if fed too often, they became shy, and avoided too frequent disturbance.

I do not think this circumstance need alarm your gardening friends; for this spider prefers a situation where it can dwell secure from the shaking of the vine or wires of the house. and it is evident that its net is intended for another sort of food. — *Frederick C. Lukis. Guernsey, Jan.* 21. 1833.

Insects. — *An Instance of Sagacity in the Dragon Fly* (*Æshna vària*).— One day, last July, walking down West End Lane, Kilburn, I observed a pair of the *Æshna* vària sporting over the surface of a pond. While admiring the elegance of their evolutions, and the brightness of their colours shining in the sun, another male made its appearance. This obtruder upon their mutual happiness *sans cérémonie* began chasing the female, but upon this the real mate immediately pursued his rival, and a very pleasing sight took place. They were now actually in a hostile engagement, flying at each other by repeated darts, the shining armour of the combatants, and their

wings rustling like tinsel, adding not a little to the scene. This lasted for about ten minutes, when at length one fell into the water, apparently from exhaustion: and now was exhibited the sagacity of the conqueror, who pounced upon his back as he floated on the surface, and remained so for a little while. During the whole of this exhibition the female continued to skim about in pursuit of prey, and seemingly not taking the least interest in the affray. She was soon joined by her companion, who had left his victim still struggling on the surface, but without the power to rise, as he had deprived him of his wings. Can this be called instinct? What could human reason have dictated to operate more effectually? — *James Fennell.*

Means to promote the obtaining Imagoes of the Death's-head Moth from Larvæ of it fed in Captivity. — In August, 1831, I had several larvæ of the above sphinx. I placed four of them in a large flower-pot with a top made of gauze, or what the milliners call catgut, in the form of a cone about 18 in. high, so as to go over the pot. The pot was filled three parts full of light moist earth; and potato tops were put in for the larvæ to feed upon; the top is easily taken off, to give them fresh food, which I did every morning. One of the larvæ went into the earth on August 22., another on August 24., another on September 2., and the other on September 5.; after which I took the pot into a small room where we had a fire every day. When the earth appeared dry, I sprinkled it with water made milkwarm, about two or three times in a week. The result was, I had three fine specimens of the sphinx, in exactly 56 days, or 8 weeks, from the time they went into the earth; namely, one on October 16., one on October 18., and one on October 27. As the other did not come out at the time, I disturbed it, and found the pupa quite alive. I placed it again in the earth; in a fortnight's time I looked at it, and found it was dead; on examination I found it had nearly attained its full growth, and most probably, had it not been disturbed in the first instance, would have become a perfect imago. I breed some hundreds of lepidopterous insects of different kinds, from the eggs and larvæ, but never succeeded with the death's-head moth in so short time before. My opinion, derived from practical experience on the matter, is, that the pupa of this moth should never be disturbed; if it is, not one in a hundred will become an imago. — *Thomas Denny, Dealer in Ornithology and Entomology. 4. Downing Terrace, Cambridge.* [Not the "Hill's Road, near Cambridge," as, through misinformation, we gave the address in Vol. V. p. 546. — *J. D.*]

MISCELLANEOUS INTELLIGENCE.

Art. I. *Retrospective Criticism.*

Corrections. — In p. 54. line 1., for "snowdónica," read "snowdònius;" line 17. for "A'tropa," read "A'topa;" line 18. for "Sýlphidæ," read "Sílphidæ." In p. 68. line 6., for "were," read "was." In p. 114. line 17., for "gallinule," read "corncrake;" and see p. 279. In p. 128. line 11. from the bottom, for "we," read "he."

The Bristol Philosophical Institution (p. 126. note at foot). — I notice with regret that Mr. Conway affirms, in a note in p. 126., that the Bristol Philosophical Institution does not admit strangers to have access to the library. I am sorry that any person should ever have visited the institution, and not have understood that the proprietor who introduced him to see the museum could also have entered his name as a visiter to the reading-rooms; and I have yet to learn if ever any difficulty has been experienced by even the casual traveller, desirous of obtaining sight of the museum or use of the library, upon application to the officers of the institution, who, rather than such should occur, would never hesitate to pay those attentions upon their own responsibility, if time would not allow the formal introduction, or order from a proprietor.—*S. Stutchbury, Curator of the Bristol Institution, Park Street, March* 4. 1833.

A long communication on this subject, signed Causidicus, has been received. Like the above, but in greater detail, it goes to exonerate the Bristol Institution from every characteristic of exclusiveness, and to claim for it inferiority to no other institution "in general urbanity to all strangers."

Mr. Richard Smith, surgeon, Park Street, Bristol, in a long communication, argues to the above effect; and, although we heartily grudge the space this uncatholic squabble has already taken, we must extract those of Mr. Smith's remarks which relate to the charge made by Mr. Conway (p. 126.), namely, the Bristol Institution "will not permit a stranger to have access to its library, merely allowing him to see its curiosities." — *J. D.*

Regulations. . . . "To these rooms [the rooms for reading in] members shall have the liberty of introducing immediately any person residing beyond ten miles of the city, either

by personal introduction or by a written order; and such introduction shall be free from all cost whatsoever. The *entrée* to be in force for one month, which time may be indefinitely extended upon application to the committee." This enables the stranger to see all the newspapers, pamphlets, scientific journals, &c.; and as, in point of fact, he is surrounded by the books upon open shelves, there is, and must be, free access to them: a few only, perhaps a dozen, being very valuable, are in a case; but even these may be forthcoming at a moment's notice, by an application to the clerk or to the curator for a key; and the former officer is always upon the spot, near the entrance to the rooms. There are upwards of five hundred persons who can make all these advantages available to strangers, simply by an order upon a scrap of paper; and, in fact, there are not less than a hundred persons who daily frequent these rooms, either as subscribers or with orders. Hence, Mr. Conway has been singularly unfortunate in this matter. I perceive in the books various notices of the visits of this gentleman and members of his family; the last was on, I believe, the 24th of May, 1832. Why did not the complainant hint to Mr. Stutchbury his 'yearnings' to inspect the books? Our curator expended no little time during this 'lounge,' in pointing out to him every thing which the museum contained worthy of notice; and would not have confined himself 'merely' to this, had Mr. Conway expressed the slightest wish to visit the reading rooms."

The Gland on the Rump of Birds. (Vol. V. p. 412. 588., Vol. VI. p. 159.) — "Adhuc sub judice." Still in court. — Sir, I see, by the last Magazine (p. 159—162.), that we have not as yet quite reached the bottom of the oil-gland on the rump of birds. While the suit is still pending, I will take the opportunity to say a word or two more on the subject.

Nothing can be so detrimental, as oily substances, to the minutely fine and downy texture of feathers. As soon as such substances come in contact with any part of the web of a feather, the appearance of that part is changed. Thus, the fat of a wildfowl which you have just killed will escape from a shot hole, and cause such damage to the under parts of the surrounding plumage, that I should say it is next to impossible to restore the original appearance of the feathers. If a bird, after extracting the oily matter from its gland, does really apply that matter to the feathers, surely the applied matter would be more or less visible to our eye. Now, during my inspection of the skins of birds, some thousands have passed through my hands; but I have never yet been able to discover that any of the feathers had been smeared

with the oily substance from the gland in question; though I have killed birds in the very act of preening themselves, and have looked narrowly into their plumage as soon as I had taken them up.

The gland, in all the duck tribe which I have examined, is completely enveloped in a dense tuft of inexpressibly soft and downy feathers, about half an inch long; and it is quite concealed from our sight. Unless this tuft was actually wanting in the Muscovy duck of which your Clitheroe correspondent speaks (p. 159.), I am at a loss to conceive how he could manage to get a sight of the gland through such a covering. Your correspondent says, "the bird exhibited the gland very distinctly." I cannot exactly understand why it should be taken for granted that birds lubricate their plumage, merely because they are seen to squeeze the nipple of the gland with their bill, and then apply the bill to the plumage. Do they equally lubricate the legs and the toes? for it is a common thing to see them bring the bill in contact with these parts, while in the act of preening themselves. Does not the tuft of feathers on the gland, which tuft is so conspicuous in waterfowl, and in the eagle tribe, require preening, and freeing from vermin? May not even nature, now and then, for reasons unknown to us, call for a discharge from this gland, which discharge the bird is enabled to effect by means of its bill; and then, after the operation, may not the bird recommence its preening? — the small quantity of liquor expressed having probably descended into the deep cavity of the lower mandible, and there mixed with the moisture in the fauces.

As your Clitheroe correspondent wishes that I would inform him "what it is for, and what end this gland answers in the economy of the feathered tribe;" I beg to say that I am in the most lamentable ignorance as to its uses. While we are at the rump, I request him just to cast his eyes to the other end of the bird, and tell us of what use is the cock's comb in gallinaceous economy? My old Malay fowl, Billy (now dead and gone: see *Wanderings*, p. 240.), had nothing that could be called a comb. There was merely a piece of red skin, on a level with the head, and bare of feathers. Two of his sons came into the world with a similar deficiency. They both passed healthy, prolific, and pugnacious lives; and at last fell victims to the spit, in the common run of things. Mr. Henslow's tame dove (Vol. V. p. 588.) actually performed a compound process, as though it were gifted with the powers of reasoning. First, it lubricated the plumage which was *within* reach of the bill; and then, in

order that those parts which were *out* of reach of the bill might equally receive the benefit of lubrication, it applied them to the feathers already lubricated. Still, unfortunately for our controversy, the unctuous matter was of such an invisible nature, that Mr. Henslow confesses he never could detect what it was that his dove procured from the gland, though the bird even allowed him to remove the feathers while it was pinching the nipple. When I see birds in the act of rubbing their head and cheeks on the back and other parts, after bathing, or after a shower of rain, I consider it an operation to get quit of the moisture; and, when I observe them doing it on a dry plumage, I fancy that they are either dislodging vermin, or rectifying the disordered webs of the feathers, or doing both. Perhaps, too, the act of rubbing may impart to them a pleasing sensation, like unto that which we ourselves receive on rubbing our faces with the hand.

Mr. Audubon, who managed to see a large American squirrel go down into a rattlesnake's stomach, tail foremost, was favoured one day with an extraordinary sight of the contents of the gland in question. He saw the entire plumage of an eagle, three feet seven inches long, and ten feet two inches of alar extent, in a complete state of lubricity! In speaking of this eagle, he says [Vol. I. p. 119.], "the whole plumage looked, upon close examination, as if it had received a general coating of a thin, clear, dilution of gum arabic." He tells us, also, that the glands of this eagle were "extremely large, and their contents had the appearance of hog's lard which had been melted and become rancid." Now, only let the reader take into consideration the proportional size of the gland on the eagle's rump; and, after comparing it with the magnitude of the whole plumage, let him calculate the immense quantity of lubricating oil which would be absorbed by the feathers, before the plumage could exhibit the appearance "of a general coating of a thin, clear, dilution of gum arabic." After this, I think, he will agree with me, that one hundred glands would not suffice to produce such a supply of lubricating matter. Moreover, Mr. Audubon tells us, that, when he dissected his eagle, he found the glands *extremely large*, and their *contents* had the appearance of hog's lard which had been melted and become rancid. After the discharge of such an amazing quantity of lubricating matter as that which, he says, appeared upon the whole plumage of the bird, I state that the glands ought to have been *extremely empty*, and their appearance, not extremely large, but extremely flaccid. By way of a concluding summary, I beg to offer three short reasons why I reject the

old and long-received notion that birds lubricate their feathers: first, because any oily application is injurious to feathers; secondly, because we have no incontrovertible proof, from any writer, that birds do actually lubricate their plumage; thirdly, because, after years of close observation, I have never once been able to detect birds in the act of lubricating their plumage.

Mr. Westwood's communication (p. 160.) is very interesting. I was not aware that the petrel could be kept alive so long in solitary confinement, especially when taken from its incubation. I think that it must have sucked (if I may use the word) the applied train oil, both as a means of nutriment, and as a way to clean the pectoral plumage of its incumbrance. Then, again, I am totally at a loss to account for its dipping the breast voluntarily into the oil; unless it were that hunger and confinement, added to a week's instruction, operated conjointly, with the prisoner, to cause it to imitate a process which it would never have performed, when free, in its own native haunts. Lubrication must have been out of the question, otherwise, having so fine an opportunity, it would not have attended solely to the breast, and neglected the other parts of its plumage.

[*The Green Sandpiper*, p. 149.] I beg to take this opportunity to inform Mr. Doubleday, that I know nothing of the haunts of the green sandpiper, except from books; I have never seen it here. — *Charles Waterton, Walton Hall, March* 19. 1833.

On Birds lubricating their Plumage from an Oil Gland. (p. 162.) — Sir, In consequence of the remarks of Mr. W. G. Barker (p. 162.) on mine (Vol. V. p. 588.), I again trouble you. Since I parted with the turtle dove, I have reared a ringdove (*Colúmba Palúmbus Lin.*) which fell from its nest in our garden one windy day last August, and, like the former bird, is allowed the range of my room, and is perfectly tame. Generally, when pluming itself, it applies its bill to the rump gland three or four times, by pinching it, and on withdrawing the bill, immediately scratches it first on one side with one claw, and then on the other with the other, as if to get rid of something unpleasant which it had procured (the turtledove I never observed to do so), and then it will go on pluming. I had also a skylark (*Alaúda arvénsis Lin.*) which I reared from the nest, and whenever it was let out of its cage on the floor it would begin pluming, and applied to the gland and acted afterwards in precisely the same way the ringdove does, except that the leg was always thrust between its wing and body. Mr. Barker says, it is evident that my

remarks on *Colúmba Túrtur*, prove nothing at all. I am, it is true, no ornithologist, and my former remarks merely went to show the possibility of birds using something from the rump gland when pluming, by their being able to apply it to their head and neck, as Mr. Waterton had asserted (Vol. V. p. 414.) that their being unable so to do was "proof positive" they did not use any thing.

The article in the *Field Naturalist's Magazine* for February, p. 75. "On the Rump Gland in Birds," translated from the writings of M. Reaumur, does not quite clear up the point to me; for, although that author was satisfied that birds do not use such gland for any purpose in pluming, I never saw my birds apply to that gland except while pluming, though they often plume without; but in what manner they use it, whether merely for the bill, or on their feathers, I cannot determine. I believe the birds I have mentioned as having seen frequently pinch the nipple on the rump gland when pluming have what are called soft bills, and are very different to those Mr. Barker mentions (p. 162.), namely, the kestrel, Washington eagle, and jackdaw, which have hard beaks, and of whose habits I know nothing. — *H. Henslow. St. Albans, March* 11. 1833.

Pride of Colour in the Black Swan. (p. 139.) — I should be glad to learn from Sir J. Byerley, how he ascertained that the black swan "considered it would be a *mésalliance* to consort with a being on whom nature had not lavished the beauty of sable plumes;" and how it was he learned that it "despised the snowy charms of the white female, and refused her because her colour varied from his own." I would ask him how he ascertained the secret motives which made the one refuse to associate with the other, and by what secret means he discovered what it "considered?" Does he understand the language of the black swan? If so, I think if he would only furnish your readers with even the rudiments of it, it would be one of the most entertaining and valuable papers ever communicated to this Magazine. At the conclusion he appears to admire the swan's "pride," and exclaims, "what a lesson for man!" The meaning of which exclamation is above my weak comprehension, but I fancy that he hints that it is improper for a black man to marry a white woman. It appears to me that what he has construed into "pride" arose solely from the grief which the swan felt for the loss of its mate; and had one even of the same colour and species been given to it, it might perhaps, from the same reason, have refused that also. — *James Fennell. March*, 1833.

The Great Grey Seamews, or Gulls. (p. 27. 111. 171.) —

I dare say Philo-Rusticus (p. 171.) is right about the "great grey gull;" and it is a most discreet thing of these gulls to be so long in making up their minds as to what species they will belong to. As may be seen in p. 111., I had a glimmering of the state of the case.

"*The Daker*" *is a Name for the Corncrake.* (p. 114.) — I observe, in p. 114., that, in order to make me speak intelligibly, it is said, "daker [gallinule]." The daker is the corncrake, well known to all countrymen for his midnight and oft-repeated cry of craik craik, craik craik; a noise which I have imitated so exactly, by drawing a bit of stick backwards and forwards along the teeth of a pocket comb, that I have brought the bird within a few yards of me. I never heard the name of "gallinule" applied to this bird. — *Rusticus. Godalming, March* 13. 1833.

The Kittiwake in the Isle of Wight, as mentioned by Rusticus of Godalming. (p. 28.) — May I ask Rusticus of Godalming, whose communications I have read with very great pleasure, whether he is quite certain of having met with kittiwakes in the Isle of Wight? I ask this, because I have heard of no other instance of its having been shot so far south, in this country. The kittiwake (*Làrus Rissa*) differs from the common gull (*Làrus cànus*) in wanting the hind toe, in the place of which it has a small warty protuberance; in plumage there is but little difference; in size the common gull is longer, the kittiwake, I believe, rather wider in the expansion of its wings. — *E. N. D. March* 11. 1833.

By the Mocking-Bird observed at Clitheroe, Lancashire, (p. 72.) T. G., I presume, means the *Currùca salicària* of Fleming. Had he appended the systematic name to the Lancashire one, he would not have left his communication open to the following query, made to me by one to whom I had lent my copy: — "Is the American mocking-bird (*Túrdus polyglóttis*) a spring visitant to England?" — *W. G. B. March* 22. 1833. [T. G., in Vol. V. p. 653., has identified the "mocking-bird" of Clitheroe with the *Currùca salicària* of Fleming. — *J. D.*]

Mr. Westwood's Chorèia nìgro-æ̀nea (p. 122.) *is the Encýrtus hemípterus of Authors.* — Mr. Westwood makes (p. 122.) a genus and species, namely Chorèia nìgro-æ̀nea, of the female of a well-known insect, Encýrtus hemípterus. Is not this carrying name-making a little too far? I would also ask what novelty there is in Mr. Westwood's summary of "the probable number of insect species" [p. 116—120.]? — *Lacon. Newcastle, March* 12. 1833.

The Scent of Anemòne nemoròsa L., *and Ìris pérsica* L.

(Vol. V. p. 758.) — With due deference to Mr. Bree's olfactory nerves (see Vol. V. p. 758.), I still aver that the wood anemone (*A.* nemoròsa) is most deliciously scented; and, as a proof that I could not mistake it for the "delightful fragrance" which, Mr. Bree rightly observes, abounds in woods, I beg to state that my attention was first called to the fragrance of the flowers of this plant by a gentleman's bringing some of them, which he had gathered during a stroll in the fields, in his hand to the garden. He extolled their fragrance; I smelt to them, and, to my surprise, found them as he represented. I afterwards found that the flowers produced by the plants in the garden were fragrant also; and, a few days after, walking through a wood where the anemone formed a complete carpet, I made the observation published in Vol. IV. p. 442., and alluded to by Mr. Bree, Vol. V. p. 758.

The Persian Iris (*Ìris pérsica*) I should pronounce to be very strongly scented; but, I recollect, about three years since, a young lady making several visits to the old botanic garden, almost on purpose to enjoy its fragrance (which I had represented to her as most delicious, though somewhat powerful) without her being able to perceive the least scent. As I knew the flowers gave out their fragrance much more plentifully in the sunshine, I one day placed a hand-glass over a cluster of the plants then in full bloom (the sun at the same time shining full upon them), and in the course of an hour the glass was fully charged with odour; upon lifting it off, they were still declared scentless, when, to myself and two other persons present, the fragrance was so great as to be fit (to use a homely phrase) "to knock one down." Allow me just to add, that the person above alluded to was particularly fond of the odour arising from the bruised seed-vessels of the Elshóltz*ia* cristàta, a scent remarkably peculiar, and approved of by few. I speak of a plant widely dissimilar in appearance, and in no way related to the popular beauty Eschschóltz*ia* califórnica. — *H. Turner. Botanic Garden, Bury, Feb. 22. 1833.*

Obliquities in the Action of the Powers of Sense in some Persons. — Sir, Having noticed, on a former occasion (Vol. V. p. 758.), some peculiarities in the scent of *Ì*ris pérsica and *A*nemòne nemoròsa, flowers which, it seems, prove scentless to the organs of some persons, while to those of others they are highly fragrant, I may be allowed to mention an instance of similar idiosyncrasy relating to other senses. The following has been communicated to me by a friend, who, being in company when the scent of *Ì*ris pérsica was made the subject of conversation, informs me that a gentleman

present stated, on good authority, that there were persons, not otherwise deficient in the sense of hearing, who could not hear the song of a particular bird, while to others who stood close by them it was perfectly audible. He did not recollect the species of bird. Two members of the same party likewise had, each of them, a friend, the one a gentleman, and the other a lady, who could not distinguish blue from red. When the lady wanted to buy a riband of either colour, she always took a friend with her, to prevent mistakes, and insure the purchase of the right article. All other colours, except blue and red, the persons alluded to could accurately distinguish. Yours, &c. — *W. T. Bree. Allesley Rectory, March* 1. 1833.

Mr. Conway's supposed Lily Encrinite (p. 126.) *is the Cyathocrinites tuberculàtus of Miller.* — Sir, I send you a plate (from a specimen in my collection) of the superior termination of Miller's Cyathocrinites tuberculàtus, to which species Mr. Conway's specimen (fig. 14. p. 126.) must be referred, and not, as there stated, to the lily encrinite of Parkinson (E'ncrinus monilifórmis of Miller), which, I believe, has not yet been found in England. The only difference between the figure in p. 126. and that in "Miller's *Crinoidea*" is the increasing diameter of the column, as it approaches the body; which is not the case in Miller's figure. In the plate I send, the column is wanting; but other specimens in my cabinet, to which a portion of the column still adheres, agree so perfectly with the figure in p. 126. in that part, as to leave no doubt of their identity. As it appears that Mr. Conway occasionally visits the museum of the Bristol Institution, he may satisfy himself of the correctness of this statement by an inspection of the private collection of the late Mr. Miller, the whole of which was purchased for that institution, and of course deposited in its museum. I am, Sir, yours, &c. — *W. Gilbertson. Preston, March* 16. 1833.

The engraved inscription on the plate received is "Cyathocrinites tuberculàtus, found near Whitewell, in Bowland, by W. Gilbertson, Preston, Lancashire. J. D. C. Sowerby, fec." The plate is sent to Mr. Conway. — *J. D.*

The Lily Encrinite not found in British Strata. — I think Mr. Conway (p. 125.) may rest assured that he is not in possession of the lily encrinite (E'ncrinus monilifórmis of Miller, and E. *l*iliifórmis of Schlotheim). The comparative figure you have given from Parkinson is sufficient evidence of the truth of my assertion. In the first place, the forms of the columns do not agree: in the former it is smooth; in the latter are observed alternate large and small joints or vertebræ. Neither do the ossicula, or bones of the pelvis, arms,

&c., agree in size or number. The specimen is also described as being embedded in mountain limestone; whereas the lily encrinite belongs to the muschelkalk of the oolitic series, which does not appertain to the British strata. The idea must therefore be abandoned; and we must endeavour to find some other encrinital remain to which Mr. Conway's specimen bears a closer analogy than to that to which it has been referred. On looking to Miller's interesting work on the *Crinoidea*, we find, in his Cyathocrinites plànus, a greater degree of resemblance; and, on reference to Mr. Cumberland's figure, in Vol. V. of the *Geological Transactions*, t. 3. (which, I presume, is synonymous), we see a still closer affinity to Mr. Conway's figure. The localities cited by Miller of the Cyathocrinites plànus is the magnesian limestone of Clevedon, Somersetshire; and Humbleton, Northumberland. Mr. Cumberland's specimen is also from Clevedon. I would recommend Mr. Conway to take an early opportunity of comparing his specimens with Mr. Cumberland's beautiful figures, as here referred to; and to favour us with a statement of the result. — *Samuel Woodward. Norwich, March* 8. 1833.

P. S. Is not the scaly portion an extraneous substance, such as a Caryophyllum? This can be determined only by a close examination of the specimen. — *S. W.*

ART. II. *Queries and Answers.*

MR. WATERTON solicited to explain the Frontispiece to his Wanderings in South America. — Sir, Having read with great satisfaction and instruction Mr. Waterton's *Wanderings in South America*, I take the liberty of addressing myself, shortly, to you respecting them. One or two matters in this delightfully entertaining work, have, I dare say, puzzled several of its readers to understand. In hopes that, through your widely circulating scientific Magazine of Natural History meeting the eye of the kind-hearted benevolent wanderer, some of these matters may be better explained, I take the liberty of requesting you to insert the following observations in it. None can peruse the *Wanderings*, without being sometimes startled at the daring, hairbreadth escapes of the author; and, when he fancies a miracle to be almost necessary to his safety, he is delighted that the dauntless adventurer escapes scathless from the fang of the serpent, and the jaw of the cayman. Many I have heard disbelieve the detail of some of these adventures; but from what I have learned from the most intimate friends of Mr Waterton, that, from his earliest youth, he was

always famed for his bold feats of daring and for the strictest veracity I do not hesitate in believing he performed the exploits described in his *Wanderings*. At the same time, though crediting the narrative of his adventures, I cannot refrain adding, that the figure in the frontispiece of the *Wanderings* has put this belief not a little to the test. Having looked at it over and over again, I cannot discover what animal it is intended to represent. In its face and head, it resembles the human; but unless it belong to a new species of *Hŏmo*, or be a hybrid between *Hŏmo* and *Sĭmia*, I am at a loss under what class of animals to arrange it. I hope it will not turn out to be a new species of *Hŏmo*; as then his majesty's attorney-general, in Demerara, may have something unpleasant to say to Mr. Waterton, for putting out of the way one of his majesty's subjects in rather too sudden a manner. Should, however, these suppositions prove unconfirmed, it is not improbable, from the well known ability of Mr. Waterton, he may have moulded some poor monkey's visage into the face divine. All who have visited Walton Hall, and looked over the beautiful collection of stuffed birds, which Mr. Waterton, in the kindest manner, suffers all to see, can bear testimony to his skill as a naturalist; and also, with what Promethean art the learned proprietor can, by his magical hand, give as it were to these lifeless feathered bodies, life and being. Whichever of these suppositions be correct, many of the readers of Mr. Waterton's *Wanderings* solicit his further explanation of the frontispiece; and, from a hint that he throws out in the work, "that on some long and dismal winter's evening the reader is to have more satisfaction respecting this curious-headed creature;" I hope Mr. Waterton will not wait the coming of winter, but seize some sweet summer's evening, when all the landscape is sun-gilt, and glittering in the rays of the setting sun; and when, instead of rude Boreas's blast, his ears will be serenaded with the melody of the sweet songsters of the grove. — *James Stuart Menteath. Closeburn Hall, June* 16. 1832.

The Literary Remains of the celebrated Bewick. — Mr. Dovaston's answer (Vol. III. p. 191.) to Mr. Bree's query (Vol. III. p. 92.) is satisfactory, so far as communicating the pleasing fact, that the history of British fishes, with engravings, and a memoir of his life, were left; but he does not allude to the probable period of their publication. I perceive, by a memorandum I made at the end of my copy of the *British Birds*, that Bewick died the 8th November, 1828, nearly four years and a half ago. Being an ardent admirer of Bewick, I am most desirous of knowing when these works are likely to be published; and shall feel greatly obliged, no doubt in

common with all your readers, if Mr. Dovaston, or any other of your correspondents would give more satisfactory information on the subject. — *O. Clapton, February*, 1833.

How can the Spirit in which Animal Substances are preserved be best kept from evaporating? (p. 92.) — This question is asked in p. 92.; and to a certain extent answered in pages 92. and 93.; but as many very important points in the closing of spirit preparations are omitted, the following directions may prove acceptable to many readers. To some, they may appear unnecessarily prolix; but all who have put up many spirit preparations know how much disappointment a failure frequently occasions, and how much expense is frequently incurred from the loss of spirit by evaporation. The bottle in which spirit preparations are placed, should have a lip round the mouth, to which the covering may be secured; the preparation should never be suspended by string or thread; if it be, the thread, passing from the spirit over the lip of the bottle to the open air, will soon, by acting as a siphon, carry off the spirit, however perfect the covering may be in other respects. The spirit in which the objects are preserved should consist of equal parts of rectified alcohol and very soft water; if hard water be used, the preparation will be cloudy. The spirit should be mixed several days before use, and filtered through blotting paper, to separate all impurities. The parts to be preserved should be suspended in as natural a situation as possible, by means of fine gut, such as is attached to fishing-hooks. This will not absorb the spirit, and, being transparent, will not be visible in the fluid. The pieces of gut to which the preparation is attached should be secured to another piece of gut tied round the neck of the bottle. The lip and neck of the bottle should be well covered with gum water, as thick as it can be made, which, being insoluble in spirit of wine, will effectually secure the bladder to the neck. A portion of bladder should then be extended tightly over the top and neck of the bottle, and bound firmly in its situation by coils of tape wound repeatedly round the neck. Before the bladder is put on it should be soaked for a day or two in water; if it be in rather a putrid state, it will answer better. The preparation should now be set aside for a few days to dry, when the tape may be entirely removed from the neck of the bottle; for the gum will have fixed the bladder so securely, that nothing further will be required; and string round the neck disfigures the appearance. A piece of sheet lead, such as is used in tea chests, should be accurately cut to cover the mouth and lip of the bottle; this should be placed over the bladder with a coat of thick white paint beneath, and a similar coat above it; wet bladder should be extended over the lead and paint,

taking care to expel the globules of air; this bladder must be bound on with tape in a similar manner to the former one, and the preparation set by for a fortnight to dry and harden; the tape may then be removed; the edges of the bladder cut level round, and the top painted, first with black paint, and then with black varnish. It should not be attempted to cut the bladder level round the neck of the bottle earlier than is here recommended; for if it be cut at first, the edges of the bladder are apt not to adhere closely: the bladder below the line, where it is cut round, will easily be removed from the bottle with a knife and a little warm water.

In putting up dried animal preparations, when spirit of turpentine is used, the same process must be pursued; but, instead of the white paint, very thick gum must be used, which, being insoluble in turpentine, effectually prevents its evaporation.

Whenever I have employed the method above recommended, my preparations have never evaporated. I have many by me which have been closed for many years, and yet appear now as full as when first put up. — *Egerton A. Jennings, F. L. S., Surgeon to the Leamington Charitable Bathing Institution. Leamington Spa, March* 27. 1833.

Are Flamingoes ever seen in the long Range of Coast intermediate between the Rhone and the Guadalquivir? — Sir, As some, perhaps many, of your readers are not aware how common that beautiful and curious bird the flamingo is in some parts of Europe, not far from us, I beg leave to say, that, in travelling through Spain some few years ago, it happened that I was at Cadiz in the month of February; and, leaving my hotel, one morning, I was greatly astonished to see a man with a pole across his shoulders, to which were affixed six flamingoes, their long necks twisted into a noose, by which they dangled on the pole; similar to the way in which rabbits are carried about London; I hailed my unexpected friend with the long necks, and bought a full-grown one for, I think, about the value of half a crown. There were two full-grown and fine specimens, and four others in early plumage; but, as they were meant for the pot more than for the museum, the plumage was so much disfigured that I could do nothing with my specimen, more than to return with it in a kind of triumph to the hotel, to have so fine a bird in my hands, and to order it to be dressed for my dinner. This was done; and it proved a very bad dish, as, no doubt, any one would anticipate. On mentioning this subject to some gentlemen resident at Cadiz, they told me that these birds were far from being uncommon at that season of the year, but only at that season; and that they were brought from the

banks of the Guadalquivir river, which runs near Seville (if I recollect rightly, Seville is about 80 miles from Cadiz); they added, that it was generally supposed these birds breed in the sandy inaccessible islets at the mouth of the Rhone. In the month of July of the same year, I was at Arles, far down towards the mouths of that river, and there I heard the same account: they are not, however, seen near that place. Perhaps some reader of this Magazine may favour you with a more perfect and satisfactory account of this interesting subject, as I consider it, and inform you if flamingoes are ever seen in the long range of coast intermediate between the Rhone and the Guadalquivir. I have visited many parts of it, and never saw or heard of them: *where from*, and *where going*, seem the extraordinary points in the circumstances. I was at Tangier and Tetuan, in Barbary, in the month of January of the same year, and neither saw nor heard of them; and being, at that time, a zealous collector in ornithology, I did not fail to make enquiries on all subjects connected with that point. I submit these observations, with diffidence, to more experienced heads. I am, Sir, yours, &c. — *H. B. Blois, Nov.* 9. 1832.

The White-bellied Swift (*Cýpselus alpìnus* Temminck) *shot in Norfolk.* — Sir, The following notice has been communicated to me, and I forward it to you, in the prospect of its proving interesting to your readers: — "About the middle of September, 1831, a bird was shot near New Buckenham church, Norfolk, of the swift kind, but larger, and of a lighter colour, and having the belly as well as the throat white; the neck and upper part of the breast have a collar of grey brown rather darker than the head and back. The bird was stuffed, and is now in the possession of a gentleman at Old Buckenham; and, judging from the bulk of the bird, now it is stuffed, it must have weighed, at least, twice as much as our common swift. Its length is rather more than 8 in., and the breadth, from point to point of the expanded wings, 20 in.: they have a copper-coloured reflection in one light, and a green one in another. Its general colour is a dusky black, with the edges of the feathers paler; the quill feathers remarkably strong and pointed, darker than the back, and having a faint shot green cast: the tail consists of exactly ten feathers; the legs are stout, and feathered down to the toes, which are flesh-coloured. Is this the *Hirúndo Mélba* and alpìnus of Linnæus, &c.?" — *Daniel Stock. Bungay, July* 2. 1832.

The swift described is, without doubt, the *Hirúndo* alpìnus, *L., Le martinet à ventre blanc* of French authors, and the *Cýpselus* alpìnus of Temminck. It is figured on the same plate with the common swift (*Cýpselus* muràrius *Temminck*) in

Part II. of Gould's *Birds of Europe*, whence we learn as follows: — "Mr. Selby has, in the *Transactions of the Northumberland Natural History Society*, noticed the occurrence of the *C.* alpinus in Britain, and an individual has been killed on the estate, and is now in the possession, of R. Holford, Esq., Kingsgate, near Margate. "The natural habitat of the *C.* alpinus is more exclusively limited to the middle of the southern districts of Europe, particularly its alpine regions, and the shores of the Mediterranean: being very abundant at Gibraltar, Sardinia, Malta, and throughout the whole of the Archipelago; and to these may be added the northern parts of Africa. In its manners, it closely resembles our well-known swift (*C.* murárius), but possesses, if possible, still greater powers of flight. It would appear that the clefts of rocks, and high buildings, are the sites which this bird chooses for the purpose of nidification; the female laying three or four eggs, of a uniform ivory white. The sexes of this species present but little difference, the colour of the female being rather less decided; in the male, a uniform greyish brown is spread over the whole of the upper surface, which descends across the breast in the form of a band, along the flanks, and over the inferior tail coverts; the throat and the middle of the belly are of a pure white, the tarsi covered with brown feathers, and the irides brown. Length, from 9 in. to 10 in." (*Gould's Birds of Europe*, part ii.)

Has any one observed the under-described Act in the Great Black Ant?— I shall consider myself very much obliged if any reader will inform me if he has ever observed the following curious movements in the economy of that most interesting creature, the ant. I have been for many years an attentive observer of them, but never, until this instance, remarked a similar occurrence.

Resting myself, a few days ago (a fine warm sunny day), on an old wooden bridge near the forest, and near to which was a large nest of the great black ant; my attention was arrested by numbers of them passing to and fro, and all of them having something in their mouths. To discern what it could be, I took one of them in my hand, when, to my surprise, I found that each ant, so employed, had one of its fellows in its mouth, but so rolled up as to appear like a ball, held by its forceps, and on its back, forming a complete round, and quite motionless; there was no attempt to get away; and when released by my fingers, the one so held made no attempt to get away, but remained *still* in my hand, seemingly not at all disturbed by its late conveyance. I tried many of them in this way, and all exhibited the same appearance. It was a fine day for the time of year, and quantities of them were

moving to and from the nest in this singular manner: they did not move far, but merely from one end of the bridge to the other, upon the wooden bars of it. — *H. B. Blois, Dec.* 1. 1832.

Mr. Robert Mallet, jun., Capel Street, Dublin, in describing the incidents of a tour which he has recently made on the Continent, thus speaks of some ants which he met with in passing from Martigny, through the Tête Noir, into Chamouni: — "Proceeding along the side of the torrent, for a considerable distance, by a nearly level path, after a steep and long descent, and having crossed a rude wooden bridge, the Tête Noir itself, the stupendous precipice from which the pass takes its name, at once opposes itself to view: a mighty mass of solid unbroken rock, it stands, projecting into the valley, in sheer descent above six hundred feet. . . . . I sat down on the planks of the rude wooden bridge, to sketch the noble outline of the Tête Noir, and was soon surrounded by numbers of huge ants, which came out of, and retreated into, innumerable small holes in the pine timber of the bridge. These ants infest dead pine timber in the south of Europe, and are nearly as great a destruction to it as the lion ant of tropical climates is to every other kind of wood. It is the *F*ormìca herculànea, I believe: its colour is a very dark chestnut, sometimes nearly black. The male is nearly seven eighths of an inch long, the female larger, and does not sting when about the person, as our ants do: it feeds, apparently solely, on the dead timber of pine trees, and seems less inclined to attack timber under cover than when exposed to the sun and air. Like our own ants, it has an acrid taste, owing to its containing formic acid. The nests of this species of ant are composed of dry leaves, of the pines chiefly, heaped together to about 15 inches in height, and in the centre is contained the nursery of young ones." (*From a Communication to the Gardener's Magazine, not yet published.*)

Instruments in the Ovipositor of the A'crida verrucívora. — In the ovipositor of the *A'*crida verrucívora there are two instruments, one to each division of the ovipositor, on the use of which I should be glad to receive information. The instruments are flat, end in a sharp point, and each is enclosed in a groove. — *E. S. T. March*, 1833.

In Kirby and Spence's *Introduction*, vol. iv. p. 152, 153., are remarks on the structure of the ovipositor of the "*A'*cridæ and cognate genera;" but it is not clear that they answer the query of E. S. T.: this it is hoped some entomologist will do. — *J. D.*

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ORIGINAL COMMUNICATIONS.

ART. I. *On certain recent Meteoric Phenomena, Vicissitudes in the Seasons, and prevalent Disorders, contemporaneous, and in supposed connection, with Volcanic Emanations.* By the Rev. W. B. CLARKE, A.M. F.G.S.

> "As if in close committee on the sky,
> Reports it hot or cold, or wet or dry;
> And finds a changing clime a happy source
> Of wise reflection, and well-timed discourse.
> We next enquire, but softly and by stealth,
> Like conservators of the public health,
> Of epidemic throats, if such there are,
> And coughs, and rheums, and phthisic, and catarrh."
>
> *Cowper's "Conversation."*

Sir,

THE title of this paper may be startling to those who consider speculation as great an evil in science as in commerce; nevertheless, I venture to put it forth, as exhibiting some singular coincidences in juxtaposition, which, if unconnected as parts of a whole, are yet interesting in their individual character.

I have been led to this undertaking by the peculiar nature of the late mild winter, and present backward spring; which have been remarkable for unusual mutations, not of local, but of universal, extent. One curious feature I have already alluded to in this Magazine (Vol. VI. p. 157.), viz. the extraordinary appearance of the toad. The date there assigned is the 5th of February; but I have since ascertained that the lanes in this vicinity were filled with toads so early as the 1st of February. Now, in the table of indications of spring, published by my friend Mr. Taylor (in Vol. II. p. 128.), the earliest occurrence of the toad, between 1750 and 1771, is

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marked Feb. 20., and the medium time of 57 years is assigned to March 30. 1763. If we may, therefore, admit this fact as a proof, the present spring commenced at a particularly early period. It has, however, till recently, been retarded by an inroad of wintry weather, as remarkable for its violence and duration, as for its unexpected arrival; and, notwithstanding the occurrence of particular symptoms, it is not till within a few weeks that the spring may be said to have actually returned.

The following memoranda demonstrate the period of these changes; and, though not essentially valuable, yet, as local data, and in connection with the present subject, may not be altogether useless.

1833. *February* 1st to 5th, Toads appeared. 6th, Heard blackbirds. 10th, 11th, and 12th *, Dreadful winds with rain from S. W. 13th*, Gale continued. 14th, Wind and lightning from ten P.M. to four A.M. on the 15th. 15th, Snow and rain; the former melted as it fell. 17th, Rain. 21st, Honeysuckle in leaf; primroses in blossom; periwinkle in flower in hedgerows about Sturte. 22d*, Heavy gale; trees and chimneys blown down. 24th, Rain. 25th, Hail in the night. 26th, Gnats appeared in great abundance. 27th, High wind. From 15th to 27th, very cold.

March 4th, Very warm; Gonépteryx rhámni appeared; Vanéssa Io (peacock butterfly) appeared. 5th, Bees on the blossoms of laurustinus. 8th, 9th, 10th, and 11th, Snow in squalls; melted as it fell. 13th, Very warm. 16th, Heavy rain. 19th, Fine clear weather. 21st, Snow. 22d,

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* During the prevalence of these gales, greater mischief was done to all the parks and woods along the western road than ever was remembered. The Chesil Bank was kept bare of pebbles for some time, and many Spanish dollars found, supposed to be part of the specie aboard the Hope, of Amsterdam, which was wrecked there on January 16. 1748. (of which event there are some interesting particulars in Hutchin's *History of Dorset*, vol. i. p. 545-6.)

After the gale of the 22d, the windows of my house, which faces the south, were found covered with particles of salt, and the brass rapper on the door was corroded by the same cause. The distance from Poole Harbour is not more than half a mile; but, on account of the nature of the situation, I do not believe that the spray from the harbour brought this salt: I am inclined to think it came much farther. The sea lies about two miles to the left, open and visible; before us is the opening in the Chalk Downs at Corfe Castle, and behind that the high land of Kimmeridge, the distance from which place, as the crow flies, is about eleven miles. I think the spray in question came from the main sea behind Purbeck; the wind driving furiously from that quarter between Kimmeridge or Lulworth and Weymouth. There are on record, in the *Philosophical Transactions* for 1704, accounts of "salt storms" in November and December, 1703, by which it appears, on the evidence of numerous credible witnesses, that the salt of the sea spray was left on all the trees, hedges, fields, &c., for twenty miles' distance from the sea. (An abstract is given in Polehampton's *Gallery of Nature and Art*, vol. iv. p. 157.) The Rev. P. W. Jolliffe, A.M., of Poole, informs me that, after a storm from seaward, a similar effect is witnessed at Downton, in Wiltshire, which place is certainly sixteen miles from the nearest sea, at Christchurch, in Hants.

Snow and frost. 23d, Ground white with snow, as far as the horizon, till nine A.M. 24th, Blackbirds. 29th, Geologising in the Bas Boulonnais, found snow two and three feet deep, evidently drifted, in the ditches and hollows on the chalk downs at Haut Buisson, and above Blanc Nez; also on Mont St. Lambert, near Boulogne. I was told it fell three weeks before, when the weather was very inclement. 31st, A very hot day; earthquake at Horsham, Sussex; frogs croaking at night (Boulogne).

April 1st, Heavy rain from S.E. (Hardinghen to Calais.) 2d, Calm and warm till noon; Channel strewed with wreck; thick fog and rain at Dover, three P.M. 5th, Very warm (Parkstone). 11th, Nightingale first heard. 12th, Hail, rain, snow, lightning, thunder. 13th, Hail and lightning; notwithstanding the cold, saw a brimstone butterfly, bees foraging, and a red butterfly (species unknown, seen at a distance). 16th, Thunder-storm. 17th, Frost; lilac in bud; tulips in blossom. 18th, Frost in the morning; gnats in great numbers; cuckoo first heard. 19th, Blackthorn in blossom; 22d, Two swallows seen at the sand hills on the shore. 21st, Mountain ash in leaf. 23d, Laburnum in leaf; turnip in blossom. 24th, Horsechestnut and maple in leaf. 28th and 29th, Hail. 30th, Rain.

May 1st and 2d*, Heavy gale all day, with great rain. 3d, Gale till noon; oaks in leaf. 4th, Very warm; lime and hornbeam in leaf; swallows building. 5th, Warm and bright; beech in full leaf. 6th, Elm in leaf; apple trees in full blossom. 8th, Cold fog from westward. 9th, Warm again; frogs croaking loud. 10th, Laburnum in blossom. 17th, Red mullet in Poole Harbour. 21st, Thick sea fog from the east.†

In addition to these facts, I may mention farther, that the red mullet (native of a warm climate) was seen in the fish-market at Boulogne sur Mer on the 19th of March, and that the quail was heard at Carrickfergus on the 24th of March, at least six weeks earlier than it is usually heard there. The mackerel has also this year indicated a striking intelligence. It is well known that, in London, mackerel in the market, and snow on the ground, were contemporaneous not many weeks since; but this fish was taken in immense quantities, together with the pilchard, in Mount's Bay, Cornwall, so early as December, 1832; and it will be long ere the extraordinary scene exhibited by the activity of the fishing-boats during the short days of "dark December," will be obli-

* Having been confined to my bed from May 1. to May 6. by an attack of influenza, I have not been able to register all the occurrences of those days; but those mentioned are accurate. My illness has afforded me, however, an opportunity of confirming a fact alluded to by G.W., Mr. Murray, Mr. White, and J. D., in p. 199. of this Volume. I have heard cuckoos all night long, at times unceasingly. As in this wild country trees are not much more common than these "*raræ aves*," those who, like me, happen to have a few trees about their houses, know well that the cuckoo does sing by night.

† By a register kept by Mr. John Bransby, at Ipswich, it appears that, during the first fifteen weeks of 1833, more rain fell than was ever remembered. In 1832 the quantity which fell between January 4. and April 28. was 2·45 inches; whereas from January 7. to April 27. 1833, 17·8 inches fell.

There were considerable thunder-storms in Suffolk on April 11. 28. and 30., and on the 30th much hail fell.

terated from the memory of the inhabitants, the oldest of whom recollect nothing like it. Whether the mackerel do or do not remain during the winter near our shores, as some assert, this unusual fact is equally observable; for it proves, that there was a something indicated by the temperature of the sea and air, which induced the fish to awake "*de bonne heure*," from their muddy bed, and rise to the surface. I lay particular stress on marine indications, because they are less likely to be mistaken; and, in agreement with the ideas which arise from the consideration of them, I was told at Boulogne, that the red mullet had appeared no more after the bitter change which took place in the weather about the equinox.

There are other facts to be adduced, still more important. The Continent has witnessed effects of a still more extensive character. The lark was heard in Denmark in March. North Russia has been peculiarly favoured with mild weather, during the generally cold months. For one day only has the thermometer at Petersburgh been lower than 18½°. Prussia has seen scarcely a flake of snow; save at Dantzic, where the weather at the equinox was severe. The centre of Europe has been nearly free from cold. But in the southern parts it has been different. Military operations were suspended, in consequence of the cold, in the armies of Egypt and the Porte. The southern parts of Russia, Georgia, and Persia have been visited by unprecedented severity. At Teflis and Erivân, where nightingales sing and roses bloom in January, the cold has been as great as in the north of Europe. The continent of India has also indicated recently some extraordinary changes, and the complete failure of the periodical rains has in places destroyed all hope of the crops. These are incontestable facts. Letters also from the Cape of Good Hope, and other tropical latitudes, mention that there has been lately a very perceptible twilight: it was there, to use the powerful words of Coleridge, in his "Rime of the Antient Mariner," that

> "At one stride came the dark;"

now, the inhabitants enjoy a transition period, like that so characteristic of higher latitudes. The last six months have also witnessed some remarkable meteoric appearances, one of which, that of November, deserved a particular memorial, seen, as it was, over so wide a space in Europe.

Those who may suppose that I have overrated the importance to be attached to these notices, will not be inclined to bear me out in my conclusions respecting a possible cause

to be assigned to such effects. Nevertheless, I venture to suggest one; and, as your pages are open to criticism, I throw down the *orange* of conjecture (if, indeed, the golden apple of the Hesperides were neither more nor less) for whoever likes to run after it.

When the cholera morbus broke out in Europe, it was observed that its progress had followed a certain linear direction from S. E. to N. W.; a direction not unknown as the line of meteoric and terrestrial phenomena. During its passage through Germany, it was noticed that its victims were not altogether human; for it is known that at Berlin and other places in Prussia, and in Saxony, even the poultry were suddenly affected, and dropped dead; and the waters of the Baltic were partially heated in an unusual degree, and without any apparent cause. Many medical writers in Germany published the opinion, that the cholera was indebted for its immediate cause to certain emanations from the earth, which poisoned the atmosphere, and induced disease. This does not affect the question of contagion or infection, in the ordinary sense of those terms; because, though the cholera may have been, in some cases, warned off by the potent mandate of a quarantine doctor, or left, in others, to riot amidst the crowded inmates of a ship or a prison, still the facts which were witnessed at Ely, in Cambridgeshire, where persons were attacked only on one side of a particular street, at a time, too, when there had been no communication with the then chiefly infected places (Sunderland and London), and where the patients were persons who had not moved away from their usual occupations, and had not mixed with strangers, prove that the disease travelled neither by coach nor packet.*

* It may be argued, that, as the course of the cholera was frequently along that of rivers, the disease was merely the fruit of miasma, to which all countries, especially flat marshy districts, have been from time immemorial periodically subject. Now, this may be true in some individual cases; but still, when the progress of the disease was equally certain in soils which were dry and warm as in moist and cold localities, when neither height nor depth impeded its career, it will not do to say that this disease was a common one, or that it could have arisen in the same way as a fen fever or the malaria. It is true that in many countries, at certain seasons, the public health is attacked at all points, as in the district of Italy called the Pontine Marshes, between Rome and Naples; and so constant has this been, that the old Romans, who well knew the cause, built their strong-holds and villages on the tops of hills, out of the reach of the miasma: but with the cholera they would have had no such success, for it has regarded neither mountain fastness nor rocky defile; even the sea itself has been insufficient to prevent its passage whither it was destined. And as to the objection alluded to in the first paragraph of this note, it may be argued farther, that along certain rivers (as the Rhine, for instance) earthquakes are known to keep a well-observed recurring course; a not

The French, who are clearer-sighted in such cases than their wiser neighbours (who keep up a hue and cry at the rate of a guinea a day), early saw the absurdity of shutting out a visiter which paid neither toll nor customs, and which leaped over the wooden heads of the properly called "*Boards* of Health," far into the midst of the land, while the cholera-catchers were gaping and staring, in their expectancy of its passport, to be "*vu*" and "*visé*," back again; and, therefore, they relaxed the embargo on innocent wheat and coals, and opened their ports to all comers. The fact of certain persons taking it from associating with other certain infected persons proves nothing against this; because, when a disease comes like the cholera, it, of course, attacks such as are predisposed to receive its attack; and the chances are, that in a house, or a ship, or in any other community, the general character of the health of the inmates may afford a number who are all equally predisposed, and who cannot resist the effects of an infectious atmosphere, whether that of the primary cause, viz. the locality, or that of the secondary cause, an infected neighbour. As to the cholera itself, I would not presume so much as to say, whether it may or may not have been prevalent before 1832; but this, I think, I may venture to say, that medical skill could not prevent it: for, if it could, why did not all the wisdom of all the well-paid preventers keep it away?* Precautions were proper and indispensable; and lives, no doubt, were saved by regulations for cleanliness, abstemiousness, &c.; and that is exactly what we may suppose, in a moral view of such a case, would be the result. For God sends his pestilence on the wings of the wind, and the angel smites in the darkness those to whom he is sent; and a posture of readiness to await the arrival of the messenger may, perhaps, avert the blow. If this reasoning appear absurd, I will retire to other ground. The present prevailing epidemic will assuredly by some be allowed to arise from atmospheric causes, although Mr. Spence (Vol. V. p. 358.) says "No." I suffered from "*La Grippe*," in

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unlikely fact in most cases where rivers owe their direction, in part or wholly, to ancient or modern agents of elevation.

* There is nothing which shows the absurdity of some of the late quarantine laws so much as the anomalies in their administration. While, for instance, ships, at Sunderland, from non-infected places, were not permitted to enter the devoted port, vessel after vessel, coach after coach, day by day, during the prevalence of the disorder, were suffered to depart on their destination, freighted, as the cholera guardians tried to persuade the public, "mutatis mutandis," with death and desolation to all who might come in contact with them. Oh, the glory of consistency! oh, the value of the adage, "*Exceptio probat regulam!*"

1830, on the Continent, and I have suffered from "*La Grippe*," in 1833, in England; and I am sure I could not have taken the complaint from others. The very sudden, and locally general, as well as individually particular, outbreak of this influenza, points to a cause not within human skill to prevent or provide for. Something in the atmosphere there must be which thus strikes down so many, and no two in the same exact way. It is a poison somehow mingled in the breath of life. Horses and other animals are now suffering from the effects of a corresponding epidemic disease; and in Yorkshire hundreds have, in consequence, died.

Now, I would connect the cholera, the influenza, the contrasted indications in the seasons, the occurrence of meteoric phenomena, &c., in one chain, as so many links in the argument up to a supposed cause of such general derangement in the different systems of nature. And, in order to show how far the supposed cause may be one that can produce such different effects, as far as appearance goes, and yet of the same nature as to the identity of atmospheric agency, I will state one or two preliminary facts, serving to point out a connection between occurrences seemingly distinct.

It has been acknowledged that meteoric phenomena, such as electrical appearances, &c., have a certain relation to volcanic agency. In the present imperfect state of science, when the most brilliant discoveries are the result of intuitive guess-work, who shall say that electricity is not connected with the interior of the earth more than with the natural external atmosphere?* After the battle of Algiers there ensued a most frightful thunder-storm, the acknowledged effect of that action; and it is also known that other great combats, since the introduction of gunpowder, have been followed by fearful storms, that have vented their destructive power on the combatants that produced them.†

* Dr. Hibbert (*On the extinct Volcanoes of the Basin of Nieuwied*, p. 252.) has alluded to the notion prevalent in the neighbourhood of Ober and Neidermennig, mentioned also by De Wyck and other writers, that, "on account of the village of Obermennig having been built upon basaltic lava, it has never been struck by lightning. The fact, also, of the Neidermennig quarries, which are only 100 feet deep, being always filled with ice, proves that "the basaltic lava of this district influences the temperature of the air, as well as its electric states." I have heard similar observations made on other volcanic districts. M. Rozet, in his memoir on the Vosges (*Bulletin de la Société Géologique de France*, iii. p. 138.), mentions a glacier near Gérardmer, in a small cavern, which, though exposed to the full heat of the sun, was full of ice in July (1832); but, on October 25., after ten days' sharp frost, had not an atom of ice.

† Navies have been often dispersed by storms immediately after action as, for instance, after the battle of Trafalgar.

In the *Philosophical Transactions* there are several accounts of an electrical phenomenon, in December, 1737, witnessed at Naples, by the Prince of Cassano; at Padua, by the Marquis Poleni; at Bononia by Dr. Zanotti; at Rome by Professor de Revillas; also at Edinburgh by Mr. Short; and at Rose-hill, Sussex, by Mr. Fuller; the character of which was of the nature of the aurora borealis, and yet so apparently connected with a preceding eruption of Vesuvius, that Meyer and other celebrated persons concluded that it was indebted to the volcano for its origin, being the ignition of ascended inflammable matter. One remark I take from Dr. Zanotti, "*that several persons positively asserted, that, in the evening of the sixteenth day, they perceived a certain stench in the air, like that which is sometimes occasioned by a fog. The same has been noticed at other times, when such phenomena have appeared.*" * Here we have meteoric appearances clearly connected with volcanic agency; and it is too well known to need mention, that, during the actual eruption of a volcano, electrical appearances, such as lightning, &c., are amongst the most interesting of the phenomena.†

I would now attempt to show a connection between volcanic agency and great storms of wind. It cannot appear

* The great aurora of 1574 was followed by earthquakes. In 1726, the aurora was both preceded and succeeded by great earthquakes; and, on the latter occasion, during the aurora, persons at Chelsea "*perceived a sulphureous smell in the air.*" (*Phil. Trans.*, 1727.)

† I may append here the following proofs:—

1. The earthquake at Lyons, in 1822, affected the magnetic needle violently at Paris. (*Journal of Science*, No. 26. p. 434.)

2. At the time the desolating earthquake of 1820 took place at Zante, about three or four minutes before the shock, a meteor five or six feet in diameter was seen burning and almost swimming on the sea, at the distance of two miles from the nearest point of land. (*Id.* No. 25. p. 230.)

3. Immediately after the earthquake of January 19. 1825, at Santa Maura, torrents of rain fell, and lasted a considerable time.

4. Previously to the earthquake which desolated Blida and Algiers on March 2. 1825, the barometer fell for several days; but, immediately before, the thermometer suddenly rose 4½°.

5. The eruption of Kattlagia, in Iceland, in 1823, after sixty-four years' repose, was accompanied by electrical phenomena which destroyed cattle, &c.

6. The eruption of the same mountain, in 1625, was attended by most extraordinary electrical appearances: twenty miles off, ignited vapours attached themselves to the dresses and flesh of the inhabitants, and all who witnessed the lightning, &c., were affected by it.

7. The eruption, also, of 1755–6 is well known by the effects produced by the earthquake at Lisbon, &c., which was caused by it. The disengagement of electrical matter on that occasion was most awful.

8. The eruptions of Leirhnukr and Krabla, in Iceland, in 1724—1730, were attended by electrical phenomena still more striking: balls of fire rose and fell; lightning, &c., ran along the ground. (*Henderson.*)

extraordinary that, when immense masses of burning matter are propelled into the atmosphere, such a rarefaction should take place as would produce a sudden suction of the colder air from all points towards the focal heat of the ascending column. And there is direct evidence on the point, that violent tempests of wind have frequently followed the outbreak of a volcano. Accounting for winds as we may, or for hurricanes and tornadoes as we can, there is no doubt, I think, that a sudden heating of air in a given spot, however occasioned, is the leading cause, and why a hurricane cannot be produced by a volcano I know not.* A gentleman, now deceased (the late Rev. Sir R. Hughes, Bart., of East Bergholt Lodge, Suffolk), who had travelled far, and was a person of discerning and reflecting habits, once told me, that he had made the observation that all sudden violent storms of wind

* As another connecting link in the argument, it may be observed, that hurricanes and storms of wind are frequently connected with electrical phenomena. Henderson (*Journal of a Residence in Iceland*, vol. i. p. 358.) says that the aurora borealis is in Iceland invariably followed by a hurricane from the north. In the British Islands I have always observed that it is followed by a wind and rain from the *southward;* and this is confirmed by other observers. Vide Winn on Aurora, *Philosophical Transactions*, 1774.) Halley considered that the aurora was connected with volcanoes. (*Phil. Trans.*, No. 347.) The years 1716 and 1737 were celebrated by appearances of the aurora, which were seen all over Europe; and in both those years, and at the exact period of time, volcanic eruptions and earthquakes were contemporaneous with the northern lights: Iceland was affected in the former, and Kamtschatka in the latter year.

As a further illustration of this point, it may be mentioned that Dr. Holger has suggested, in a paper on the analysis of the meteorites of Lenarto and Agram (the latter of which fell on May 26. 1751), that aerolites are the product of terrestrial emanations, which have been consolidated by electro-chemical agency. (*Zeitschr. für Physik*, viii. 129., quoted in Férussac's *Bulletin*, March, 1830.)

M. Necker, also, in a very interesting discussion (*Bib. Un.*, Fév. 1830, p. 166.) on the direction of the magnetic curves, illustrated by Capt. Sabine's map of the northern hemisphere, has endeavoured to show that the ranges of mountains and conformation of continents are coincident with the direction of these curves. It is too long to allude to further in this place, than to say that it is most singular that there should be an apparent connection between the stratification, direction of mountains, shape of continents, and the curves of equal magnetic intensity. M. Boué, in his analysis of this paper, says M. Duhamel had, in his theory of the earth, remarked the same coincidence. (Vide Férussac, June, 1830.)

On April 5. 1820, an aerolite fell on board a vessel in lat. about 20° N., and 51° W. long. It fell from a cloud, attended by heavy rain, and had the smell of sulphur. From February till March in that year earthquakes were experienced in the Ionian Islands and elsewhere, and a volcano in the Aleutian Isles was in eruption; and the year 1819 had been famous for volcanic eruptions and earthquakes in both hemispheres. (Vide note, p. 296.; also list of eruptions, &c., September 9.) In June, 1791, Vesuvius was in eruption; and in July there was a fall of meteoric stones, twelve in number, at Sienna.

seemed to take place immediately after the action of some volcano near or distant.*

In the *Bulletin of the French Geographical Society* there is an article on an eruption of Etna, which took place on the 16th of May, 1830. This eruption was of a frightful character; no less than eight villages having been destroyed by the lava and ejected materials. The calamity is described as more terrible, unexpected, and general, than was ever known. Now, this eruption was attended by a consequence which I shall adduce as an example of the above position. It is stated that the coast of Calabria, and all the ports of Italy which were exposed to the wind which blew during that disastrous night, were covered with a reddish dust, in some slight measure like that which covers the neighbourhood of the mountain. This dust was, of course, attributed by some persons to the eruption; but letters from Palermo state that it was observed throughout Italy, and that, its principal deposition being in the south of Sicily, it must have been brought by a south wind, and therefore could not have proceeded from Etna: analysis, moreover, contradicts its claim to a volcanic origin. It is known that a similar dust fell in 1807 and 1813; and that, at those epochs, frightful storms, raised in the deserts of Africa, caused a whirlwind of sand, which, borne across the sea by the sirocco, was deposited on the shores of Sicily and Italy. In the present case, also, there is distinct evidence, in accounts received from Africa, that, during the month of May (while Etna was in eruption), a caravan perished in the desert under a whirlwind of sand; and, therefore, it is not unduly concluded, that the red sand before alluded to was borne from the plains of Africa by the south-east wind which blew during the eruption, and carried across the Mediterranean to the shores of Italy. Nor is it, if this fact be allowed impartial consideration, an extravagant idea, that hurricanes in the West Indies, or typhoons in the China seas †, may be in some measure connected with the outbreak of some volcanic eruption, in those archipelagos of burning mountains. The next step in the argument is, that the cold air from more distant countries would, in rushing forwards to produce the equilibrium, occasion the occurrence of partial or general storms; always making due allowance for the prevalence

* Dr. Daubeny has some observations on the connection of hurricanes with volcanoes and earthquakes. (Vide *Description of Volcanoes*, p. 321. and p. 303.)

† The eruption of St. Vincent's, in 1718, was attended by a hurricane; that in 1812 was preceded by earthquakes for a year; and that of Sumbawa, in 1815, by a hurricane which did great injury.

of those periodical winds to which other causes are duly assigned.*

The passage marked in italics, from the paper of Dr. Zanotti seems not improperly paralleled by an extract from the *Lancet* of the 26th of April, 1833:—"*We have heard it remarked by no less than twenty respectable individuals, residing in this metropolis and its suburbs, that an odour of a very particular description prevailed over a large surface of London, on, we believe, the 10th instant, just at the period when the influenza was at its height.*"

To sum up all; it would seem that there is nothing wanting to establish the possibility, perhaps the probability, of my supposition, but testimony of a kind which will bear directly on the point at issue. If the outburst of heated and gaseous matters from the interior of the earth is not capable of producing temporary derangement in the atmosphere, thereby occasioning partial influences of unusual heat and cold, storms of wind, and hail storms (which are electrical†), as well as deleterious effects on the human constitution, producing the symptoms associated with the late prevalent epidemics; then, of course, these observations are mere conjectural trifling: but if the chimneys of steam engines, kitchens, and parlours, pouring forth diurnal successions of carbonaceous matter in a state of vapour (and, put them all together, what ratio does all the smoke from all the fires in Christendom bear to the abundance of destructive matters pumped up from below by a single spasm of a single volcano in eruption?), are said to have influenced public health to such a degree, that the plague, which may have been imported into London thousands of times since the dolorous days of its triumph in 1665, has been rendered harmless; surely, a like power‡, for worse as well as better, may be assigned to those mightier chimneys of the

* The *Annales de Chimie*, December, 1829, contain a memoir by M. Lambert on the "causes of the earthquakes in Chile and Peru, with the means of preventing their ravages," in which he wishes to make it appear that earthquakes and volcanoes depend on the sun. Bartholon, in 1779, advanced the notion that earthquakes were occasioned by a discharge of electrical matter from the earth to the atmosphere.

At Copiapo, it is said, the year is divided into three portions:—the first three months are the season of earthquakes, the next four the sickly season, the others the season of famine. However M. Lambert's theory may be received, it tends to confirm the connection between the atmosphere, the seasons, and diseases, with volcanic phenomena. There is an abstract of this paper in Férussac's *Bulletin* for July, 1830, p. 27.

† If any doubt remained on this subject, it has been completely done away with by the effect of the *paragrêles* erected in the vineyard districts of the south of France, by which a simple electrical conducting rod converts hail into a thin soft flaky snow.

‡ Vide examples quoted by Mr. Lyell, *Geology*, vol. i. p. 329, 330.

great laboratory, which, according to geologists, may occupy an extent commensurate with the globe which we inhabit."* I proceed, therefore, in the last place, to furnish you with a list of earthquakes, volcanic eruptions, &c., which have occurred within the last few years, reserving till a future time its continuation and additions; the latter of which are as numerous as the instances cited below; merely observing, that I pay as much attention to the occurrence of the earthquakes as to the other phenomena, because I believe them to be effects of like causes†, and that it appears unreasonable to suppose that such effects can take place unaccompanied by the discharge of mephitic vapours. I regret that I cannot make this list more perfect; its materials are derived from different sources, and many of these are imperfect in detail: such a list, however, is not uninteresting, independent of any rash or jejune observations deduced from its consideration; and, as such, it may deserve a place in your journal, even if you reject the prolegomena, especially the idea, that, if a handful of ships engaged in the ignition of gunpowder can produce electrical appearances on a scale called terrible, an infinite number of engines infinitely more powerful than all the artillery of man are able to induce the occurrence of storms to which human means of multiplying atmospherical phenomena must be less than nothing in the scale of equivalents.

1827. *January*, Earthquake in Belgium; great disengagement of electric matter, stated to be the *effect*, and not the *cause*, of the phenomena. 2d, Earthquake (violent) at Mortagne, Alençon, &c. (France).

November 16th, Earthquakes at Bogota, emitting sulphureous vapours, and attended by extraordinary rains.

1828. Earthquake in Belgium, and along the Rhine. This shock was severely felt at Brussels. The mineral springs at Aix la Chapelle and at

* "It is evident, indeed, that any atmospheric air which may reach the spot at which the volcanic action resides will be deprived of its oxygen by the process; and that, even at a great distance from the volcano itself, the presence of metallic and other sulphurets will more slowly, though not less certainly, give rise to the same effect." (*Daubeny on Volcanoes*, p. 376.)

† "Some are unwilling to admit earthquakes as any probable indication of subterranean fire, while others not only include these, but go so far as to class hot springs, gaseous exhalations, like those of Pietra Mala, and the eruptions of mud and petroleum commonly called 'salses,' amongst volcanic phenomena.

"With regard, however, to the first of these, I apprehend that those who coolly examine the facts that have been collected on the subject, will scarcely entertain any other difference of opinion, than as to whether their connection with volcanoes is universal; for in some instances earthquakes have occurred so immediately antecedent upon volcanic eruptions, and are so manifestly derived from the very same centre of action, that we want no better proof to establish an identity of origin." (*Daubeny on Volcanoes*, p. 360.)

Bertrich Bad (Vide *Mag. Nat. Hist.*, Vol. II. p. 71.) were affected by it; and there were symptoms of renewed action in the extinct craters of the Eifel. Earthquake in New Holland.

January 7th, Eruption of fire and water at Jokmali, Persia.

March 14th to 22d, Vesuvius in great eruption.

March 30th to *April* 4th, Earthquakes at Callao and Lima; many villages destroyed; dust thrown up, and the sea, before calm, agitated by gaseous bubbles; and ships violently shaken in twenty-five fathoms water.

April, Kamtschatka mountain in action. Showers of ashes fell on the snow. [The south of Europe visited by unusual heat.]

September 18th, Earthquake at Calcutta.

October 9th and 10th, Earthquake at Genoa: terrible noises, and many buildings destroyed.

December 9th, Earthquake at Manilla. Symptoms of renewed action in the extinct volcanoes of Auvergne.

1829. *January*, Earthquake at Old Chamacé.

February 24th to *March* 10th, Earthquakes several times each day in the country of Tounka, Irkoutsk, south of the Lake Baïkal. Houses destroyed; rocks thrown down; the earth opened; ice on lakes and rivers rent; always accompanied by extraordinary subterraneous noises.

February 24th, Earthquake at Troitsko-Savks and Kiakhta, in Russia, from N. E. to S., preceded by a subterraneous noise like that of a violent storm. Soldiers on duty could not stand: houses violently shaken. Similar phenomena in 1814 and 1792.

March 8th, Earthquake at Junka (Irkoutsk), Russia. 12th, Earthquake at Bangalore, accompanied by a violent current of wind. 21st, Earthquake at Orihuela. Earthquake in Murcia, felt also at Madrid: thirteen towns destroyed, and many villages entirely swallowed up. Earthquake at Ancona. 31st, Earthquake at Port au Prince.

April 2d, Earthquake at Dieppe. End of April, Volcano near Hudson's River, New South Wales, in eruption.

May 19th, Earthquake in Mexico. End of May, Earthquake at Albano, Gonsano, La Riccia, and Castel-Gandolfo, Italy: smoke disengaged. 29th, Earthquake at Jamaica.

June 1st to 10th, Earthquake at Torres Vejas, in Spain. 24th, Earthquake at Paris. 26th, Earthquake at Caen.

August 7, Earthquake at Colmar. 18th, Earthquake at Copenhagen.

September 9th, Aerolite, containing olivine (a volcanic product), fell at Krasno Ougol, in Russia. End of September, Earthquake at Torres Vejas.

October 12th, Earthquake in the country of Saanen, canton of Berne. 26th, Earthquake at Valparaiso, equal in intensity to that of 1822: a great number of houses thrown down at St. Jago, where many of the inhabitants were killed, and at Casa Blanca, which was nearly destroyed.

November 26th, Earthquakes at Jassy, Odessa, and Czernowitz (frontiers of Russia and Turkey). 27th, Earthquake at Rochelle, Rochefort, &c. (France).

December 6th, Earthquake at Rochelle. 8th, Earthquake at Hermanstadt (Transylvania). 22d, Earthquake at Bellay (France).

1830. *January* 18th, 19th, 20th, Earthquakes at Manilla; water violently agitated; cattle greatly alarmed; houses rent, and lives lost.

March 9th, Earthquake at Kisliar, Asia Minor: a mountain opened with frightful noise, filling a valley with ruins. Five hundred persons perished by fall of temples and houses.

March 29th and *April* 13th, Earthquake at Port au Prince.

April 27th, Vesuvius in great eruption. Earthquakes violent at Naples; the dressers of vineyards greatly alarmed.

May 16th, Etna in eruption (alluded to p. 298.)

July 26th, Torrents of rain, attended with lightning and thunder, fell at Malta, and there, for the time of year, was considered a *phenomenon*.

1831. *January* 2d *, Earthquake at Lago Negro, in the kingdom of Naples; houses, &c., damaged.

March 2d, Earthquake at Dover; felt also at Ramsgate, Margate, Folkstone. The tide flowed half an hour earlier than usual. The captain of the Crusader told me that the day was fine and calm; but that, without any previous indication, a sea suddenly arose in mid-channel, and that it ran so high that there was great danger: felt also at Calais, and down the French coast.

July, August, The formation of Graham Island, in the Mediterranean. (Vide *Mag. Nat. Hist.*, Vol. IV. p. 545.)†

During the summer, Eruption of Bos Tepe, on the Caspian Sea.

December, Vesuvius in eruption.

1832. *January*, Earthquake in the Apennines, felt at Rome. The eruption of Vesuvius ceased at that instant. Earthquake along the Rhine.

March, Earthquake at Venice.

July, Vesuvius in eruption.

September, Earthquake at Poictiers.

November, Earthquake at Bermuda. Wells very dry; unusually low tide. Etna in eruption. ‡

December, Vesuvius in eruption.

1833. *January* 4th, 5th, and 6th, Earthquakes in South Wales, felt at Swansea, Neath, Llandovery, Fishguard; also felt at Exeter, and in Ireland. Shocks very severe, attended by a moaning and rushing sound, and great vibrations. 13th, Earthquake in Gothland, and at Dalarne, in Sweden. At the end of the month the iron mine at Fahlun fell in. Subterraneous noises, and the falling in of the mine continued till February.

February 8th, till *March* 27th, almost daily, Earthquakes at St. Kitt's, West Indies; felt in Nevis and Antigua. Shocks more severe than ever known. All the stores closed in consequence; the residents fled on board ship for safety. So much mischief not done since 1797. The commotion in Nevis so great as to have broken a great quantity of wine in the cellars at Mount Pleasant. In one night, a friend writes me word, there were twenty-four shocks.

March 31st, Earthquake at Horsham, Sussex.

April 4th, Undulating earthquake at Vicenza; bells tolled in the churches; people greatly alarmed.

N.B. During March and April (up to April 15.) the cholera ravaging Lisbon, Cuba, and West India Islands.

It will be observed that, since 1827, the greater part of Europe, and many countries of Asia and America, have been shaken by earthquakes; that Vesuvius and Etna have been

* I have mislaid the other memoranda which have reference to 1830, 1831, and 1832. They may form part of another communication.

† It is observable that on August 11. a violent hurricane from the south-west desolated Barbadoes and several other of the West India Islands, as Dominica and St. Vincent; and that on August 17. a most frightful storm passed over England, from the north-west to the south-east, being attended by thunder and lightning: celebrated by the loss of the Rothsay steamer.

‡ Dr. Daubeny (*Description of Volcanoes*, p. 214—216.) has given a table of correspondences between the eruptions of Vesuvius and Etna, to which these and one or two other instances in the present list might be safely added, especially the two violent eruptions April 27. and May 16. 1830.

in violent eruption, and frequently during the latter part of that period; and that there have been coincidences between those eruptions and earthquakes in distant countries; as, for instance, those of Nov. 1832. I wish it had been in my power to have rendered the list more complete: other coincidences between these volcanic phenomena and electrical appearances might then have been mentioned. But it may be observed here, that the occurrence of meteors in November and December, 1832, witnessed so simultaneously over a great part of Europe, corresponds with the eruptions of Etna and Vesuvius during those months; and that the brilliant appearances of the aurora borealis of the month of September, in 1826 and 1827, and Sept. 1828, seen throughout Europe, occurred during the prevalence of earthquakes; while that of May, 1830, widely observed on the Continent, was coincident also with the activity of Etna and Vesuvius.

It is during the period here employed that the cholera has been traversing the world; and it is singular that the period of its first rising into notice was marked by a striking occurrence of volcanic phenomena.* It is not my present purpose to allude here to the examples which might be quoted from India and the islands of the East. An example or two I shall quote by and by. But to all this it may be argued, that countries in which volcanic craters are situated are liable to earthquakes and eruptions; and that it is not extraordinary that the theatre of ancient convulsions should, in modern times, be visited by similar occurrences. I by no means dispute the validity of this argument; but my object has been, not to show that there has been any thing unusual as to the localities quoted, but to endeavour to illustrate a number of striking peculiarities in the kingdoms of nature by reference to a simple fact, the number and universally extending instances of volcanic agency during the existence of these peculiarities.

This is all I have attempted to prove: and if the subject be one of mere speculation, and without a correct foundation in science, nevertheless I hope the apposition of the alleged facts is not out of place in the pages of a magazine which

* The cholera made its first appearance at Jessore in August, 1817. It ravaged Bombay in 1819, traversed the Moluccas in 1822, and in 1830 broke out on the shores of the Caspian. Now, in 1816, the islands in the Indian seas were frightfully shaken by earthquakes, and in 1815 occurred the most awful eruption ever known, that of Sumbawa, which produced effects felt over an area of 1000 miles in circuit. In 1819 the country of Bombay was ravaged by the earthquake of Cutch; in 1822, Sumatra, Java, &c., were the scene of dreadful volcanic eruptions; and in the end of 1829 the countries on the Caspian were shaken by earthquakes.

levies its contributions from the whole round of natural phenomena.

It would be an interesting enquiry to ascertain, by comparison of undoubted records, whether any, and what, connection exists between the prevalence of former pestilential diseases and such phenomena as I have treated on: but this would require, especially with respect to very distant periods, the study of documents which, perhaps, either do not exist at all, or are altogether unworthy of esteem.*

It would appear, however, that the year 1822 offers an example connected with the period under consideration.

That year was celebrated by some extraordinary phenomena.

February 13th, to 24th, Vesuvius was in eruption by a new crater. 19th, Earthquake at Lyons, Paris, Geneva, Bellay, Chamberry, &c.†

October 22d, Vesuvius again in eruption. The account of this latter convulsion, which was of an unusual character, is well detailed in the *Journal of Science*, by Mr. Poulett Scrope (vol. xv. p. 175.), of which a similar account is given by Professor Lyell (*Principles of Geology*, vol. i. p. 340.) More than 800 ft. of the cone carried away, so that the mountain was reduced from 4200 ft. to 3400 ft.

November 19th, till end of *September*, 1823 (contemporaneous with eruptions in Iceland), Coast of Chile and the adjacent country, through a space of 1200 miles, elevated three or four feet, and desolated by a succession of earthquakes. 100,000 square miles of country elevated in level. (Vide *Geol. Trans.*, 2d series, vol. i. p. 415.)

1822. Aleppo destroyed by an earthquake; country elevated over a tract nearly 600 miles in circumference: 8000 lives lost. Rocks also elevated near Cyprus.

July 23d, After fifteen years' repose, the mountain of Gunung Beru Api, in Sumatra, in frightful eruption.

September, Continued earthquakes in the country between that volcano and Gunung Tallung, with noises that seemed to come from each alternately: the latter hill smoked, but had been long in repose.

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* It may be here mentioned, that the old chroniclers associate earthquakes, inclemency of the seasons, famine, and pestilence as the contemporaneous and united causes of distress to men and animals in England and other parts of Europe, during the reign of Edward the Confessor, about 1053; and it is no less remarkable that, to use the words of Dr. Lingard (*History of England*, vol. iv. p. 70.), "a succession of earthquakes, which shook the continent of Europe from Calabria to the north of Poland, ushered in the fatal year 1348; and though England escaped this calamity, it was deluged from the month of June to December with almost incessant torrents of rain." The historian describes the course of the pestilence of that year, as coming from Cathay (China), through Egypt, Greece, Italy, and France, to England: and in the character of the malady, as well as in its Indian origin, there is more similarity with the cholera than with any thing else. Query, Was it not that disease?

Whether the calamities of 1315, which were of a similar kind, had a similar connection, is not so easy to determine, but they were attended by great rains and unusual storms.

† Vide Bakewell's Travels, vol. ii. p. 61.

Mountain of Galoun-goung, in Java, not known before as a volcano, in terrible commotion: 4000 persons killed. Ashes, stones, and lava.

[N. B. During 1820 the volcano in the Isle of Banda was in eruption; and thus the convulsion of that district commenced earlier than 1822.]

October 8th to 12th (contemporaneous with the eruption of Vesuvius), Gounong-Gountour, in Java, in violent eruption. (Vide *Bulletin de la Société de Géographie*, Nov. 1829.) Dr. Daubeny says (*Description, &c.*, p. 316.) that the modern lavas of Java are very similar to those of Vesuvius.

December, 1821, to *June*, 1822 (contemporaneous with Vesuvius), Eyafialla Jokul, in Iceland, after a century's repose, in violent eruption.

Now, this year, 1822, was striking, as being the epoch of famine and pestilence in various countries, amongst which Ireland was conspicuous. A singular confirmation of the involved theory was the fact, that the year 1821 *, the intermediate year between the eruptions in Banda, Java, and Sumatra, was a fatal year for the inhabitants of those islands: the ravages of the cholera morbus were most terrible, the rice crop and that of the nutmeg failed entirely; and sickness ensued, in 1822, from the vapours poured forth by Galoung-Goung, a mountain like Gunung-Api, which is proverbially the cause of insalubrity and disease.†

As an illustration of this, I would refer to the eruption of Skâptar Yökul in Iceland, in 1783; when so much mephitic vapour was disengaged, that famine and pestilence spread over the land. Disease consumed the people, and the cattle were reduced to the extremity of feeding on each other. In two years, 9336 human beings, 28,000 horses, 11,461 cattle, and 190,488 sheep perished. (Vide Henderson's *Iceland*, vol. i. p. 275.)

The year 1829 ‡, in which, as may be seen above, there were such frequent earthquakes, especially in France, was celebrated in France by the occurrence of a continuance of storms to which there had been no parallel. Hurricanes, of almost tropical intensity, attended by thunder, hailstones of enormous magnitude, and rain, stripped trees and houses, and destroyed men and animals. Several leagues of land were irremediably ruined. The ravages of these tempests extended into Switzerland and Belgium. (For some of the particulars, see the *Annual Register*, July 1829.) That same year was the epoch of hurricanes in Ireland, and of the awful floods in Scotland, which took place in the month of August, and concerning which so much has been written. Now, is it

* The winter of 1821–2 was peculiarly mild in England.

† Vide Coup d'Œil sur l'Ile de Java, p. 314. 324.

‡ On the state of the weather during the winter of 1829–30; vide Mr. Jenyns's paper, *Mag. Nat. Hist.*, Vol. III. p. 538.

too vague to connect the existence of these tempests and earthquakes concurrent in France; or is it altogether hypothetical to say that the storms in Ireland and the floods in Scotland, being the result of meteoric causes, form part of the evidence in the endeavour to establish a connected series of facts? I myself was witness to the almost hourly succession of the thunder-storms in Belgium during the month of July, 1829; and I could adduce evidence of more careful observers, to show, that those storms were not only unusual in number, in even that *thunder-land*, but more than ordinarily fearful in character. Prussia, also, in that year, was visited by extensive inundations.

But these remarks have already extended to an extravagant length. Future observation may, however, justify such a dwelling upon the subject; and if these remarks shall induce that observation, the end of their publication will be answered.

I am, Sir, yours, &c.

Parkstone, May 11. 1833. W. B. CLARKE.

Since the above was committed to the press, the following additional facts have come to my knowledge; and, as some of them illustrate what has gone before, it is better to append them now.

It appears that an unusual quantity of ice has been disengaged, and at an early period, from the coast of Greenland; and that several vessels have been lost in consequence. On May 9. the Harvest Home was struck and staved in by an iceberg; and the crew were taken from a boat by the Lima, when herself entangled in ice, on May 13., 400 miles from Newfoundland, in lat. 46° 20′ N. and long. 45° 50′ W. Vessels, also, have been fifty-one days on the passage from Halifax to St. John's.

This disengagement of the ice is sufficient to account for the sudden change of the weather alluded to about the date of the equinox, and in April.

But that the season, on the whole, has been unusually warm (more so, perhaps, than any on record), is proved by the following facts: —

On February 2., the cholera was raging fearfully at Madras; and it was attributed (though I only quote this to illustrate the weather) to a long drought.

Up to March 20., the colony of the Cape of Good Hope were suffering from an unusually long continuance of dry weather.

In England, and parallel latitudes, up to the end of April, there has, on the contrary, been an excess of rain. Since then, the weather has been extremely dry and hot.

Haymaking commenced in Berwickshire on the 19th of May. Green peas appeared in Covent Garden Market on May 14. (See *Gard. Mag.*, vol. ix. p. 382.); and it is said that, but for the frosty nights of April 12—19., they would have been ready by May 10., within five days of the earliest period known.

On May 24., the springs were so low in London that the pumps were dry. At Durham, on that day, the thermometer was 70° (Fahr.) in the shade; and no rain had fallen for a month. A north-east wind, on the 27th, reduced the temperature to 59°.

In Holland, the heat, in May, was excessive. On the 17th, at Amsterdam, the thermometer stood at 84°; at the Hague, same day, 80°; a thunder-storm followed.

On May 2., the river Bug was so low, that one hundred and forty barges were detained, on their way to Dantzic, for want of water.

On the same day, three shocks of an earthquake occurred at Trinidad.

On May 3., the ice was suddenly driven down the Neva, from Lake Ladoga; and all the bridges, in consequence, were carried away.

The whole of the above facts, though the ice may have brought cold with it, point out some extraordinary terrestrial heat.

As a singular coincidence with the occurrence of earthquakes, it may be mentioned, that, on Feb. 19., whilst the latitude of 22° *north* and 79° *west* long. was shaken by earthquakes, the ship Columbia, from Batavia, was visited by a contemporaneous hurricane in 22° *south* lat. and 79° *east* long.; a circumstance particularly curious.

The 11th and 12th of June have been rendered remarkable by a hurricane, which has left too recent evidences to require further observation. All along this coast, its ravages are very great. The trees and shrubs are burnt and withered by the wind. I have, in this instance, seen the same effects of salt spray, as mentioned above, under the date of March 22. This hurricane was preceded, on the previous day, which was very hot, by a sea fog driving up Poole harbour from the north-eastward; directly contrary to the wind, which, on that day, as on the 11th and 12th, was from the south-west. If my conjectures be founded on fact, we shall, perhaps, hear of some convulsion elsewhere.

It is known that, in June, 1780, a similar hurricane occurred; and, at that time, Etna, and Volcano (one of the Lipari Islands), were both in eruption.

Parkstone, June 17. 1833. W. B. C.

ART. II. *The Habits of the Pheasant.*
By CHARLES WATERTON, Esq.

THIS splendid well-known inhabitant of our woods and plains is generally supposed to have come from Asia, though the time of its arrival in this cold and cloudy climate seems to be quite unknown.

A variety of this bird, sometimes spotted and sometimes milk-white, appears among the other pheasants, and breeds with them. I have never yet been able to perceive that it continues its white or varied plumage to the offspring. The plumage of the white or pied pheasant seems purely accidental, and is produced by a male and female of ordinary colours. The ring-neck pheasant, so common in the more northern parts of the kingdom, is never seen in this immediate neighbourhood.

By the laws of England, the pheasant is considered game; and the sportsman is under the necessity of taking out a licence from government, in order to qualify himself to shoot it. When we consider the habits of this bird, we are apt to doubt of the propriety of placing it under the denomination of *feræ naturâ*; and I am one of those who think that it would be a better plan to put it on the same footing with the barn-door fowl, by making it private property; that is, by considering it the property of the person in whose field or wood it may be found. The pheasant is a more than half-reclaimed bird. While the hare and the partridge wander in wildest freedom through the land, heedless of the fostering care of man; the bird in question will come to us, at all hours of the day, to be fed. It will even sometimes associate with the poultry on the farm; and, where it is not disturbed, it will roost in trees, close to our habitations.

Its produce with the barn-door fowl is unprolific, and seems to have nothing to recommend it to our notice on the score of brilliancy of plumage, or of fineness of shape.

The pheasant crows at all seasons, on retiring to roost. It repeats the call, often during the night, and again at early dawn; and frequently in the daytime, on the appearance of an enemy, or at the report of a gun, or during a thunder-storm. I am of opinion that it does not pair. The female lays from seven to eighteen eggs; but in general the nest

contains about twelve. [On the pheasant's precaution to conceal its nest and eggs on leaving them for a short time, Mr. Waterton has incidentally communicated most interesting information, not repeated in this paper, in his description of the "Habits of the Carrion Crow," p. 212—214.—*J. D.*]

Notwithstanding the proximity of the pheasant to the nature of the barn-door fowl, still it has that within it which baffles every attempt on our part to render its domestication complete. What I allude to is, a most singular innate timidity, which never fails to show itself on the sudden and abrupt appearance of an object. I spent some months in trying to overcome this timorous propensity in the pheasant, but I failed completely in the attempt. The young birds, which had been hatched under a domestic hen soon became very tame, and would even receive food from the hand, when it was offered cautiously to them. They would fly up to the window, and would feed in company with the common poultry. But, if any body approached them unawares, off they went to the nearest cover, with surprising velocity. They remained in it till all was quiet, and then returned with their usual confidence. Two of them lost their lives in the water, by the unexpected appearance of a pointer, while the barn-door fowls seemed scarcely to notice the presence of the intruder. The rest took finally to the woods, at the commencement of the breeding season. This particular kind of timidity, which does not appear in our domestic fowls, seems to me to oppose the only, though, at the same time, an insurmountable, bar to our final triumph over the pheasant. After attentive observation, I can perceive nothing else, in the habits of the bird, to serve as a clue by which we may be enabled to trace the cause of failure in the many attempts which have been made to invite it to breed in our yards, and retire to rest with the barn-door fowl and turkey.

Though a preserve of pheasants is an unpopular thing, still I am satisfied, in my own mind, that the bird cannot exist in this country without one. At the same time, I am aware that a preserve may be overdone. Thus, hen pheasants are reserved for a day of slaughter, under the appellation of a *battu*, the regular supply of the market is endangered, the diversion has the appearance of cruelty, and no good end seems to be answered. It exposes the preservers of pheasants, in general, to the animadversions of an angry press, which are greedily read, and long remembered, by those whose situation in life precludes them from joining in the supposed diversion. However ardently I may wish to protect the

pheasant in an ornithological point of view, — I say ornithological, for its flesh I heed not, — still, I am fully aware that the danger to be incurred, and the odium to be borne, are mighty objections. We read, that the ancients sacrificed a cock to Æsculapius: perhaps the day is at no great distance, when it will be considered an indispensable act of prudence, for the country gentleman to offer up his last hecatomb of pheasants at the shrine of public opinion.

The more we look into the habits of the pheasant, the more we must be persuaded that much more attention ought to be paid to it than is generally paid to other kinds of game. The never-failing morning and evening notice which it gives of its place of retreat, together with its superior size, cause it to be soon detected, and easily killed. The tax, too, which government has put upon it, enhances its value as an indispensable delicacy at the tables of those who give good cheer. In fact, few are the autumnal and winter dinners of the wealthy where a roasted pheasant does not grace the second course. The fowling-piece of the nocturnal poacher is the most fatal weapon used for its destruction. The report of a gun, or a clap of thunder during the night, will often cause the pheasant to begin to crow, as I have already stated; and this greatly endangers their safety. When once they are frightened from their roost, they never perch again during the remainder of the night; but take refuge among the grass, and underneath the hedges, where they fall an easy prey to the cat, the fox, and the stoat. A poacher armed with a gun finds a cloudy night fully as good for slaughter as one in which the moon shines; and, if larch trees grow in the wood, to these he resorts; knowing, by experience, that the pheasant prefers this kind of tree to any other. The larch suits pheasants admirably, on account of its branches growing nearly at right angles from the stem. This renders the sitting position of the birds very easy. I consider the smoking of pheasants, while they are roosting in the tree, as a mere idle story. I myself ought to be a pretty good hand at poaching; still, I am obliged to confess that I have never been successful, in one single instance, in the many attempts I have made to bring down the pheasant from his roost by the application of a smoking apparatus. Indeed, when we reflect that the mouth of the bird is always shut during sleep, and that both it and the nostrils are buried in the dorsal feathers, we are at a loss to conceive how the smoke can enter them, and cause the bird to fall in stupefaction. If smoking were a successful method, depend upon it the poachers would never be such noodles as to use a

gun; the report of which is sure to bring an attentive keeper up to the scene of their night's diversion.

To the illegal possession of the pheasant, alone, may be traced the cause of all the sanguinary nocturnal conflicts between the poachers and those who are appointed to watch for its safety. The poacher is well aware that he cannot procure pheasants without the aid of a gun; and he knows, at the same time, that the report of that gun will betray him, and bring up the watchers, against whom he would have no chance, single-handed. Wherefore, in order that he may come off victorious, he musters an overwhelming force of tinkers, cobblers, masons, smiths, and labourers, armed with bludgeons, and, perhaps, here and there a rusty gun. Taking the precaution to get well primed with beer, off they go, fully bent on having every thing their own way. The pheasants fall; the watchers come up; oaths and curses are poured out, and a desperate fray commences. Here are furnished, work important for the nearest magistrate, profit to his clerk, expense to the county, and practice for Mr. Ketch. Let it be here observed, that the unlawful capture of the hare and the partridge (which are really *feræ naturâ*) does not produce similar work of mischief. These are taken with nets and snares. The fewer poachers employed, the more certain is their success. A number of men would only do harm, and mar the plan of capture. So silently is this mode of poaching carried on, that the owner of the soil is not aware of the loss he is about to sustain in the plunder of his game. When his hares and partridges are actually on their way to the dealer's shop, he, "good easy man," may fancy that they are merely on a visit to his neighbour's manor, or that the fox and the polecat may have made free with them. Not so with regard to the capture of the pheasant. The mansion is sometims beset; guns are fired close to the windows; females are frightened into hysterics; and, if the owner sallies forth to repel the marauders, his reception is often the most untoward and disagreeable that can well be imagined.

Having now treated of the pheasant, and the mode which is adopted for its destruction, I will draw upon the reader's time a little longer, by proposing a plan for its propagation and protection.

Pheasants would certainly be delightful ornaments to the lawn of the country gentleman, were it not for the annoying idea that, any night, from November to May, he runs the risk of getting a broken head, if he ventures out to disturb the sport of those who have assembled to destroy them. There

must be something radically wrong in the game laws. How or when those laws are to be amended, is an affair of the legislature. The ornithologist can do no more than point out the grievance which they inflict upon society, and hope that there will soon be a change in them for the better. But to the point. Food and a quiet retreat are the two best offers that man can make to the feathered race, to induce them to take up their abode on his domain; and they are absolutely necessary to the successful propagation of the pheasant. This bird has a capacious stomach, and requires much nutriment; while its timidity soon causes it to abandon those places which are disturbed. It is fond of acorns, beech mast, the berries of the hawthorn, the seeds of the wild rose, and the tubers of the Jerusalem artichoke. As long as these, and the corn dropped in the harvest, can be procured, the pheasant will do very well. In the spring, it finds abundance of nourishment in the sprouting leaves of young clover; but, from the commencement of the new year till the vernal period, their wild food affords a very scanty supply; and the bird will be exposed to all the evils of the vagrant act, unless you can contrive to keep it at home by an artificial supply of food. Boiled potatoes (which the pheasant prefers much to those in the raw state) and beans are, perhaps, the two most nourishing things that can be offered in the depth of winter. Beans, in the end, are cheaper than all the smaller kinds of grain; because the little birds, which usually swarm at the place where pheasants are fed, cannot swallow them; and, if you conceal the beans under yew or holly bushes, or under the lower branches of the spruce fir tree, they will be out of the way of the rooks and ringdoves. About two roods of the thousand-headed cabbage are a most valuable acquisition to the pheasant preserve. You sow a few ounces of seed in April, and transplant the young plants, two feet asunder, in the month of June. By the time that the harvest is all in, these cabbages will afford a most excellent aliment to the pheasants, and are particularly serviceable when the ground is deeply covered with snow. I often think that pheasants are unintentionally destroyed by farmers during the autumnal seedtime. They have a custom of steeping the wheat in arsenic water. This must be injurious to birds which pick up the corn remaining on the surface of the mould. I sometimes find pheasants, at this period, dead in the plantations, and now and then take them up, weak and languid, and quite unable to fly.

I will mention, here, a little robbery by the pheasants, which has entirely deprived me of a gratification I used for-

merly to experience in an evening's saunter down the vale. They have completely exterminated the grasshoppers. For these last fourteen years I have not once heard the voice of this merry summer charmer in the park.

In order to render useless all attempts of the nocturnal poacher to destroy the pheasants, it is absolutely necessary that a place of security should be formed. I know of no position more appropriate than a piece of level ground, at the bottom of a hill, bordered by a gentle stream. About three acres of this, sowed with whins, and surrounded by a holly fence, to keep the cattle out, would be the very thing. In the centre of it, for the space of one acre, there ought to be planted spruce fir trees, about fourteen feet asunder. Next to the larch, this species of tree is generally preferred by the pheasants for their roosting place; and it is quite impossible that the poachers can shoot them in these trees. Moreover, magpies and jays will always resort to them at nightfall; and they never fail to give the alarm, on the first appearance of an enemy. Many a time has the magpie been of essential service to me, in a night excursion after poachers. If there be no park wall, an eye ought to be kept, from time to time, on the neighbouring hedges. Poachers are apt to set horse-hair snares in them; and these villanous nooses give the pheasants apoplexy. Six or seven dozen of wooden pheasants, nailed on the branches of trees, in the surrounding woods, cause unutterable vexation and loss of ammunition to these amateurs of nocturnal plunder. Small clumps of hollies, and yew trees with holly hedges round them, are of infinite service, when planted at intervals of 150 yards. To these the pheasants fly, on the sudden approach of danger during the day, and skulk there till the alarm is over. When incubation is going on, the diurnal poachers make great havoc among the pheasant's eggs. They sell sittings of them for five shillings (and sometimes for ten, if the risk in procuring them be great), to gentlemen in towns, who place them under bantam hens. If to these arrangements for protecting pheasants there could be added a park wall from nine to ten feet high, and including about 250 acres, consisting of wood, meadow, pasture, and arable land, the naturalist might put all enemies at defiance, and revel in the enchanting scene afforded by the different evolutions of single pairs, and congregated groups of animated nature. Unmolested by packs of hounds, unbroken in upon by idle boys, and unannoyed by stray cattle, and by those going in search of them, his wildfowl would never desert the pool till their day of migration arrived; and his pheasants (except for the

purpose of incubation, and then in no great quantities) would seldom rove beyond the protected enclosure.

The teal and wigeons stay with me till the last week in April; long after the pochards and the main flocks of mallards have winged their flight to northern polar regions; and a white male pheasant has taken up his abode here, for seven years, without having been once seen to wander half a mile from the house.

Birds thus protected have very different habits from those which are exposed to the caprice and persecutions of man. When the ornithologist pays attention to them, in their safe retreat, where they can follow, without molestation, the impulse of that instinct which has been so bountifully given to them, he will have great cause to suspect that there is many an error, and many a false conclusion, in the works which we have at present, on the habits and economy of the feathered race. These errors are, no doubt, quite unintentional on the part of the writers on British ornithology; and can only be corrected by great care, and a frequent personal attendance at those places where birds are encouraged and befriended.

CHARLES WATERTON.

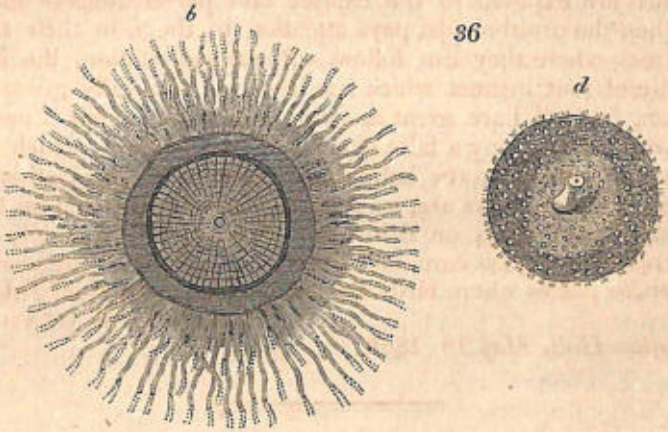
Walton Hall, May 18. 1833.

ART. III. *Descriptions and Figures of some Marine Animals.* By Mr. ANDREW MATHEWS. With Remarks by a Contributor.

MR. MATHEWS is an intelligent collector of natural productions in South America. He is frequently mentioned in the *Botanical Miscellany* of Dr. Hooker, and has received the high compliment, from that illustrious botanist, of having his name commemorated in a new genus of plants, Mathéws*ia*. The following figures were communicated to us in a letter dated "Lima, February 8. 1831;" but as the descriptions which accompany them are very short, and in several respects imperfect, it has become necessary to add a few remarks, which, though far from satisfactory, may render them more useful to our readers. Before, however, we proceed to this examination, we will quote a passage from the letter, since it confirms the accuracy of the observations of an esteemed correspondent. "During my passage," says Mr. Mathews, "from England to Chile, thence to the Friendly Islands, and back to Lima, I paid some attention to the luminosity of the sea, and had extracted some remarks from my journal, with an intention of sending them to you; when, upon looking over

the first twenty Numbers of the *Magazine of Natural History*, I find the subject has been so ably and correctly treated on by Mr. Baird [Vol. III. p. 297—392.], that what little I can add would be merely repeating his opinions. Instead of doing this, I only send you some figures and short descriptions of some animals which I discovered in the course of my investigations." [Mr. Baird has subsequently communicated another valuable paper on this subject, published in Vol. IV. p. 500.]

b *36* *d*



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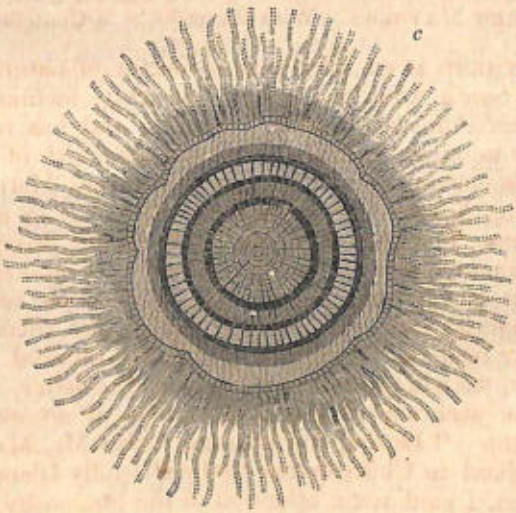


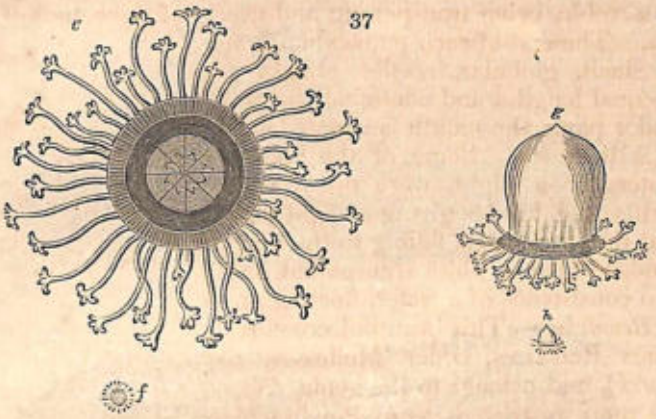
"*Fig.* 36., *b* and *c* are drawn of the natural size and colour. When floating in the water, the tentacula are not

observable, being transparent, and nearly of the colour of the sea. The end of each tentaculum is furnished with two rows of small, globular, sessile glands. The tentacula are of unequal lengths, and continually in motion. *Fig.* 36. *d* is the under part: the mouth is situated in the centre, in the form of a little sac. Some of the above, which I kept in salt water for a night, were dissolved by morning; the tentacula and border giving a slight purple tinge to the water, and the brown part falling to the bottom like small grains of sand, leaving a white transparent substance, about the size and consistence of a wafer, floating on the water." — *A. M.*

Remarks. — This beautiful creature is a kind of sea jelly (class Radiaires, order Mollosses, section Anomales, *Lamarck*), and belongs to the genus Pórpita of Lamarck, or to the more restricted genus Polybrachiònia of the Rev. Lansdown Guilding. In the third volume of the *Zoological Journal*, p. 404., this enthusiastic naturalist has described a species nearly related to the one now figured, which possibly may have been hitherto unnoticed. The centre of *fig.* 36. *b* is buff orange streaked with yellowish brown, encircled with a narrow band of China blue, and a broader one of Berlin blue; and from this the arms seemed to radiate. In *fig.* 36. *c* the centre is imperial purple, marked with two dark circular bands, and with numerous radiating lines, and bounded by a pale circle, exterior to which there is a China blue line, and then a pale blue circle edged with a neat somewhat indented and scored border. The inferior surface (*d*) seems imperfectly drawn: it is of a wood-brown colour, roughened with numerous small tubercles; the mouth projecting from the centre in the form of a short cylindrical proboscis.

I am inclined to consider this species distinct from the Polybrachiònia Linnæàna of Mr. Guilding. In the latter, the glands on the arms are stalked, and more diffused along the margins; in ours, the glands are sessile, and almost confined to the summits. There are some differences in colour, which are obviously, however, of no importance; and the absence of the proper tentacula from the ventral surface, in *fig.* 36. *d*, cannot be reckoned upon as a distinctive character, as it is probable they have been broken off when the creature was captured. Whether it is the same as the Pórpita glandífera of Lamarck, I have not the means of determining. — *N.*

" *Fig.* 37. *e* is a magnified representation of *f*. In this the tentacula were less numerous, 4-partite at the end, each division being furnished with only a single gland. *g* is the magnified representation of *h*, furnished with a transparent inflated sac; tentacula the same as *e* and *f*. These were all taken up in lat.



3° 8′ S., and long. 25° 52′ W.; and I believe them to be all luminous. Upon disturbing the water in the dark with the finger, the water gives out sparks, the same as observed in the sea." — *A. M.*

Remarks. — The centre of *e* is greenish blue, marked crosswise with eight darker lines, and with an octangular spot in the middle. The inner circle is indigo blue, and the outer one greenish blue, scored with darker lines. The arms are a faint blue, obtaining a deeper tint in the glands. The circular band in *g* is greenish blue.

From the exact similarity of the arms, it is obvious that these figures represent the same species of sea jelly; and I suppose it is referable to the same genus as the preceding. If this supposition be admitted, *g* must be drawn in a reversed position; for the "transparent inflated sac" is the mouth in a state of inflation, and the mouth in all these animals is inferior. There are some of the regular Medùsæ, e. g., Æquòreæ and Dianæ`æ, which have a clear gelatinous body, similar to *g*; but Mr. Mathews's comparison of it to a sac, and the fact that the Polybrachiònia has a purse-shaped and extensile mouth ("os inferum, centrale, bursiforme, extensile," *Guilding*), along with the arrangement of its glanduliferous arms, incline me to consider this animal as a Polybrachiònia, which cannot be better named than by denominating it, in honour of its discoverer, P. Mathéws*ii*. — *N.*

"*Fig.* 38. *l* is very commonly met with at sea: *m* is the under part, showing its mouth and tentacula. It also possesses the power of stinging, similar to the Portuguese man of war." — *A. M.*

Remarks. — The figure agrees exactly with Lamarck's

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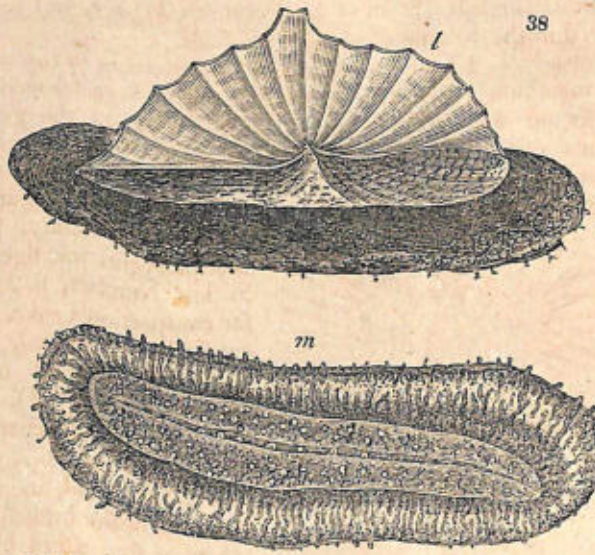

description of the Velélla scaphídia of Péron and Le Sueur (*Hist. Nat. des Anim. sans Vert.*, vol. ii. p. 482.) Velélla is a genus of irregular sea jellies, which stands between Physàlia * and Pórpita; and the species here figured, apparently with great accuracy, is one of the most beautiful and remarkable of its family. The dorsal crest is thin and transparent, spread out like a fan, lightly tinted with blue and pink, and the base marked with stripes and spots of green, blue, pink, and yellow. The back is of a uniform China blue, a little clouded with darker streaks, rivalling the corollas of the dwarf or vernal gentians [Gentiàna acaúlis *L.*, and *G.* vérna *L.*] in vividness of colour. The ventral surface is azure blue, or ultramarine, except the oblong space in the centre, which is a wood-brown, and appears to be roughened with numerous small tubercles or suckers. The tentacula originate from the blue portion of the ventral surface: they are very numerous, linear, and short, and of a fine blue colour. It is to be regretted that Mr. Mathews has told us nothing of its manner of swimming, &c.—*N.*

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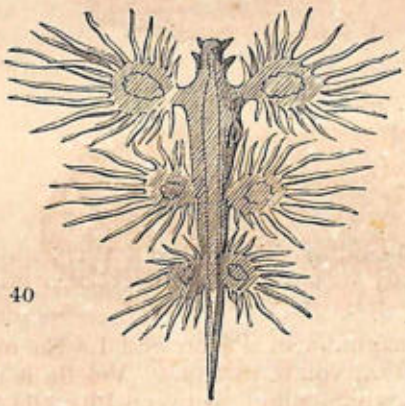
"*Fig.* 39. *k* is a beautiful little thing. It is described in

* See a good figure and description of Physàlia pelágica, the Portuguese man of war, in *Mag. Nat. Hist.* vol. iv. p. 475.

the third English edition of La Pérouse's *Voyage*, and is also figured in the volume of plates." — *A. M.*

Remarks. — I have no opportunity of referring to the work just mentioned; but the figure represents a gasteropodous molluscum with naked branchiæ, belonging to the genus *Glaúcus* of Cuvier. One species has been long known and frequently figured: it is the *G.* hexapterýgius; and no one has mentioned it without some expression of admiration at its elegance and beauty. [*G.* hexapterýgius was figured in last Number, p. 237.: for conspection's sake, the cut is here repeated, *fig.* 40.] The animal now figured (*fig.* 39. *k*), is equally elegant and charming. The dark lines, the spots on the head, and the filaments of the branchiæ, are of a fine azure blue colour, while the rest of the body is tinted with pale blue and pink. It differs from the hexapterýgius in having only two pairs of fan-shaped branchiæ, and the filaments in each are much fewer in number; and these characters, I think, determine it to be the *Glaúcus* tetrapterýgius of Rang, which, so far as I am aware, has not been previously figured. *



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"Pauca hæc vidimus operum Dei!"

[We have seen these few of the works of God.]

April 10. 1833. N.

* Besides the figures given above, and so ably explained by "N.," Mr. Mathews sent three others, lettered *a*, *i*, *j*. Of these "N." thought it unnecessary to engrave or notice that lettered *a*, which appears to be only *b* with its central part more enlarged; and on *i* and *j* he remarks, "I believe them to be only pieces of an animal." This information may be useless to our readers generally, but will not be so to Mr. Mathews, who closes his letter with this remark: —"In this part of the world, books are among the scarcest articles, especially books on natural history. I have therefore been unable to ascertain if they (the figures sent) are all known, or if they have been published. I should feel obliged to any contributor who has the means of ascertaining their names, to inform me of them through the pages of the *Magazine of Natural History*, the receipt of which, in this part of the world, is one of the greatest treats to me." Repeated notices of the rich gathering of Messrs. Mathews and Bridges, and other collectors in South America, are registered in parts viii. and ix. of Hooker's *Botanical Miscellany;* and at tab. xcvi. (part viii.) is figured that plant, Mathéwsia foliòsa, which Messrs. Hooker and Arnott have named

ART. IV. *Illustrations in British Zoology.* By GEORGE JOHNSTON, M.D., Fellow of the Royal College of Surgeons of Edinburgh.

12. DIANÆ'A BAI'RDII. (*fig.* 41.)

Cl. Radiàta, Ord. Móllia, Fam. Medùsidæ.

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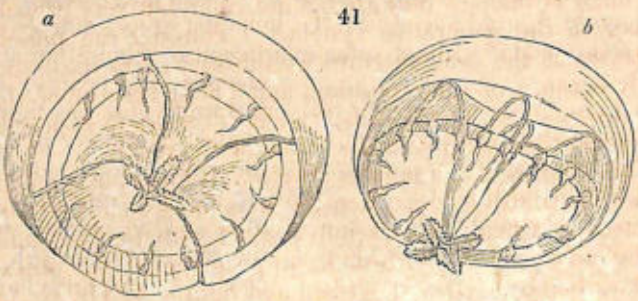


THE specimen here delineated of this beautiful species of Medùsa, or sea jelly, was taken in Berwick Bay on the 27th of September, 1832, floating on the surface of the water, in which it moves by alternate contractions and dilatations of the circumference of the body. Our figures represent it of the natural size, the first (*a*) being a view of it when looked on from above; the second (*b*) when looked on from below. It is a semiglobular mass of a perfectly translucent and almost colourless jelly, divided, by four opake milk-white narrow ligaments, or bands, into four equal compartments. These bands arise at the angles of the mouth, and are at first very fine, but become broader and somewhat curled in their course towards the upper surface. The very delicate membrane investing the body is folded at the margin, which is furnished with a circle of rather distant tapered white tentacula. In our specimen there were thirteen of these. The under side is produced in the middle, so as to form a kind of stalk, at the apex of which is the mouth, of a square form, and encircled with four white plumose branchial appendages. When magnified, these are shown to be formed of a thin membrane, beautifully but irregularly folded like a frill, and edged with a neat thickened border.

Dianæ'a Baírd*ii* seems to be invested with two membranes of great tenuity. The outer one covers all, like as it were a a glass inverted over a smaller globe, the intermediate space being occupied with a consistent but colourless jelly, in which neither vessels nor membranes can be distinguished. This

(p. 140.) in honour of Mr. Mathews. On tab. cii. (part viii.) is figured Bridgèsia spicàta, which Messrs. Hooker and Arnott have named (p. 168.) in honour of Mr. Bridges. — *J. D.*

coat forms two loose folds around the circumference, from the innermost of which the tentacula arise; and the inner coat is probably a continuation of the outer reflected upwards; but it is not a simple membrane, since several laminæ can be perceived to cross the body. The white crucial bands adhere to this inner envelope: they are not muscular, but very probably belong to the generative system. I consider the plumose processes at the oral aperture as subservient to respiration, partly because of their position, and partly because of their folded structure; intended, as it appears to me, to expose the largest possible surface to the action of the water.

This Medùs*a* is a luminous species. It gives out a copious light of a whitish colour when the water in which it swims is agitated, or when it comes into contact with foreign bodies. In the possession of this wonderful property it resembles the Medùs*a* hemisphæ'rica, described and figured by Dr. Macartney in the *Philosophical Transactions* for 1810, p. 267.; but differs otherwise in too many particulars to permit us to consider it as the same species. If the readers of this Magazine will turn to the figure of the Medùs*a* hemisphæ'rica, given in Vol. III. p. 313. fig. 82. *e*, they will perceive that our animal is vastly larger; has much fewer tentacula pendent from its circumference; has a more produced peduncle, which, instead of being divided into four equal "tentacula, covered with little cups or suckers, like those on the tentacula of the cuttlefish," is not divided at all, but provided with plumose appendages. With these differences I think myself justified in describing it as a distinct species, which I have taken the liberty of naming in commemoration of my friend Mr. William Baird, surgeon to the Berwickshire East Indiaman, and the author of several interesting papers in this Magazine [Vol. II. p. 208., Vol. III. p. 308., Vol. IV. p. 475. 500.], two of which are descriptive of luminous animals: and Mr. Baird deserves the compliment the more, as, in fact, one of the Medùs*æ* described by him, but not named, appears to be this species in an early stage of its existence, for it was only about the size of a small pin's head.

The character of the species may be thus given: —

1. D. hemisphæ'rica. — Hemispherical, crossed in an arched manner with four opake lines; margin of the umbella undivided, surrounded internally by a row of pale brown spots, and numerous small tentacula; central process divided into four segments covered with suckers. Medùs*a* hemisphæ'rica, Macartney in *Phil. Trans.* 1810, part ii. p. 267. tab. xv. fig. 5, 6.; Loudon's *Mag. Nat. Hist.*, vol. iii. p. 313. fig. 82. *e*. Geryòn*ia* hemisphæ'rica, Flem. *Brit. Anim.* 500. — *Hab.* Coasts of

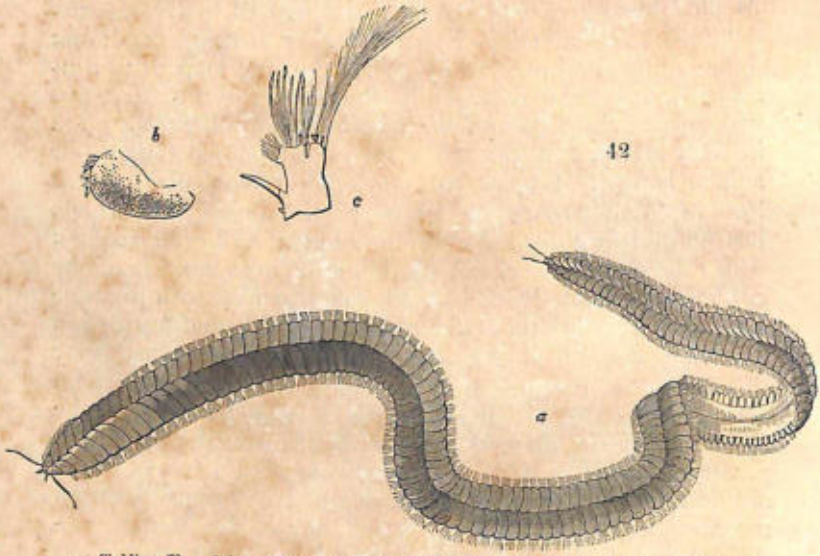
Britain in autumn. Herne Bay, upon the northern coast of Kent. *Macartney.*

2. D. Baírd*ii*.—Hemispherical, crossed in an arched manner with four white bands; margin of the umbella undivided, spotless, encircled with about thirteen tentacula; central process furnished at the aperture with four plumose appendages. Medùs*a*, Baird in Loudon's *Mag. Nat. Hist.*, vol. iii. p. 312. fig. 81. *h.*—*Hab.* Straits of Banca, *W. Baird.* Berwick Bay, *G. J.*

Berwick upon Tweed, October 12. 1832.

13. Siga'lion *Bo'a*. (*fig.* 42.)

I offer, for the first time, to British naturalists, a native representative of Sigàlion, a genus of annulose worms established by MM. Audouin and Milne Edwards, for such spe-



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a, Sigàlion *Bo*a, of the natural size; *b*, a scale enlarged; *c*, side view of a foot magnified.

cies of the aphrodite family as have a greatly elongated body, and cirrhi to all the feet. One species is indicated by Cuvier in the *Règne Animal*, vol. iii. p. 207.; but, as the name only is given, I cannot say in what respects it agrees or differs with the one now figured. (*fig.* 42.)

The body is long, linear, flattened, slightly tapered towards the tail, the anterior extremity obtuse and somewhat rounded. Back covered with two rows of close scales of an ash colour; but, as some of the scales are often paler or whitish; the body then appears piebald. Mouth inferior, furnished with a re-

tractile proboscis, about an inch long, cartilaginous, cylindrical, marked with a pale line along each side, and some fine transverse lines, armed near the apex with four triangular, acute, horny teeth, placed round at equal distances; and exterior to these there is a series of corneous serrated plates, which form, in fact, a circular saw at the entrance. Palpi two, setaceous, simple, half an inch long, arising above and at the sides of the mouth. Head minute, concealed by the rounded anterior pair of scales, without eyes, terminated in front with three short setaceous two-jointed tentacula, the central one larger and longer than the others. Scales overlapping, kidney-shaped, convex, roughish, cinereous; the concealed portion white, the outer and larger margin fringed with very delicate hairs and some short anomalous processes: there are probably not less than two hundred scales on each side, and they are affixed each to a fleshy process, from the outer end of which a tentacular filament is extruded, equal to the feet in number, and placed exactly above them. Feet extremely numerous, fleshy, cylindrical, obtuse, bifid; the upper branch terminated with a brush of long unequal hairs, and the under furnished with two rows of shorter bristles. Base of the foot armed with a spinous fleshy process, and with a small tubercle. Between the branches of the feet there are some processes like those on the edges of the scales. The hairs of the upper branch are setaceous, roughish, multiarticulate, non-retractile; those of the under are in part retractile, and have a curious claw-like joint at the end; in some short, in others long and sharply pointed. Tail terminated with two short filaments. Ventral surface pale, perlaceous, marked down the middle with a red vessel. Length, when at rest, 7 in. or 8 in.; when extended, not less than 10 in. or 12 in.

Sigàlion *Bòa* lives under stones, at low-water mark; and, in some parts of Berwick Bay, is found abundantly. When placed in a basin of sea-water, it appears sluggish; but it burrows in loose sand with much rapidity, being enabled to do so by the play of its innumerable feet. I much wonder what can be the use of the jointed claw-like bristles of these organs: even a probable conjecture does not occur to me. The worm is the Goliath of its race, and, I fear, the tyrant also; for its unprepossessing appearance seems to indicate a cruelty of disposition which the dreadful structure of its mouth confirms: so that I doubt not that, like the giants of our early story-books, he delights in blood, and makes his prey of every unwary worm that enters the same furrow, or shelters under the same stone.

Young individuals are generally of a light grey colour. I have described the cranial tentacula as being three in number, but I am not certain that the description is very accurate: sometimes I can see one only, and sometimes I think I can see more.

Berwick, March 20. 1833.

ART. V. *An Enumeration of the Land and Freshwater Shell Snails met with in some Rambles in Norfolk and Derbyshire; with a passing Mention of some other Natural Objects observed.* By the Rev. ANDREW BLOXAM.

Sir,

DERIVING much pleasure, a feeling doubtless partaken by many other of your subscribers, from the short rambling notes of Rusticus of Godalming, and other similar correspondents, I venture to send you a short notice of the different objects of natural history which have lately fallen in my way.

SHELL SNAILS AND SOME PLANTS MET WITH IN NORFOLK.

Being a resident at Harleston, in Norfolk, during part of the spring, I was astonished to find such multitudes of snail-shells as are to be met with about there, so far more numerous than I have seen in the midland counties, where I have hitherto chiefly resided. The way in which I account for their being so numerous is, 1st, the nature of the soil, which affords plenty of calcareous earth, which, I believe, is necessary for the construction of their shells; and, 2dly, the formation of the fences [generally of hawthorn], which afford protection to them during the winter; the quickset being placed on banks of earth, which are frequently raised two or three feet above the level of the fields, and abound in holes, into which the snails creep; and thus they are free as well from the intrusive attacks of the peering thrush and blackbird, as also from the severity of the season.

The Common Snail (*Hèlix aspérsa*; the names are taken from Turton's valuable little *Manual of British and Freshwater Shells*, which contains excellent coloured engravings of each of the 126 ascertained species) I found huddled together in troops of forty or fifty, fixed upon each other at the operculum, by means of a thick glutinous substance which the animal has the power of secreting; a large shell having sometimes three or four thus adhering to it. The snail

seemed to be drawn within the shell often half an inch or more. I generally found their nests in the hollow stump of a tree or large thorn, and often discovered traces of an enemy among them, as there were dozens of broken shells in snug and cozy spots, where one or perhaps a pair of thrushes had been regaling themselves with a treat. The variety, in colour, size, and marking, was great, as scarcely two were similar to each other.*

The Girdled Snail (*Hèlix nemoràlis*) I found but sparingly crawling out on the fine days in April, when the bank lay exposed to the warm rays of the sun.

In addition to these, I found Hèlix horténsis, arbustòrum, on low grounds near the river; carthusiàna, very common; ruféscens, caperàta, ericetòrum, nìtens, radiàta.

Of Freshwater Shells, I found, on a bank of sand in the river Waveney, below Shotford Bridge, the following different species: they had been left there by the floods, and several land shells were also among them. I collected these: — Cỳclas córnea, ámnica, and pusílla; A'nodon *cygneus*, *Mysca* pictòrum, Succínea amphíbia and oblónga; Planórbis carinàtus, marginàtus, vórtex, córneus, contórtus, and fontànus; Limnèus auriculàris, péreger, stagnàlis, palústris; Phỳsa fontinàlis; Valvàta obtùsa, spirórbis, planórbis; Paludìna vivípara, achátina, impùra, símilis; A'ncylus lacústris. Also these

* The Rev. Thomas Image, of Whepstead, near Bury St. Edmunds, has a collection of selected varieties of the shells of Hèlix aspérsa, nemoràlis, and perhaps other species. They are admirably cleaned and preserved, and mounted or fixed, singly or in pairs, according to size, on little square wood blocks or pavements (between two and three inches square, and perhaps more than half an inch thick), with a white or coloured ground, I have forgotten which, with which Mr. Image has paved the floors of the drawers in which he keeps these snails' shells. The shells were arranged in lines of (I think) the length, not breadth, of the drawer, and yet (I also think) in a quincunx order. Of each variety there was a row, and the varieties were of this kind: of Hèlix aspérsa, a row of shells devoid of the black band; a row with the black band present in a broad state; a row with it, in a narrow state; a row with (if I have not forgotten) two black bands present, &c. Of Hèlix nemoràlis I have forgotten every thing, save that the shells looked bright and beautiful, but as the bands or "girdles" on this pretty shell are very various, numerous distinct varieties might, and may, be at pleasure collected. I was surprised at the wide distinctness of the varieties of H. aspérsa, although, in gardening practice, I had killed thousands of individuals of it; which fact may show how instructive are conspective displays of many individuals of any kind of natural object. Mr. Image is much devoted to the study of objects of nature, especially of fossil remains, and of the last and other subjects has a rich collection of specimens, all which he was so kind as, with the greatest patience and pleasure, to show me, when I once called on him. — *J. D.*

Land Shells: — Bùlimus lùbricus, Achátina acícula, Vertìgo sexdentàta.

Plants. In Gawdy Hall Wood, in the neighbourhood, I found Orthótrichum Lyéll*ii*, growing upon several trees. In the same wood are also found *O*'phrys nìdus àvis, *L*áthyrus Nissòl*ia*, *D*ípsacus pilòsus. In a field adjoining Mendham Lane, *C*ròcus vérnus was very abundant. I was informed that Fritillària melèagris also grew there. At Shotford Bridge I saw Hottòn*ia* palústris; and above Mendham mill, a large patch of *Tùlipa* sylvéstris. In Weybread gravel pit I found one or two species of the fossil *E*chìnus, and numerous species of the more common mosses, with *Hý*pnum *a*lopecùrum, dendròìdes, and *f*ilícinum. I also found Tórtula rígida, Dícranum *a*diantòides, and Bartràm*ia* pomifórmis in the neighbourhood.

SHELL SNAILS AND OTHER NATURAL OBJECTS MET WITH IN DERBYSHIRE.

On my return into Derbyshire, I entered into an investigation of the land and freshwater shells in the park and neighbourhood of Calke Abbey, and discovered the following

Land Species: — Vítrina pellùcida, Hèlix nemoràlis, arbustòrum, ruféscens, caperàta, aspérsa, nìtens, híspida, radiàta, fúlva, pulchélla, brévipes; Clausília rugòsa, Bùlimus lùbricus and obscùrus, Achátina acícula, Carýchium mínimum (this is not uncommon among the roots of *Br*ỳum ligulàtum); Pùpa umbilicàta and edéntula. Most of the above I found under large stones, and in the crevices of the limestone rock, which is here very abundant.

Of Freshwater Species, I found A'nodon *cy*gneus, Cỳclas córnea, Succínea amphíbia, Planórbis vórtex, Limnèus péreger. In dragging the river Trent, between Repton and Swarkeston Bridge, I procured A'nodon *cy*gneus, *My*sca pictòrum, ovàta; Succínea amphíbia, oblónga (found on stalks of grass some feet from the water side); Limnèus péreger, palústris, fossàrius.

The Fish we captured were bream, barbel, roach, chub, pike, perch, eel, and trout.

[*Plants.*] In some ponds by the side of Swarkeston bridge, I saw *R*ùmex *H*ydrolápathum; and in Calke Park I found Lathræ'a Squamària, growing at the roots of old thorn trees.

[*Birds.*] The tree pigeon or stockdove (*C*olúmba *Œ*'nas) is not uncommon in the park: I have found their nests on one or two occasions. They were built in the hollow of a

tree, where a large branch had been originally broken off, and, the wet having penetrated, the wood had decayed and formed a large hole about 18 in. deep, at the bottom of which was the nest. One was in a tree of common maple (*Acer campéstre L.*), about 10 ft. from the ground. It was formed of a few small twigs, dried reeds, and straws; and contained two white eggs of a smaller size than those of the wood pigeon. The nuthatch is common here, and the lesser spotted woodpecker is occasionally seen.

I have duplicate shells of many of the above-mentioned species, and should be happy to make exchanges, for other British land and freshwater shells, with those of your correspondents who may be so disposed.

I am, Sir, yours, &c.

At Sir G. Crewe's, Bart., A. Bloxam.
Calke Abbey, Derbyshire, May 24. 1833.

Art. VI. *Some Remarks relating to the Fall of an aged Ash Tree.* By the Rev. W. T. Bree, M.A.

"Te, triste lignum, te caducum." *Hor.*
Thou luckless falling tree.

Sir,

The heavy gales of wind from the west and north-west, which prevailed in the early part of December last, inflicted upon me what I consider an irreparable loss. On the 3d of December, a large and very aged ash tree, completely enveloped with ivy, was blown up by the roots, crushing its humbler neighbours in its fall, and leaving in my shady walk a sad unsightly gap, "*hiatus valde deflendus,*" which it will require many long years to fill up, if, indeed, its place be ever again supplied with an object of equal beauty and grandeur. The tree bore the appearance of having formerly, at some distant day, been pollarded or lopped at about eighteen feet from the ground; and the trunk had certainly for many years been partially hollow, and in a state of decay, insomuch that the wasps occasionally constructed their nests within it, making their entrance just above the surface, through an orifice caused by the decay of one of the spurs. I had long been aware that the fatal day could not be very far distant, when this most picturesque object would be levelled with the ground; for it had for several years retained its hold in the earth, apparently, by little more than one main fang of its roots, aided by the large stem of

The Ivy (of greater thickness than a man's thigh), which, springing up directly on the opposite side, clasped the trunk, and acted like a backstay to keep it in its erect position; the ivy and the ash thus mutually supporting each other. Moreover, the ivy, towards the very top of the tree, formed so large and massive a head of persistent foliage, as to occasion the wind to have additional power against it, and cause the vessel, as it were, to carry too great a press of sail. In order to give some idea of the magnificence of this individual specimen of ivy, the finest, perhaps, on the whole, out of many extraordinary fine ones on the premises, I may mention that the men employed to cut up and clear away the windfall calculated that there was at least enough of the evergreen to form a good waggon-load or more, which now, alas! served no better purpose than to feed the sheep, to whom the shrub affords a favourite and wholesome repast. But to what purpose, you will ask, is this lamentation over my private loss, which can hardly be a subject of the slightest interest to you or any of your readers? I have, however, a motive in recording the circumstance, over and above the, perhaps, pardonable satisfaction I might naturally feel in offering a tribute to the memory of a departed favourite. All the catastrophes of nature are more or less interesting, were it only that they serve oftentimes to bring to light her hidden treasures, and present us with objects which otherwise would have escaped observation. An accidental landslip, for example, or the disrupture of an overhanging cliff, discloses the fossils and minerals embedded beneath the earth's surface. The bursting of a dam, and the consequent draining of the waters which were confined by it, expose to view the aquatic plants and animals which abound in that element. So, also (without multiplying examples), from the fall of my venerable ivy-mantled ash, may be gleaned, if I mistake not, some scraps and odd ends of natural history, not quite devoid of interest, perhaps, to others as well as to myself.

In the first place, if any doubt could remain upon the subject, I had, on this occasion, an incontestable proof of the injurious effects of

> "The ivy which had hid the princely trunk,
> And suck'd the verdure out on 't."

The decay of the tree, I feel no hesitation in believing, had, in some degree at least, been hastened and promoted by the close and pinching embraces of the parasite; the stems of which were tightly laced and plaited together, and in some places literally tied in hard knots round the smaller branches

of its foster-parent: and, accordingly, the effects of this strangulation were plainly to be seen in the deep weals or indentures imprinted in various parts, not merely of the bark, but of the solid wood of the tree itself. The foliage, too, had, in consequence, become scanty in quantity, and diminished in luxuriance; a circumstance, I may add, which served greatly to heighten the picturesque effect of the object. The ash foliage is at all times delicate and beautiful; and in the present instance, as it hung in light and airy festoons, backed and set off by the sable masses of ivy from behind, it might have vied in comparison with the choicest lace or needlework embroidered on a dark rich mantle of velvet. I have seen such repeated instances of the palpable injury produced by ivy upon timber trees, that, even putting aside the *à priori* probability of the case, as well as the testimony of antiquity, I cannot but feel surprise that the contrary opinion should ever have been seriously entertained. The lovers of landscape, I think, would be acting at least a more ingenuous part, were they undisguisedly to take up the defence of this charming evergreen on its own merits alone, and endeavour to preserve it from spoliation solely on the score of its intrinsic beauty and ornamental qualities*, rather than have recourse to the untenable position, that it does no injury (or even does good) to the trees it decorates.† Let us grant (if it be so demanded of us) that the ivy derives no nutriment, by means of its fibres or tendrils, from the tree to which it clings (though whether it may not do so in some slight degree may well be made a question); still, it must be admitted that the root, especially if it be a large one, impoverishes the soil more or less, by taking up some portion of the moisture which would otherwise go to the support of the timber tree. A dense impervious covering of ivy, too, must, one would suppose, be prejudicial,

* The following remarks are from Dr. Johnston's interesting *Flora of Berwick upon Tweed:* — "St. Pierre has said he never saw the ivy on the trunks of pines, firs, or other trees whose foliage lasts the whole year round. [With us it frequently envelopes firs, pines, holly, and other evergreens. — *W. T. B.*] It invests those only which are stripped by the hand of winter; and, when its protector has fallen a prey to death, it restores to him again the honours of the forest, where he lives no longer." (p. 209.)

"'Should aught be unlovely which thus can shed
Grace on the dying, and leaves on the dead?'
Bernard Barton." (p. 64.) — *J. D.*

† See a letter, in the 11th vol. of the *Linnean Transactions*, by H. Repton, Esq., in which he contends "that ivy is not only less injurious to trees than it is generally deemed, but that it is often beneficial." The facts adduced of timber trees attaining to a very large size, though profusely covered with ivy, are no conclusive proof of the beneficial effects of the evergreen. Trees so circumstanced *will* often thrive, and attain a large size; not, however, in *consequence* of the ivy, but in *spite* of it.

by excluding from the trunk and branches the light of the sun, and preventing a free circulation of air round their surfaces. Even practical woodmen, who maintain that ivy proves beneficial by "keeping the trees warm," have before now acknowledged to me that it is injurious to the bark; which, they allow, is hereby prevented from attaining its usual thickness and substance. But all this, it will be urged, is little more than mere theory and plausibility of argument, which ought to be employed cautiously and with a sparing hand in such a matter-of-fact affair as natural history. What I would chiefly insist on then, is the *fact*, that deep weals are often inflicted on the solid wood, positive grooves, occasioned by the tight pressure of the ivy.* Young trees, also, or at least trees

* Mr. Bree has sent a length of 6 in. of one of the branches, about 4½ in. in diameter, of the fallen ash tree, for the purpose of exhibiting the effect of the ivy's constriction on the ash tree's bark and wood. Into the bark and wood of the cylindrical log sent are impressed two weals or grooves, each an inch or more in breadth, and from half an inch to near an inch in depth; and the weals or grooves have a course so gently spiral, that not quite two coils take place on the log's length of 6 in. The depth of the grooves is, in part, produced by the bark and wood having, from the tightness of the ivy's constriction, risen, like the banks of a channel, into a ridge on each side the grooves which the branches of ivy, one in each, had first occasioned and then occupied. The bark of the ash at the bottom of these grooves is dead, dense from pressure, and scarcely the eighth of an inch in thickness: still the wood beneath it is quite alive.

That the ivy, and other twining shrubs, both deciduous and evergreen, do cause by their constriction more or less of injury to most of the trees and shrubs about which they entwine themselves, is not to be disputed. Shakspeare (as quoted by Smith in his *English Flora*, vol. i. p. 326.) has truly and tastefully remarked —

> " So doth the woodbine, the sweet honeysuckle,
> Gently entwist the maple."

Gentle, howsoever, as are the first embraces of the honeysuckle, and of other twining shrubs, while their stem or branch is yet tender, and, through its tenderness, powerless; they become, with the age, size, strength, hardness, and consequent incapacity for dilatation, of their stem or branch, effective agents of an obviously injurious constriction; for the coils of woody-stemmed twining plants are scarcely in any, perhaps in no, species enlarged in capacity so fast as is the diameter of the trunk, stem, or branch, which these coils encircle; that is, presuming the supporting tree or shrub to be in a healthy and freely growing condition.

Cowper, whose notices of nature are most accurate, gives coincident evidence, and most eloquently deposed, on this fact, in the following lines: —

> " As woodbine weds the plant within her reach,
> Rough elm, or smooth-grain'd ash, or glossy beech,
> In spiral rings ascends the trunk, and lays
> Her golden tassels on the leafy sprays;
> But does a mischief while she lends a grace,
> Straitening its growth by such a strict embrace."

Cowper was one of those whose mode of apprehending was such as

> " Draws us a profit from all things we see; "

of small dimensions, mere poles, are frequently to be seen clogged with ivy almost to suffocation, and their growth and vigour appear to be impaired accordingly.

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and he has "moralised this spectacle" into a "simile" replete with instruction "of great pith and moment;" which the reader will find in his poem on Retirement, whence the lines above are taken.

An instance of the fact which these lines describe, also, exists hard by the office of this Magazine. Mr. Loudon, in 1824, planted, in a shrubbery in his garden, a cherry tree, and at its foot a honeysuckle: both have since grown, and still are growing, together. The stem of the honeysuckle is spirally coiled about the stem of the cherry tree; and so much straitened into its bark and wood, as to be, in some of the coils, not only not prominent or in the least relief, but is even beneath the surface of the bark of the cherry tree, from the bark of the cherry tree's having risen up on each side of the constriction in the manner the ash tree's wood and bark had risen above the constricting branches of the ivy. The result of the progressive strangulation is, in conjunction with the cherry tree's being too much invaded by the shrubs about it, that, although it has been planted nine years, the stem of the cherry tree, at 3 in. from the ground, does not measure quite 9 in. in circumference; and the honeysuckle, at the same place, not more than 3 in. in circumference.

As another instance, I may mention that, in the old botanic garden at Bury St. Edmunds, an individual, of some little age, of that most interesting plant the Periploca græ'ca *L.*, whose pertinacity in twining is meant to be expressed in the word Periploca, was implanted at the foot of a young, healthy, and vigorously growing western plane tree (*Platanus occidentalis L.*). Both grew rapidly; and, in three or four years, the Periploca græ'ca had insculptured a deep and deforming spiral groove in the plane tree's trunk, from near the ground to the setting off of the spreading branches which form the umbrageous head of this large-leaved pleasing species of tree. I say a deforming groove, because, in the spaces between the coils of the groove, the plane tree's trunk had swollen out, and so had been deprived of that graceful tapering form which otherwise would have accrued to it. The stem of the Periploca græ'ca was, in the end, unless I am mistaken, broken transversely in two by the resistless increase in the diameter of the young plane tree's growing trunk.

On the instances of this natural insculpturing, as it may be called, which the woods, groves, and hedgerows occasionally supply, it may be noticed that they are usually appropriated and much prized by the tasteful in rustic matters, as eligible for walking-sticks, whip-handles, &c. These, it would appear, will oftener occur in such kinds of wood as maple, elm, ash, and beech: to these kinds may be added birch and hazel, and probably any other species of wood with which the twining shrub may happen to grow in contact. In gardens, the result seems effectible on any tree or shrub to which we may please to appose the twining shrub.

True, then, although it is, as shown above, that twining shrubs effect more or less of injurious strangulation on the stems, boughs, and branches of the trees and shrubs they entwine, it is also true that they must ever be present in every well-furnished tastefully decorated flower-garden. No plants are more elegant, graceful, ornamental: and the notable flexibility of their twining shoots, while these are young and tender, allows us to lead them whither we will,

"To deck the wall or weave the bower." *Cotton.*

For such purposes of decoration, climbers will be added: these climb by

But, to return to the aged and prostrate ash: round one half of its trunk (as I have often been told) had formerly been fixed a semicircular bench, of which, however, no trace remained since my recollection, save the seat-handles, as they may be called, consisting of two pieces of oak timber 1½ ft. in length, carved at the end in rude imitation of the elbows of a chair, and let into the living wood, one on each side of the tree, to serve the purpose of a back-rest to the seat. As the tree had increased considerably in circumference since this barbarous treatment had been practised upon it, the living wood had, of course, closed in upon, and partially overgrown, these chair-handles, which consequently became more firmly fixed and deeply embedded by every succeeding year's growth. On the breaking up of the but, I was surprised to find that the portion of these oaken handles which was enclosed within the live timber was, for the most part, in a state of complete decay, while that which was without, and had been exposed all along to the action of the elements, was still sound and solid. Hence it would appear that the sap, or internal moisture, of a tree effects the decay of extraneous timber artificially brought into contact with it, far more powerfully than do the ordinary alternations of heat and cold, drought and moisture.

The trunk of the ash, for about the first 18 ft. (i. e. up to the place where it appeared to have been pollarded), was hollow, and decayed at the centre, and afforded some twenty or thirty good barrow loads of rotten wood, which, in the course of another year, when it becomes more completely "wroxed," will be very serviceable for horticultural purposes.

Dórcus parallelipípedus Stephens, *and Sinodéndron cylíndricum* Stephens. — Throughout this carious portion of the tree there occurred numerous specimens, both in the larva and the perfect state, of the lesser stag-beetle (*Dórcus* [*dorkos*, a stag; from the mandibles resembling antlers] parallelipípedus

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"clasping tendrils," and do not constrain, although occasionally they do some injury by choking and destroying the foliage of the plants up and over which they climb. Cowper, on climbers, has thus elegantly written :—

> "[Some clothe the soil that feeds them, far diffused
> And lowly creeping, modest and yet fair,
> Like virtue, thriving most where little seen :]
> Some, more aspiring, catch the neighbour shrub
> With clasping tendrils, and invest his branch,
> Else unadorned, with many a gay festoon
> And fragrant chaplet, recompensing well
> The strength they borrow with the grace they lend."
>
> *Cowper's "Garden."* — *J. D.*

they must have worked their way from the bottom. May not the

Woodpeckers bore into decayed trees, for the double purpose both of forming a suitable situation for making their nests, and also of feeding on these and similar insects to be found therein? Should the bird, while working out its habitation, chance to meet one of the fat grubs of the *Dórcus* or Sinodéndron, it would, no doubt, afford him a rich and delicious morsel.

Several species of the feathered race will have cause, no less than the proprietor himself, to lament the loss of this aged tree.

The Rooks, indeed, never, to my knowledge, occupied it, though they built in several adjoining trees of no greater altitude, and much smaller dimensions. These birds appear to be capricious in their choice of a situation*; and as it is difficult to induce them to take to trees which they do not freely, and of their own accord, select for the purpose of nidification†, so neither is it easy to expel them from such as they have voluntarily selected.

The Starlings usually found suitable accommodation for themselves in some of the deep nooks and interstices formed by the interlacing stems of the ivy; and, like their favoured kindred at Walton Hall‡, were allowed to rear their broods in peace and security. A pair of

Stockdoves§, or at least of some species of wild pigeon, annually occupied the shelf-like entrance of a cavity occasioned by the rupture of a large horizontal arm, which had been

* Not a single rook's nest was completed last spring in the group of elms situated near the south-west angle of the church, though many were begun, and pulled to pieces, and begun again, and the trees themselves had for many years been a favourite resort of the birds. The spring before (1831), there had been a rather unusually large number of nests in the same group.

† I have been informed, but cannot vouch for the accuracy of the statement, that the readiest way to establish a rookery where one did not previously exist, is to withdraw the eggs from the nest of a magpie that is about to sit, and has built near the place where it is wished the new colony should be raised, and to substitute in their room the eggs of the rook. The young birds, it is said, will return the following spring, and take up their quarters in the same tree in which they were reared.

‡ See an interesting article in defence of this bird's *harmless* character, by C. Waterton, Esq., p. 37.

§ Without having particularly attended to them, I had supposed these pigeons to have been the common wood-pigeon, or queest; but, since the fall of the tree (which happened to start conversation on the subject), I have been assured by an intelligent domestic that they were not wood-pigeons, but stockdoves. If this information be correct, it adds a new bird to our parish Fauna: I was not previously aware that the last-named species occurred in this neighbourhood.

broken close to the main stem of the tree. There they constructed their scanty nest, laid their eggs, and hatched them without molestation from the starlings, who (be it remembered), dwelling in the same tree, and engaged in a like occupation, must, no doubt, have found it extremely convenient to have had a supply of pigeons' eggs so near at hand, if they, poor birds! had really so strong a partiality for such food, as is sometimes (unjustly, I think) attributed to them.

The Nuthatch, too, (I don't know where he built his nest, but he) found it, if I may use the expression, a most convenient set of vices in the chinks and crannies of the ash bark, wherein to fix the stones of haws, nuts, &c., while he worked away with his beak, and jobbed * out the kernels. The crevices of the bark, on the only portion of the tree's trunk which was not sheathed with ivy, were frequently to be seen copiously charged with the refuse of emptied shells, in evidence of this bird's power of bill. But I must refrain; having already trespassed too long on your patience, and being apprehensive withal lest you may think these gossiping remarks about a rotten old ash tree unworthy of your notice. I beg, therefore, that you will use your own discretion on the propriety of presenting them to your readers; and will only add that, should you think them fit to occupy a corner in your Magazine, you are at full liberty to place at the head of the article the same quaint title that Izaak Walton has affixed to the 16th chapter of his *Angler*, which, says he, "is of nothing, or that which is nothing worth." I am, Sir, yours, &c.

W. T. Bree.

Allesley Rectory, Jan. 16. 1833.

Art. VII. *Observations on the supposed Connection of Rocks with Plants.* By Alexander Murray, M.D. and A.M., Aberdeen.

[The scope of the following article is the same as one, also by Dr. Murray, published in Professor Jameson's *Journal* for July, 1831; but the article is essentially different, a few sentences only being common to the two. In the present communication there is a list of Aberdeenshire plants, contained in various important families: a feature of some interest, as no allusion has ever before been made in print to any portion of the flora of that county. The plants quoted in *Jameson's Journal* relate to a limited tract. In the present list will be found Scílla vérna and Rhodìola *r*òsea, which, till lately, were not supposed to be natives of the east coast of

* "Nutjobber" is one of the provincial names of the bird.

Scotland. Dr. Murray found Rhodìola *rosea*, several years ago, on the sea-side in Aberdeenshire; where it had, upon the land side of it, one of the most extensive plains in Scotland.]

I HAVE never had an opportunity of perusing this Magagazine in a regular manner; but Major Youngson of this county, a subscriber to it, having some time since obliged me with a considerable collection of the recent Numbers, I observe more than one notice of remarks formerly offered by me in Jameson's *Journal*, with the view of endeavouring to prove that native vegetables are not materially influenced by the subjacent rocks. This circumstance has led me to think of the present communication, wherein I shall aim at a more satisfactory, though a shorter, consideration of the question, than was offered in that place; and, feeling an anxiety to arrive at the truth, I venture to express a hope that some of the numerous correspondents of this Magazine may be induced to give their opinions upon a subject undoubtedly of an interesting description; on which there is a common tendency to a conclusion which, in my estimation, is far from being well supported. The question may be stated as being —

Whether or not vegetable species are usually determined by the nature of the subjacent rocks? Or, in other words, *Whether native plants spring up, and extend themselves, upon all rocks indiscriminately; or some only over one kind of rock, and others only over another?*

In the first place, I think it may be stated, that there are only two very evident cases wherein plants can be influenced by the nature of the mineral strata: 1st, when the vegetable roots come into contact with these strata; and, 2d, when the soil is wholly, or in a great measure, derived from the rock beneath. Let us, therefore, endeavour to ascertain if those conditions frequently exist.

The distance of rocks from the surface differs greatly in different instances. At Amsterdam, 230 ft. of soil have been penetrated; and upon the plains in the north of Germany it is said that a rocky surface is never found. In short, all degrees of depth are met with, from those just mentioned, to the bare rock upon which the humble lichen can scarcely find a suitable abode. It may, however, be laid down as a general rule, that, in the present day, rocks lie at so great a depth that they cannot be reached by the roots of vegetables. It is next to be considered, that, in numerous instances, the soil is not derived from the subjacent solid strata: as it will be admitted, that, when a proper opportunity offers for making the observation, it is frequently apparent

that the chief part of the mineral ingredients of soil is not derived from the rock beneath, but has been transported from some distance. The decay of plants is constantly tending to increase the foreign matters on the earth's surface, and to separate the vegetable kingdom still farther from the rocks. This vegetable soil must abound chiefly in climates favourable to the production of luxuriant vegetation; but it may deserve notice, that in Orkney, the Western Isles, and even in the most northerly parts of Scotland, there is often found a thick and dense covering of peat, which must prevent any chance of native plants being influenced by the rocks. Further, it will appear, that, even when the soil has not been transported, the following grave objections occur to the connection here discussed.

Different specimens of the same rock differ materially in respect of the circumstances most likely to influence vegetables; namely, in the nature and proportion of the constituents, together with the degree of tendency to pass into the condition of soil. For instance, the granite of Aberdeenshire has almost every possible variety in composition and hardness. Sometimes it resists the weather in a complete manner; while, on the other hand, it frequently furnishes an abundant soil. It is worth adding, that, in the parish of Strathdon, I have noticed specimens of this rock retaining all its usual appearance, which proved to be masses of almost loose earth extending to a great depth. Gneiss, too, is subject to frequent and material differences. Dr. Macculloch, in his late work on geology, has particularly noticed the bareness of many of the Scottish gneiss isles; whereas, in Guernsey and Aberdeenshire, a deep and good soil is often derived from the same rock. Passing to the secondary rocks, we may find basalt, greenstone, amygdaloid, and others, often varying in structure; each being occasionally of the most obdurate description, though more commonly producing a copious and fertile soil. I shall only further specify sandstone, a rock which is important in the present view, as it occupies large tracts of country in many parts of the world. It is clear that there could be no unvarying relation between this rock and the vegetables which grow over it, as it is characterised in no degree by the nature of its ingredients, but by circumstances altogether of another kind; the rock differing entirely from itself in different instances, being siliceous, calcareous, or aluminous, according to circumstances. So great are these differences, that sandstone is sometimes nearly allied to quartz rock; while, occasionally, it is with difficulty distinguished from limestone. Not only does the same species often exhibit material varieties, but, on

the other hand, rocks of which the mineralogical and geological characters are dissimilar, may furnish a soil essentially the same. Thus, the following branches of the primitive series, granite, gneiss, mica slate, and clay slate, being all composed principally of silex and alumine, usually give rise, when converted into soil, to a sandy clay; while, with respect to the secondary rocks, it may be said of many of them that they run into one another by insensible gradations, and that each will produce a soil similar to that from any one of the rest. There are, indeed, various obvious facts which confirm the foregoing remarks. Every one knows that, in an extensive tract composed of a single rock, the soil is very far from being uniform, but may consist of not a few kinds. On the other hand, it is almost equally well known that the leading soils are much the same every where, however different the rocks may be. It is even true that the soil of secondary tracts is frequently not dissimilar to that met with in primitive districts; nor is this much to be wondered at, when we consider that, in point of the principal chemical or mineral ingredients, the one series of rocks is by no means very different from the other.

It thus seems, *à priori*, highly improbable that the native plants are regulated by the rocks; as it appears that, generally speaking, the roots of vegetables are not in contact with the rocks; and that these frequently do not furnish the soil which lies over them. It is also true, that, frequently, the varied forms of a particular rock differ from one another with regard to the circumstances most likely to influence vegetables, more than some rocks do from others which are of a different species.

It is, however, only by facts that the question can be settled, though the preceding observations may not be unworthy of notice. As the best means, within my reach, of putting the matter at issue to the test of experience, I propose to compare, in some measure, Aberdeenshire with the tract around Edinburgh, and with Devonshire. It is not in my power to offer a minute account of the rocks of these different regions; but, indeed, for the present purpose, nothing is necessary beyond a short notice of their solid surfaces.

Devonshire appears to be composed of granite and slates, together with sandstone and limestone. The country around Edinburgh is a secondary tract, chiefly consisting of trap, sandstone, and mountain limestone. In Aberdeenshire, the surface is almost entirely composed of granite or gneiss; but I cannot form any estimate of the relative quantities of these rocks, as it is not always easy to trace the distinction between

them, even with better opportunities than usually exist in this county. Granite and gneiss, however, are not in every instance the most superficial rocks. In a few parts of the county, the surface consists of one or other of the following rocks; but they are always in very limited quantity, and not in every instance to be distinguished from granite, which, at times, passes by insensible degrees into perhaps every one of them: mica slate, clay slate, porphyry, serpentine, sandstone, and limestone.

I take the plants of Devonshire from the *Flora* of Jones and Kingston; and those of the Edinburgh district, from Woodford's *Catalogue*. The Aberdeenshire list is given entirely from plants in my own possession. I shall first exhibit a view of the Aberdeenshire species, contained in certain natural orders, excluding our alpine plants, that the comparison may relate to districts nearly similar in altitude: —

Filices. *Polypòdium* vulgàre and *Dryópteris*; *Aspídium* Oreópteris, *Filix más*, *F. fœmina*, dilatàtum, and frágile; *Asplènium* marìnum, *Trichómanes*, and *Adiántum* nìgrum; *Scolopéndrium* vulgàre; *Ptèris* aquilìna; *Blechnum* boreàle; *Botrýchium* Lunària.

Cyperàceæ. Erióphorum vaginàtum and angustifòlium; *Schœ'nus* rùfus and compréssus; *Eleócharis* palústris, multicaúlis, and aciculàris; *Scírpus* cæspitòsus, pauciflòrus, flùitans, lacústris, setàceus, and marítimus; *Cárex* dioíca, pulicàris, pauciflòra, incúrva, arenària, vulpìna, paniculàta, teretiúscula, stellulàta, cúrta, ovàlis, remòta, flàva, binérvis, præ'cox, pilulífera, panícea, recúrva, cæspitòsa, and ampullàcea.

Júnceæ. *Júncus* bálticus, effùsus, conglomeràtus, squarròsus, bulbòsus, bufònius, uliginòsus, acutiflòrus, lampocárpus, and obtusiflòrus; *Lùzula* [*Luciola Smith*] máxima, pilòsa, campéstris; *Narthècium* ossífragum.

Asphodèleæ. *Scílla* vérna and nùtans; *Allium* vineàle and ursìnum.

Orchídeæ. *Orchis* máscula, latifòlia, maculàta, and conópsea; Habenària víridis, álbida, and bifòlia; *Goódyera* rèpens; *Listera* ovàta and cordàta.

Polygòneæ. *Polýgonum* Bistórta, vivíparum, amphíbium, Persicària, *lapathifòlium*, Hydrópiper, aviculàre, and *Convólvulus*; *Rùmex* aquaticus?, crìspus, sanguíneus, acùtus, obtusifòlius, Acetòsa, and Acetoséllа; *Oxýria* renifórmis.

Primulàceæ. *Anagállis* arvénsis, cærùlea, and tenélla; *Lysimàchia* némorum; *Prímula* vulgàris; *Trientàlis* europæ'a; *Glaux* marítima.

Monotròpeæ. *Pýrola* secúnda, rotundifòlia, and mìnor.

Compósitæ. *Tragopògon* praténsis; *Sónchus* arvénsis and oleràceus; *Leóntodon Taraxàcum* and palústris; *Apárgia* autumnàlis; *Hieràcium* Pilosélla, Lawsòni, murórum, sylváticum, paludòsum, sabaúdum, and umbellatum?; *Hypochæ'ris* radicàta; *Lapsàna* commùnis; *Cichòrium Intybus*; *Arctium Lappa*; *Cárduus acanthòides*; *Cnìcus* lanceolàtus, palústris, and arvénsis; *Centaurèa* nìgra and *Cyanus*; *Bìdens* cérnua; *Tanacètum* vulgàre; *Artemísia* marítima and vulgàris; *Gnaphàlium* dioícum, sylváticum, réctum, uliginòsum, mínimum, and gérmanicum; *Tussilàgo Farfara*; *Senècio* vulgàris, sylváticus, Jacobæ'a, aquáticus, and saracénicus; *Aster Tripòlium*; Solidàgo Virgaúrea; *Doróniсum Pardaliánches*; *Béllis* perénnis; *Chrysánthemum* Leucánthemum and ségetum; *Pyrèthrum Parthènium*, inódorum, and marítimum; *Achillèa Ptármica* and *Millefòlium*.

Caprifoliàceæ. Linnæ'*a* borèàlis; Lonícer*a* *Periclýmenum*; *Sambùcus E'bulus* and *nìgra*; *Hédera Hèlix*; *Córnus suécica*.

Leguminòsæ. *Spártium* scopàrium; *Genísta ánglica*; *U'lex* europæ'a; *Onònis* arvénsis; *Anthýllis* Vulnerària; *O'robus* tuberòsus; *Láthyrus* praténsis; *Vícia* sylvática, *Cráccα*, sativa, *lathyröides*, and *sèpium*; *E'rvum* hirsùtum; *Astrágalus* hypoglóttis; *Trifòlium* officinàle, rèpens, praténse, mèdium, arvénse, procúmbens, mìnus, and *filifórme*; *Lòtus* corniculàtus and màjor; Medicàgo lupùlina.

Hypericineæ. *Hypéricum* quadrángulum, perforàtum, humifûsum, hirsùtum, and púlchrum.

Sempervivæ. *Sempervìvum* tectòrum; *Sèdum Telèphium*, villòsum, and àcre; Rhodìola *rò*sea.

Ranunculàceæ. *Thalíctrum* mìnus; *Anemòne* nemoròsa; *Ranúnculus* aquátilis, *hederàceus*, língua, flámmula, Ficària, aurícomus?, sceleràtus, àcris, rèpens, and bulbòsus; *Tróllius* europæ'us; *Cáltha* palústris.

It is next to be mentioned, that all the preceding plants are found in the Edinburgh district, except the following: —

Cárex pauciflòra and incúrva; *Júncus* bálticus; *Scílla* vérna; Goódyer*a* rèpens; *Rùmex* aquáticus; *Polýgonum* vivíparum; Oxýria renifórmis; *Anagállis* cærùlea?; Trientàlis europæ'a; Pýrola secúnda; *Hieràcium* sabaúdum; *Senècio* saracénicus; Linnæ'*a* boreàlis; Rhodìola *rò*sea.

And they are all found in Devonshire, with the following exceptions: —

Polypòdium Dryópteris; Aspídium Oreópteris; Botrýchium Lunària; *Schœ'nus* rùfus and compréssus; *Scírpus* pauciflòrus; *Cárex* dioíca, pauciflòra, and incúrva; *Júncus* bálticus and obtusiflòrus; *Scílla* vérna; *O'rchis* conópsea; Habenària víridis and álbida; Goódyer*a* rèpens; Lístera cordàta; *Polýgonum* vivíparum; Oxýria renifórmis; Trientàlis europæ'a; Pýrola secúnda, rotundifòlia, and mìnor; *Hieràcium* Lawsòni, paludòsum, and sylváticum; *Gnaphàlium* sylváticum; *Senècio* saracénicus; *Dorónicum Pardaliánches*; Linnæ'*a* boreàlis; *Córnus suécica*; *Astrágalus* hypoglóttis; *Sèdum* villòsum; Rhodìola *rò*sea; *Ranúnculus* língua; *Tróllius* europæ'us.

From the preceding statement it appears, that, of more than two hundred Aberdeenshire plants, taken, I may say, indiscriminately, all are found in the environs of Edinburgh, except fifteen; and, except thirty-six, they are all found in Devonshire. It deserves particular notice, that the deficient species alluded to are rare, or at least not extensively distributed: and hence they bear a far less proportion to the total vegetation than might at first sight be supposed. On the whole, I am satisfied that a very large proportion of the plants of this county are likewise found in the two other districts alluded to. We have found, too, above, that, with reference to Aberdeenshire plants contained in certain families, the deficient species are much more numerous in the county of Devon than around Edinburgh; and it remains to be added, that I have ascertained that the additional species are also considerably greater in the former situation than in the latter. So far as the examination has been carried, we are, therefore, entitled to believe that the Aberdeen flora approaches much more nearly

to that of Edinburgh than to the Devonshire flora: and this is a circumstance of great importance, in relation to the present object, when we consider it in connection with the fact, that, so far as rocks are concerned, this county is totally unlike to the tract around Edinburgh; whereas it is by no means equally dissimilar to Devonshire, which contains a considerable portion of granite, our prevailing rock.

Enough has, I hope, been said to show that the opinion of those who believe the native vegetation to be defined by the rocks is not supported by *à priori* reasoning or by facts. This view of the matter was derived entirely from my own consideration of the subject; but I am glad that it accords exactly with the opinion of the Rev. J. P. Jones and J. F. Kingston, whose excellent observations I may quote, as they admirably confirm my views: — "With all this variety in the rock strata (of Devonshire), we know of no peculiar vegetable features by which to distinguish one formation from another. The *Cistineæ*, *Conyza squarrosa*, and one or two other plants, seem to affect the limestone; the *Clématis* also appears to grow more luxuriantly amongst the crevices of that rock than elsewhere; whilst the *Iris fœtidissima* and the elm prevail most in red sandstone: still, neither of them, nor any other species, so far as we are aware, is exclusively confined to any particular formation. We may trace the same plants frequently along the whole of our coast line, whether the cliffs are sandstone, limestone, or slate; and, if we choose to push our investigation farther along those of Cornwall, we may still find them in the serpentine formation of the Lizard district, and in the granite rocks around the Land's End."

It is probable that the distribution of vegetables is mainly regulated by climate: a term implying a combination of circumstances, which depend very much upon altitude and latitude.* I presume it would be found that, in general, different floras resemble, or differ from, one another, not with any regard to the rocks, but according as the regions to which they relate are similar or not in altitude and latitude. The same leading rocks, and these but few in number, every where occupy the greater part of the earth's surface; yet, in some climates, how different is the vegetation from that which is found in others! Though the rocks are essentially similar, the vegetation of the mountainous part of Aberdeenshire is

* The researches of Hewett Cottrell Watson, Esq., on the geographical distribution of British plants, have a relevant relation to this second question; as shown in his *Outlines*, and in his communications to some recent numbers of Jameson's *Journal*. A notice of the *Outlines* has been given in p. 265-7. of the current volume of this Magazine. — *J. D.*

entirely different from that of the rest of the county. It has been already mentioned that the flora of this county is more alike to that of Edinburgh than to the Devonshire flora; while, on the other hand, I am inclined to believe that, were a complete comparison made, the plants of the last-named situation would be found to come nearer to those of the second than to the Aberdeenshire species. Our rocks, however, have been stated to be more similar to those of Devonshire than to the rocks around Edinburgh; to which last, indeed, they are utterly unlike, though the plants of the two tracts have a great similarity. These circumstances I am disposed to explain, simply by this county having, in point of latitude and climate, a greater resemblance to the district around Edinburgh than to Devonshire.

These views might, with advantage, be prosecuted much farther than I can at present carry them. I shall just add that it is clear, did any decided connection subsist between rocks and vegetables, it would be very easy to establish the fact indisputably by a suitable list, as the main rocks of the world are but few indeed. Let, therefore, those who advocate such a connection produce a satisfactory catalogue of the kind alluded to. There may be instances in their favour, I admit: but are these more numerous than the exceptions to every general rule?

It ought not, however, to be considered as certain, that a small number of plants may not show a degree of predilection, or the contrary, for one or more rocks. This may be, in some measure, the case with regard to limestone and serpentine. It is probably true that lime favours the existence and propagation of wild plants: and hence it may be explained why fewer plants are often found on primitive tracts than upon others, as lime is a very sparing ingredient in the oldest rocks. In this way I am disposed to explain a part of our inferiority in vegetable numbers; limestone being more abundant in the two other districts than it is in Aberdeenshire. The difference may also be imputed, in some degree, to our less genial climate: but, indeed, not a little of it may be owing to the Aberdeenshire list being almost entirely the result of my own observation, not always under the most favourable circumstances; whereas, the other tracts have been more fully investigated. It also deserves to be recollected, that all the species found only in the alpine parts of Aberdeenshire are excluded from the list. As to serpentine, I have made the following observations upon a small elevated tract in the parish of Strathdon, composed of this rock. Not only is the rock itself uncommon in that quarter, but its

vegetation is likewise peculiar, entirely different from that of the contiguous hills. These are invariably clothed with the heaths; but the tract just mentioned derives its name (Green Hill) from a covering of grass. It produces Arenària vérna, Cochleària officinàlis, and Státice Armèria; of which the last two are very rare in that quarter: as to Arenària vérna, I never met with it in that part of Scotland, unless on the spot mentioned; and again in the parish of Leslie, growing over serpentine, the same rock with which it is associated at Strathdon.

Though this communication may be already quite long enough, I wish to occupy a few sentences with a notice of remarks, in this Magazine, upon some observations made by me at a previous period. In the first place, my thanks are due to Mr. Thomson, Manchester, for his courteous and interesting observations, in Vol. III. p. 410—419. Mr. Loudon has likewise, with reference to me, made a few remarks, of a fair and judicious description, in Vol. V. p. 195.; and there (p. 196.) directed my attention to a contributor of a very different stamp, who writes in Vol. IV. p. 460., under the signature of Causidicus. I may be permitted to copy a couple of sentences, as being the origin of the strictures of this writer: —"I venture to suggest, that there is not, in science, a more hopeless labour, than the attempt to discover an unvarying and necessary relation between most plants and the chemical nature of the soils in which they spontaneously grow. I feel convinced that, except in point of moistness, compactness, and depth, soils have in general no cognisable relation to their native products." I shall not offer a detailed notice of the remarks of Causidicus, but content myself with requesting your readers to refer to them; and I shall be satisfied that the cause be judged upon his own pleading. I may, indeed, just quote his opening sentence relative to me. "The first point whereon I should differ from Mr. Thomson would be, the apathetic calmness, and almost scepticism, with which he treats that most extraordinary hallucination of Dr. Alexander Murray, which prefaces Mr. Thomson's remarks." This passage (which alludes to the opinions above quoted) may be considered a pretty fair specimen of the whole article. The meaning of the sentence no one can positively tell; and the meaning which it may be guessed to have is entirely devoid of foundation, as Mr. Thomson's allusion to me is of a complimentary description. With respect to the "hallucination," I shall not say much on that head, as no one can be considered the best judge of whether or not his own opinions deserve this epithet. I shall, however, observe that

the soundest thoughts may pass for error and "most extraordinary hallucination," in the view of those whose information or judgment happens not to be of a first-rate description. It may suit the quibbling turn of mind occasionally imputed to the profession to which the signature of Causidicus implies him to belong, to allege, as he does, that "Dr. Murray entirely changes the terms of his proposition. There is a vast difference between 'a decided connection' and 'an unvarying and necessary relation.'" I shall only add that Causidicus is welcome to view me as standing upon either of the positions which he appears to have in his eye; and I am persuaded the footing is firm enough to enable me to defy such efforts as his. I am, Sir, yours, &c.

Aberdeen, April 17. 1833. ALEXANDER MURRAY.

THE above communication relates strictly to the connection between rocks and plants. On the relation between soils and plants, see Mr. Goldie, in *Gard. Mag.*, vol. ii. p. 125.; Mr. Gordon, in vol. iv. p. 463.; Causidicus, in vol. vi. p. 216.; Mr. Gordon, in vol. vi. p. 359.; Causidicus, in vol. vii. p. 371., vol. ix. p. 291. — *J. D.*

ART. VIII. *Volcanoes.* By W. M. HIGGINS, Esq. F.G.S., Lecturer on Natural Philosophy in Guy's Hospital, and J. W. DRAPER, Esq.

(*Continued from* Vol. V. p. 637.)

GEOGRAPHICAL POSITION AND HISTORY OF ACTIVE VOLCANOES.

Africa. — THE continent of Africa does not offer a single example of an active volcano; but nearly all the neighbouring islands are of volcanic origin, and many of them present examples of active vents.

The whole group of the Canaries is the product of some vast subaqueous volcano, to the furnaces of which the various islands seem but as openings.

Teneriffe is the first of these to which our attention is drawn. The Peak of Teneriffe is one of the most elevated volcanic mountains, and lifts its towering head to a height of 12,176 feet above the level of the sea. It is a pyramidal mass, having a base of more than 115,110 yards in circumference. The cone is small in proportion to the mountain, and is said to be not more than 537 ft. high. Its crater is about 300 ft. in its greater diameter, 200 ft. in its lesser, and 100 ft. deep. It is not, however, from this that the

eruptions proceed, for it has not been active since the island has been inhabited. Lateral eruptions have not been unfrequent, and particularly from the mountain Chahorra. In the year 1706, an eruption destroyed the harbour of Garachico, which was the finest harbour in the island; and at that time the lava was observed to travel at a rate of nearly three miles an hour. The last eruption from the crater of Chahorra was in 1798, when it threw out lava and scoriæ for the space of six months.

In the Island of Palma there is a conical mountain, the crater of which is 5000 ft. deep; it was in a state of eruption in 1677.

Lanzerote has also been the site of most terrific volcanic action, its last eruption continuing from the 1st of September, 1730, to the 16th of April, 1736. Von Buch has given an interesting description of the phenomena which attended and followed this violent effort, and also a description of the vent itself. The crater is walled in by precipitous rocks; and, in the interior, two other craters are observed. A space of three square miles on the west is covered by a mass of black lava: but the crater was not the only source from which this vast mass of lava was emitted. "How much was I astonished," he says, "when, on reaching the summit, I perceived an entire series of cones, all nearly as lofty as the Montagna de Fuego, placed so directly in a line, that the nearest covered the farthest one in such a manner that their summits alone were seen peeping from behind."

The Island of Ferro has a volcano, which was active, in 1692, for a continued period of six weeks.

The only island among the Cape de Verde group that has an active volcano is that of Fogo, or Fuego; but, as little is known concerning it, we may turn our attention to the Azores; all of which are of volcanic formation, and some contain active volcanoes.

M. Bory de St. Vincent has given a drawing of Mount Dolomieu, in the Isle of Bourbon. (*fig.* 45.) This cone is one of those in the phase of permanent activity. It has no regular crater; but occasionally opens small apertures as required, and fills them again during the continuance of the eruption. The table-formed appearance of the top of this mountain furnishes us with a good example of the manner in which lava may, in the first instance, have issued from fissures in the plain surface of the earth before the mountain mass itself was elevated.

St. Michael's Island, which is the largest of this group, has several times suffered from volcanic action. The last eruption

was in 1810 and 1811. In the beginning of the latter year, an island was formed, about two miles from St. Michael's, containing a crater 500 ft. in diameter; but it has been gradually worn away by the action of the waves, and is now beneath the level of the sea. In El Pico there is a volcano, which was active in 1718; but, since that time, has not suffered an eruption. The Islands of San Georgio and Fayal have each a volcanic mountain. Ascension and Madagascar contain extinct volcanic cones; but the volcano of Jibbel Teir has been recently active.

Asia. — The volcanoes of Asia, as well as those in Africa, are entirely confined to the islands, with the solitary exception of Kamtschatka, the whole of which is of volcanic origin; and we may, perhaps, add Mount Elbourz in Persia; the mountains of Tourfan, in lat. 43° 30′, long. 87° 11′, and in lat. 46°, long. 76° 11′; and Bisch Balikh. (See *Annales des Mines*, vol. v. p. 135.) The principal volcanoes of Kamtschatka are Awachinski, Tulbatchinski, and the Kamtschatka Mountain.

Awachinski is situated to the north of the Bay of Awatcha. One of the earliest eruptions of this mountain with which we are acquainted is that which happened in 1779, when Captain Cook was off the coast. But its most violent effort was in the year 1737, which was followed by a tremendous earthquake and encroachment of the sea; although it afterwards receded, and united the first and second Kurile Isles with the continent.

Tulbatchinski is situated between the rivers Kamtschatka and Tulbatchik. It was in violent activity during the year 1739, and has ever since emitted dense vapours. The Kamtschatka Mountain is the highest elevation in the country. It was active in 1728, and again in 1737; and, since that time, it has not ceased to eject scoriæ three or four times a year. To

these may be added several other active volcanoes; but little is known concerning them.

From Kamtschatka we may proceed to the Kurile Isles, where, according to Kracheninnikow, there are not less than nine active volcanoes.

The Japanese Islands contain ten active volcanoes, three of which are in the Island of Niphon. This island appears to have been formerly connected with Jesso; but, however this may be, they are now equally the seat of this devastating agent. The Isles of Oosima and Coosima are each incessantly pouring out volumes of smoke, and have evidently been the theatres of eruption.

As we proceed from the south of Japan, we come upon the Sulphur Isles, in the Loo Choo group, and Formosa, both of which are said to emit sulphureous vapour, and to bear evident marks of present activity.

Several of the Philippine Isles have volcanic cones. In Manilla there are several; in Luçon, three; in Fuego, one; and one in Mindanao, which suffered a violent eruption in 1764. Borneo is said to contain several volcanoes; but their position is doubtful.

Barren Island, one of the Andamans, has a mountain which is nearly 4000 ft. high, and is remarkable for the ejection of immense masses of rock, some of which are three and four tons in weight.

The Moluccas, also, abound with volcanoes. The Islands of Ternate and Tidore each contain an active cone.

The Celebes, also, are said to possess many volcanic mountains; and, in the Island of Sanguir, between Mindanao and Celebes, there is one of the largest in the world. But, in all these interesting groups we are almost entirely ignorant of the periods of eruption.

In the Isle of Sumbawa we find the Tomboro, which was the source of the tremendous eruption in 1815, which we have already described.

Java has eleven active volcanoes. Payandayang was one of the largest mountains in this island; but, in 1772, it was entirely carried away by a violent explosion. The cavity which was thus formed measures fifteen miles by six. There are four volcanoes in Sumatra, and two in New Guinea, which were burning when Dampier explored the coast in 1700; and several others have been observed in the New Hebrides, Friendly, and Ladrone Islands. Owhyhee, one of the Sandwich Isles, contains an active cone; which has been described by Mr. Ellis, in his interesting tour through the Sandwich Islands.

The Rev. C. Steward has published an interesting account of an ascent to the great volcano of Kirauea, in this island, which has been copied, by Professor Jameson, from Silliman's *American Journal.* (Jameson's *Edin. Journ.,* vol. iii. p. 45.) The crater of this volcano, instead of being the truncated top of a mountain distinguishable at a distance in every direction, is an immense chasm, in an upland country, near the base of the mountain Mouna Roa; which is between 16,000 ft. and 18,000 ft. high; approached not by ascending a cone, but by descending two vast terraces; and not visible from any point at a greater distance than half a mile. It is probable that it was originally a cone; but assumed its present aspect (it may be centuries ago) by the falling in of the whole summit.

America. — For the knowledge we have of the volcanoes of the American continent we are entirely indebted to M. Humboldt. But, notwithstanding the indefatigable industry of this naturalist, we may consider it as a fine field for personal examination, as there are probably many that are yet unknown. There are three active volcanoes in California, Mount Saint Elia, Mount del Buen Tiempe, and Volcano de las Virgines. The former of these is said to be 17,875 ft. above the level of the sea. The five active cones of Mexico are all situated in a line, and appear to be derived from a fissure traversing the country from west to east, perpendicular to that of the great mountain chain, which, extending from north-west to south-east, constitutes the great table land of the American continent. Tuxtla is the most eastern of this chain, and is situated on the south-east of Vera Cruz. In the eruption of 1793, its ashes were carried to Perote, a distance of fifty-seven leagues. Orisaba (*fig.* 46.) is 17,300 ft. high, but it has not recently been in a state of activity. Popocatepec is 17,600 ft. in height, and is the most lofty elevation in New Spain. Since the year 1530, it has been in the phase of moderate activity. Colima was discovered by Dampier, and is about 10,000 ft. above the level of the sea. It was never known to eject lava, but frequently throws up scoriæ and ashes. Jorullo is situated between Colima and Mexico, and an account of its eruption in 1759 has been already given.

In the provinces of Guatimala and Nicaragua, which lie between Mexico and the Isthmus of Darien, there are twenty-one active volcanoes, and all of them situated between 10° and 15° N. latitude. On the southern side of the isthmus, in the provinces of New Granada and Los Pastos there are several others: and in the neighbouring province of Quito we again come upon an interesting series. Antisana, which is about 18,000 ft.

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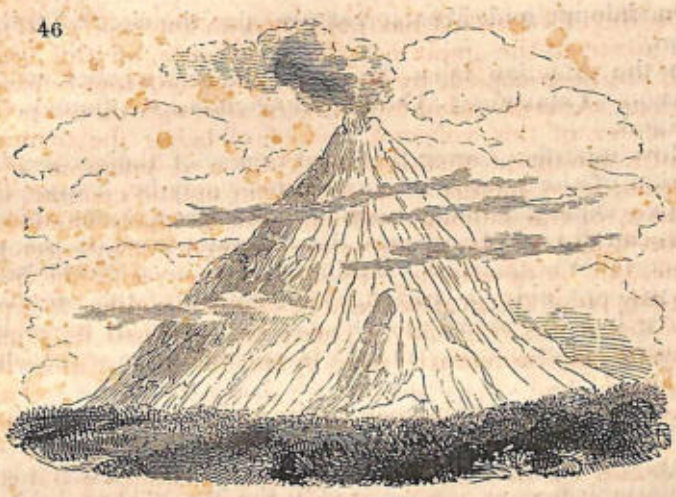

above the level of the sea, was active in 1590. Of Cotopaxi we have already spoken. Tunguragua was in a state of eruption during the year 1641; and Carguairago in 1698. Besides these, we may enumerate Chimborazo, Rucupichinca, and Sangay. Between Mexico and Chile there is only one active volcano, namely, that of Arequipa, in Peru; but in Chile there are sixteen.

In several of the Leeward Isles we find volcanic mountains. St. Vincent has one active cone, called Le Souffrier; its first eruption of lava was in 1718, which, like that of Tomboro, was accompanied by a hurricane. In 1812 it was again active, and, antecedent to the eruption, the surrounding country was agitated by two hundred shocks of earthquakes, by one of which the city of Caraccas was destroyed.

The Needles of St. Alousie, in the Island of St. Lucia, are volcanic rocks. In one deep valley at their foot, says Raynal, there are eight or ten ponds, the water of which boils up in a dreadful manner, and retains some of its heat at a distance of 6000 fathoms from its reservoirs.

The beautiful and romantic Island of Nevis was probably produced by volcanic agency. In its general outline it appears as a pillar penetrating the skies. On its summit there is a crater still incrusted with sulphur; and hot springs impregnated with the same substance flow down its sides.

Mount Misery, in St. Christopher's, is a volcanic mountain, 3711 ft. high; occupying all the north-west part of the island, and gradually declines into smaller hills, which end in the plain of Basseterre. The soil around the crater of Mount Misery is so hot that it is unpleasant to walk on.

Guadaloupe and Montserrat are also the sites of volcanic action.

In the Aleutian Isles there are six active cones, namely, Kanaga, Tatavanga, Oominga, Oomilaska, Omnak, and Ourimak.

How imperfect soever this brief review of the geographical position of the known active volcanoes may be, it cannot fail to give some adequate notion of the great extent of subterranean fires. Those who have never witnessed the phenomena that accompany eruption, or examined its effects, are not perhaps able to conceive the power of this wonderful agent; but the above statements may prevent them from the error of supposing that it is partial in the extent of its action.

The deductions which may be drawn from our knowledge of the locality of volcanoes are peculiarly important and interesting. The first observation that we make is, that almost all the active cones are situated in the immediate neighbourhood of the sea, or some large saltwater lake. The greater number are found in islands, many of which seem to have been the products of their activity. Some few exceptions, however, may be made to this rule, particularly in the case of the American volcanoes, a few of which are situated in the interior of the continent, far from the sea; but none at a greater distance than 50 leagues; and we are not acquainted with any instances, except in the volcanoes of Asia, in which there is not abundant reason to believe that they are connected with other volcanoes, which are on the borders of the ocean. The volcano of Jorullo is more distant from the sea than any other; yet, on one hand, it is connected with the Atlantic by Tuxtla, and on the other with the Pacific by Colima.

Another observation, deduced from the geographical position of volcanoes, is, that they are generally arranged in lines. It is true, volcanoes are sometimes solitary, and seem to have no connection with the surrounding mountains: such is the case with Etna and the Peak of Teneriffe. At other times we observe them in irregular groups, as in the Grecian Archipelago: but their most common arrangement is in lines. This is generally the case in South America; and suggested to Humboldt the idea that they were ranged over an immense chasm of intumescent matter. From the knowledge we have of the geological character of the situations in which volcanoes occur, one other observation may be deduced, that they are not confined to countries of any particular geological formation, but may be found in all parts of the series, from the tertiary to the primitive.

(*To be continued.*)

REVIEWS.

ART. I. *Catalogue of Works on Natural History, lately published, with some Notice of those considered the most interesting to British Naturalists.*

Wood, W., F.R.S. L.S., Author of "Index Testaceologicus," &c.: Index Entomologicus; or a complete illustrated Catalogue of the Lepidopterous Insects of Great Britain. 11 pages of letterpress; 3 coloured plates in each Number. Wood, 39. Tavistock Street, Covent Garden.

A WORK of moderate price, and exhibiting accurately coloured figures of all the British Lepidóptera, is no light undertaking, and has long been felt as a great desideratum by the entomological student. Such a work Mr. Wood is now presenting to the public, in periodical numbers, under the title of *Index Entomologicus; or, a complete illustrated Catalogue of the Lepidopterous Insects of Great Britain.* The first number only is yet out; and we hail its appearance with no ordinary satisfaction. Pleased, however, as we are with the plan and general execution of the work, we cannot resist the inclination we feel to point out some few defects which appear to us to mar its beauty; and, what is worse, to diminish its utility as a book of reference, at least of *convenient* reference. It is much to be regretted that the insects are not depicted of their natural size. If, however, the adoption of such a plan would have so increased the price of the work, as in great measure to have defeated its very object of supplying a cheap publication, we think that, at least, a uniform graduated scale ought to have been employed by the artist, so as to have shown at a glance the relative proportions of the respective species. As it is, we have large insects and small figured of the same, or nearly the same, size. Nay, more; Hippárchi*a* Sémel*e*, pl. ii. No. 38., which is a rather larger insect than H. Janir*a*, is, nevertheless, represented on a smaller scale; and the male sex of H. Sémel*e* is drawn larger than the female. It is true, certain significant signs are inscribed beneath each figure, for the purpose of showing the size of the insects delineated: but we dislike these signs, as they impose a disagreeable tax on the memory to keep their meaning constantly in mind; nor are they, in our judgment, happily contrived.

The typography, too, employed for the occasion, is so minute, that, so far as these signs are concerned, it requires almost the assistance of a magnifying lens to decipher them.

We have next to complain of the great confusion unnecessarily created by the disorderly arrangement of the species figured (especially in pl. ii.), and by the irregular mode of numbering them. The ringlets (Hippárchiæ) and the hair-streaks (Thèclæ) are jumbled together promiscuously; and one sex of an insect is sometimes separated from its partner "*longo post intervallo.*" Then, again ("*fiat mixtura*" with a vengeance!), there are blues (Polyómmati) and coppers (Lycæ'næ), blues and coppers alternately, and blues again, chequering the surface of the same plate. Why is such a confused medley introduced into the plates accompanying a systematic catalogue, in utter defiance of every thing like "*lucidus ordo?*" Would it not have added greatly to the beauty and perspicuity of the work, and especially to the convenience of the reader, if all the species of a genus, and the males and females of each species, and the under sides, had been placed altogether in juxtaposition, with their specific names engraved beneath? We quite long to marshal them afresh, and number them in regular consecutive order; and we have even entertained serious thoughts of cutting up the plates for this purpose. Both sexes of each insect (in all cases, at least, where the sexes materially differ) ought to have been figured; as should also the under sides, which oftentimes (as, e. g., in such insects as the smaller ringlets, some of the hairstreaks, and the blues) are of importance, if not essential, in determining the species. The under sides, however, of all the *P*apiliónidæ, we hope, will make their appearance in the next number. We much wish that they had been arranged along with their fellows in their proper order, as already hinted.

Of the inconvenience liable to arise from omitting to give a figure of both the sexes, one example may suffice. In pl. i., Mr. Wood figures the male sex only of Còlias Chrysóthem*e*, and only the female of C. Edùs*a*. These two species, it is almost unnecessary to say, are so very closely allied, and their distinguishing characters are so slight, that many entomologists doubt whether the two are really distinct, or more than mere varieties of one and the same. Now, let us suppose that some tyro, or less experienced collector, in one of his first entomological excursions, takes a male example of C. Edùs*a*, on turning to the *Index*, in order to make out the species, will he not unavoidably be led to conclude, on an inspection of pl. i. fig. 4., that the insect he has captured is C. Chrysóthem*e*?

In our copy, the colouring of the plates is, in general, deficient in brilliancy. We do not mean to complain that these artificial tints are unequal to those of nature's pencilling (for that, we are aware, is unavoidable); but merely that the figures are less highly coloured than they might and ought to have been. Póntia cardámines, for example, Apatùra Iris, Limenìtis Camílla, and one or two of the coppers, all of them brilliant insects in reality, cut in Mr. Wood's plates but a very sorry dingy appearance. In some few instances, too, we are almost inclined to quarrel with the shape or outline of the drawings; as, for example, those of Leucophàsia sinàpis, Còlias Edùsa, and Hỳale, which are unnatural. The figure of Vanéssa Polychlòros, it strikes us, is quite a caricature. We particularly admire the figures of most of the fritillaries in pl. i.; Hippárchia Galathèa, in pl. ii.; and, still more, the under sides in pl. iii., which do the artist great credit.

Thus much for the plates: we now turn to the letterpress.

At. p. 2. of the preface, Mr. Wood says, "It must be observed, that, where the male and female are both figured, the number is always repeated. Thus, in pl. ii. 48. *a* + the male; 40. the female." There must surely be some error here: "48. *a*" represents Hippárchia Hèro; and "40," the female of a quite distinct insect, Hippárchia Tithònus. We presume that number "48. *a*," in the page alluded to, is a typographical error for number "40. *a*:" an oversight this, in correcting the press, calculated to occasion no little perplexity in the minds of beginners.

The fourth column in the catalogue informs us of the place and time at which the insects are to be met with. Papílio Machàon is stated to appear in the end of May. There are, we believe, two broods of the fly during the summer; at all events, we have ourselves captured fresh specimens of it in the month of July. Gonépteryx rhámni is unquestionably among the very earliest butterflies to be seen in the spring, usually making its appearance in April or in March, if the weather be fine, and sometimes in February; but, according to Mr. Wood, its season is not till the month of June. The same remark applies also to Vanéssa c. álbum, Polychlòros, and urticæ, all which come forth in early spring: Mr. Wood notices only their estival flight. Vanéssa Atalánta is peculiarly an autumnal fly, though it makes its appearance, as stated in the catalogue, in June and July. Thècla rùbi we have been accustomed to take in May: June and August are assigned to it as its season by Mr. Wood. We believe it usually disappears long before August. These remarks may be deemed trifling; but it should be remembered that a cor-

rect knowledge of the exact season at which each species is to be found is of importance to the collector, and may be interesting also to the general naturalist.

"The doubtful species," we are informed, "such as *Papílio* Podalírius, &c., will be reserved for an appendix." We do not know precisely what other insects are meant to be included in this *et cætera;* but as Mr. Wood, following the steps of his leader, Mr. Stephens, publishes as genuine species such questionable articles as Còlias Chrysótheme, Póntia Charicl*è*a, Mètra, and sabéllicæ (he has omitted Póntia napæ'æ of Stephens), we hope and trust that he will likewise find a place in the appendix for those no less interesting insects, Còlias Edùsa álba (*Papílio* Hélice of Haworth), Melitæ'a Pyrònia, Argýnnis Charlótta, Hespèria (Thýmele) lavátеræ, &c. In short, we recommend him to record and figure all the strong varieties, which the rich cabinets to which he has access may furnish.

In conclusion, should we appear to Mr. Wood, during the course of our remarks, to have indulged in any thing bordering on severity of criticism, we beg to assure him that nothing of the kind was intended. We admire his work; which, from the specimen afforded by the first number, promises to be, when completed, one of the neatest and most useful books we know on the subject of British entomology. As such, we recommend it to our readers, most sincerely hoping that the author may meet with sufficient encouragement from the public, to enable him to bring his labours to a successful termination.

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Latreille, Pierre André: De l'Organisation extérieure et comparée des Insectes de l'Ordre des Thysanoures.

Sir, Considering that, in consequence of the lamented decease (on February 6. 1833) of the celebrated Latreille, a notice of an unpublished memoir from his hands cannot fail to be interesting to your entomological readers, I send you one on his papers upon the Thysanùra, intended for publication in the next part of the *Nouvelles Annales du Muséum d'Histoire Naturelle*, — a copy of which he was kind enough to forward to me before his decease, — written during his last illness, while in his retreat in the country, whither he had gone to regain, if possible, strength enough to enable him to complete his admirable *Cours d'Entomologie*. How feelingly does the veteran, full of zeal to the end, speak of his infirmities! "Privé de collection, étant dans l'impuissance, à raison de mes infirmités, de faire des excursions lointaines, je me suis vu réduit à ne pouvoir recueillir que les insectes des environs de ma demeure..... Il falloit me

livrer à un examen fort minutieux et très délicat, que sembloit m'interdire l'affoiblissement de ma vue..... Vu mon âge (soixante-dix ans) les entomologistes excuseront les inexactitudes que auroient pu m'échapper."

The memoir before us, however, needed no apology, since it bears all the marks of the superior intelligence of its talented author. The subject of it is a small group of insects to which the sugar louse (Lepísma saccharina) and the ground fleas (Podùræ) belong, and which are remarkable on account of the circumstance of their agreeing with the true insects, except that they do not undergo any transformation. They form the order Thysanoúra of Latreille (Thysanùra *Leach*), the peculiar structure of which had been but imperfectly noticed; so that it is fortunate for entomology that Latreille was compelled to investigate this group, especially since its situation in the system of Mr. MacLeay has rendered it so interesting. The characters of the order are given at great length, of which it would be impossible to give an abstract. Among these, however, the singular circumstance that these are the only insects in which aerial orifices in the outer surface of the skin, named spiracles, are not observable, is stated. Does not the flea exhibit the same anomaly? Latreille divides the order into two families,—Lepismènæ and Podurélläe. In the former he only adopts two genera, sinking Dr. Leach's Petròbius into a section of Máchilis, the characters of which are given at great length, and of which he notices three species, correcting the synonymes of the Lepísma polýpoda of Linnæus. The genus Lepísma, the family Podurélläe, and its two genera, Podùra and Synthùrus, are defined; but the species of the latter genera, of which those of Podùra are very numerous, are not noticed. These require a distinct monograph. It is remarkable that only one extra-European species has been observed, viz., a Lepísma from New Holland. The memoir is not illustrated by figures. It occupies 27 4to pages. — *J. O. W.*

Brown, Captain *Thomas*, F.L.S. &c.: The Conchologist's Text Book, embracing the Arrangements of Lamarck and Linnæus. With nineteen steel plates bearing very numerous engravings. Small 8vo. London. *5s.*

The chronological information afforded by shells, as found deposited in the various strata of the earth, has endowed these productions of nature with a degree of interest and importance of which, at first sight, they seemed scarcely susceptible; and they have been emphatically, as well as most truly, designated the *medals of creation.*

Nor is it a less philosophical part of the study of conchology to endeavour to trace the structure, and investigate the uses, of the animals which inhabit recent shells. Since the Almighty has formed nothing in vain, these creatures, however low in the scale of being, are destined to perform particular service in the great plan of creation.

In this text book the systems of Linnæus and Lamarck are placed before the reader, for his examination and choice. The comparative view of the genera afforded by the tables commencing at p. 53., accompanied by more than 350 figures in illustration of their various forms, will, we think, lead the student, on reflection, like the experienced author of the work, to adopt the extended generic divisions and scientific arrangement of the French conchologist. Shells, from their beauty and delicacy of colour, the elegance and endless variety of their shape, and the ease with which they are preserved and arranged, are particularly adapted to the notice of our fair and intelligent females; and the work before us is a cheap and useful manual, worthy extensive support.

Bakewell, Robert: An Introduction to Geology: intended to convey a practical Knowledge of the Science, and comprising the most important recent Discoveries; with Explanations of the Facts and Phenomena which serve to confirm or invalidate various Geological Theories. The fourth edition, greatly enlarged, with additional plates and numerous woodcuts. 8vo, 589 pages. London, 1833. 21*s.*

It may be deemed unnecessary to do more than notice the appearance of a new edition of *An Introduction to Geology* which has been for many years favourably received. A former edition was translated into German, and the third edition was republished in America by Professor Silliman; such, however, has been the rapid progress of the science in the last four years, that, in recording the most important discoveries, and in stating the conclusions to which they lead, the present volume assumes in many respects a new character. It contains nearly one third more letter press, being printed closer and in a fuller page. In the First Volume of our Magazine, November, 1828, p. 353., we gave an analysis of the third edition of this work, to which we refer the reader, and shall confine our remarks to those parts of the present edition which are, strictly speaking, new, and illustrate the progress of geology. The first article is entitled preliminary observations on living illustrations of fossil conchology, with a plate containing 18 figures, chiefly relating to chambered shells, of which two species are existing. The author recommends to scientific voyagers to examine

carefully the Sèpiæ that may be caught in tropical climates, as he thinks it probable that there are now existing several species with internal chambered shells, more or less resembling fossil species supposed to be extinct. Most of the chapters comprising the transition and basaltic rocks, and the great coal formation, are considerably enlarged. In describing the mountain limestone of Derbyshire, the author has given his recent observations on that district, and states that the stratification is not plane, as it has been before described, but is arched; but the curves are frequently on a large scale, and the bending of the strata (of which a remarkable instance occurs at Creek Cliff, near Matlock) he attributes to the protrusion of toadstone basalt. The chapters on the secondary strata contain the most recent discoveries respecting them, and sections of the different formations in various parts of the Continent, compared with sections of the English secondary formations. Such comparisons show, in a striking manner, that, though there is a great similarity in some of the more important features of the same secondary formations in distant countries, yet that it is useless labour to attempt to establish an identity between all the minor series that compose those formations. The five new chapters in the present edition relate to objects of great interest in the natural history of the earth:— On the formation of secondary limestone and sandstone; and on the progressive developement of organic life. On the quaternary or most recent tertiary strata. On subterranean currents and caverns, in which is comprised an account of the caverns containing human bones recently discovered in various parts of the Continent. On the elevation of mountain ranges and continents. On the temperature of the earth; on central heat; and on astronomical causes illustrative of geological theories. The attention of geologists has recently been deeply engaged in the investigation of the subjects of these chapters: we intend, therefore, in a future Number, to state the views of the author more fully, and to trace the progress which has been made in what may be called the new departments in geology. We shall, for the present, confine our remarks to observing, that the author, in opposition to some modern theories, strenuously contends for the progressive developement of organic life.* "One of the most interesting

* By the doctrine of "the progressive developement of organic life" is to be understood the successive creation and increase of plants and animals, ascending from the lower to the higher classes and orders, and terminating with the creation of man. This doctrine is altogether different from that of Darwin, Lamarck, and other theorists, who maintain that new orders of animals were gradually produced by the growth of new organs. In a recent number of a popular work the two doctrines have been absurdly

circumstances," he says, "attending the secondary strata is, the convincing evidence they afford that, at different periods of their formation, the earth had extensive tracts of dry land, either islands or continents; for, though the prevailing character of the secondary strata is that of marine beds, yet we find among them, beds containing exclusively freshwater shells, and also terrestrial and marsh plants, and in almost all the secondary strata, except chalk, though the organic remains may be chiefly marine, we find remains of some freshwater animal or terrestrial plant, which were probably brought by rivers from the land, and floated into the ancient ocean. We have, beside, the regular coal strata 3000 ft. or more in thickness, abounding in terrestrial plants. We have also a great thickness of freshwater strata in some parts of the oolite formation; and again, the Wealden strata, more than 1000 ft. in thickness, appear to have been deposited in a freshwater estuary or river, which would have required a large continent of dry land for its formation. Now, it is remarkable that, in all the above beds, we do not find a single bone of any large mammiferous land quadruped, nor even of the smallest species, except in the anomalous instance at Stonesfield. To maintain that such bones, not having been discovered, is no evidence that they may not exist, appears to be making a retrograde step in science. It is true that "the bottom of the sea has not been dredged," to discover what species of animals have existed in former ages: the geologist, however, can have no need of such an operation, for the land beneath the former sea has been laid bare, and is now exposed to observation over an extent equal to the whole habitable part of the globe. Every island and continent has formed part of an ancient bed of the ocean, and that not once, but repeatedly. The absence of remains of the higher orders of animals in all the secondary strata, and the frequent recurrence of these remains in the more recent or tertiary strata, appear to afford presumptive evidence, amounting almost to certainty, that the higher orders did not exist, at least in the northern hemisphere, till an epoch subsequent to the deposition of all the secondary formations." (p. 308.) The present volume has a copious index, and a glossary of the principal fossils mentioned in different parts of the work. Though on various occasions the author evidently addresses his arguments to the consideration of experienced geologists, it is but justice to state that he never

confounded. Mr. Bakewell, at p. 354. of his *Geology*, says, "I am fully convinced that the Author of Nature has established laws for the preservation of distinct classes and orders of animals;" but he adds, "these laws are not limited by the artificial classifications of naturalists."

appears to lose sight of the geological student, in his endeavours to explain the subject or the argument in the clearest manner. — *S.*

Mantell, Gideon, F.R.S. &c., and Fellow of the Royal College of Surgeons: The Geology of the South-East of England. 8vo, 415 pages, numerous cuts. London, 1833. 21*s.*

The destruction of monsters was the occupation of the demigods and heroes of the fabulous ages: the discovery and restoration of monsters is the occupation of many distinguished naturalists and geologists in the present age. Had our ancestors, a century since, been told that some of their posterity, distinguished for knowledge and talents, could engage most ardently in the pursuit of flying dragons and enormous crocodiles, in different parts of England, and spend no inconsiderable portion of their time in endeavouring to reset and replace their broken bones, the announcement would have been received with incredulity and contempt. Little was it anticipated that our knowledge of the animal kingdom was about to receive such important additions from the discoveries in geology, and that the structure and functions of many of the enormous inhabitants of a former world, that had ceased to exist on our planet several thousand years, would become as well known as those of many species of animals existing in the southern hemisphere. Mr. Mantell, the author of the present volume, has been one of the most fortunate of modern discoverers: his scientific labours in this new department of natural history are well known to his own countrymen, and to the *savans* in France and Germany. His knowledge of comparative anatomy has enabled him to develope the structure of two of the most extraordinary animals, perhaps, that ever inhabited our planet; remarkable not only for their immense size, but for the peculiarities of their external form and internal osteology, differing in many respects from those of any other known species, living or fossil.

Mr. Mantell's *Illustrations of the Geology of Sussex* being out of print, the present volume combines the most interesting portions of that and of his other works, with an account of his recent discoveries. The part of England more particularly described by Mr. Mantell comprises the county of Sussex, the south-east part of Kent, and the district called the Weald, extending from the south downs of Sussex to the north downs of Surrey and Kent. Of the geology of this district nothing was correctly known until within the last few years. Messrs. Conybeare and Phillips, when they

published their *Outlines of the Geology of England*, in 1822, although they had both examined the country, were not acquainted with its true character, which remained to be discovered some time afterwards by the labours of Mr. Mantell and of Dr. Fitton. The Weald district contains a series of freshwater strata, below the chalk formation, 1000 ft. or more in thickness. Dr. Fitton states "that in the year 1831, when he was about to visit Hastings, he was informed that there was nothing there of any interest; that the whole was merely iron sand, with few or none of those appearances which so well repay the close examination of other districts. It is now known, on the contrary, that the range of varied country included by the chalk downs of Kent, Surrey, Hants, and Sussex, is one of the most interesting geological tracts in England; that it is the depository of some most curious and peculiar organised remains, and affords some of the best evidence hitherto obtained respecting the great and astonishing changes which have taken place upon the surface of the globe." It is this interesting country which Mr. Mantell describes in the present volume, from long-continued observations. He has delineated the features of its physical geography, and the peculiarities of its geology, in a very luminous manner; and has also given a full and clear account of its organic remains, elucidated by beautiful lithographic drawings, and numerous well-executed woodcuts. The Hylæosaúrus, or forest lizard, an unknown animal, of which the remains were discovered by Mr. Mantell, in 1832, in Tilgate Forest, appears to have been about 25 ft. in length, and differs in several remarkable parts of its structure from any known species of crocodile or lizard, living or fossil. A large and finely executed lithographic print is given of these remains. Of the monstrous animal, the iguanodon, formerly discovered by Mr. Mantell, some account is given in this Magazine (Vol. III. p. 13.), since which time the claw and other parts of the animal have been found, and are delineated in this work. It contains a complete tabular arrangement of the fossils of Sussex. Various sections are also given of the district. Among these not the least interesting are those of the cliffs at Brighton, in which Mr. Mantell has discovered many remarkable circumstances that had escaped the attention of former observers, particularly a bed of conglomerate, which contains the bones and teeth of the ox, the deer, the horse, and the Asiatic elephant: he has denominated this the elephant bed. It extends from Brighton to Rottingdean. We regard this volume as one of the most valuable works on local geology that has yet appeared; and, as it relates to a country that is more frequented than any

other in England for its watering-places, it cannot fail to become the travelling companion of the numerous intelligent visiters of the south-eastern coast.

In a future Number we may state Mr. Mantell's views on the former submergence and elevation of the Weald district, and compare them with the opinions of other geologists.

Phillips, Sir *Richard*: An Essay on the Physico-Astronomical Causes of the Geological Changes of the Earth's Surface, and of the Changes in Terrestrial Temperature, by Sir Richard Phillips, with a Preface by William Devonshire Saul, Esq. F.G.S. &c. 8vo, 72 pages. Sherwood and Co. 1832.

As the author of the parent pamphlet rejects the generally received doctrine of universal gravitation, his explanation of the causes of astronomical phenomena and their influence in changing the relative position of the sea and land on the earth's surface, will not meet with the ready acceptance either of astronomers or geologists. This, however, is not alone sufficient to prove that these explanations are erroneous. It would be foreign to our purpose to enter into the controversy respecting the existence of universal gravitation; the name represents a series of constant effects, of whose cause we know nothing; but all modern attempts to introduce another cause in the place of gravitation appear to us to render the subject more unintelligible to the astronomical student, and to impede the progress of science. We will endeavour to state the leading features of Sir R. Phillips's system, as applied to geology. It is well known that the relative proportion of land and water on our planet is very different in the two hemispheres. If the surface of the two hemispheres were each estimated at 500 parts; in the northern hemisphere there are 210 parts land, and in the southern hemisphere there are only 64 parts land. The cause of this inequality is here stated to be the ellipticity of the earth's orbit, by which the earth is brought nearer to the sun, and moves with greater velocity through its orbit in the winter solstice, when the south pole is turned from the sun. "This increased motion, and all the combined forces, generate an increase in the tides, and accumulate a body of waters towards that parallel of that hemisphere [the southern] in which lies the perpendicular direction of the forces, or the actions and reactions." But, as the line of the apsides is variable, the perihelion, or nearest part of the orbit to the sun, will, in the course of about 10,000 years occur at the summer solstice, when the south pole will be turned towards the sun, and the north pole from it; at that time the increased motion of the earth, at its perihelion

distance, will draw the waters from the southern and throw them over the northern hemisphere, by which the present continents will be once more submerged under the ocean, and again covered with marine strata. In 4594 years from this time the perihelion point will pass the equator; about which period the author anticipates that the waters, retiring from the southern to the northern hemisphere, may cause another universal deluge: but he consoles the inhabitants of Britain by observing, "at a period so remote it can signify little to all who now 'fret through life,'" whether our island shall have its seedtime or harvest, or shall be buried in the darkness of the deep during the greater part of the next 8000 years." We cannot stop to state the objections which might be made to this theory; in one respect the author has not done it justice. He omits to take into account the eccentricity of the earth's orbit which is now diminishing; but at a former period the perihelion distance of the earth from the sun was less than the present one, and the impulse of the waters must have been greatly increased thereby, if his system be true. We cannot omit to notice an error into which the author has fallen, by describing the earth's orbit to be in "the form of an egg" (p. 5.); and afterwards he speaks of the "broad end of its egg form;" forgetting that a true ellipsis cannot have one end broader than the other, both ends of the major axis being equally distant from its foci.

We wish that some competent mathematician and astronomer would examine with attention the cause which Sir R. Phillips assigns for the accumulation of the ocean in the southern, and its former retreat from the northern, hemisphere, as it appears to admit of direct proof or refutation.

Woodward, Samuel: An Outline of the Geology of Norfolk. 8vo, 64 pages, with maps, and plates of fossils. Longman, 1833.

Mr. Woodward is already favourably known by his *Synoptical Table of British Organic Remains.* The present small volume, relating to a county of which the geology has been less accurately examined than any other district in England, cannot fail to be acceptable to English and foreign geologists. The chief reason why the geology of Norfolk has remained obscure is owing to so large a portion of its surface being covered by beds of clay, sand, and gravel, regarded as alluvial and diluvial depositions. Mr. Woodward has given a map and general section of the county, in which the extent of the tertiary and upper secondary formations is delineated. The first consists of that peculiar formation called the crag. The secondary formations consist of the

chalk, chalk marl, iron sand, and, according to Mr. Woodward, the Kimmeridge clay, which is bounded on the east by low marsh land. The second plate contains six sections of the coast. Besides the map and sections, there are six lithographic plates of fossils, containing nearly one hundred and sixty figures of organic remains, from drawings by the author. Of these about sixty are from the crag. It appears that, with a few exceptions, the fossil shells in the crag are marine. Mr. Woodward conjectures that the crag was deposited in an estuary which once divided the eastern side of Norfolk from the western. Perhaps many of Mr. Woodward's geological readers will regret that any part of so small a volume should be occupied with speculations respecting the ancient condition of the country, when what is particularly wanted is a more full and detailed account of its present condition, extending the observations to the limits of the crag in the adjacent county of Suffolk. Before concluding, we cannot avoid recommending to Mr. Woodward to republish a table of British organic remains, arranged under the heads of the different formations, with lithographic plates (like those in the present volume) of all the most characteristic fossils. Such a work, at a moderate price, is much wanted: it would have an extensive sale, and would be eminently useful to the English geologist.

Russell, Rev. *Michael*, LL.D.: Nubia and Abyssinia; comprehending their Civil History, Antiquities, Arts, Religion, Literature, and Natural History. Small 8vo, with a map and wood engravings, and forming No. xii. of the Edinburgh Cabinet Library. Edinburgh and London, 1833. *5s.*

An excellent little book, in the compilation of which the author has availed himself of all that had been previously published, and of much that has not yet been laid before the world in a printed form.

ART. II. *Literary Notices.*

MR. CURTIS is preparing for the press a new edition of his *Guide to an Arrangement of British Insects.* This eminent entomologist has removed to 57. Upper Charlotte Street, Fitzroy Square.

Professor Dewhurst informs us that his *Natural History of the Order Cetàcea and the Oceanic Inhabitants of the Arctic Regions* will make its appearance in August next. The work is to form one handsome octavo volume, illustrated by numerous lithographs and cuts.

SHORT COMMUNICATIONS.

MAMMIFEROUS ANIMALS. — *A Dog that fed on the Oats supplied to a Horse.* — In Vol. V. p. 714. are instances of "eccentricity of appetite in a horse and dog." In the month of May, 1832, I saw a very remarkable instance of the same kind; but in this case the eccentricity was confined to the dog. I accompanied a friend, a barrister, to his stable. The first object which presented itself was, a pointer dog, seated on the back of a mare; the face of the dog to the rump of the mare. When in the stable together, this is the constant position of these animals. The barrister took some oats, put them into the manger, and pointed them out to the dog, upon which, it sprang from its position, into the manger, and instantly commenced eating the oats, which it continued to do till the whole were consumed. When horses eat oats, they make a rubbing noise, as though they are grinding the oats; this dog did not do so, but made a cracking noise, and the splitting of the oats was very distinctly heard. Although this horse, when eating, would not suffer the approach of any person, yet it treated its canine companion with great kindness. —*J. M. Houghton le Steane, County of Durham, Dec.* 15. 1832.

This case is well worth recording, and we thank our correspondent for communicating it; but it strikes us as being less remarkable than the case of the pointer feeding on heath mould, described in Vol. V. p. 714., because, in the meal and husk of the oats, there is a much nearer approach to oatmeal, barley meal, bran, and pollard, on one or more of which dogs are usually, in good part, fed. I have known a bitch lapdog very expert at cracking Barcelona nuts, and eating the kernels. When the nut was given her, she would crack it, and let the nut fall upon the carpet, and then, with her chin, rub aside the broken shell, and, when she had got the kernel clear, take it up, chew, and swallow it. Dogs (I can speak to three or four) are rather partial to ripe gooseberries, when they can gather them off the bushes for themselves; and, I have, in days past, more than once, had pleasure, in the company of a favourite and most remarkable dog of my father's, which, in fruit-eating strolls among the gooseberry bushes, would accompany me, and help himself at the bottom of the bushes, while I partook, as more convenient, of the berries towards the top. I must pay my Toby, for such was his name, the com-

pliment to say that he was a dog of taste, and partook not gluttonously and indiscriminately of the berries, in succession, as they hung; but selected those he deemed preferable, and crushed and swallowed them in a wellbred mode of leisurely enjoyment. Another dog, afterwards kept by my father, would, in like manner, help himself to, besides gooseberries, raspberries and red or white currrants. — *J. D.*

Posthumous Hares. — Sir, The following anecdotes occur in the *Dorset County Chronicle*, for 27th September, 1832. They may, perhaps, excite the unbelief of some; but your publication of them cannot, I imagine, displease any of your readers. — *W. B. Clarke. Parkstone, near Poole, Sept.* 28. 1832.

" *Wiltshire.* One day last week, a sportsman, in the village of Tilshead shot a female hare, which he immediately paunched, and found in her three young ones, with but faint symptoms of life. The next day, as the gentleman was shooting in the same field, he saw the three young hares in the place in which he had left them; but, to his great astonishment, they were all alive. He took them home, with the intention of rearing them. One of them has since died, but the other two are still living, and doing well."

" *Cornwall.* As Mr. Richard Rosewarne, of Guinear, was carrying corn in one of his fields last week, a hare started from the arish, and, Mr. Rosewarne being himself on the spot with a greyhound, the dog very naturally followed, caught, and killed her. On being taken home, the hare was paunched, and the entrails thrown on a dunghill. In the evening, a workman passing by thought he saw the entrails in motion, and, on examining, found a young hare enclosed, which, being immediately extracted, and placed before the fire, soon became active, and partook freely of some warm milk. The little animal, thus strangely preserved, is quite the pet of the family, and is likely to add one to the members of Mr. Rosewarne's domestic establishment." (*Cornubian.*)

P. S. Perhaps your correspondent, S. V. W. [Vol. IV. p. 274.], may pardon my using the present occasion, to say, that, if your numerous other friends had not borne such testimony to what I stated, respecting " hares taking the water " (a fact, which I have since heard confirmed, nearly twenty times, in other quarters), I might have quoted a parallel to Havergate Island, in a small island in the " Little Belt," in the Baltic Sea, in which is a colony of hares, which, according to the statements of the Danes, swim over the water from the other side of the channel. — *W. B. C.*

Some Account of the Habits, &c., of the Striped Squirrel of Canada (*Sciùrus striàtus*), *Striped Dormouse* Pennant. — This

interesting and elegant little animal seems, in some measure, to form a connecting link between the squirrel and dormouse tribes, having the outward form of the former, with the habits of the latter. It is very common in the neighbourhood of Quebec, but is rather difficult to meet with, on account of its retired habits; its colour above is brownish red, on the under side white; along the ridge of the back, and on each side, runs a black streak, the spaces between each being of a pale yellow colour; its tail is rather longer than the body, and covered with a spreading fur, but less abundantly than in other squirrels. It is plentiful in the crevices of the rocks forming the bank of the St. Lawrence, from the Chedier River to St. Nicholas. It also breeds commonly in the cellars and crevices under some of the Canadian wood houses. A young one of this year, which was captured in a room, soon became very tame, and played about, regardless of the persons to whom it was accustomed; but was always timid before strangers, skulking into a corner of its cage, and burying itself in some dry grass placed there for its bed. It had a very shrill whistling cry, which it repeated at intervals, as it jumped against the wires in front of its cage. It was extremely nimble, and could get through very small crevices, frequently escaping by pressing asunder the wires of its cage, and on these occasions was very difficult to recapture; but if allowed to run about the room for some time, would attempt to enter its cage again of its own accord. It was fed principally upon shelled almonds and raisins, but was fond of apples, and other pulpy fruits; it also ate grain: and this forms a large portion of its nutriment in the wild state. I regret to say that one day, during the temporary absence of my friend, the squirrel escaped, and, in endeavouring to retake it, the people of the house frightened it out into the fields; and although it several times returned as far as the threshold of the door, yet the ill-judged attempts at re-capturing it at last completely scared it from the spot.— *E. H. Greenhow. Dec.* 10. 1832.

The Rat's Perception of Medicine. — My garden is near the river, and some time ago rats swarmed in it. I employed a rat-catcher to destroy them by poison. Numbers of them, after taking it, were creeping about, into and out of their holes. I had put my plants of the genus *Aloe* out of doors for the summer, as I had done for twenty successive summers before. The rats fell about them, and ate some of them quite up; and, amongst them, a large mitre-leaved aloe, which weighed from fourteen to twenty pounds. Is it not surprising that the rats should know that the aloes,

exotic plants, are of a purging quality? and I think it is quite clear that they ate them for their purgative effect, as I had never before had a plant of *Aloe* touched by the rats, nor have I had since. — *Thomas Hitchen. Norwich. Oct.* 20. 1832.

PLANTS. — *The Common Berberry* (Bérberis *vulgàris* L.) *perfectly harmless to Wheat.* — Sir, It must be satisfactory to every botanist to have the characters of his favourites cleared from all accusations; I therefore make no apology for requesting a place for the following: — It is a commonly received opinion that the *Bérberis* vulgàris (common berberry) has the effect of completely preventing the fertility of corn growing near to it, even to the distance of some hundreds of yards from it. As illustrative of the inaccuracy of this idea, a friend of mine, residing at Bath, mentioned to me, that, during the last autumn, when walking round some corn land belonging to one of his relatives who lives in Wiltshire, his attention was particularly called to the very heavy crop in one of the fields; in the hedge adjoining which, he, at the same time, observed *Bérberis* vulgàris in plenty. His relative was fully impressed with the idea of the destructiveness of *Bérberis*, and, not being a botanist, did not know that it grew there. I may add that the wheat from that field, on being threshed, completely answered the expectations raised by its fine appearance. — *Charles C. Babington.*

Typha latifòlia, or Broad-leaved Reed Mace. — I am not aware whether the following applications of the reed mace (too commonly called bulrush) are generally known, and I communicate them, because I consider that such facts should be recorded. A weaver of velvet told me, that in Spital-fields, and other places, the head of this rush is used for cleaning their work, in preference to a common brush. Since then, on being in the neighbourhood of Blackheath, I met a man carrying a large bundle of them, and, upon enquiry, he told me that they would be sold to the poor at one penny each, for the purpose of a hat brush. I see no reason to doubt their utility in either case, for their softness and elasticity render them very applicable to these purposes. — *James Fennell. Nov.* 1832.

Four several Habitats for Four rare Species of British Plants. — *Càrex speirostàchya.* On the 5th of July, 1832, I found this plant in plenty, at the foot of Clogwyn ddû'r Arddû, Snowdon, between the lake and the bottom of the perpendicular part of the rock. This is the black precipice which appears in front of a person, during the greater part of the ascent from Dolbadarn Castle. This plant had not been

observed in England, and only by Mr. Don in Scotland, previously to my discovery of it in the above spot, Aug. 30. 1830. It does not appear to occur in other parts of the mountain.

Lùzula [*Lucìola* Smith] *spicàta.* In some very wet bogs, near Llyn y Cwm, on Glyder Fawr, Caernarvonshire, July 10. 1832. This locality is mentioned for it, in the *Botanist's Guide* with a mark of doubt; it does not appear to have been noticed by any other author.

Festùca *ovina.* On the top of Cader Idris I found, on July 25. 1832, a variety of this plant, with the corollas very hairy. It is probably *F.* hirsùta of Host, mentioned in Hooker, *Br. Flora*, p. 46.

Scheuchzèria palústris. I found this plant in seed, at Bomere Pool, near Shrewsbury, on Aug. 4. 1832. This is, I believe, the second recorded British locality for this very rare plant; the other being in Yorkshire. — *Charles C. Babington.*

Geology. — *The Red Sandstone along the Meuse is merely the Rubbish cast up from below the Limestone.* — Sir, In Phillips and Conybeare's *Geology of England and Wales*, there is a note on the red sandstone along the Meuse, near Huy, and some observations as to its position, as affecting its claim to the name of *old* red sandstone. I have been frequently at the alum mines along that range of hills; and I can certify that all the red ground seen *above* the limestone, to the left of Huy, descending the Meuse, is accidental. It is merely the rubbish cast up from *below* the limestone: the red sandstone itself is partly a conglomerate and partly fissile, and highly micaceous, and belongs to the greywacke, not to the new red sandstone. — *W. B. Clarke. Parkstone, near Poole, Sept.* 8. 1832.

Meteorology. — *One of the most terrific and awful Hail Storms* that perhaps ever occurred in this part of the country happened about three weeks ago. Hot-houses, and hot-bed sashes of every description, had the glass nearly all broken, as some of the hailstones measured 5 in. round. Several trees, with trunks measuring 12 in. and 15 in. in diameter, were completely cut over by the lightning (some just above the surface, and others about 6 ft. from the soil), and carried a considerable distance. Hedges and other fences were, in various places, levelled with the ground. The streets in Lancaster appeared like rivers; and, on my return from town to my garden, I found it like one large lake, wholly covered with water. The gardens on sloping grounds were completely destroyed; the soil, crop, gooseberry bushes, and hedges being all washed away. — *M. Saul. Lancaster, May* 4. 1833.

MISCELLANEOUS INTELLIGENCE.

Art. I. *Retrospective Criticism.*

Mr. Audubon, *Jun.*, *in Reply to Mr. Waterton's Remarks* (p. 215.) *on Audubon's Biography of Birds.* — Sir, Mr. Charles Waterton having asserted (p. 215.) that Mr. Audubon was not the author of the *Ornithological Biography*, and that "he possesses undeniable proof that, when Mr. Audubon was in England, he did actually apply to a gentleman to write his history of the birds for him," I do not feel willing to permit such an assertion to pass uncontradicted during my father's absence from England.

I have the authority of the gentleman Mr. Waterton refers to, in stating that "Mr. Audubon's proposal to him was to obtain his assistance in the scientific details, and in no other part of the work whatsoever;" and further, I have the authority of this gentleman, for stating his "firm conviction, arising from personal intercourse and the perusal of the original manuscripts, that Mr. Audubon, and no other person, is the *bonâ fide* author of the *Ornithological Biography*.

I shall not notice Mr. Waterton further, except to express my thanks for his generous conduct, in withholding his attacks on Mr. Audubon for two years after the book in question was published, and during the time the author was in England, and bringing these charges forward when my father has returned to the forests of America, and is unable to answer for himself.

Should my father hereafter think it worth his while to notice Mr. Waterton, he will be quite able, on his return to England, to prove the correctness of all that he has said on the natural history of America. I am, Sir, yours, &c. — *V. G. Audubon.* 121. *Great Portland Street, June* 7. 1833.

Observations on Mr. Waterton's Attacks on Mr. Audubon. (p. 215.) — Sir, The biography of men who have devoted their lives to the acquisition of knowledge, led on by a lofty enthusiasm in pursuit of a favourite science, regardless of danger, and foregoing the pleasures and comforts of civilised life, — I say, the biography of such men is particularly instructive; but it frequently presents us with facts not very creditable to human nature. Numerous are the instances of

the unjust treatment which they have received from their contemporaries. While occupied in distant countries with their favourite pursuits, they have sometimes found on their return that envy and jealousy have been busily employed in detracting from their merits, and endeavouring to blight their fair fame, and deprive them of the just reward of their labours. Such is now the fate of a man whom posterity will regard as the most distinguished ornithologist of the present age; I mean, Mr. Audubon. For the last two years Mr. Audubon has been again exploring the forests and prairies of Western America, encountering all the hardships and dangers of savage life, to acquire a more complete knowledge of the characters and habits of the feathered inhabitants of these regions. There are few of your readers to whom the graphic excellence of Mr. Audubon's pencil is entirely unknown. His felicity in seizing the characteristic attitudes of birds, and transfusing into his figures the spirit of life, has never before been attained by any naturalist. Mr. Audubon, it is well known, is engaged in a large, and necessarily expensive, work on ornithology; but he has experienced the common fate of too many devotees to science; a part of his reward is snatched from him by others, who pillage from his works, and publish them under another form. Of this, however, he has less reason to complain, than of the envious attacks on his fair fame and credit as a naturalist. I was greatly surprised and grieved to see two attacks of this kind, in your Magazines for March and May last, from a correspondent whose *Wanderings* are always amusing. On these attacks I shall request room to offer some remarks, as Mr. Audubon is not in the country to defend himself, which he is fully able to do if he could spare time from his favourite pursuits to attend to subjects of a personal nature. Mr. Charles Waterton's remarks on Mr. Audubon's account of the habits of the turkey buzzard (*Vúltur Aúra*) (p. 163.) occupy seven pages, evidently written to throw ridicule on Mr. Audubon's statements respecting the powers of sight and smell of that animal, though they contain no facts or arguments whatever to invalidate the descriptions of Mr. Audubon, but are filled with a series of quizzing interrogatories that are undeserving a serious refutation. I appeal to the good sense of your readers to confirm this judgment. I shall only stop to remark, how would Mr. Waterton's *Wanderings* appear, if subjected to the test of ridicule, or even to the severe ordeal of sober criticism? Surely the author of the *Wanderings in South America* should have some charity for a brother traveller, if required; but I deny that Mr. Audubon requires

more than justice, to have his merits fully acknowledged. In the second letter, Mr. Waterton insinuates that Mr. Audubon did not write his *Biography of Birds*; but he will not pretend to deny that the facts on which the value of the work solely rests were ascertained and furnished by Mr. Audubon. One fact of great importance is most uncandidly overlooked. Mr. Audubon is the son of French parents: he was educated in France until the age of seventeen; at that time he could not speak the English language. It cannot, therefore, be the least disparagement to Mr. Audubon, if, when he had a valuable work to publish in English, he should wish to receive the assistance and correction of a native. Mrs. Audubon, his wife, is a lady of distinguished merit, and possesses great intellectual cultivation and mental power. She is descended from a highly respectable English family, and is well qualified to correct her husband's manuscripts, except, perhaps, in those parts relating to technical classification. With respect to the "gentleman" who, Mr. Waterton informs us, was to have written Mr. Audubon's history of birds, "but the agreement fell to the ground on account of Mr. Audubon insisting that his own name should be given to the work," I cannot but suspect there must be some mistake in Mr. Waterton's account; because I should hope there are not many *gentlemen* who would expect Mr. Audubon to be so unmindful of what was due to his own reputation as to suffer a hired writer to arrogate to himself the honour of his, Mr. Audubon's, labours or discoveries; and I hope, also, that few gentlemen would desire to appropriate to themselves the approbation which Mr. Audubon's arduous labours were fully entitled to receive.

Without making any comparison between the merits of Mr. Waterton and Mr. Audubon as writers or travellers, I cannot but remark that in some things they present a remarkable contrast. Mr. Waterton travelled from his own rich plantations in Demerara, surrounded with his slaves and attendants. Mr. Audubon was a solitary wanderer in the forests of America, often dependent on his gun for support. While Mr. Audubon is exposed to dangers and privations, and looks forward to the patronage of the public for his sole support and reward, Mr. Waterton is tranquilly seated in a magnificent English mansion, surrounded by paternal acres, and endeavouring to deprive the solitary wanderer of that patronage, the expectation of which is the only hope that can cheer his labours.

"Look upon this picture and on this."

To some of your readers it may be gratifying to learn that Mr. Audubon is now on the coast of Labrador, observing the nidification and habits of the winged inhabitants of those northern regions. He has, I believe, made some important discoveries. In a letter I received last week from New York, I am informed that he intends to return to England in October.

It is with much reluctance that I have undertaken to write upon a subject foreign to my own pursuits. Indeed, the fate of some of your correspondents ought to be a general warning to all. It is much safer to put the foot into a hornet's nest, than provoke a swarm of naturalists. I could not, however, see what appeared to me great injustice done to a highly meritorious character, without endeavouring to repel it. I am, Sir, yours, &c. — *R. B. Hampstead, June* 10. 1833.

The Wandering Albatross (*Diomedèa exulans* L., p. 148.) — "Had this albatross been a sea-gull, the above [lines by Coleridge, p. 147, 148.] might have been fact as well as fancy;" and not less so, it may be remarked, if it be presumed that Coleridge actually speaks of the albatross itself. This bird is one of the *Láridæ*, or gull tribe; and, as our correspondent Mr. Main has in person remarked to us, "every voyager round the Cape of Good Hope may have observed it to 'follow' and 'fly round' the passing vessel from day to day." He added, "This large bird seems to subsist on any animal matter which floats on the water. In their following of ships, they are easily caught by a strong hook baited with a bit of pork or beef. Their body appears emaciated, being small in proportion to the size of their plumage; as the wings, when extended, measure 9 or 10 ft. from tip to tip. They appear to be very stupid birds, perhaps from being broken-hearted from the paucity of food they meet with 800 miles from the nearest land."

Dr. Arnott, as quoted by Mr. Rennie, remarks, "How powerful must be the wing muscles of birds which sustain themselves in the sky for many hours! The great albatross, with wings extended 14 ft. or more, is seen, in the stormy solitudes of the Southern Ocean, accompanying ships for whole days, without ever resting on the waves."

Mr. Main, whom apprehension of exceeding the truth always leads to speak within bounds, gives above the spread of the wings at "9 or 10 ft.;" Dr. Arnott, as appears by Mr. Rennie's quotation, at "14 ft. or more;" while the specimen in the Zoological Society's Museum, in Bruton Street, and we have seen this specimen, is set down in the

Society's *Catalogue*, where a picture of it is given, at the following dimensions:—"Length from tip of bill to extremity of tail, 3 ft. 4 in.; expansion of wings, 9 ft." The mean of these three statements of the spread of the wings of the albatross, is 10 ft. 10 in.; and although true, without doubt, is the proverb "*Medio tutissimus ibis*" (the middle course is the safest), we care less about the precise dimensions than to show that the expansion is on all hands admitted to be great. This great expansion of wings, and that wonderful provision in the physiology of birds, by which they are enabled to charge and fill every bone in their body with rarefied air, to promote and secure, as by a series of balloons, their buoyancy; and, together with the comparative smallness, and therefore lightness, of the body of the albatross, in part prepare us to give credence to a supposition entertained by some, that this bird sleeps while on the wing, and the great distance from any land at which it is frequently seen towards the close of day farther favours the supposition. This power of sleeping in the air has been alluded to by Thomas Moore, in his beautiful Eastern poem of *Lalla Rookh*, where, describing a rocky mountain beetling awfully o'er the Sea of Oman, he says,

> "While on its peak, that braved the sky,
> A ruin'd temple tower'd, so high
> That oft the sleeping albatross
> Struck the wild ruins with her wing,
> And from her cloud-rock'd slumbering
> Started, to find man's dwelling there
> In her own silent fields of air."

This elegant quotation was kindly pointed out to us by S. T. P., whose lucid remarks have so often enriched our pages.

The albatross is doubtless spoken of in the following facts told us by a sailor friend, now dead and gone:—"A very large bird sometimes alights upon the yards of vessels passing the coast of the Cape of Good Hope; and no sooner is it upon the yards than it is asleep, and, while sleeping, is very easily captured. When upon the deck, it cannot soar into the air, on account of the length of its wings. It makes a loud and disagreeable noise when molested. It is called 'the booby' by the crew."

The term "booby" is, we have since been told, commonly applied by sailors to any long-winged bird of a whitish colour; although, in the above case of the albatross, the term would seem to express its incautious or booby-like habit of going to sleep within reach of molestation; a habit which those who

scout the idea of the bird's sleeping in the air will impute to the desperateness of its necessity.

With the considerations on the wing-muscles of birds, which the above remarks may induce, it may not be irrelevant to couple those which E. S. offers (Vol. IV. p. 436.) on the powers of flight of "*Sphínx A'tropos*," and other insects "met with at sea," at from 20 to a 100 miles from land. — *J. D.*

G. W.'s Notices on Butterflies, &c. (p. 198—202.) — Sir, The title prefixed to G. W.'s communication (p. 198.), namely, "Notes on butterflies, and other natural objects," &c., somewhat disappointed me, as but little is there said about butterflies, and that little of no great interest or importance. By "the veined white butterfly" (p. 199.) is, no doubt, meant the green-veined white (Póntia nàpi). As there is another and quite different insect, Pièris cratæ`gi, which has been distinguished by the English appellation of "black-veined white," the simple term "veined white" may apply to one as well as to the other, and so may mislead the inexperienced.

The Cuckoo's singing at Night. (Vol. IV. p. 147. 466., Vol. VI. p. 199.) G. W. is not quite correct in saying (p. 199.) that the cuckoo sings by day only. It was after sunset when I heard the bird for the first time this season; and during the first week in May I heard him singing after dusk, between eight and nine in the evening. This is no unusual circumstance. I recollect once hearing him before daylight in the morning. [See a notice on this subject incidentally given by Mr. Clarke, p. 291, note *.]

[*Zygæ`na filipéndulæ.*] Under the date May 25. (p. 201.), your correspondent says, "Although I picked up several cocoons and caterpillars of the six-spot burnet moth (Zygæ`na filipéndulæ), I did not meet with an imago." It was not likely he should, as the season for the winged insect was not arrived.

[*Familiarities effected with Butterflies, &c., by Mr. Lukis.* (p. 222.)] I have seen enough of the familiar habits of Vanéssa Atalánta to corroborate, in some degree, Mr. Lukis's interesting communication on that subject, in p. 222., though certainly I never witnessed such decided instances of the insect's "friendly intercourse with man," as are there stated. Gonépteryx rhámni will often permit itself to be taken up with the thumb and fingers, while it sits with closed wings on the blossom of a thistle, &c., and is busily employed in extracting the juices of the flower. The purple emperor

(Apatùr*a* I`ris) is, from his habits, almost beyond the ordinary reach of the entomologist. "He invariably fixes his throne" (observes Mr. Haworth, *Lepidoptera Britannica*, p. 19.) "upon the summit of a lofty oak, from the utmost sprigs of which, on sunny days, he performs his aerial excursions," &c.: but this accurate observer goes on to remark, "when the purple emperor is within reach, no fly is more easily taken, for he is so very bold and fearless that he will not move from his settling place until you quite push him off; you may even tip the ends of his wings, and be suffered to strike again." I once took a specimen of Apatùr*a* I`ris in the Isle of Wight, as it sat on the top of some low oak copse-wood, with no better entomological apparatus than my hat.

[*Notes in relation to Mr. Conway's Communication on Butterflies*, p. 224—228.] Mr. Conway (p. 224.) doubts whether Gonépteryx rhámni be double-brooded or not. Certain it is we have the insect twice in the year, viz., in the early spring, and again towards the end of July and August; but whether the vernal specimens are such as have survived the winter in the winged state, or have burst from the chrysalis in the spring, is a point on which entomologists seem to be not quite agreed. The same gentleman asks, also, whether all the early ones are females? I answer, decidedly not. The earliest example I ever saw was a male, and many of that sex I have observed this (and usually do, every) spring. Mr. Conway's remarks on the deeper tinge of that portion of the under side of the primary wings which is usually covered with the lower wings, when the insect is at rest, are ingenious and plausible enough: but the theory, I apprehend, will not hold good; because, in perfectly fresh specimens, the portion of the wings alluded to is found also to be of a brighter yellow than the remainder of the same surface, and in the female specimens the corresponding portion is likewise of a purer white.

In p. 224. Còlias Edùs*a* is called the "clouded sulphur." The English name of C. Edùs*a* is "clouded yellow, or orange." "Clouded sulphur" is the proper English name of C. Europòm*e*, a very rare insect, which has been admitted into the British catalogue on rather doubtful authority. (See Vol. V. p. 333. note †.)

Póntia "ràpi," p. 224., is, doubtless, a mere misprint for P. "nàpi."

Melitæ`*a* Dictýnn*a*, pearl-bordered likeness, is enumerated in Mr. Conway's list; and he says he has "always found it in a bog at a considerable elevation on the mountain side." (p. 225.)

I suspect the insect he means is not M. Dictýnn*a*, but M. Selèn*e*, a common species in bogs, and which otherwise is not included in the list. Perhaps Mr. Conway has been misled by the English name, "pearl-bordered likeness," which is, in truth (though that is not his fault), a very unfortunate one, because it would have been far more applicable to M. Selèn*e*, the small pearl-bordered fritillary, an insect so like M. Euphrósyn*e*, that it is sometimes mistaken for it, though the two are undoubtedly distinct. M. Dictýnn*a* has more resemblance with, and is more closely allied to, M. Cínxi*a*, than to M. Euphrósyn*e*, and accordingly might more fitly have been called the "Glanville likeness."

The specimens of Thècl*a* quércus which Mr. Conway finds (p. 227.) "with the upper surface of the primary wings almost entirely of a deep blue" are the females; those with a brilliant irregular spot of blue on the disk of the wings are the males. Contrary to what is the case with most butterflies, the females of Thècl*a* quércus appear to be the most abundant. Mr. Conway expresses his surprise that Apatùr*a* Iris is not found in his vicinity, which, he says, "is almost entirely overrun with oak." If abundance of oak would insure the presence of this fine insect, we ought to have good store of it in Warwickshire; but here it is very rare: I never saw more than two or three examples of it alive in this neighbourhood, and these occurred many years ago. A collector at Coventry has a fine pair, a male and female, which he reared from caterpillars, found within a few miles of that city.

Polyómmatus Argìolus, it seems, is only single-brooded in Monmouthshire; a circumstance which tends rather to add to the probability of an opinion which I ventured to throw out in Vol. V. p. 496., that it is perhaps only in the more southern counties that this insect proves double-brooded. The common blue (Polyómmatus Icarus, or P. Aléxis of Stephens) is omitted in the Monmouthshire catalogue, though it must occur in that county, and is to be found in all parts of the kingdom. Another very common fly, Pámphil*a* Sylvànus, is likewise omitted, unless (as I rather suspect), that insect is intended by "Hespèri*a* cómma," (pearl, not) "pale-spotted" skipper, which last is a local species, chiefly found, I believe, in chalk districts.

I will add, in conclusion, that Mr. Conway, if I mistake not, will derive much amusement and instruction from Wood's *Index Entomologicus*; a work, the first number of which has just appeared, and which promises to be of the greatest utility to the British lepidopterist, even in spite of

the strange irregular manner in which the figures are numbered, and the confused arrangement of the species in the plates; blemishes which, without possessing any counterbalancing advantage, cannot but cause the reader much unnecessary trouble and perplexity. Yours, &c. — *W. T. Bree. Allesley Rectory, May* 20. 1833.

Retrospective Notices, by J. C. Dale, Esq., on Insects, in relation to Remarks by Mr. Bree, Mr. Westwood, and others. — *The Variety of Argynnis Aglaia* (Vol. V. p. 750., Vol. VI. p. 175.) is very similar, on the under side, to one I have from the cabinet of the late Dr. Abbot; but, on the obverse, mine scarcely varies from the common one, except in the lituræ near the base of the superior wings: and I have another specimen, taken near Peterborough, which completely decides its being only a variety, being, on the reverse, Aglàia on one side, and Carolétta on the other (or Geórgius of Dr. Abbot's *MSS.*).

The figure 122. (Vol. V. p. 749., Vol. VI. p. 175.) is unquestionably also another variety of Aglàia; and very similar to Mr. Curtis's figure (*Brit. Ent.*.) of one caught in Ipswich: "the prevailing *green* tint of the posterior wings beneath, and the *small* (smaller than usual) silver spots," I have never observed in A. Adippe.

Fig. 124. (Vol. V. p. 751., Vol. VI. p. 175.), I think, is very likely *P.* Dìa (but, without seeing a specimen, it is difficult to pronounce decidedly, as the doing this depends chiefly on the second wings beneath), and it is another example of the additions made to our list of British *P*apiliònes since the time of Harris and Lewin, &c. An exact copy of *P.* Lathònia (Latòna) of Gamlingay, from Petiver, whose work is scarce, would enable us to form a better opinion whether it be the same species; but I have also doubts about that, as my Lathònia, taken by Dr. Abbot at Whitewood, Gamlingay, and Shelford's also, which I have seen, are the true Lathònia. Ray (p. 126.) mentions several being taken, in Cambridgeshire, by Vernon, Antrobus, and others. Mr. Scoresby found Còlias Palæ'no (and I have a pair of the same, alias Europòme, from Russia, *not* Europòme St., or Philódice Godap., which I also have from America) and Melitæ'a Dìa (purple under-wing fritillary), in great numbers, on the east coast of Greenland, 71° N.

The fine Procèrus taúricus being found in Siberia extends the hope that *this* northern latitude may yet furnish further novelties in entomology.

Stylops. (Vol. III. p. 332., Vol. IV. p. 266., Vol. V. p. 321. and p. 592.) Dr. Leach, in *Zoological Miscellany*, vol. iii.,

states that Latreille has convinced him that the appendages are *not* elytra. (See Dr. Leach's letter, and Mr. Kirby's letter about ichneumons and ménthrastri, &c. — Curtis's *Br. Ent.*, Stylops, Elénchus, and Halictóphagus.

The date of the capture of the Elénchus Wálker*i* (Vol. III. p. 332., and Vol. IV. p. 266.) being the same, I thought was sufficient to show it was the same specimen; but, though I referred to one only then, I have taken another still more extraordinary, and which I have named after my friend Curtis, which he has done me the honour to adopt in his plate.

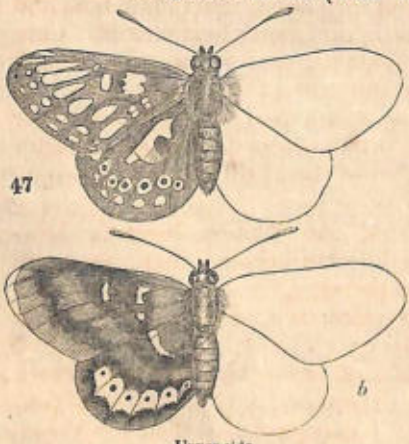
An Individual of B*ómbyx menthrástri, and Six Individuals of* O*phion vínulæ, all hatched from a Pupa of* B*ómbyx vínulus.* (Vol. IV. p. 267., Vol. V. p. 592.) "Pupæ" of *B*ómbyx ménthrastri should have been "pupa." I meant that the pupæ of the ophions and *B*ómbyx menthrástri were found in company within the hard cocoon of the vínulus, and that I bred them.

Several species are marked with interrogations in Vol. V. p. 249—252., because I was not certain of the species then; but the greater part may now be expunged; and others are closely allied, if not the same.

The Halictus xánthopus (Vol. V. p. 249.) should be Lasioglóssum tricíngulum, lately figured by Curtis, a new species; and I have lately taken the true xánthopus, and had another previously. The *L*ocústa lineàta? is not that species; neither can I yet ascertain which: but I have lately taken the true lineàta.

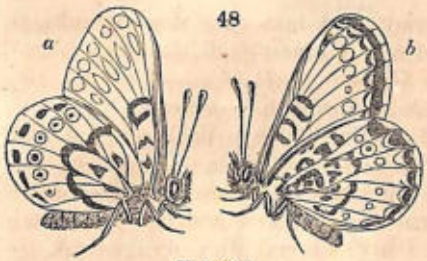
The Bórborus hírtipes? (Vol. V. p. 250.) should be Cœlopa frígida.

The Penthóphera larvæ (Vol. V. p. 252. 685.) both died; but the Psyche (Vol. V. p. 685. fig. *a*) bred radiélla ♂.



Upper side.

I now send a sketch of two extraordinary varieties of Melitæa *A*rtemis. *Figs.* 47, 48. *a* was found at Enborne, near Newbury; and a similar one I have given to the British Museum. The ocelli on the under wings give it much the appearance of Melitæa Cinxia. *Figs.* 47, 48. *b* was found near Haverford West by



Under side.

Captain Blomer. Both varieties are female.

Dates of the appearing of certain Butterflies, stated in relation to the Notices registered in Vol. V. p. 753., Vol. VI. p. 88. 176. — Dr. Abbot's MSS. mention Gonépteryx rhámni being taken Feb. 13. 1797; and I have seen it from the end of February to November. Dr. Abbot took Póntia brássicæ (or the variety) April 28. 1797. The earliest I have seen it was on May 9.; and latest, about the end of August. *P.* ràpæ, I think, I saw on Jan. 29. 1820; and, certainly, March 14 1828, to the middle of October. I bred two from larvæ I found feeding on weeping willow. The individuals of this species vary greatly in size and colour: Mr. Curtis has one of the exact colour of Gonépteryx rhámni ♂, taken near Manchester. *P.* nàpi, from April 18. to Sept. 12.: two or three permanent? varieties of this. I have one of Melitæ'a Selène (no variety except small), taken at the same time and place with Lathònia, by Mr. Standish, viz. Sept. 1818. Vanéssa I'o I have seen at Christmas, in cutting down an old hollow pollard tree; but, on Jan. 30. 1824, I saw one flying on Parley Heath; and have also seen it every month of the year but December; and V. Atalánta every month but January and April. Cynthia cárdui I took once on April 8. and 27. 1827.

Mr. Babington's Device for securing captured Insects. (Vol. VI. p. 155.) I should recommend the insects to be put separate in pill boxes, pierced with holes, into the tin box, and the use of spirit of turpentine in preference to ammonia. Care should also be taken what kinds are confined therein. Small Lepidóptera should each be put into a pill box, and put into another tin box without any spirit, and killed with sulphur afterwards. The tin will keep them from drying too fast after death; and well (at least most of them) till the next morning after a hard day's collecting.

A Water Lizard, or Newt. At Maiden Newton, Dorset, I have heard, from two different persons, that a very odd sort of water lizard is found there.

Astrántia màjor, a Swiss plant, is said to be in plenty at Enborne, near Newbury, Berks.

The Ascription of the Habit of eating Grain to the Weasel, by Dr. Johnson and others, as noticed p. 175. 202. In connection with these notices, I may mention that, in Virgil,

Curcùlio is often translated weasel, instead of weevil. I am, Sir, yours, &c. — *J. C. Dale. Glanville's Wootton, April* 17. 1833.

Mr. Westwood's Reply to Lacon and to others. — It is due to your subscribers that I should state, in answer to the ill-natured remarks (p. 279.) of the person who dates from Newcastle under the name of Lacon, that Choreìa nìgro-æ̀nea and Encýrtus hemípterus are generically and specifically distinct. As to the latter part of his remarks, it does not become me to speak of the value of my observations. I leave them in the hands of your readers, who will, I trust, respond to Mr. Lacon's query in proportion to the quantity of information they have severally received from the perusal of my paper. I trust that, before allowing your pages to be made the vehicle of detraction, you made yourself acquainted with the real name of the writer (which, in all such cases, ought to be published), so as in future to be able to judge of the degree of attention which his communications deserve.

I may also be allowed this opportunity to notice a review of my paper "on the number of insect species," contained in the third number of the *Entomological Magazine*, p. 306. The gross truthless attack made upon me in a preceding page of that work is undeserving of notice, further than as evidencing the animus of the reviewer.

Review. "Mr. W. continues the old error of supposing the Coleóptera so greatly superior to the other orders in point of number."

Answer. Instead of adopting Messrs. Kirby and Spence's calculation that the beetles were as 1 to 2, I reduced the proportion, and estimated them as 1 to 3 of the insect tribes. If their superiority in point of numbers is intended to be denied, I will maintain it upon the far higher authority of Latreille: — "Les insectes compris dans cet ordre (Coleóptera) sont, *sans contredit*, les plus nombreux."

Rev. "Agonioneùrus *W.* is Aphelìnus *Dalman.* [This, as I have stated, is by no means clear.] The wing and antennæ appear to be copied from that author. [My figures were taken from nature.] The name, moreover, is inappropriate, as in the wing of this insect the stigmal does form an angle, though a slight one, with the subcostal nervure." [In the type, I was unable, with a very high-powered lens, to perceive any deflexed stigmal nerve.]

Rev. "Choreìa nìgro-æ̀nea is probably the female of Encýrtus hemípterus. [It is no such thing.] The abbreviated subcoriarious wings of this insect, Mr. Westwood describes as the sides of the mesothoracic scutellum [I have nowhere

described either wings, or what is here unscientifically termed sides], which part, he says, is quadrate, whereas it is triangular with the apex acuminated." [My description of the scutellum is perfectly correct.]

Rev. "Hemiptarsènus fulvicóllis *W.* is an exceedingly common little insect, and has two remarkable characters; first, the variation of the colour of the thorax, two being seldom found alike (bright green is, perhaps, the prevailing colour, which, by the by, makes fulvicóllis a bad name); and, secondly, the beautiful snow-white tips to its antennæ. Neither of these characters are noticed."

Ans. I have never seen but two specimens in which the colour of the thorax offered no variation. It was not necessary, in descriptions like those contained in my paper, to notice *every* character, but rather such as would enable any person to recognise the insects described. Those which I selected were evidently sufficient, since they enabled the reviewer to do this. — *J. O. Westwood. The Grove, Hammersmith, May* 20. 1833.

The Trilobites figured in p. 287. of Vol. III. are without letters of reference; and, as an instance of confusion has occurred in consequence, the cut is here repeated, into which the identifying letters are introduced.

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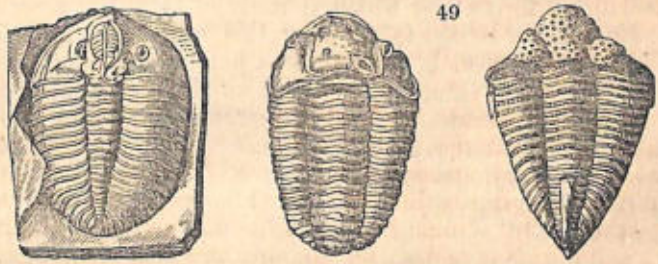

a *b* *c*

a, A'saphus Debùchii, from Dynevor Park, South Wales.
b, Calymène variolàris, from Dudley limestone. *c*, Calymène Blumenbàchii, from Dudley.

Art. II. *Queries and Answers.*

"Plus illà nobis *facie*, quam creditis actum est
Arsacidæ." *Lucan.*

You scarcely can believe, my friends,
How well this phiz has served my ends.

The Nondescript. — After thanking Mr. Menteath (p. 282.) for his courtesy to me, and for the kind manner in which he speaks of the *Wanderings*, I beg to inform him, in

answer to his queries respecting the Nondescript, that I intentionally enveloped it in mystery, on account of the illiberality of the British Treasury.* I had spent many years in trying to improve the common defective manner in which specimens of natural history are prepared for museums. I succeeded beyond expectation, and was doomed to pay for my discoveries to the uttermost mite. Dissatisfied with the contents of the letter from the Treasury, and annoyed at the long detention of the collection at the custom house, I abandoned the plan, which I had conceived, of giving a full and detailed account to the public, of an entirely new mode, which I had invented, of preparing quadrupeds, birds, insects, and serpents, upon scientific principles. But, in order that the public might have some idea of what I had done, I chose the Nondescript for the frontispiece to the *Wanderings;* calculating that its appearance would give rise to much investigation by naturalists, especially by those who are connected with museums. All visiters are allowed to examine the original for any length of time, and are furnished with a magnifying glass, if required. I feel certain, quite certain, that no museum in the world possesses a similar specimen.

Should there be any expression in the *Wanderings* (but I think there is not) by which the reader may be induced to imagine that I wish to pass off this extraordinary thing, either for the head of a man, "os homini sublime," or for that of an ape, "simia! —— quam similis, turpissima bestia nobis;" it is my earnest desire that the expression may be considered null and void. My sole object has been, to leave the thing in absolute doubt; and I have no wish whatever that it should pass for any other thing than that which the reader himself may wish it to pass for. Not considering myself anywise pledged to its identity, I leave it entirely to

(Copy.)

* Gentlemen, *Treasury Chambers*, 18 *May*, 1821.

The Lords Commissioners of His Majesty's Treasury, having had under their consideration your report of the 10th, on the application of Mr. Charles Waterton for the delivery, duty free, of some birds, quadrupeds, reptiles, and insects, collected by him in Guiana, and recently imported from Demerara, I have it in command to acquaint you that my Lords have informed Mr. Waterton that, if he will specify the articles which he intends to give to public institutions, my Lords will not object to their being delivered duty free; but that, with regard to the specimens intended for his own or any private collection, they can only be delivered on payment of the *ad valorem* duty of 20 per cent; and I am to desire you will give the necessary directions to your officers at Liverpool in conformity thereto.

I am, &c.

Commissrs. Customs. (Signed) J. R. Lushington.

the reader's own penetration to say what it is, or what it is not.

And now a word on the *Wanderings*. Any book which is proved to contain contradictory statements or assertions, or theories which cannot be maintained, ought certainly to receive due castigation, and to have its errors exposed; but unenviable is that man's lot, whose adventures are disbelieved, solely on the score of want of faith in him who reads them. Some there are, who pronounce certain parts of the *Wanderings* to be exaggerated, because, forsooth, they know full well in their own minds that such things could not be done. Probably, the editor of a weekly journal was possessed by this spirit of presumption, when, forgetful of that polished form of diction which sometimes even tends to disarm an unjust criticism of its venom, he pronounced to the world, that I "*lied* on a serpent's tail."

If the readers of the *Wanderings* fancy that they can perceive any thing of a contradictory tendency in the work, or if they can point out any suspicious statement, or any passage not sufficiently clear, I shall always be most willing and ready to answer every query, and every remark, through the medium of Mr. Loudon's Magazine; should it suit that gentleman's convenience to admit my correspondence.

Though some of the encounters with wild beasts may appear hairbreadth escapes, and have a very ugly aspect to readers at their own fireside; still, I would fain try to persuade those readers that the encounters presented nothing of a very alarming physiognomy to me in the forest. We are told, that death itself is not heeded when the battle rages. "In hot pursuit, the wound which brings him, is not felt," said Corporal Trim. In fact, our feelings soon become habituated to circumstances; and, when honour, fame, or duty, push a determined man forwards, I am of opinion that he never knows what it is to fear. Thus, the soldier marches boldly up to the cannon's mouth. The fox-hunter, in conscious pride, flies over the five-barred gate. Half way down Dover's cliff "hangs one that gathers samphire, dreadful trade!" to maintain his needy family. But, would a "pampered menial" storm the smoking breach? would an opera dancer surmount on fiery steed the turnpike gate? would a gouty country squire descend the rock of Ailsa, based by the roaring ocean, in quest of seafowl's eggs? No. Their habits and their ailments would disable or prevent them; and probably nothing could induce them to face the apparent danger. Now, as regards myself, I was well fitted out for adventures. I went expressly to look for wild beasts, and I

should have been sorely mortified if I had failed in my attempts to find them; and, having found them, it would have been impossible for me, under these circumstances, not to have come in personal contact with them.

I know not of any other form of words, by which I may be enabled to persuade the reader that all is true which I have written in the *Wanderings*. If I knew of any other mode of persuasion, I would willingly adopt it here. — *Charles Waterton.*

Are Flamingoes ever seen in the long range of Coast, intermediate between the Rhone and the Guadalquivir? (p. 285.) — During the pestilence which raged in Malaga at the beginning of this century, as I was walking on the strand, about a mile to the eastward of the city, twelve flamingoes flew past me almost within gunshot. — *Charles Waterton. Walton Hall, May 6. 1833.*

The Question of the Wigeon's breeding in England. (Vol. V. p. 383. 590. 679.) — In my communication of a "safe mode of transporting eggs to be hatched" (Vol. V. p. 383.), I mentioned having found a wigeon's nest, with eggs in, upon a heath. Mr. Waterton remarks (Vol. V. p. 590.), "it is the first time I ever heard of a wigeon building in England;" and asks if I reared the young? Now, Sir, to be candid, I was not aware, until Mr. Waterton put the question, but that the wigeon did breed in England; and I thank him for his correction of the error. It must, doubtless, have been a teal, instead of a wigeon. In regard to rearing the young, that was a failure. Had I then known of the vermicelli (Vol. VI. p. 269.), I have little doubt that the young ones might have been reared. — *J. C.*

Of what Species (in Systematic Ornithology) is the Greenfinch of Pennsylvania? — R. C. Taylor, in his delectable description of an American "ice storm," (p. 97—103.) says, in p. 102., "Flocks of greenfinches continued in the vicinity of the warm springs, near my residence, throughout the winter." [January and February, 1832.] What species of Greenfinch is here spoken of? — *E. B. June*, 1833.

It is said that a Worm, if cut properly, may be multiplied into many new Worms. — When we look at a worm, we are apt to look at it as one creature; but we are, in reality, looking at an aggregate of several creatures, which, for the present, are united, but may, if we please, be disjoined. (*Rev. C. S. Bird*, in *Entomological Magazine*, p. 108.)

This seems said of the earth-worms (*Lumbrici*): can any correspondent vouch for its verity in relation to them? — *J. D.*

THE MAGAZINE

OF

NATURAL HISTORY.

SEPTEMBER, 1833.

ORIGINAL COMMUNICATIONS.

ART. I. *Some Remarks on Genera and Subgenera, and on the Principles on which they should be established.* By the Rev. LEONARD JENYNS, A.M. F.L.S. *

THE vast accumulation of new species which has resulted from modern discoveries in natural history has led, as might have been expected, to a great increase also in the number of genera.

So long as these genera are constructed upon true philosophical principles, it would be ridiculous to declaim against them on the mere ground that, by enlarging the nomenclature, we render the science more difficult, and less inviting to beginners. As the science extends, the difficulty of studying it in all its details must necessarily increase also; and it clearly cannot remain stationary, so long as new forms continue to pour in upon us, wholly different from those we are already acquainted with.

But it deserves to be considered by naturalists, whether it be not owing to the violation and neglect of these principles, that some *real* ground has been afforded of late years for complaints of this nature. It appears to be very much the practice of zoologists, in this country, to establish genera upon every slight variation of structure, even when confined to a *single organ*, without considering the agreement or disagreement of the *organs in general*; or, at least, without duly estimating the *value* of those characters, which the supposed variation may afford. The consequence has been, that, in

* Read at Cambridge before the Section for Natural History of the British Association, June 26. 1833.

some cases, genera strictly natural have been divided in the most artificial manner; while in others, where a division might have been made without violating any natural affinities, there has still been no regard paid to the *subordinate* nature of the groups so separated, as compared with that in which they were before included.

It is more particularly with reference to cases of this last nature that I would make a few remarks on the present occasion. The only principle upon which we can ever establish a correct and natural classification must be that of a due *subordination of groups*, founded on a *subordination of characters*. Every body acknowledges the *order* to be subordinate to the *class*, the *family* to the *order*, the *genus* to the *family*. The same principle, then, requires that if, in any natural *genus*, we find ground for still further division, the groups so separated *must* rank as *subordinate* to that genus. It is remarkable, however, that this principle, at least as bearing upon the construction of genera, has been almost entirely overlooked in this country; that is to say, the principle which determines that *all groups bearing the same title should be groups of the same value*. On the Continent it has been more appreciated; and, accordingly, the French have instituted what they have termed *subgenera* for the reception of these small groups, of inferior value to that of the true *genera*. Among our own naturalists there appears, with some exceptions *, to be a general feeling against the adoption of subgenera. I know not in what that feeling has originated, nor stop to enquire into it. I shall only observe, that, if it arises from a mere dislike to the having any intermediate group between the genus and the species itself, it is still, in some measure, arbitrary with such persons, to which group they will give the name of genus: only they are to remember, that if they affix the title to groups of the smallest value, such as the French have termed *subgenera*, it is contrary to every right principle to apply the same name to those higher groups (the *genera* of the French) the value of which is manifestly a degree greater.

General principles are, perhaps, best illustrated by reference to particular cases. With the view, therefore, of making myself more clearly understood on this subject, I shall take a few examples from the department of ornithology, in which the impropriety in question will, I think, be made to appear. I select this class, not because such examples are more numerous or more conspicuous here than elsewhere, but

* I allude particularly to Mr. Swainson, who has adopted subgenera in the *Fauna Bor. Amer.*, and whose views on this subject appear to be guided by the principles I wish to advocate.

simply because it was while examining our genera of British birds, as adopted by most ornithologists of the present day, that I was led to notice their great inequality in respect to the *value of the characters* on which they rested. As one instance in point, I may mention a small group separated by Meyer from Emberìza of Linnæus, under the name of Plectróphanes, and by Vieillot under that of Passerìna. The original genus Emberìza, of which our common bunting is the type, may, perhaps, be considered, on the whole, as a strictly natural one; and as forming a group of equal value with those of *A*laúda and *F*ringílla, two allied genera, belonging to the same family. Plectróphanes agrees with Emberìza in its most essential characters, but, at the same time, offers one or two peculiarities, by which it is distinguished from the more typical species of that genus. On these grounds, taken in connection with some slight difference of habits, it deserves to be considered as a peculiar group; but surely we must allow that it ought to rank subordinate to Emberìza itself, inasmuch as its characters are of less value than those which serve to connect all the species originally comprised in that genus.

As offering examples to the purpose in another order, I may mention the Linnæan genera *T*étrao and *P*érdix. These groups likewise are strictly natural ones, and clearly of the same value. Each, however, includes several smaller and more subordinate groups, among which we may select *L*agòpus and *C*otúrnix, as well known and not the least conspicuous. The former bears the same relation to *T*étrao that the latter does to *P*érdix, resembling it in its *general*, but differing from it in one or two *particular*, characters. Now, however we may assert (and, perhaps, the assertion is not more than the truth) that the above four groups are all equally *natural*, it surely never can be said that they are all of *equal value*; that is to say, that *L*agòpus has not many more characters in common with *T*étrao than it has with *P*érdix, and *C*otúrnix with *P*érdix than it has with *T*étrao. How, then, with any show of regard to the true principles of classification, can we consider them as so many equally distinct *genera* in the family of *T*etraónidæ? *

We find a third example offered us in the genus *A*rdea, among the Grallatòres. This group, equally natural with those last alluded to, rests in point of value on much the same grounds with *C*icònia and *P*latàlea, and some other genera belonging to the family of *A*rdèidæ. It comprises, however, as in the former instances, within itself several

* See *Zoological Journal*, vol. ii. p. 402., where they appear to be so considered.

subordinate forms; that is to say, forms characteristic of smaller groups, distinct from one another, but marked by characters of far less importance than those common to all of them. Such, among others, are those of Botaúrus and Nyctícorax *Steph.*; which, accordingly, may well deserve to rank as *subgenera:* but surely it is against all principle to retain *Ardea*, Botaúrus, Nyctícorax, Cicònia, &c., as so many distinct *genera* in the family of Ardèidæ, thereby leading to the inference that the two middle groups are of the same value and importance as the first and last.*

The above cases are sufficient to illustrate the subject I am considering. To multiply examples is unnecessary. It is no part of my object to point out, in every instance, what groups are to be ranked as *genera*, and what as *subgenera*, or even to offer any definition of the term *genus*†, with the hope of reconciling the various opinions that have been given on this point. I merely wish to remind naturalists of those principles which must be the basis of a natural classification; and to observe, that, whatever value of meaning they may attach to the word *genus*, it is most unphilosophical to designate alike by that title two or more allied groups, of which the values are manifestly *not the same.*

It may be observed, indeed, that, acknowledging the principle in question, we may still err, oftentimes unavoidably, in attaching its proper value to any new group that presents itself. To determine this with exactness, presupposes our knowledge of all the other existing groups belonging to the same family. For the value of a group depends on the value of its characters; and although, in general, in the higher groups especially, we judge of characters *à priori*, that is to say, from their importance, considered in themselves, and not with reference to the number of species in which they may be found present, yet there *are* cases, in which their value may be in some measure modified by considerations of this nature. Thus, if we were to find a single species assuming a particular character apparently of no great importance in itself, we might regard such character as indicating a specific peculiarity, but should hardly look upon it in any higher light. If, however, it was discovered afterwards that the same character belonged to a considerable number of species, especially if those species offered among themselves a general resemblance in their

* See *Shaw's Zoology*, continued by Mr. Stephens, vol. ii. part 2.

† I must beg, however, to decline adopting one lately given, which is so indefinitely worded as to be almost applicable to any natural group, of whatever value. See *Entomological Magazine*, No. iii. p. 298.

other characters, the value of that character would, in consequence be, to a certain extent, enhanced, and we might justly transfer it from particular species to an entire group. It is owing to circumstances of this nature that many of the Linnæan genera are now with great propriety considered as natural families, while several of the species of that day are found to be types of so many natural genera; and, in the same manner, those groups which, in the present state of the science, we consider as *subgenera*, may hereafter rise in value, and be found to constitute groups of a higher denomination.

All that we can do is, to determine the value of a group with reference to the present state of our knowledge of the family to which it belongs: and, for this purpose, we must carefully compare its characters with those of other *acknowledged* genera belonging to that family. If, on such comparison, they appear to be of equal value with the characters of these genera, the group in question may be considered as a genus also: but, if of less, it is clear that the group itself is of less importance, and that it must occupy a subordinate station. We are to take care, however, that such comparison be strictly confined to genera of the *same* family, in which alone the same character is necessarily of equal value in all cases.*

What has been said hitherto relates to the principle by which the value of groups is regulated, and is intended to show the impropriety of applying the same term, *genus*, to two groups, however natural in themselves, of which the values are different. It is not merely, however, to the neglect of this principle, that we may attribute the great mutiplication of genera at the present day. Many of the groups which modern naturalists have designated by this title hardly deserve to rank as *subgenera*. They rest on characters far too trivial and unimportant, and unconnected with any marked peculiarity either of form or habit. In some cases, one isolated character of this nature has been laid hold of, in order to effect a division of those genera which it was deemed *expedient* to break up, merely because they contained a large number of species. But no supposed expediency can justify such a step, which is at variance with the well known and universally received Linnæan maxim, *character non facit genus*. However allowable in an *artificial* system, of which the sole

* "Les mêmes caractères n'ont pas la même valeur dans toutes les familles, dans tous les genres." (*Decandolle, Théorie Elémentaire de la Botanique*, p. 214.; a work which should be read by every student in zoology as well as botany.)

object is to facilitate the student in recognising the species he meets with, it can clearly hold no place in a *natural* one. Every group in such a system must be shown to exist in nature; and every natural group must remain entire, except it contain others likewise natural and well characterised, which others must yet always be considered as of mere secondary importance, and as holding a subordinate rank. Such a group may contain *few* or it may contain *many* species, but its value will not be affected by circumstances of this nature. As has already been observed, the value of a group is determined by the importance of its characters, and these are what we are to look to in the establishment of new genera. If it be thought expedient, in the case of very extensive genera, to adopt some method of abridging labour in the search after particular species, we may sufficiently attain this object by instituting *sectional* divisions. Such sections may be grounded upon any character which presents itself for this purpose, and be indicated by *signs*; but let us not impose *names* on collections of species which do not exist in nature as distinct and well-marked groups, and raise them to a rank which they manifestly do not deserve.

Swaffham Bulbeck, June 22. 1833.

ART. II. *A Notice of a remarkable Lengthening in the cutting Teeth of the Rat, and of the physiological Principle of Dentition in the Animàlia rodéntia generally; with an incidental Notice of the Dentition of the Elephant.* By C——.

Sir,

IN Vol. II. p. 134., Vol. III. p. 27., and Vol. VI. p. 21., are given notices of a remarkable lengthening in the incisor teeth of the rabbit; but I think that not any mention has been made of the same occurrence in any other species of the Animàlia rodéntia, perhaps from your correspondents' thinking them, as the same conformation of teeth prevails through the whole order, not of sufficient importance to be individually noticed.

An instance, however, of this deformity in the rat has fallen under my observation; and an account of it may be interesting to some of your readers. The animal was sent me by a friend, who requested me to stuff it for him; I therefore, unfortunately, was unable to dissect the head, and cannot say whether the increase of growth was caused by any malformation or dislocation of the jaws: the rat, however, had no appearance of emaciation. My description will be

better understood by reference to a drawing which, at the time, I made of the head. (*fig.* 50. *a* and *b*.) The in-

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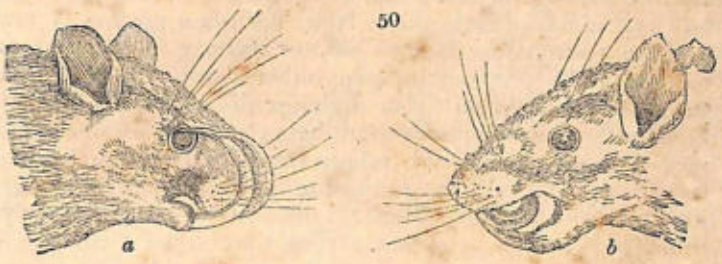

cisors of the lower jaw (*a*) made a turn over the snout, inclined to the right side, and gradually tapered to their extremity. The external incisor was much longer than the internal one, and had grown into the eye, so as totally to destroy the sight. The two incisors in the upper jaw (*b*) passed down to the left of those in the under jaw, and made a short turn round into the roof of the mouth. I did not take notes at the time, and my sketch does not show whether they had perforated the bones. From the appearance of the animal, I should say that this extraordinary growth had not much impaired the animal's power of mastication, nor prevented its obtaining food. I should think that this species would, in fact, suffer much less from this disease than the more herbivorous Rodéntia; as, for instance, a rabbit, which must employ the fore teeth in cropping the herbage.

In accounting for this growth, I agree with Mr. Jenyns (Vol. II. p. 134.) that it is caused by the want of apposition, in some way, between the upper and lower teeth, which prevents that attrition and loss of the growing substance of the teeth which is necessary. The growth of the incisors in this order varies from that generally followed in the growth of teeth. All teeth are formed originally from a vascular pulp, which is of the form of the future tooth, and through which the vessels and nerves enter. On the upper surface of this pulp the growth of the bony portion commences by the secretion of a thin layer, under which another layer is secreted; the pulp diminishing with the increase of bone, till the tooth is fully formed, when it becomes a vascular membrane lining the tooth. Differently to this, in the incisors of the Animàlia rodéntia the pulp does not diminish, but goes on secreting the tooth, which is formed of a hard external layer of enamel, and a softer bony layer. The latter, being more quickly worn away than the enamel, gives to the incisor the

form of a chisel, or, when the upper and lower incisors are brought together, that of a pair of scissors; which is so requisite for cutting the grass, as in rabbits, or for gnawing, as in rats and squirrels, &c. Now, if, from a portion of one of these teeth being broken off, or from a dislocation or fracture of the jaw, or from any other cause, the teeth are prevented meeting, so as to undergo the necessary friction, the growth of the opposite tooth being at the same time continued, it must pass the other, so as to be quite beyond its action; and might, supposing time allowed, be continued to any length. Hence I do not suppose that these growths arise from any morbid condition of the teeth themselves.

Each grinder, or molar tooth, in the hare (and, I should suppose, in other completely herbivorous Rodéntia), is composed of laminæ of harder enamel and softer bony substance; and these teeth are of the same size throughout; are convex anteriorly, to give them a firmer hold in the jaw; and grow from a pulp, as do the incisors: but I am not aware of the same unnatural growth having been observed in the grinders, perhaps from its being more difficult to prevent the necessary attrition.* In the more omnivorous Rodéntia, as the rats and squirrels, the molares [grinders] are not continually growing, but are knobby, covered with enamel, and fixed in the alveolar processes by fangs.

[*The Dentition of the Elephant.*]—While upon the subject of continued developement of teeth, it may be interesting to give a short account of the dentition in the elephant.

The tusks of this animal (after the milk tusks have been shed) continue to grow from a pulp, as do the incisors in Rodéntia. This is easily proved by the circumstance of iron and leaden balls being often found embedded in the substance of the tusks. The formation of the molares, or grinders, differs materially from this. The molar tooth, when it first cuts the gum, is formed of perpendicular laminæ or plates covered with enamel, and joined by interstitial layers of bony substance; the whole tooth being covered by a bony crust, which gives it smoothness: this latter substance, being much softer, becomes worn away more quickly than the enamel, and gives to the tooth the appearance of its being ribbed. The hard laminæ are formed first; and, when covered by their proper enamel, are joined together, beginning at the fore part, by the bony substance. When the anterior layers of the tooth are

* Mr. Lukis has (p. 22.) described, and there, in fig. 3., has shown, an instance of some elongation in the grinders of the rabbit: I have described a second instance in p. 24. — *J. D.*

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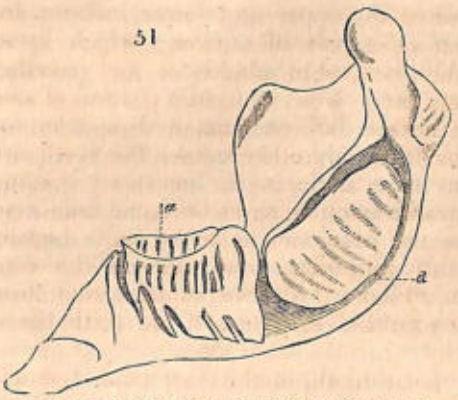


a, The old tooth; *d*, the second grinder, coming forward.

fully formed, the fang is added. This, at first, consists of a thin lamina of ivory, extending backwards: as the anterior part of the tooth, however, becomes worn down by mastication, the fangs and alveolar processes are absorbed. Their place is then filled by the next lamina; and, when the last lamina of a grinder has advanced sufficiently to supply the place of its predecessors, the anterior lamina of the next tooth comes forward; and so on in succession. There is never more than one tooth and part of another to be seen at once in the same side of the jaw. (*fig.* 51.)

Should any of your readers wish to see a very full and learned account of this mode of dentition, they will find it in the first volume of Sir E. Home's *Comparative Anatomy*, from which many of these remarks are taken.

I am, Sir, yours, &c.

January, 1833. C——.

Another Mention of an Instance of extraordinary Length in the Incisor Teeth of a Rat. — Sir, The instances of extraordinary growth of the incisor teeth in rabbits, already registered in Vol. II. p. 134., Vol. III. p. 27., and Vol. VI. p. 21., induce me to mention that an instance of a similar condition has been observed in a rat, as is shown by the following account, copied from the *Birmingham Chronicle* into the *Kaleidoscope*, a work published at Liverpool in 1822: — "A rat was, a few days ago, found near this town, the death of which had been occasioned by two teeth in the shape of tusks; one of which, it appeared, had penetrated the brain." — *James Fennell. London, May* 20. 1833.

ART. III. *A Notice of the Habits of the Jackdaw.*
By CHARLES WATERTON, Esq.

Sir,

THIS lively bird is the constant friend and companion of the rook, in our part of Yorkshire, for nine months out of twelve; and, I think, there is no doubt but that it would remain with the rook for the other three if it only had that particular kind of convenience for incubation which its nature, for reasons totally unknown to us, seems to require.

Though the jackdaw makes use of the same kind of materials for building as those which are found in the nest of the rook; though it is, to all appearance, quite as hardy a bird; and though it passes the night, exposed to the chilling cold and rains of winter, on the leafless branches of the lofty elm; still, when the period for incubation arrives, it bids farewell to those exposed heights where the rook remains to hatch its young, and betakes itself to the shelter which is afforded in the holes of steeples, towers, and trees. Perhaps there is no instance in the annals of ornithology which tells of the jackdaw ever building its nest in the open air. Wishing to try whether these two congeners could not be induced to continue the year throughout in that bond of society which, I had observed, was only broken during incubation, I made a commodious cavity in an aged elm, just at the place where it had lost a mighty limb, some forty years ago, in a tremendous gale of wind which laid prostrate some of the finest trees in this part of Yorkshire. At the approach of breeding-time, a pair of jackdaws took possession of it, and reared their young in shelter; while the rooks performed a similar duty on the top of the same tree, exposed to all the rigours of an English spring. This success induced me to appropriate other conveniences for the incubation of the jackdaw: and I have now the satisfaction to see an uninterrupted fellowship exist, the year throughout, between the jackdaw and the rook.

Those who are of opinion that birds are gifted with a certain portion of reasoning, superior to that which is usually denominated instinct, will have cause for reflection, should they ever examine the materials of a jackdaw's nest, or pay any attention to the mode by which the bird tries to introduce those materials into the hole. The jackdaw invariably carries into it a certain quantity of sticks, fully as thick as those which are made use of by the rook. Now, it always occurs to us that the rook conveys sticks up to the branches of a tree in order to make a kind of frame which may support

the inner parts of the nest. But why should the jackdaw deposit a large heap of strong sticks in the hole which is already calculated to support every kind of material proper for a nest? Then, again: how the act itself of introducing those apparently useless sticks causes us to suspend our judgment, before we finally conclude that the bird is endowed with any sort of reasoning superior to what is commonly denominated the instinct of brutes! You may see the jackdaw trying, for a quarter of an hour, to get a stick into the hole; while every attempt will be futile, because, the bird having laid hold of it by the middle, it is necessarily thrown at right angles with the body; and the daw cannot possibly perceive that the stick ought to be nearly parallel with its body, before it can be conveyed into the hole. Fatigued at length with repeated efforts, and completely foiled in its numberless attempts to introduce the stick, it lets it fall to the ground; and immediately goes in quest of another, probably to experience another disappointment on its return. When time and chance have enabled it to place a quantity of sticks at the bottom of the hole, it then goes to seek for materials of a more pliant and a softer nature.

The shrill and quickly repeated notes of the jackdaw, especially during incubation, are far from being unpleasant to the ear which is accustomed to rural sounds; but very few people have an opportunity of paying attention to them, as this bird is by no means a general favourite with man. It is commonly accused of sucking eggs: but eggs form no part of its diet, otherwise it would be a bad neighbour here; and ringdoves, house-doves, wagtails, fowls, and ducks would wish it far away. It is vastly fond of peas and cherries. When these are done, the jackdaw repairs to the pastures, where it devours an incredible number of insects.

After the young have left the nest, they join the rooks, and roost with them in the surrounding woods till near the autumnal equinox; when both rooks and jackdaws regularly retire at nightfall to the eastward of this place, in immense flocks, and return to the westward every morning for the ensuing half year.

The jackdaw lays from four to six eggs, varying very much in colour, and often in size and shape. When protected, it will build its nest in holes not above six feet from the ground, where people are passing and repassing every hour of the day. If you take away the eggs, and substitute those of magpies, the bird will hatch them, and rear the young ones with great care and affection.

The plumage of the jackdaw is black, with shining silvery

grey behind the head, changing when exposed to the different rays of light. A jackdaw once appeared here with a remarkable portion of white in one of the wings; it tarried with us for two years, and then disappeared for ever. Probably the singularity of its wing had attracted the fatal notice of some experienced gunner, in its peregrinations beyond this vale of safety.

The jackdaw, like the rook, collects insects in its mouth, to feed its young; and this gives it the appearance of a pouch under the lower mandible.

I know not how far naturalists will agree with me in the speculation that these birds remain in pairs the year throughout. When November's winds have stripped the sycamore of its every leaf, I see the daws sitting in pairs, side by side, upon the naked branches. They seem fond of preening each other's heads; and, as they mostly leave the trees in pairs, and in pairs return, I am led to conjecture that their union is not dissolved at the period when the young no longer need parental aid.

He who is fond of rural scenes, and loves to rove

> " On a mountain's lonely van,
> Beyond the noise of busy man,
> Painting fair the form of things,
> While the yellow linnet sings,
> Or the tuneful nightingale
> Charms the forest with her tale,"

will never bring his mind to drive away this playful merry bird, or allow his gardener to take its life, for the value of a handful of cherries.

I am, Sir, yours, &c.

Walton Hall, June 26. 1833. CHARLES WATERTON.

COWPER, whose spaniel dog " Beau," with notable sagacity, "plunging, left the shore," or bank, of the river Ouse, to crop, and bring from the stream, a water lily's blossom which it had observed its master, " with cane extended far," take " unsuccessful pains" to reach, might well be excited to express himself thus: —

> " Charm'd with the sight, the world, I cried,
> Shall hear of this thy deed:
> My dog shall mortify the pride
> Of man's superior breed."
>
> *The Dog and the Water Lily.*

Should the feat of Beau give umbrage to our pride, the jackdaw may serve to soothe it; for Mr. Waterton's interest-

ing information of this bird's defective sense of proportion apprises us that the degree of rationality possessed by it is not only far below the human degree, but even far below the degree of which Beau's unsolicited interpretation and fulfilment of his master's wish bespoke his possession. Interesting, however, as are both these instances of instinct capability, there is not sufficient parity in them to justify my coupling them together; except as two separate facts, individually valuable in their lucid relation to that most interesting of natural subjects, the respective boundaries and capabilities of instinct and reason, the two faculties through which are actuated all the movements of all animals.

In relation to the habits of jackdaws, I have an incident (it can scarcely be called a habit) to report, which, I think, will show that this bird, like others of

"The houseless rovers of the sylvan world,"

has a just sense of the value of expediency. At Cambridge, then, there is good accommodation for jackdaws, in the numerous receptacles for their nests which the thirteen, or more, parish churches, and many college buildings, supply; and in the sufficiency (so one would suppose) of sticks for their nests which the trees in the grounds of the colleges, and elsewhere around the town, afford. Jackdaws are, whether in consequence or not, comparatively numerous at Cambridge. The botanic garden there has three of its four sides enclosed by thickly built parts of the town, and has five parish churches and five colleges within a short flight of it. The jackdaws inhabiting (at least, for a certain time in each year) these and other churches and colleges had, in the years 1815 to 1818, and, doubtless, had, for years before, and have since, discovered that the wooden labels placed before the plants, whose names they bore, in the botanic garden, would well enough serve the same purpose as twiggy sticks off trees, and that they had the greater convenience of being prepared ready for their use, and placed very near home. A large proportion of the labels used in this garden were made out of deal laths, and were about 9 in. long, and an inch or more broad; and, although of this size, were, as they were thin, when dry, pretty light. To these the jackdaws would help themselves freely whenever they could do so without molestation; and the times at which they could do this were, early in the morning, before the gardeners commenced working for the day, and while they were absent from the garden at their meals; and the jackdaws would sometimes fetch away labels, during the gardeners' working hours, from one part of the

garden, when they observed the gardeners occupied in another, as was often the case in their attending to the plants in the glass houses, &c. To describe the mode of action in all by that of one: a jackdaw would grasp a label edgewise in its beak, and draw it out of the soil; and, as this was pretty friable and light, it could usually extract it with but little difficulty: but where the label happened to stand in a more cohesive soil, or to have been more deeply infixed, it would pull the label first to one side, then to the opposite one; and, by persevering in this process of leverage, either effect the extraction of it, or tire itself and leave it. As soon as it had extracted one, it proceeded to balance it in its mouth; letting it fall, and picking it up again, until it had ascertained the place at which it could be held in equilibrium; when it flew off with it. Those who are aware how closely some species of the grasses, garlic, umbelliferous plants, &c., resemble each other, and who, consequently, know how needful it is to prefix labels to them as remembrancers of their names, will readily perceive that much inconvenience arose from the jackdaws' appropriation of the labels; and this, especially, when they removed, as they sometimes did, the labels from sown seeds, as the plants arising from these seeds must, in some species, grow for a year or more before their names could be ascertained. I cannot give a probable idea of the number of labels which the jackdaws annually removed; but have more than once been told, by persons who had ascended the tower of Great St. Mary's church, and the towers or steeples of other churches, that wooden labels, bearing botanical inscriptions, were abounding in these places. The house of the late Dr. (I think, a Dr.) Kerrich, in Free-school Lane, was close beside the botanic garden; and the shaft of one of the chimneys of his house was stopped up below, or otherwise rendered a fit place of resort for jackdaws. From this chimney-shaft Dr. Kerrich's man-servant got out, on one occasion, eighteen dozen of the said deal labels; and these he brought to Mr. Arthur Biggs, the curator of the botanic garden: I saw them delivered and received. This fact, however, gives very little information as to the number of labels annually removed from the garden by the jackdaws, as I am quite without a knowledge of the number of the years which intervened the jackdaws' deposition of the first label into the chimney-shaft and the withdrawal of the eighteen dozen. This number of labels, and the fact of the occurrence of plant-labels on other buildings about the town, prove that, in general terms, the aggregate of labels lost from time to time could not be an inconsiderable one. — *J. D.*

ART. IV. *A Notice concerning the Red Viper* (*Cóluber chersèa* Lin.). By HUGH E. STRICKLAND, Esq.

Sir,

THERE is no department of the British fauna in which greater doubt and uncertainty exist than in the class of reptiles; and this is the more extraordinary, as our indigenous species are so very few in number. Thus, while in the class of insects we have careful and accurate lists and descriptions of upwards of 10,000 species, our native reptiles, although not more than twelve or thirteen in number, have been so neglected, that even the best works on natural history contain many inaccurate statements respecting them. I send you this paper, in the hope that it will aid in supplying the deficiency of our knowledge on this subject; not, indeed, with a view of communicating any new discovery, but of claiming a due degree of importance for an old one.

The red viper was distinguished from the common one (*Cóluber Bèrus L.*) by Linnæus, and described by him under the name of *Cóluber* chersèa. It was first noticed as a British species by Mr. Rackett, in the *Linnæan Transactions*, vol. xii., where he states that it occurred in Cranbourne Chase in Dorsetshire; and Mr. Sheppard, in the same work, has recorded his discovery of it in various parts of Suffolk. Since that time, however, Dr. Leach, in the *Zoological Miscellany*, has regarded this as a variety of the common viper; and Dr. Fleming has done the same in his excellent work on *British Animals*. I conclude, however, that neither of those authors can have seen the animal, as its characters are such as to remove all doubt of its being a distinct species. Two specimens were caught near Evesham in the summer of 1831, of which one was presented to the Zoological Society, and the other is now in my collection.

The most prominent distinction between the red and the common viper consists in their size; the former not exceeding 9 in or 10 in. in length, while the latter often attains 3 ft. The length of my specimen is $8\frac{3}{8}$ in., its largest circumference $1\frac{1}{10}$ in. It is of a bright ferruginous red, with zigzag markings down the back, resembling in form those of the common viper; but, instead of being black or dark brown, they are of a deep mahogany colour. It has also a series of irregular spots of the same colour along each side. The zigzag line terminates at the back of the head in a heart-shaped spot, placed between two converging dark-coloured bands, which meet on the top of the head, and again diverge towards the eyes. The head is much broader and shorter

than in the common viper; but both species agree in the arrangement of the scales, having three scuta larger than the rest on the crown of the head, namely, one between the eyes, and two others immediately behind it. They have also a large scale over each eyebrow. The body of the red viper is more cylindrical than the common one, which is somewhat flat beneath. The belly, instead of being steel-coloured, is ferruginous, like the back.

Linnæus has correctly described this species in the *Swedish Transactions*, where he gives 9½ in. as the length. He states the abdominal scuta at 150; the caudal pairs at thirty-four. My specimen has 150 of the former, and thirty-two of the latter: it is, however, well known that these numbers are liable to vary in the serpent tribe. Among other characters, Linnæus notices a small dark speck on the tip of the tail, which is very distinct in my specimen. I have, however, observed this speck, though less strongly marked, in the common viper. I may here add the authority of Cuvier in favour of this species being distinct. (See *Le Règne Animal*, vol. ii. p. 92.) It would seem, however, that he was unacquainted with our common English viper, and that his "vipère commune" is unknown in this country, as he classes the latter in a section of the genus *V*ìpera, in which the head is uniformly covered with small granular scales; whereas the common viper of England agrees with the red viper in having three scuta larger than the rest on the top of the head; a character on which he forms another section.

The red viper is known to the inhabitants of Worcestershire under that name, and has the reputation of being very venomous. It is certainly a rare species, and I have never been able to procure any more than the above-mentioned specimen.

I have thus stated the claims of the red viper to be considered a distinct species, and I hope the observations of your readers will confirm those claims. To facilitate their investigation of the subject, I have appended the references to different authors on the subject, distinguishing those which are copied from those which I have myself ascertained.

*V*ìpera chersèa. — *C*óluber chersèa, "Lin. Act. Stockholm. 1749, pl. 6.;" "Fauna Suecica, p. 285.;" Syst. Nat. p. 377.; "Weigel. Abhand. der Hall. Naturf. vol. i. p. 12.;" Rackett, Lin. Trans. vol. xii. p. 349. *C*óluber *B*èrus, "Laurenti Rept. p. 97. pl. 2. f. 1.;" "Daudin, Rept." Pèlias *B*èrus, "Merrem." *V*ìpera *B*èrus, "Fitzinger." *V*ìpera chersèa, Cuv. Règ. An. vol. ii. p. 92. *C*óluber *B*èrus var., Fleming, Brit. An. p. 157.; "Leach, Zool. Mis. vol. iii."

I am, Sir, yours, &c.

Worcestershire. HUGH E. STRICKLAND.

In Vol. II. p. 458. are given a figure and description of a presumed new species of snake, discovered near Dumfries, in Scotland, by Mr. T. M. Simmons. Has a second individual of this snake been met with? and has its presumed distinctness as a species been confirmed? — *J. D.*

Art. V. *Observations on the Molluscous Animals of the Genus Gastrochæ'na, preceded by some Strictures on the reputed Means by which the Burrowing Mollusca effect ingress into Rocks and Stones under Water.* By Frederick C. Lukis, Esq.

There are few creatures among the Mollúsca which present more interesting details than those of the genera Phòlas, Saxícava, and Gastrochæ'na. The difficulties offered to our researches by their hidden habitation, and the variety of their characters and habits, oppose the exertions of the naturalist, and contribute to the permanence of the marvellous and extraordinary accounts which have been stated concerning them. They are said to usually inhabit limestone rocks, which they perforate by means either of a dissolving power they possess, or by a mechanical boring of the rocks by their own shells. By one or other of these means, or a combination of both, they are said to soften or reduce the stone intended to afford them a future place of habitation. By some it is imagined that the animals secrete an acid, or powerful solvent, capable of affecting the stone in which they are so frequently found; and that they, at the same time, can yet prevent that solvent from injuring their own calcareous covering. By others it has been advanced that they have the power to soften the spot on which they fix, and then introduce themselves into the rock by the attrition of their own shells. Although many instances offer themselves to foster and support, in some degree, these opinions, still considerable difficulties are presented to our observations in the process of examining this curious tribe of Mollúsca.

It cannot be denied that, whatever powers they are endowed with in common with other shelled Mollúsca, they have capabilities above those of many kinds, by which they are enabled to accommodate themselves to situations very different from those appropriated by others. If, however, they are discovered in a locality where they may be thought to be necessitated to put forth a solvent, or eroding power, to procure a permanent concealment, they are, nevertheless, found equally in situations where no such exertion is required.

In assuming that one or other of these means is the method by which they introduce themselves into rocks, how shall we account for the statement (if true) of Spellanzi, namely, that he found them in basalts and lavas? rocks so much harder than their shelly covering, and not easily acted upon by solvents. The argillo-ferro-calcite, so often perforated by them in the river Medway, contains abundance of Pholàdia; yet the Phòlas crispàta, and others, have their shells seriously worn by their action against the sides of the cavity of a stone comparatively soft; and, if such is the case in the old shells, it must be seen that the difficulty of their introducing themselves when in a young and tender state is almost insurmountable. The attributing to the stone subsequent induration does not remove the whole of the difficulty. Again, many of the Saxícavæ are found extremely distorted and eroded, evidently by the same action. It has, farther, been advanced by authors that some of these animals have been detected in granitic and some of the harder rocks. Residing, as I do, on a primitive formation, where the nature of the rocks forms a bar to the introduction of any thing like a shell, numerous proofs might be adduced to oppose this opinion. So far from this case obtaining, I have never observed any shell embedded even in the softer part of a decomposing stratum. The *Mýtilus incurvàtus*, so abundantly found on this rocky coast, affords one striking proof of the hardness of its usual nest, as the simple action of opening its valves produces the most serious and effective destruction of its surface. The A′rca Nòæ, which lodges in the clefts of rocks, has, in like manner, its exterior markings sometimes completely obliterated by the same action. It should be remarked that the incautious conchologist may mistake the incrusting *Pólypi* spread over granitic rocks, and not suspect his error.

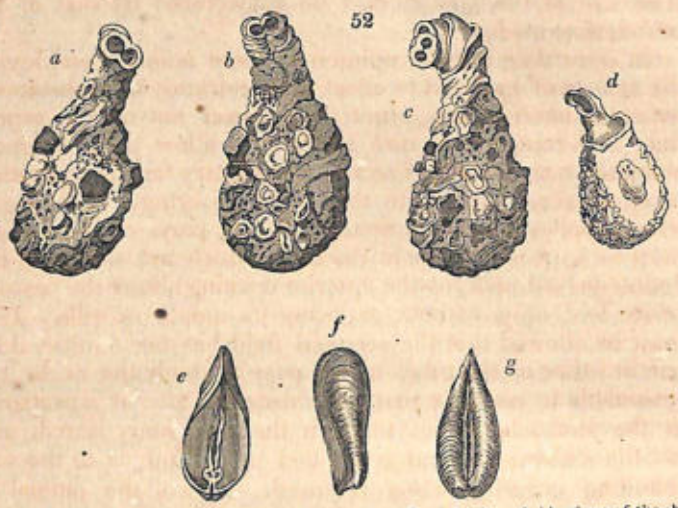
The adequacy of the chemical action of any juice, produced by the animal, to perforate such rocks cannot be entertained. It cannot be denied that shells attached to hard rocks may put on the appearance of having encaged themselves, so as to deceive even the experienced conchologist: an instance of this has recently occurred, where a specimen was sent to me in proof of it. This was a block of silex [flint], rolled and incrusted with marine substances, containing in a cavity a beautiful specimen of the A′rca Nòæ, attached by its delicate byssus [thready cable, or, vulgarly, beard]. To this cavity it had conformed its shell so exactly as apparently to produce indubitable proof of its eroding or solvent powers; but a more intimate examination soon removed any doubts on the subject. The block in question was found to be an adven-

titious mass of flint from some secondary bed, having its natural cavities untouched and in their own native state.

On the nature and habits of this interesting class of animals much remains to be known. The difficulty of observing their economy must tend to hinder the progress of this knowledge; but every fact discovered must lend its aid towards the desired object. With this view, I beg to offer a few remarks on the habits of the Gastrochæ`na, as observed on this coast.

The Gastrochæ`na Pholàdia (*Mỳa dùbia* of Turton and others, blended with the G. cuneiformis of Spengler, but more properly the G. modiolìna of Lamarck) is found frequently on these shores. This shelled animal has been stated by authors as living in the interior of rocks and stones, in the same manner as the Phólades and Saxícavæ. Cuvier, Lamarck, and others, however, denote it as inhabiting madrepores and corals. The first two are not agreed as to the position of the tubes in the body of the animal. The examination of the shells in question would lead me to conclude, with Cuvier, that the tubes proceed from the upper or posterior end of the animal as it lies in its cavity, and issue out when the valves are open, as is the case in the Solènes and *Mỳæ*. These authors do not mention any case or envelope surrounding the shell. Turton, in his *Conchylia*, represents this animal as "living in the interior of rocks and stones covered by the sea, where it forms an outer testaceous coat in which the shell itself is embedded, surrounded by a slimy mucus; and this outer coat, or case, which is formed on the inner surface of the decomposed rock, is quite smooth." In a country destitute of limestone, or soft rocks, these animals are indebted to other means for supplying them with a habitation. The G. Pholàdia accommodates itself to crevices, not the interior of rocks, where it forms its residence by covering its shell, as here exhibited. (*fig. 52.*) It is found among madrepores and shelly fragments, thrown up with alluvial sand and rubbish on the sides of rocks. The cases here shown are composed of broken shells and gravel, mixed with fragments of felspar, hornblende, and sand, strongly agglutinated together: these are frequently intermixed with Sérpulæ, particularly the S. semínulum. The inside is smooth, and consists of thin layers of the calcareous secretion applied by the animal in the formation of this chamber, which somewhat resembles a flask; the lengthened neck, through which the animal passes its double tube, is formed of concentric layers of the same substance, preserving, to a certain depth, the same figure as at the summit of it.

52



a, *b*, *c*, *d*, Cases of Gastrochæ`na Pholàdia. *e*, *f*, *g*, Front, back, and side views of the shell.

Fig. 52. *c* represents one which had three distinct openings, subsequently extended to a fourth, carried onwards in a less straight direction. The enlargement, or extension, of this neck may, perhaps, have been rendered indispensable by the increase of the madrepores, or the accumulation of extraneous substances in its vicinity, and proves how abundant is the supply of the liquid provided for repairing or increasing its case. On comparing the size and thickness of the secreted substance with the delicacy of the shell (*e*, *f*, *g*), we are struck with the disproportion; at the same time, it must be supposed that this covering does not commence until the animal has first made its lodgement in the substance it attacked. The simple perforation of a rock, or the enlargement of a previous small cavity, might, perhaps, be in like manner effected by the Phólades and Saxícavæ, and the cell increased as more room was required for its subsequent stages of growth; but some other arrangement must be provided in the condition of the Gastrochæ`na, if covered over in its young state by a calcareous chamber. As these animals are often found in the substance of old oyster shells, and not always furnished with a similar covering, it may be supposed that they only commence this envelope when the cell suited to their future mature size has been formed.

Fig. 52. *d* represents an old chamber perforated by a new inhabitant. The aperture formed for its entrance was stopped up from the inside, and a fresh neck issued out of the old one.

The size of the animal may be conjectured by that of the orifice thus made.

In discarding the old opinion of these animals' employing the agency of a solvent to effect their entrance into substances, we must, nevertheless, admit their power not only to reproduce and repair their own shells, but allow them a superabundant quantity of this secretion necessary for the reparation of all external injuries to this outer covering. The organ which applies this liquid to the different parts of these cases must be supposed to lie in the tubes which are situate in the double-valved neck, as the anterior opening allows the passage of its foot only, without exposing its mouth or gills. If it must be allowed that the secreted fluid has been injected by one or other of the tubes which pass through the neck, it is reasonable to conceive that this substance, after it is prepared in the stomach, passes through the alimentary canal, and not the abdominal; and is applied by the animal to the surrounding covering when required. When the animal is in its young state, having full liberty to move around the cavity in every direction, it may be easily conceived how injuries can be repaired; but, when fully grown, and incapable of then moving freely, the tube must be supposed to extend itself to all parts of the cavity; or else the foot or tongue must assist, or be endowed with, this function.

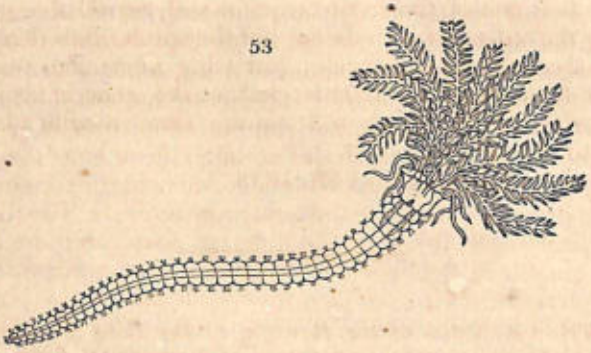
Guernsey, Jan. 15. 1833. F. C. L.

THE student of the interesting subject which this communication elucidates, will find additional valuable information on it in G. J.'s essay "On burrowing and stationary Mollúsca," published in our Vol. IV. p. 351—363.; where figures of three Saxícavæ, a Phòlas, &c., are given. — *J. D.*

ART. VI. *Illustrations in British Zoology.* By GEORGE JOHNSTON, M.D., Fellow of the Royal College of Surgeons of Edinburgh.

14. SABE'LLA AMŒ`NA. (*fig.* 53.)

THIS is a minute but singularly beautiful worm, which lives in a small tube composed of gravel and sand, reared by and for itself, amid the entangled roots of corallines. When danger threatens, the worm withdraws entirely into its furrow, twisting its feathery ornaments into a cylindrical shape; but when all is calm without, the anterior portion of the body is



thrust cautiously from the tube, and the garniture of the head is displayed so as to form a circle of miniature plumes of great elegance and delicacy.

The animal is scarcely an inch long, with a vermiform body of a reddish or flesh colour, the tint varying in intensity, according to its state of repletion. The head is truncated, and invested with a fine membrane divided in front and produced at the sides into angular points. On the upper and dorsal margin there are two dark, prominent, minute specks, something like eyes. From the anterior surface of the head originate the pectinated, or plume-like, branchiæ, collected into two bundles or tufts, but apparently forming a continuous circle when expanded. There are six branchiæ in each tuft, but it is rather difficult to ascertain the exact number: they are of a uniform yellowish colour. The mouth is inferior, and is encircled with not less than six tentacular filaments, of unequal length. Body tapered posteriorly, very distinctly annular; the segments shorter than their diameter, and armed on each side with a few short unequal bristles: a darker line down the middle marks the course of the alimentary canal, which runs straight from the head to the tail. Just below the head, and on each side of the intestine, there is a linear-oblong organ of a dark colour, which is in a state of constant alternate contraction and dilatation; and which, therefore, I presume to be the heart propelling forward the circulating fluid.

The genus Sabélla occurs in the *Systema Naturæ* of Linnæus, who, having no distinct knowledge of the variety of the inmates, placed in it every tube composed of particles of sand and broken shells united to a membrane by a glutinous cement. As at present restricted and defined, the genus may be considered as having been instituted by Cuvier, whose name Lamarck has uncourteously changed to that of Amphi-

trite. It is one of the most beautiful and remarkable genera among the sedentary Annélides; but the species now described differs from the typical species, in having more than two tentacular filaments at the mouth; so that the generic character of Cuvier and Lamarck will require some modification in order to the reception of it.

Berwick on Tweed, May 28. 1833.

ART. VII. *A Notice of the Ravages of the Cane Fly, a small winged Insect, on the Sugar Canes of Grenada, including some Facts on its Habits;* by a SUBSCRIBER in Grenada: *with additional Observations,* by J. O. WESTWOOD, Esq. F.L.S. &c.

Sir,

FOR these last six months [back from March 13. 1833] this island has been infested with a species of insect that threatens not only great injury to the present crop of sugar cane, but also to render the labours of the planter entirely abortive for the next crop. The Aphis, puceron, vine-fretter, blight, or cane fly, as the insect is here termed by the planters, has long afforded an interesting study to the naturalist, and been a pest to the husbandman and gardener, and is too well known to require particular description. I am not aware that any species of insect hitherto noticed has been found so formidable, either in number or destructive qualities, as the cane fly, which is now propagating, and so rapidly overrunning the sugar plantations in this colony. I therefore hope the following particulars respecting it will not be altogether uninteresting to your readers, and that these particulars will draw forth some useful observations from those who may have had opportunities of witnessing the habits and ravages of this tiny destroyer of the cane, and who may, consequently, be able to throw some light on the most effectual method of extirpating it. The insect, formed with a snout and beak ending in a bristle, no doubt for the double purpose of depositing its eggs and extracting its food, attacks the cane in all the stages of its growth; but is more particularly injurious to plants or ratoons when they are young and tender. The under surface of the leaf, and towards the midrib, or the course of the larger sap-vessels, is selected by the insect for the scene of its operations. There it makes an oblique puncture, resembling that which would result from a lancet introduced in the same direction. Into

each of these punctures from five to fifteen eggs are deposited; and each egg is placed transversely with respect to the direction of the fibre of the cane, which serves to overlap them, and thus afford a protection from the many enemies they have among the insect race. The aperture is then covered by a very light substance resembling that which protects the eggs and young of various species of spider (*Aránea*). This substance is always observed to be attached to the posterior part of the body of the insect, and to cover the two spines placed there, and which are characteristic of the genus. When the insect appears on the surface of the leaf after its first transformation, it seems dull and inactive, and is generally covered with a light floss of the substance already mentioned; but having changed its skin, which it leaves perfect and attached to the leaf, it becomes lively, active, and voracious, and joins in the work of propagation and destruction.

There can be no doubt, or at most but little, that the A'phides do not select the sugar cane merely as a medium for the deposition of their eggs, but that, like millions of other creatures, they also regale themselves with its sweets, and, from their numbers, literally bleed the plant to death. The A'phis sácchari, for such it ought to be called according to Linnæan nomenclature, like most of the tribe, produces in great abundance the substance called honey-dew, so much so, that the upper surface of the leaf infected is covered over with it. This substance, when dry, becomes black and of a light texture, which, being nearly insoluble in water, destroys or interrupts the action of the atmosphere, and aids in the general destruction of the plant.

This destructive insect, which might have, at first, been easily exterminated, has now overrun a great part of this island, and has baffled every attempt made to destroy its countless offspring. There is no doubt that, although they are new in this colony, they must have been known in many other parts of our tropical regions; and information on this point and on any other point of the subject will be much valued. Accompanying this, I send you specimens of the full-grown insect, with a specimen of the diseased leaf, and a magnified sketch (*fig.* 54. *b*) of the insect, in case of the loss of the insect itself. Although this species of the A'phis generally confines itself to the sugar cane (Sáccharum officinàrum *L.*), like as other species of A'phis severally addict themselves to distinct species of plants, yet it may be worthy of notice that I have found it on the *P*áspalum distichum *L.*, a grass of so opposite a nature, that it has here obtained the

name of sour grass, although the taste is more that of a bitter with a slight acidity, and, being avoided by cattle, horses, &c., is considered poisonous.

I am, Sir, yours, &c.

Grenada, March 13. 1833. A SUBSCRIBER.

Additional Observations upon the Insect which infests the Sugar Canes in Grenada. By J. O. WESTWOOD, Esq. F.L.S. &c.

Sir,

As the circumstances detailed in the preceding communication, although here and there somewhat obscure, are of much interest in a commercial point of view, and as they add another species to a catalogue, already too extensive, of insect destroyers of the sugar cane, I trust that the following observations thereupon will not be deemed unacceptable.

The insect forming the subject of the preceding account, submitted to me for examination, proves, both from your correspondent's sketch, and from various specimens contained in the box of cotton accompanying his remarks, to be a Homopterous insect belonging to the Linnæan genus *Cicàda*, and to the subgenus *Delphax* as restricted by Latreille. Consequently your correspondent is in error in assigning to it the scientific name of an A`phis, although it is not improbable that persons unacquainted with entomology in the West Indies may have bestowed upon it, from its resemblance to the common plant lice, the French vernacular name of the A´phides, *puceron*. So also your correspondent appears to have gratuitously furnished the insect, in his description of it, with two spines, which, as to place, he has assigned to the posterior part of the body, but which, although characteristic of the genus A`phis, are not found in the specimens which he has himself forwarded of the insect in question, nor, indeed, in any of the *Cicádidæ*.

It does not appear quite clear in what manner the insect attacks the plants. Your correspondent, indeed, mentions "a snout and beak ending in a bristle," which he considers may be for "the double purpose of depositing its eggs and extracting its food." As, however, it is of absolute necessity that we should be perfectly acquainted with the peculiar modes of attack of our insect depredators, before we can think of proposing any effectual remedy for their destruction, it may be allowed me to endeavour, from the peculiar anatomy of these insects, from analogy, and from your correspondent's notes, to show the real cause of the mischief. Now, the

female of this insect, in common with all of the Cicádidæ, is furnished at the extremity of the body, beneath, with an admirably formed pair of saw-like organs, which are expressly for the purpose of cutting grooves in various vegetable productions, in which the eggs are then deposited. A full account of this apparatus is given by Reaumur: but, the A'phides not being furnished with it, their progeny is deposited upon the surface of plants. Where, therefore, the Grenada insect abounds, it is not improbable that much mischief may be occasioned by the interruption of the juices of the plants; but I can scarcely think that this (which is the chief complaint of your correspondent) can be the primary cause of the mischief. He, indeed, adds, although doubtingly, that the insects regale themselves upon the sweets of the sugar cane, and, from their numbers, literally bleed the plant to death. Now, the under side of the head of the insect in all the different stages of its life, is furnished with a jointed sucker having several fine internal darts ("the snout and beak ending in a bristle," of your correspondent), which it thrusts into the leaves or stems of plants, for the purpose of pumping up its fluids, which are its only nourishment; but in no instance of which I am aware is this kind of rostrum employed in forming a receptable for the eggs.*

Many of your readers have, doubtless, often observed in the spring a quantity of frothy matter upon various plants. This is caused by an insect nearly allied to the Grenada pest, and is commonly known by the name of the cuckoo-spit insect (Aphróphora spumària). In this instance the frothy matter is nothing else but the sap of the plant which the insect has pumped up into its stomach by its snout, and afterwards ejected; and we can easily conceive, if any plant were to be attacked by myriads of this insect, how great would be the damage which it would sustain; the operations of this insect, from the similarity in the structure of the mouth, being very similar to those of the plant lice: and your readers are all aware how exceedingly detrimental some species of the latter genus (A`phis) are in England; one of them, A`phis hùmuli, often occasioning damage as serious to the grower of the hop as the Grenada insect does to the planter of the sugar cane.†

* In the weevils (Curculiónidæ), however, this appears to be the case, it being recorded that the nut weevil (Balanìnus nùcum) pierces with its long snout the shell of the nut in which it deposits its eggs. (See, also, Rusticus of Godalming, in the *Entomological Magazine*, p. 35.)

† See a most able essay on the habits, and injurious effects on vegetation, of the A'phides generally, and of the A`phis hùmuli (or hop fly, or hop louse) in particular, and in full detail, by Rusticus of Godalming, in the *Entomological Magazine*, vol. i. p. 217 to 224. — *J. D.*

I may also mention, as closely connected with this subject, that, at the meeting of the Society of Natural History of the Island of Mauritius, on the 12th of September, 1832, a memoir was read upon the habits of another insect nearly allied to the Grenada insect, termed the *cercope écumeuse* (Aphróphora Goudòt*i* Bennett), found in very great quantities upon trees in the island of Madagascar, the larva of which has the power of emitting a considerable quantity of clear water, especially in the middle of the day when the heat is greatest. A further account of this insect appears in the *Proceedings of the Zoological Society of London*, on January 22. 1833; from which it is evident that, instead of remaining in a frothy mantle, as with the cuckoo-spit insect, as a defence to the insect, the fluid which it has pumped up from the plant into its stomach is ejected in great quantities, and falls to the ground in a constant and considerable shower.*

From these circumstances, I think it can scarcely be doubted that the chief injury caused by the Grenada insect arises from its continually sucking the plants.†

The sugar cane is also attacked by other insects. In the *Transactions of the Society of Arts*, vol. xlvi., the late Rev. Lansdowne Guilding has published a valuable paper, for which he received the gold Ceres medal of that society. He describes a very large weevil ‡ (*Calándra* palmàrum) which, although generally feeding upon the species of palm, will occasionally attack the sugar cane; also a smaller species of the same genus (*C.* sácchari *Guild.*), commonly termed "the borer §," which confines its attacks to the latter plants, the larva burrowing into and feeding within the centre of the stems of the cane. A third insect, called "the little borer," is a pyralideous moth (Diatræ`a sácchari *Guild.*), for the destroying of which a reward of 50*l.* was offered by the Society of Arts. (Kirby and Spence, *Introd.*, vol. i. p. 183.) This is by far the most destructive and common enemy to the cane, especially

* Mr. Bennett has informed me that he has observed that the common cuckoo-spit insect is capable of producing similar effects, although in a much less degree.

† We have several British species of *Dèlphax* nearly allied to the Grenada insect; but it is curious that they are here generally found among grass and low herbage. I, however, have recently met with a species near Cambridge, in some quantity, upon tall reeds.

‡ This is evidently "the unknown species of horned beetle" noticed by Kirby and Spence. (*Introduction*, vol. i. p. 183.)

§ A figure of the larva, cocoon, pupa, and imago of *Calándra* palmàrum, and of those of *Calándra* sácchari *Guilding*, with a description of the habits of the two species of insect, are given in this Magazine (Vol. V. p. 466—470.): both the figures and description are copied from the *Transactions of the Society of Arts*, vol. xlvi. p. 153.

in the caterpillar state, when, like the preceding insect, it burrows into and feeds upon the centre of the stems. The cane is never exempt from this dreaded pest, which occasionally, in some islands, destroys whole acres of plants. In addition to these, Mr. Guilding (on the authority of Kirby and Spence, who quote Humboldt and Bonpland) mentions the large firefly (E'later noctilùcus *L.*) as having been said to have been bred in the cane, but probably only accidentally. Myriads of ants (*F*ormìca saccharívora *L.*), also, which once infested, but have now disappeared from, Grenada, committed the most frightful ravages, which are detailed by Kirby and Spence in their *Introduction*, vol. i. p. 185. Latreille also describes a solitary species of ant under the name of *F*ormìca anàlis (which is the *F.* fœ`tens *Fab.*), which lodges in the interior of the stems, and destroys the plants. Messrs. Kirby and Spence add, from Browne's *Civil and Natural History of Jamaica*, that the sugar cane has also its A`phis, which sometimes destroys the whole crop; and on this authority Mr. Guilding mentions that "an undetermined A`phis" proves injurious. He also mentions "the jumper fly," which, he thinks, is "probably one of the Chrysomélidæ," perhaps alluding to one of the Hálticæ, of which our turnip fly is a species: but, as your Grenada correspondent has shown that the *D*élphax is regarded as an A`phis; and as, like all the other *C*icádidæ, it possesses the power of leaping; it seems very probable that it is also identical with "the jumper fly;" and, consequently, "the jumper fly" is not a chrysomelideous insect, or a Háltica.

As to any attempts which may be made for the extirpation of this insect, I confess that I can see but little chance of success. In respect to the first three insects recorded by Mr. Guilding, the grubs of which, it must be borne in mind, feed upon the internal part of the stems of the cane, and are only injurious in their first state, that gentleman thinks that no remedy can be applied in extensive tracts of land, although, by carefully searching the plants, and stripping them of their dead leaves, which harbour the parent insects, they may be prevented from depositing their eggs. In the instance of the ant (*F*ormìca saccharívora *L.*), whose destructive powers were so dreadful that a reward of 20,000*l.* was offered to any one who should discover an effectual mode of destroying them, nothing could be found to stay their ravages. The aid of fire was even resorted to in vain; the insects "rushing into the blaze in such myriads of millions as to extinguish it. Vain was every attempt of man to effect their destruction, till, in 1780, it pleased Providence to annihilate them by torrents

of rain." The insect under consideration differs from the preceding kinds in the nature of its depredations, since, like the A'phides, it feeds externally in all its stages; and I have no doubt that, like those insects, it is chiefly upon the young and tender shoots that it makes its attacks. Now, it is well known that, owing to this circumstance, and to the great fecundity of the insects, no success has hitherto attended the innumerable attempts which have been made to destroy the A`phis of the hop plant (A`phis hùmuli): and, in like manner, I can see but little ground for coming to any other conclusion than that arrived at by Mr. Guilding, namely, that man will not be permitted to frustrate the intentions of Providence, but that we must look alone with submission to that Power for the removal of these pests.

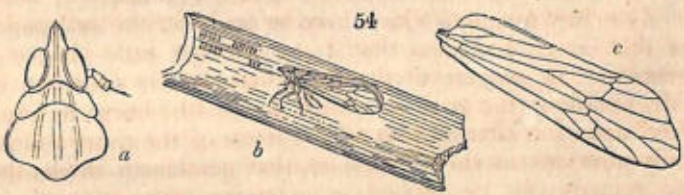
I shall conclude these observations by describing the Grenada insect under the name of

DE'LPHAX saccharívora *Westw.* (*fig.* 54. *b*, somewhat magnified.)

Pallide virescens; capite subrostrato; alis anticis (*c*) nervo secundo apicali tantum bifido; antennis supra lineâ nigrâ.

Longitudo corporis 1¾ lin.; expansio alarum 4¾ lin. Habitat in Insulâ Grenadâ, Indiæ occidentalis, Sáccharum officinàrum *L.* destruens.

Allied to *D*élphax marginàta and pellùcida. Head, thorax, and abdomen pale yellowish green, the latter clothed at the extremity with a white downy secretion; head produced in front into a short narrow nasus, clypeus beneath 3-carinated; eyes brown, with a notch beneath to receive the base of the antennæ (which are of a pale green colour with a dark line in front, and which are not quite so long as the head) with the basal joint half the length of the second; the terminal joint is a slender seta (*a*); rostrum extending to the base of the middle legs; upper wings (*c*) ample,



much longer than the abdomen, nearly transparent, and almost colourless, the inner margin slightly tinged with yellowish; nerves pale green, the second apical nerve alone (and not the 2d and 4th, as in our allied British species) forked; under wings colourless; legs of a pale dull greenish yellow, formed for leaping, the anterior part not dilated.

The Grove, Hammersmith,
July 24. 1833.

I am, Sir, yours, &c.
J. O. WESTWOOD.

IN *fig.* 54., *b* is a copy of the drawing sent by our Grenada correspondent; *a* and *c* have been obligingly added by Mr. Westwood. In the first, at the upper end, are exhibited the eggs of the insect; in the last two, the objects represented are considerably magnified. — *J. D.*

ART. VIII. *Further Notices of the British parasitic Hymenopterous Insects; together with the "Transactions of a Fly with a long Tail," observed by* Mr. E. W. LEWIS; *and additional Observations.* By J. O. WESTWOOD, Esq. F.L.S. &c.

(*Continued from* p. 123.)

Sir,

"CHALK and cheese;" you know the rest. If you *will* have *popular* bits of natural history, you *shall* have *technical* descriptions, at least, of remarkable insects. Mr. E. W. Lewis, of Chelsea, whose communication, in the fourth number of the *Entomological Magazine*, p. 422., entitles him to the rank of a very ingenious observer of nature, has transmitted to me the result of a series of observations upon the natural history of an ichneumon, which appears to me to be not inapplicable as a prelude to a continuation [from p. 123.] of my descriptions of some interesting forms among the minute parasitic Hymenóptera. Mr. Lewis's communication is as follows: — "On the 28th of September, 1832, I observed an ichneumon flying about a lilac tree in our garden, great numbers of the leaves of which were rolled up by the larvæ of a leaf-rolling moth. After it had alighted, I observed that it thrust its long ovipositor into a rolled leaf, drawing it up and down, and working it about in all directions; evidently, as it seemed to me, with some other intention than that of laying its eggs in the enclosed caterpillar, which was not larger than itself; and, in a few moments, it succeeded in driving it out. This extraordinary behaviour attracted my attention; since, if its sole object had been to lay eggs in it, it would not have acted thus. I therefore caught the ichneumon, and placed it under a tumbler, together with a caterpillar, almost dead, which happened to be in the leaf I put in with it. A short time afterwards, the ichneumon began eating the caterpillar; and soon ate nearly half of it, at the same time moving about its head and palpi very quickly. The next morning, I furnished it with several caterpillars, closely rolled up in a leaf; when it immediately began walking over the leaf, with its antennæ bent and intensely vibrating, apparently with the intention of finding some place through which it might easily introduce its ovipositor. Having found a place which had been half eaten through, it directly introduced its ovipositor, moving it about as before; and, having found out where the larva was, it withdrew it; and, taking its station upon the edge of the leaf, with its antennæ arched, the tips between the folds of the leaf, plunged the ovipositor in again, and succeeded in driving out a caterpillar, which was immediately pounced

upon and seized with its mandibles; but, the caterpillar twisting about, it thrust its ovipositor into it, at the same time held it with its legs, and then commenced eating it. It soon left this caterpillar, and drove out another, proceeding in the same manner until it had destroyed all. At one time, after having thrust its ovipositor several times through a spot in the leaf, which had been half eaten, and was very thin, without the caterpillar coming out, it began gnawing the leaf; and I afterwards found a caterpillar there, which had been unable to move. I supplied this ichneumon with caterpillars every day for a week; and it destroyed every one, partly eating them. It then died; and, from the lateness of the season, I was unable to follow up this interesting subject.

"When boring, it generally proceeded in the following manner: — It elevated the abdomen, and placed the whole of the ovipositor perpendicularly on the leaf, keeping it in that position until it had fixed the point; it then withdrew the outer cases about the eighth of an inch, but still directing the dart of the ovipositor with them, until it was firmly driven in; when it took them away entirely, and, all the while, moved its ovipositor half round and back again (like as one would use a brad-awl), the muscles in the last segment of the abdomen being actively employed. This may easily be seen with a glass of an inch and a half focus, for the ichneumon is not very easily disturbed. Sometimes it places its ovipositor under its body, steadying it with its hinder coxæ [hips].

"It seemed unable to capture the caterpillars when not rolled in a leaf, as, whenever it approached them, they dropped down. I have several times put them under a glass together, with a leaf, and it never touched them until they had rolled themselves up. While they were doing so, whenever it approached them they immediately retired into or under the leaf; and, when they had finished, it drove them out, and murdered them: for murder it certainly was, since it killed sufficient to feast a hundred ichneumons.

"This ichneumon also laid several eggs in the rolled part of the leaf while in confinement; and I also found several eggs in the leaves upon the tree: but the larvæ, when hatched from these eggs, would not be able to find subsistence, as the leaf-rollers began to go into the ground on the 24th of September. The eggs were little more than half a line long, and about the same in circumference in the middle, and were narrowed to a point at each end; the external part transparent, the inner opaque. The ichneumon laid one on the side of the glass after I had driven it from the leaf; the external part was then very soft."

During the months of May and June in the present year (1833), Mr. Lewis recommenced his observations, having succeeded in rearing some perfect ichneumons at the commencement of the former month. He accordingly "placed a male under a glass, with some flowers of *Alýssum*: the insect, after perambulating the flower for some time, went into the corolla as far as he could, but did not seem able to reach the honey. I then exposed the nectary; immediately on finding it, he began eating, and remained until he had finished it. I afterwards gave him some sugar, of which he was extremely fond; but he died in four days.

"On May 13. I bred a male and female, both of which ate sugar; but, in the evening, the female began to attack the rolled-up caterpillars. On May 14. she killed a caterpillar, but could not get it to come previously out of the leaf; she, therefore, gnawed a hole through the leaf, keeping her ovipositor in the caterpillar, and gnawing round it as a guide. She then withdrew her ovipositor, and began eating the caterpillar: when she had eaten as much as was under the hole, she used her tail as a fork to bring her dinner within reach. One thrust of the ovipositor in the head of a larva generally deprives that part of motion; caterpillars above half an inch in length require more killing: the ichneumons, however, killed some an inch long.

"In one instance I observed an ichneumon drive out a caterpillar from the folds of a leaf; when another ichneumon thrust at it, and drove it to the edge of the glass, where, after a stab or two, it became motionless. She then began eating it; but the former, thinking she deserved part, wanted also to eat: this, however, the latter would not allow, and drove her away. Nothing daunted, she returned to the charge, and, unsheathing her ovipositor, seemed determined to maintain her rights; whereupon the other, recollecting, perhaps, the fable of the bear and the lion, or convinced by the more powerful argument *behind*, allowed her to have a share. They ate together amicably," (?) "until the caterpillar was too small for two; when they fought again, one of them seizing it in her mouth, whilst the other went in search of more: but, finding none, she jumped suddenly on her companion; and, upsetting her, seized the skin of the caterpillar, now not worth contending for. They are very pugnacious, fighting with their wings and legs; and frequently lose a dinner, which makes the best of its way off. They, however, spent a considerable time every day at the sugar.

"Towards the end of May the females commenced laying their eggs, which hatched in three or four days.

"I could not ascertain whether they stung the larvæ or not. Some caterpillars required more stabbing than others. One which received three stabs died in a few hours; another, half an inch long, died in about ten minutes; while one which I stabbed with a pin was as merry as ever four days afterwards."

So far Mr. Lewis, whose facts offer another striking peculiarity in the extraordinary economy of the parasitic Hymenóptera. Hitherto it has been considered that the little nutriment taken by ichneumons in the perfect state consisted merely of the nectar of flowers: hence it is that so many are observed upon the blossoms of plants, especially upon those of umbelliferous plants; and, indeed, from Mr. Lewis's statement, it appears that his ichneumon would occasionally resort to nectar and sugar. With the exception of the wasp, which may often be observed feeding upon the meat hanging in butchers' shops, and the ants, which will skeletonise a small animal in a very short time, no hymenopterous insect, to the best of my recollection, has hitherto been observed to be carnivorous.

The power of stinging has been denied to the ichneumons and other hymenopterous insects of the section Terebrántia of Latreille. They appear to me, however, to possess this power to a certain degree; since, although they do not sting so painfully as the bees and wasps, yet the general construction of the ovipositor being perfectly similar to that of the sting of the aculeate tribes, enables them to inflict a wound; and, from experience, I can state that irritation has followed the puncture. * It may, indeed, be said that this irritation was merely produced by the wound, and was not the effect of the poison; but Mr. Lewis's statement proves that, in the instance of the larvæ of the leaf-rollers, poison must have been injected.

Respecting the manner in which the egg is excluded in hymenopterous insects, on which subject no decided observations have been recorded, Mr. Lewis informs me that the egg passes down the central dart of the ovipositor, which is gradually dilated as the egg passes, the two external sheaths being detached; that its passage is caused by the alternate motion of the two internal spicula, which are enclosed in the

* I may add, that a few days ago, while collecting in Richmond Park, a small-sized ichneumon fell upon my face, close to the corner of my eye, from a branch of an oak tree which I was beating. The lids instinctively closed in an instant, catching the intruder by his leg, which so annoyed him that, for self-defence, he stung me in the eyelid, and I felt the effects for an hour afterwards; sufficiently long to show, regard being had to his size, that the wound was irritated by poison.

channeled dart, and which are constantly drawn up and down; and that the egg, which must be very elastic, is protruded out of the ovipositor at a short distance before its extremity. At times, however, the ichneumon made use of its ovipositor, neither as an instrument of oviposition, nor as a sting, but merely as a means of retaining the larva upon which it was feeding in a convenient position.

But, one of the most extraordinary facts which Mr. Lewis has communicated to me on the history of this ichneumon is, that the species of larva which is devoured by the perfect ichneumon is also that in which the females deposit their eggs for the support of their future young, Mr. Lewis having observed many of the larvæ of the ichneumons feeding externally upon the leaf-roller caterpillar in the roll of the leaf, where also he found the ichneumon pupæ, which subsequently produced perfect insects, as stated by him. Now, from Mr. Lewis's account, the ichneumons appear in the perfect state as early as the beginning of May; and they were also observed in September: at both which seasons (and, probably, during all the intermediate time) there is a supply of leaf-rolling caterpillars for their support. Hence it is most probable that the larvæ of the ichneumons destined to prey upon the leaf-rollers are the offspring of some of the earlier bred ichneumons, it being absolutely necessary that there should be a supply of the leaf-rolling larvæ for the support of the ichneumon's larvæ; as these feed only upon the leaf-rolling larvæ, which latter go into the earth towards the end of September.

The history of the moth which produces these leaf-rollers is not less interesting than that of its parasite: this Mr. Lewis reserves till another occasion.

The perfect insect, Mr. Lewis tells me, does not confine itself to the leaf-roller; but will devour other caterpillars, he having given it the larva of a Lozotæ'nia, that of the little ermine moth (Yponomeùta padélla), and of two other species.

It only remains for me to add, that the leaf-roller is an undetermined species of Gracillària; and that the ichneumon agrees with the Pímpla stercorator of Fabricius and Gravenhorst, except that the ovipositor is rather shorter than the abdomen.

In conclusion, I add short descriptions of six curious minute parasites belonging to the families *C*halcídidæ and Proctotrùpidæ: —

Epico'pterus * *Westw.*, Pterómalo affinis. Corpus brevissimum,

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* *Epikopeis*, cut, and *pteron*, wing; from the notch in the front of the wing.

latum; antennæ 12-articulatæ subclavatæ (*fig.* 55. *b*); alarum portio inter marginem anticum et nervum subcostalem anticè (et præsertim ad nervi conjunctionem cum margine) dilatata, et ibi obliquè truncata (*a*).

Body very short, convex, and contracted; antennæ short, subclavate, 12-jointed, the 3d and 4th joints annular; wings with the humeral portion anteriorly dilated and obliquely truncate at the union of the subcostal nerve with the front margin of the wings; abdomen sessile.

Spec. 1. Epic. choreiformis *Westw.* Nigro-æneus haud nitidus; facie viridi; antennis piceis articulo basali rufo; abdomine nitido cyaneo-nigro; lateribus cupreo-nitentibus; pedibus testaceis; alis basi obscurioribus.

Longitudo corporis, lineæ dimidium. Expansio alarum, lineæ $\frac{7}{8}$. In musæo nostro. Habitat in gramineis prope Cantabrigiam, Julio, 1833.

Brassy black, not shining; face greenish; antennæ pitchy, with the basal joint reddish; abdomen shining cyaneous black, with the sides coppery; legs reddish; wings darkish towards the base.

I found several specimens of this curious little insect at Gog Magog Hills, near Cambridge, during the late meeting of the British Association [June 24—28. 1833], in company with Choreìa nìgro-æ`nea *W.* [described p. 122. 279. 380.]; which it so much resembles, that, until I had carefully examined it, I thought it was its male. I have seen no other insect in this very extensive family with wings similarly formed.

Smaragdi'tes * *Westw.* ab Eulophìnis omnibus differt antennis longis. Corpus nitidissimum; antennæ ♂, ut mihi videtur, 9-articulatæ, corporis longitudine, articulo primo dilatato, secundo brevi, tertio minutissimo, reliquis elongatis filiformibus longe pilosis; abdomen thorace paullo longius, at illo duplo angustius.

Body very shining; antennæ apparently 9-jointed, as long as the whole body, with the basal joint dilated, the 2d short, the 3d very small, the remaining long filiform, with long hairs; head rather broader than the thorax, the latter ovate, with the front margin rounded; the abdomen rather longer but much narrower than the thorax, elongate ovate, concave above; tarsi 4-jointed.

Spec. 1. Smar. admirábilis *Westw.* Caput lætè viride, posticè auratum; thorax et abdominis basis lætè aurata, hujus parte postica cyanea, maculâ pallidâ ante medium; antennæ pallidè fuscæ, articulo primo viridi nitido, basi apiceque albis; pedes albi; alæ immaculatæ.

Long. corp. $\frac{3}{4}$ lin. Expans. alar. $1\frac{1}{2}$ lin. In mus. nostr. Habitat in Sylva Coombe, Maio, 1831.

Head splendid green, behind golden; thorax and base of the abdomen beautiful golden coloured, the hind part of the latter cyaneous with a pale spot before the middle; antennæ pale brown, the basal joint splendid green, with the base and tip white; legs white; wings spotless.

At Coombe, in May, 1831; beaten from the oak?

Clostero'cerus † *Westw.*, Eùlopho affinis. Antennæ 8-articulatæ, articulo primo apicem versus dilatato, articulis reliquis clavam depressam fusiformem formantibus, articulo ultimo minutissimo (*fig.* 55. *c*); thorax

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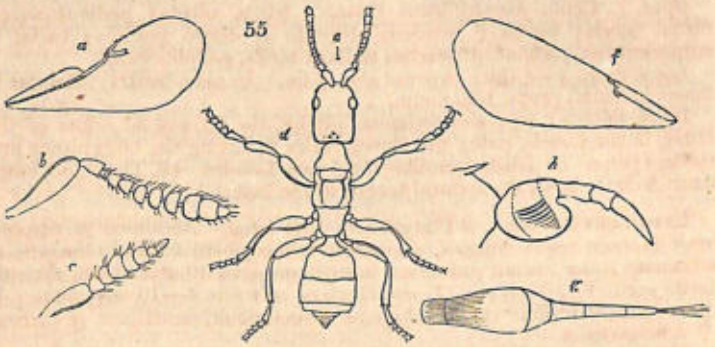
* *Smaragditēs*, the emerald stone; in allusion to the splendour of the insect.

† *Klōstēr*, a spindle, and *keras*, a horn; from the fusiform [spindle-shaped] antennæ.



ovatus; abdomen subsessile thoracis magnitudine, ovato-depressum, posticè subconicum.

Antennæ 8-jointed, the 1st joint dilated near the tip, the remaining joints forming a flattened fusiform club, the 4th joint rather larger than the 3d and 5th, the 7th joint minute subquadrate, the terminal one very minute subulate; thorax ovate; abdomen nearly sessile ovate depressed, as large as the thorax, somewhat conical at the apex; wings large; tarsi short tetramerous.

Spec. 1. Clost. trifasciàtus *Westw.* Niger, thorace cæruleo-viridi; abdomine chalybeo-nigro; oculis fuscis; alis fasciis duabus arcuatis, apiceque fuscis; tarsis basi pallidis. Variat fascia antica fere obliterata.

Long. corp. $\frac{2}{3}$ lin.; expans. alar. $1\frac{1}{4}$ lin. In mus. nostr. Habitat apud Ensham, prope Oxoniam; Augusto, 1826.

Black, with the thorax greenish blue; the abdomen chalybeate black; eyes brown; wings with two arched fasciæ, and the apex brown; the tarsi pale at the base.

At Ensham, near Oxford, in August, 1826. Oaks, Richmond Park, August, 1833.*

Cephalono'mia † *Westw.*, Telèadi affinis. Caput ♂ mediocre fere rotundatum, ♀ magnum oblongo-quadratum planum; antennæ in utroque sexu 10-articulatæ, articulo secundo tertio multo majori, ♂ filiformes longitudine fere thoracis, ♀ capite non longiores fere moniliformes, haud apicem versus incrassatæ; collare triangulare, anticè rotundatum; alæ nervo subcostale brevi (tertiam partem longitudinis alarum non attingenti), callositate parva ad costam terminata, alteraque subapicali discum versus posita; nervo stigmaticali nullo (*fig.* 55.*f*); ♀ interdum aptera.

Antennæ 10-jointed in both sexes, with the 2d joint larger than the 3d; in the male filiform, and nearly as long as the thorax; in the female, submoniliform, and not longer than the head, which is oblong, quadrate, and flattened; thorax elongate-ovate; collar large and triangular, rounded in front; wings with a very short subcostal nerve, terminated by two minute callous spots; ♀ sometimes apterous (*d*).

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* Speciem alteram (Closterócerus formòsus *Westw.*) cepi e quercu, in "Richmond Park," Aug. 16. 1833. Cæruleo-viridis, abdomine cyaneo fasciato, antennis nigris, pedibus nigro alboque variis, alis fascia substigmaticali nigra. Magn. Clost. trifasciàti.

† *Kephalē*, the head, and *anomoios*, unlike; from the dissimilarity of the form of the head in the sexes.

Spec. 1. Ceph. *formicifórmis Westw.* Nigra, nitida; pedibus antennisque piceis; his in ♀ articulis secundo et tertio pallidis; variat ♀ corpore piceo, pedibus, præsertim tibiis et tarsis, pallidioribus.

Long. corp. ½—⅔ lin.; expans. alar. 1 lin. In mus. nostr. Habitat in fungis [pileatis] prope Londinum.

Black shining; legs and antennæ pitchy, the 2d and 3d joints of the latter, in the female, pale; the female varies in having the body pitchy and the legs paler. In [mushroom-like] fungi near London. (*d*, The insect much magnified; *e* shows the natural length of the insect.)

Epime'ces * *Westw.*, a Platygástro disjunctus. Abdomen in utroque sexu thorace triplo longius, segmentis tribus posticis valde elongatis et attenuatis; alæ aveniæ; antennæ in utroque sexu 10 articulatæ, articulo tertio secundo minori; in ♂ subfiliformes articulis 4—10 æqualibus; in ♀ articulis 4 ultimis clavam magnam formantibus; scutellum ♂ inerme, ♀ mucronatum.

Abdomen in both sexes three times as long as the thorax, with the last three segments very long and slender; wings nerveless; antennæ in both sexes 10-jointed, with the 3d joint smaller than the second; in the male they are subfiliform, with the 4th to the 10th joints equal-sized; in the female the last four joints form a large club; scutel in the male unarmed, in the female mucronate.†

Spec. 1. Epim. énsifer *Westw.* Niger, subnitidus; femoribus piceis apice pallidis; tibiis fuscis, basi et apice tarsisque pallidis; abdomine nitido, basi longitudinaliter striato (*g*).

Long. corp. 1⅔ lin.; expans. alar. 1¼ lin. In mus. nostr. Habitat in Sylva Coombe, fine Maii.

Black, somewhat shining; the thighs pitchy, with the tips pale; tibiæ brown with the base and tips, and also the tarsi, pale; abdomen shining, longitudinally striated at the base.

At Coombe.

Spec. 2. Epim. ventràlis *Westw.* Niger, subnitidus; abdomine segmentis tribus basalibus subtus rotundato-compressis (abdomen Cýnipis referentibus), segmentis tribus apicalibus valde arcuatis; e parte supera articuli præcedentis exeuntibus (*h*); pedibus nigris; tibiis basi tarsisque rufescentibus.

Long. corp. ⅔ lin.; expans. alar. 1¼ lin. In mus. nostr. Habitat prope Cantabrigiam, Julio, 1833.

Black, somewhat shining; abdomen with the three basal segments compressed and rounded beneath (resembling the abdomen of a Cýnips), the last three segments much curved and arising from the upper part of the preceding segment; legs black; tibiæ at the base and the tarsi reddish.

I possess other species of this subgenus.

Messrs. Haliday and Curtis do not appear to be acquainted with the type of the genus Platygáster (Pl. ruficórnis *Latr.*), since it is erroneously located in their tables (vid. *Gen. Crust.*, vol. iv. p. 31. last line): the description there given, I can affirm from an examination of Latreille's specimens, is perfectly correct.

I am, Sir, yours, &c.

The Grove, Hammersmith,
July 29. 1833.

J. O. Westwood.

* *Epimēkēs*, long; from the elongation of the abdomen.

† The sexual differences of Platygáster, and its subdivisions, have not been previously correctly ascertained, sexual characters having been regarded as sectional.

ART. IX. *A short Account of a Fossil Skeleton of a Plesiosaurus, lately discovered near the Town of Bedford.* By Mr. EDMUND R. WILLIAMSON.

Sir,

IN the early part of January [17.], 1833, the labourers employed in digging brick earth on the property of Mr. John Howard discovered some bones about five feet and a half beneath the surface, which circumstance they communicated to Mr. Robert Adams, the curator of the museum attached to the Bedford General Library, who immediately proceeded to the spot, commenced clearing away the earth, and in a few hours discovered the caudal vertebræ of a fossil animal, in an almost perfect state, which in the end proved to be a Plesiosaúrus. Mr. Adams next uncovered the right hind paddle, which he completely cleaned and washed, and which was also very perfect. The parts that had been found were now covered up with matting and straw, to preserve them from the weather, until the digging could be resumed on the following Monday. Upon Mr. Adam's walking to the field to ascertain whether every thing was safe, he found the matting and straw removed, and some of the cleaned bones broken and scattered about; but the greater part had been stolen during the morning. I am sorry to say that it was found out that some of the missing bones were in the possession of a person who, from his station in life, *ought* to have known better. As I was not in Bedford when the skeleton was first discovered, I did not go to the place until the Monday, when I found, to my great mortification, the report of its destruction too true. As we had never previously found any thing of the kind, we went on with the digging in hopes of getting the fore part of the animal, and in this we partly succeeded. We first found some fragments of ribs, but in too decayed a state for removal; the left fore paddle next came to light; and of this, when cleaned, the lady of Captain William H. Smith, R.N., took a very good impression in plaster; but, upon our subsequently attempting to remove the bones, most of them fell to pieces: perhaps the oil used in taking the impression had softened them too much. This fin or paddle was 3 ft. 9 in. long, from the shoulder bone to the tip of the phalanges; and 1 ft. 2 in. wide at the broadest part of the blade-bone: at the part between the metacarpal bones and the phalanges it was 8 in. wide. The phalanges are $2\frac{1}{2}$ in. long, by $1\frac{1}{2}$ in. wide, at each extremity; in the middle of their length their diameter was not so much. There were four rows of phalanges; and seven in the first row, eight in the second, eight in the third, and four in the fourth.

The neck was about 3 ft. 6 in. long; the vertebræ displaced for about 1 ft., then straight for 2 ft., then bending to the left for about 6 in. No head was found. About twelve of the cervical vertebræ are remaining, and are pretty hard, but none of the hatchet-like appendages adhered to them on their removal. Neither a right fore paddle nor a left hind one was discovered, nor any dorsal vertebræ. The soil in which the skeleton was found was a strong clay or gault (the "clunch clay" of Bedford), about $5\frac{1}{2}$ ft. beneath the surface of the earth, and 3 ft. beneath that of the gault. The body of the animal was completely encased with hardened clay and some siliceous matters cemented together by a substance very similar to the divisions in the Septàrium: one half of an ammonite, and one large fragment of belemnite were among the stones. It is perhaps worthy of observation that no stones similar to those in which the animal was embedded have ever been found in that neighbourhood; and, as the animal was found on the slope of a knoll of ground, close to which is a hollow, which tradition assigns as the ancient bed of the river Ouse, it may be conjectured that the animal, in floating down the stream, may have lodged against some obstruction, and, by causing a greater one have stopped a number of stones, that would otherwise have been washed farther down the stream. The fragments of bone now in our museum are very ponderous, and have become very hard, and are of a deep reddish-brown colour where they are broken, and they were so embedded in and fastened to the stones, that it was quite impossible to separate them. The computed length of the animal, as far as could be judged after the spoliation that had overtaken its discovered remains, was between 17 ft. and 18 ft.; and the width between the two fore paddles must have been nearly 2 ft. The field is in the parish of St. Paul, in the borough of Bedford, adjoining the road between Bedford and Higham Ferrers, between that road and the river Ouse, and about one mile from the centre of the town of Bedford. I might also observe that fragments of a head of one of the saurian tribe was found about twenty feet behind this animal, but no teeth were with it: and also a leg bone of very large dimensions; one joint is 1 ft. 10 in. long, by 4 in. wide.

I am, Sir, yours, &c.

EDMUND R. WILLIAMSON, Hon. Sec.

General Library, Bedford, May, 1833.

ART. X. *Observations on the Affinities between Plants and subjacent Rocks.* By Mr. HEWETT C. WATSON.

THE various attempts made by different writers in this Magazine with a view to prove or disprove a direct connection between the geology and botany, or between the rocks and vegetation, of particular districts in Britain, have, doubtless, been read by many with considerable interest; but, as yet, it must be confessed that very little appears to have been effected with regard to a settlement of the point mooted. Some botanists have pronounced the attempt at tracing such connection to be utterly hopeless; while others see, or fancy that they see, the most palpable and positive evidence in proof thereof. In the fullest sense of the term, indeed, geology is intimately connected with botany; but, in saying this, it is to be understood that the form, structure, and elevation of countries are all taken into consideration. Neglecting these, and looking only to the comparative age and mineralogical character of the rocks, so far as a very slight acquaintance with these matters authorises an opinion, it would, on my own part, be adverse to the existence of any except very feeble affinities. Throughout nature, the secondary or weaker influences are so frequently overshadowed by others more powerful, the feeble are so very often held in abeyance by the stronger affinities, that hasty or partial observations continually lead us to opposite opinions; and, in perusing some of the recent essays and remarks on the connections between rocks and plants, we can scarcely avoid the suspicion that something of this kind has at times caused the difference of belief in regard thereto. How often do we find the mechanical properties of bodies interfere with, and prevent the due display of, their chemical action on each other! How frequently does one powerfully excited passion control and conceal all feebler tastes and feelings! How common is it for a man at one time to appear proof against some contagious disease, to which, at another period, his frame yields with a facility altogether inexplicable! Partial observation has hence drawn the axiom, that "exceptions may be found to every rule," save this supposed rule itself; whereas the very idea of an exception to a law of nature is an utter absurdity; the apparent exceptions being only examples of another law more forcible in its sway, and capable of controlling, but not changing or destroying, the feebler one. It is thus necessary that all conditions of vegetable distribution be studied in connection. He who neglects any, will so far fail in his generalisations. In illustration of this, I propose to give, as briefly as can be, the general results of my own observations on the affinities between rocks and plants. Pre-

viously, however, I shall venture a very few remarks on the opinions of others in relation to the same subject.

The authors of our general floras of Britain have not attempted any thing beyond occasional notices of the soil which some particular species appear to affect. Of our local works, the recent *Flora Devoniensis* and *Flora of Berwick on Tweed* alone treat of this. The authors of the former deny, almost *in toto*, the existence of any decided affinities; while the author of the *Berwick Flora* points out some few seemingly strong examples. The principal papers on this subject are in this Magazine, and they will of course be familiar to its readers. This is now more particularly true, since the substance of Dr. Murray's remarks in the *Edinburgh New Philosophical Journal* have been repeated in this Magazine [in the present volume, p. 335—344.]. It is very justly remarked by this writer, that "the distribution of vegetables is mainly regulated by climate; a term implying a combination of circumstances which depend very much upon altitude and latitude:" and, if the propositions presently to appear be correct, the influence of rocks over the plants of any two compared districts can only become very evident where all the other circumstances are as nearly as possible at an equilibrium, which rarely occurs. A comparison, therefore, of the floras of Aberdeenshire, Edinburgh, and Devonshire, adopted by Dr. Murray, will not be at all adequate to determine the influence of subjacent rocks, since the more potent sway of climate differs so widely in the latter. Dr. Murray takes a few natural orders, and shows that Devonshire is wanting in a greater number of the Aberdeenshire species than is Edinburgh; though the latter presents a greater dissimilarity of rocks. But the species absent from Devonshire are those reaching their southern limits to the northward of that county, and which could not be expected to re-appear there, however favourable the rocks might be; while the climate of Edinburgh, and its geographical proximity, are highly favourable to similarity of vegetation. Several of the plants common to Edinburgh and Aberdeenshire, but not found in Devonshire, are those which affect vegetable earth, and accordingly they find a congenial soil in the woods and bogs of the former, uninfluenced by the rocks that lie beneath. Suppose we meet this with an opposite example, and contrast the plants of Cambridge with those of other similar and dissimilar districts in regard to their rocks. In the *Flora Cantabrigiensis* are the following species, considered to have an affinity with calcareous rocks, which they find in the chalk of that county: —

Ligústrum vulgàre, *Verónica* spicàta, *Avèna* pubéscens,

*D*ípsacus pilòsus, Scabiòsa columbària, Aspérula cynánchica, *P*lantàgo mèdia, Campánula glomeràta, C. hýbrida, *T*hèsium *l*inophýllum, Gentiàna amarélla, *S*éseli *L*ibanòtis, Pimpinélla mágna, *V*ibúrnum Lantàna, Silène Otìtes, S. noctiflòra, *S*piræ`a Filipéndula, Potentílla vérna, Heliánthemum vulgàre, *A*nemòne *Pulsatílla*, *C*lématis Vitálba, *A*`cynos vulgàris, Hippocrèpis comòsa, *O*nobrỳchis satîva, *H*ypochæ`ris maculàta, *C*árduus nùtans, *C*onỳza squarròsa, Cinerària integrifòlia, *O*`rchis pyramidàlis, *O.* ustulàta, *O*`phrys muscífera, *O.* apífera, *O.* aranífera, *T*áxus baccàta.

Though several of these are far from being limited to calcareous soils or rocks, they are commonly much more abundant thereon. Now, with the single exception of *C*árduus nùtans, they are all of them wanting in the lists of plants in Charnwood Forest and its vicinity, as given by the Rev. A. Bloxam in this Magazine [Vol. III. p. 167., Vol. IV. p. 162.]; the rocks of the forest being syenite and slate. Their names not occurring in these lists may be held a presumption of their absence from the district; for, being all plants of local occurrence, they would surely have been enumerated if seen there. Charnwood Forest does not, I believe, rise to the height of 900 feet, and its neighbourhood must be much lower. If we pass over this tract, and gain the limestone rocks of Derbyshire and Yorkshire, rising to a greater elevation, and in a climate more removed from that of Cambridge, we again meet with the greater number of them, and some in the utmost profusion. Numerous examples, equally striking, might be adduced; and I therefore conclude that Dr. Murray and the authors of *Flora Devoniensis* have gone too far in depreciating the influence of rocks; but, assuredly, Mr. Thompson, and one or two other writers, have erred in the opposite extreme. Indeed, the essay of Mr. Thompson [Vol. III. p. 410—419.] betrays that his knowledge of the actual distribution of plants within Britain was not sufficiently exact, to authorise the decided tone in which Dr. Murray's assertions are condemned by him. The conclusions drawn from my own observations (which have been made in widely distant and very dissimilar parts of Britain, from Cornwall to Caithness) will be found to tally very nearly with the negative reply to Dr. Murray's query, "whether or not vegetable species are usually determined by the nature of the subjacent rocks." These conclusions refer to other conditions than the rocks, with a view of showing the inferior importance and proper estimate of the latter.

I. The principal conditions of vegetable distribution should be arranged in the following order; the first-named being of greater sway than those which succeed, and consequently a

small difference in the former operating more change than a great dissimilarity in the latter: — 1. Temperature; 2. Moisture; 3. Configuration of surface (chiefly with relation to shelter and exposure); 4. The mechanical and chemical properties of the surface soil; 5. The mechanical and chemical properties of the subjacent rocks.

II. The *combined influence* of these, with some minor conditions, determines the flora and vegetation of countries.

III. As to comparative influence, these conditions are not always in equal ratio or proportion; but, when the more potent condition or affinity is in its full play, the feebler one is less apparent; and *vice versâ*. Thus, when the temperature is best suited to any given species, soil is of little moment; but when the temperature barely suffices, then soil may determine even the existence of the species.

IV. Comparing these conditions with each other, the influence of temperature (being less local) is chiefly shown in the flora of a country; while the other conditions (often partial in their sway) may not at all affect the flora of a considerable tract, and yet greatly modify its vegetation; the latter term having reference to the comparative prevalence, the former to the mere existence, of the *species*.

V. Comparing one species with another, some are more influenced by one, some by another of the above conditions. Some, for example, have a wide range of temperature, others are indifferent to soil or moisture.

VI. With regard to subjacent rocks, their influence is so frequently veiled by the other conditions, that for the most part the flora of a country is not obviously affected thereby, though the vegetation of small tracts may evidently betray it.

These appear to be general rules; and, limiting attention to the affinities between species and subjacent rocks, we may add: — 1. That most species grow well on various and widely different rocks, though not with equal vigour on all of them; 2. That very few species (if any) are absolutely limited to one subjacent rock; 3. That several species have an affinity with a certain range of rocks; being seldom seen, and growing feebly, on others. Thus, granite, grit, and alluvial gravel have a resemblance in the species growing on them; a similar agreement is observable between those of limestone and trap rocks; serpentine rocks agree often with trap ones: peat bogs tend to produce the plants of granite and grit, but rarely those of limestone or chalk.

The evidence from which my conclusions are drawn would be far too voluminous for insertion; but should any correspondent be inclined to call in question their justness, I must endeavour to defend that or those so objected to. H. C. W.

REVIEWS.

ART. I. *Catalogue of Works on Natural History, lately published, with some Notice of those considered the most interesting to British Naturalists.*

CONOLLY, J., M.D., of Warwick, late Professor of the Practice of Medicine in the London University, &c.: A Proposal to establish County Natural History Societies, for ascertaining the Circumstances, in all Localities, which are productive of Disease or conducive to Health. 8vo. Printed by H. B. Tymbs and H. Deighton, Worcester, 1833.

This pamphlet is a reprint of an essay in the recently published first volume of *The Provincial Medical and Surgical Transactions*. We are happy in having an opportunity of recommending Dr. Conolly's views and proposal to our readers by a notice of them in this insulated form.

The principle upon which the argument turns has been before touched on by the intelligent author, in his introductory lecture before the University of London: experience based on observation, and applied by careful and chastened ingenuity; the foundation, in short, of all sciences demonstrative or not. "As nature does not abound in abrupt transitions, so slight deviations from health constitute incipient disease, &c., &c., and these changes are indicated by corresponding, and often very subtle, variations of external phenomena, as well as influenced by innumerable remedial means." (*Introductory Lecture* by Dr. Conolly, p. 13.)

Impressed with the value of this truth, Dr. Conolly has, in the opening pages of his essay, pointed out some striking instances of the effects of situation, changes of weather, &c., in modifying and changing the health of individuals and families; introducing, by way of illustration, recorded cases, during the last four or five years, of epidemic disorders coincident and connected with atmospherical phenomena. In our last Number we have given place to some general speculations on this very subject (see p. 289—308.); and Dr. Conolly's pamphlet, coming as it does *ex cathedrâ*, fully justifies the purport of the views there developed, and which, in an early Number, will be more particularly stated. Want of space forbids minute analysis of the doctor's observations. We can only catalogue them. He points out the advantages of the

medical profession to *observers of nature*, animate and inanimate (p. 3.); the causes which influence health (p. 4.); the nature and changes of diseases (p. 5.); the order, nature, and duration of epidemics (p. 6.); the coincidences between them and the weather (p. 7.), illustrating his positions by examples, under his own eye, of ineligible situations for houses (p. 8—10.), want of regard to health in modern buildings (p. 11.), &c. Then follow some examples of the inflammatory fevers, cholera, &c., recently so prevalent, showing how these were affected by changes in the wind * (p. 12. 16. and 24.), and other atmospherical causes (p. 18—25.), and that the cholera has been *twice preceded* by *influenza* (and, we add, a *third time*, as the present return of that malady proves); the whole involving the great problem of the communicability and caprice of diseases (p. 26, 27.).

To elucidate this, it is proposed to found a series of County Natural History Societies, to be divided into sections, on statistics, geology, geography, meteorology, agriculture, botany, archæology, chemistry, &c.; the meetings to be held at the quarter sessions, the members to be medical and scientific men, and country gentlemen interested in the enquiry; the matter of discussion to be all questions in these various departments of enquiry, and the form of publication of the results "*Annuaires*," after the manner of those of the departments of France (p. 28—36.).

Of the value of such a concentration of observations there cannot be a shadow of a doubt, but of the probability of the adoption of the plan recommended we have serious doubts, not from any unwillingness on the part of those best calculated to further it, but from the fewness of the numbers of men likely to be induced to make common cause in any work of public utility not producing *a per-centage*. We fear that Dr. Conolly has overlooked in his hope the current of public opinion, and the universal direction of popular pursuits: for, notwithstanding all that science has done, and continues to do, for the good of man, the drift of men's minds is towards the increase of their worldly stores more than their mental profit or the public advantage. Still there would be so much of

* To Dr. Conolly's observations may be added the following remarkable fact: — The cholera broke out in November, 1822, at New Orleans, contemporaneously with a north-east wind. It occurred again, under similar circumstances, in April and May, 1833. In both instances it ceased when the wind changed. The cholera made its first appearance at Goole, in Yorkshire, with a north-east wind. Its departure was preceded by a furious thunder storm, which cleared the air without rain; after which the cholera ceased its ravages entirely. In various parts of India, the cholera was observed, *amico teste*, to occur simultaneously with a wind from the north-east.

benefit in the adoption of the plan proposed, that we would cordially second its trial, and we earnestly recommend it, though our idea is, that, even if the days of Paracelsus were to come over again, and men were to be subject to the disgusting pharmacy of his era, they would rather submit to such abominations than lend a hand, if it touched their pockets, to assist by their personal sacrifices, even in so interesting a sphere of congenial enquiry, in strengthening the hands of the truly anxious and scientific men to whom the modern art of healing has been committed. So long as science and *enquiries not bearing a discount* are concerned, all the eloquence of the world cannot do much. "*No importa*," says Nino, in the *Moorish Letters*, "*Pedro Fernandes siempre será Pedro Fernandes.*" Nevertheless we quote Dr. Conolly's final sentence, with every expression of sympathy and concurrence:—"I cannot doubt that in each county of England and Scotland there will be found a sufficient number of well-informed, public-spirited, and influential individuals, to insure the success of an undertaking that must, in its progress, reflect both advantage and honour on the country at large." Let the trial be made forthwith, and good luck attend it!

St. Hilaire, Geoffroy: Histoire Générale et Particulière des Anomalies de l'Organisation chez l'Homme et les Animaux, &c. Paris, 1832.

It is gratifying beyond measure, to contemplate the amazing progress that has of late years been made in the advancement of all branches of science; and in no branch has this progress been more signally displayed than in the science of teratology [*teras, teratos*, a monster, and *logos*, a discourse], or the knowledge of monstrous productions, their varieties, the causes of them, the laws by which they are governed, and the circumstances by which they are influenced. These interesting subjects have been fertile sources of controversy and speculation to naturalists and philosophers of all ages and nations, and have engaged the attention of many of the most talented and enlightened of the human race, from the days of Aristotle, the father of natural history, down to the present time; yet they are subjects which, until the commencement of the last century, continued involved in the darkest obscurity, and of which, during the immense lapse of time that preceded this period, mankind knew no more than they now know of the inhabitants of Jupiter or Saturn. History affords abundant evidence of this fact. If we revert to the times of the Greeks and Romans, those monopolists of civilisation, and of all the existing knowledge of their day, we shall find the

most absurd and ridiculous notions universally in vogue regarding the nature of monstrosities, which frequently gave rise to practices the most cruel and barbarous. Similar preposterous ideas prevailed in the world to a comparatively modern date: we are even gravely told by Riolanus, one of the most distinguished men of his age, who lived in the seventeenth century, that giants, dwarfs, or children born in any way deformed,—all of whom, according to his opinion, are made after the image of the devil,—*may* be allowed to live, but should be excluded from public sight, and be perpetually shut up in some place of security. About the beginning of the eighteenth century this species of philosophy was becoming less popular, and the unprecedented rapidity with which the sciences of anatomy and physiology advanced during that period soon brought to light facts which demonstrated its total fallacy. The immortal Haller, however, was the man who gave the death blow to the old doctrines, and, in his work *De Monstris* was the first to reduce teratology to any thing like a science. After the death of this great man, teratology was doomed to a long period of repose; it was, no doubt, sufficiently discussed and agitated, but it was in no way improved, or enriched with the addition of original matter, until Bichat and Serres, by their profound investigations, extended its boundaries very considerably. But no one has ever contributed so much towards the improvement of this branch of knowledge as M. Geoffroy St. Hilaire, by the publication of his late most elaborate and instructive work on the subject. It is not too much to say that this author has effected in teratology what Linnæus did in other branches of natural history. He found the science in the greatest confusion, a heap of facts thrown together with little method or order, disgusting to the tyro, and perplexing to the advanced student. He has arranged these into a system, which it will be for future enquiries and researches to perfect. It is to be hoped that the glorious results of the labours of this illustrious naturalist will excite in the minds of the scientific of England a desire to investigate for themselves, and improve a science which they have hitherto most unaccountably neglected, and which many among them hesitate not to avow is an impenetrable mystery, and beyond the reach of human ken. They can no longer advance this sophism as an excuse for their indolence. The truth is, Englishmen must associate the ideas of pounds, shillings, and pence, with every object they pursue, be it scientific, literary, or commercial; and any thing unproductive, directly or indirectly, of those commodities, they cast aside as not being worthy of their notice. — *J. J.*

Cuvier, Baron, and *Latreille*, *P. A.*: The Animal Kingdom arranged according to its Organisation, serving as a Foundation for the Natural History of Animals, and an Introduction to Comparative Anatomy; by Baron Cuvier. With figures designed after nature. The Crustacea, Arachnides, and Insecta by M. Latreille. Translated from the latest French edition; with additional notes, and illustrated by nearly 500 plates, on steel. 8vo, in 36 numbers, 1*s.* each: to form four volumes. Number I. published on July 1. 1833. London, 1833.

This "new English version" of Cuvier's *Règne Animal* is, we think, produced at an opportune time, and in a judicious manner as to the rate of price and style of execution. The first number, the only one we have seen, contains the introduction, and the primary principles of classification. Three plates and two coloured figures are also included, as specimens of those which are prepared for the work: one is of birds, the second of fishes, the third of crustaceous animals. On the figures of the birds we may remark, that the "collared pheasant (*P*hasiànus torquàtus)" stands in a point of view in which we have never yet seen a pheasant stand; and the legs of "the wild hen of Java (*G*állus *Baukìvus* Tem.)" look as if they had the wires of a museum within them. With the plate of the fishes, and that of the crustaceous animals, we have no fault to find.

In the prospectus of this edition are these statements: — Baron Cuvier, "shortly before his decease, put forth a final edition of his *Règne Animal*, and in so altered and improved a form as to give it a completely new character. This publication, consequently, has had the effect of superseding the old edition, together with all the translations made from that edition." In the translation now offered, "the letterpress will be an exact and close translation of the original, and will furnish not only the definite meaning, but also the spirit of the text. In addition to this, a series of notes will be subjoined, in which each branch of the general science will be carried up to the present state of knowledge." The notes by the English editor amount, in this number, to a page and a half. They are two: one comprises a compendium of Blumenbach's views on the "varieties of the human species:" the other supplies some information, of interest, on the structure of the *S*imia *S*átyrus and *S*imia *T*roglódytes.

The plates in this edition, it is announced, "will amount to no fewer than *five hundred*. They will be engraved on steel, and coloured in the most accurate manner, in con-

formity with the great object of illustrating according to nature those characteristics of animals which depend on colour.

Ampère, S., Membre de l'Institut: Classification des Connaissances Humaines; ou, Tableaux Synoptiques des Sciences et des Arts. Folio sheet. Third edition.

This classification was published early in the present year (1833), and has excited very considerable interest among the learned men of France. Its author is M. Ampère, Member of the Academy of Sciences, and Professor of Natural Philosophy in the College of France. The *Classification* strikes us as exhibiting much more of ingenuity in the author than of utility to the public. Of the "carmen mnemonicum," prefixed to it, we think quite otherwise. It is a synopsis, in Latin verse, of all the objects of human knowledge; and these are so pleasingly enumerated, that a perusal must delight the student, as showing him the objects which are presented in nature and in life for the human mind to employ its capacity upon; and, we think, must, as well, fire him with the endeavour to extend his mind to the comprehensive grasping of a knowledge of them all. The poem deserves to be learned by heart, and so rendered indeed a "carmen mnemonicum," or poem to be remembered. Notwithstanding our indifference to the *Tableau*, or *Classification*, it is quite likely that it may be deemed of much interest by those whose taste is more metaphysical than ours.

Silliman, Benjamin, M.D. LL.D. &c.: The American Journal of Science and Arts, No. xlix., April, 1833. 8vo, 212 pages, and several woodcuts. London, O. Rich.

The present number contains the following papers in relation to natural history, besides others on other branches of knowledge: — Essay on the gold mines of Georgia; by Wm. Phillips, engineer. The essay indicates, by sections and maps, the range of the veins of metal; and gives information on the process of separating the gold from the ore in which it is found.— Observations on the saliferous rock formation in the valley of the Ohio; by Dr. S. P. Hildreth of Marietta. — On the transition rocks of the Cataraqui; by Capt. R. H. Bonnycastle, R. En.—Supplement to the "Synopsis of the organic remains of the ferruginous sand formation of the United States;" by S. G. Morton, M.D. This communication is illustrated by two pages of lithographed figures of the organic remains, all shells. — Abstract of meteorological observations taken at Marietta, Ohio, with notices of floods, fruits, and

flights of pigeons, in the year 1832; by S. P. Hildreth. Besides these, some of the shorter communications and notices, classed as "miscellanies," are on subjects of natural history.

Anon.: Arcana of Science and Art; or, an Annual Register of useful Inventions and Improvements; abridged from the Transactions of Public Societies, and from Scientific Journals, British and Foreign, of the past Year. Small 8vo, with engravings. Sixth Year. London, Limbird, 1833.

The volume for the present year contains 312 pages; and, of these, there are 111 on natural history, 35 of which are taken, with acknowledgment, and 3 without acknowledgment, from this Magazine. The frontispiece to this year's volume is a portrait of Baron Cuvier. This work has been publicly mentioned as "an encyclopædia, to which the most eminent of their time are constantly contributing:" it should rather have been said, "into which the meritorious communications made to, and published in, other works are *freely* transferred." The above-given eulogy has been copied into the "advertisement" which is prefixed to the volume; but the copier, it would seem, felt conscious of its liability to exception, for he adds, "This opinion does justice to the value of the communications, *or materials*." We give his last two words in italics, to increase their significance. In the foot note to p. 217., for "*Philosophical Magazine*," read "*The Magazine of Natural History*."

Various Contributors: The Entomological Magazine. Published quarterly; each Number to contain 104 pages, and sometimes a plate of figures. 8vo. London. 3*s.* 6*d.*

The following are the subjects of the contents of No. iv., published in July, 1833: — 37. Colloquia Entomologica. Full of soul and matter. In the conversation a description of the hunting of bears in Russia is incidentally given. — 38. Essay on the classification of parasitic Hymenóptera, &c.; by A. H. Haliday, Esq. M.A. Continued from a previous number. The author founds several new genera. This portion of his valuable contribution to systematic entomology occupies 18 pages. — 39. Observations on Ignis Fatuus; by George Wailes, Esq. They go to prove, what almost every one believes, that the "Will with the wisp" is not an insect, but the result of gaseous exhalation from bogs and swamps. — 40. Observations on the influence of locality, time of appearance, &c., on species and varieties of Butterflies; by J. C. Dale, Esq. M.A. F.L.S. &c. The species to which the remarks relate seem, for the most part, quite the rare ones. — 41. On the structure of the antennæ in the order Aphaniptera of Kirby, with reference to the propriety of the

establishment of genera upon the variations of those organs; by J. O. Westwood, Esq. F.L.S. &c. The premises in this communication teach "the various formations stated to exist in the antennæ of different species of fleas," parasitic on various animals. — 42. Observations on Blight; by Rusticus of Godalming. A valuable history of the habits of the turnip fly, flea, or beetle. Rusticus conceives that the egg from which the beetle proceeds is laid by the parent beetle on the seeds of the turnips. — 43. Monographia Chalcidum; by Francis Walker, Esq. F.L.S. A continuation from a previous number: the present portion occupies upwards of 17 pages. — 44. Notes on the habits of Insects; by Delta. Delightful. — 45. The establishing of the Entomological Society of London. The event, of which the process is here given, was announced on the cover of our July Number. — 46. The osteology, or external anatomy, of Insects; by Edward Newman, Esq. F.L.S. Letter 1., on the primary parts of insects. This paper argues and instances the analogies in the parts of structure of all insects, however dissimilar these parts may seem; and, in the very limited range of our knowledge of the matter, the paper is the most important and valuable one which has been ever published upon it in Britain. The author's conclusions have, as his foot notes and known eminence in entomology assure us, been carefully drawn from a countless number of instances; and so his propositions are safely founded, and must command adoption; and, in receiving this adoption, must induce a consistency in the language of entomology, and, with this, a material improvement in its condition as a science. By "Letter 1.," prefixed to this contribution, it is inferable more are to follow. — 47. Entomological Notes; by Edward Newman, Esq. F.L.S. — 48. Notice of Works on Entomology. — 49. Varieties. In the latter, Mr. Yarrell contributes valuable directions for the preservation of Crustàcea. Mr. Evan Webster Lewis details a habit of Microsètia ruficapitélla; a minute moth, whose caterpillar causes a curious appearance in autumn on the leaves of rose bushes, marking these leaves "in various directions with broad brown lines, having a narrow black one running down the middle." Mr. Haliday defends Mr. Westwood's conduct from an imputation by the editor in a former number: this is one of the matters noticed by Mr. Westwood in our July Number, p. 380.

Rennie, James, A. M. Professor of Zoology in King's College, London: Habits of Birds. Part I. published June 1. 1833; Part II. published July 1. 1833. The two parts, price 2*s.* each, form vol. xix. of The Library of En-

tertaining Knowledge. 12mo; in the two parts, or one volume, 380 pages and 82 woodcuts. London.

This work is richly stored with valuable quotations, and contains a proportion of original facts, duly, yet properly, noted by the subjoined initials "J. R." Both the quoted and the original facts and remarks are digested into chapters inscribed with the following titles:—I. Habits of cleanliness in birds; II. birds solitary and gregarious on account of food; III. on account of shelter or assistance; IV. pairing; V. peculiarities in pairing; VI. structure of eggs; VII. colour of eggs; VIII. facts observed in hatching; IX. evolution of the chick; X. sheltering of the young; XI. feeding the young; XII. training of young birds by their parents; XIII. vocal organs of birds; XIV. language of birds; XV. XVI. songs of birds; XVII. imitation and mimicry of birds; XVIII. longevity of birds; XIX. the phœnix; the bernacle goose.

Younger students in ornithology may experience an advantage in getting interleaved their copy of this work, and in noting down, upon the blank leaves, the facts that they may observe, and the views which may arise to them, in connection with those expressed in the work, whether they coincide with these or oppose them.

Stephens, J. F., F.L.S. &c.: The Nomenclature of British Insects. Part I. extending to, and including, the order Hymenóptera. 8vo. London, 1833.

I have just received the second edition of Mr. Stephens's *Nomenclature of British Insects*, which is in many respects an improvement upon the first edition; especially in the numbering of the genera and species, and in giving the synonymes of both. I have, however, a few remarks to make respecting certain improvements of which it is still susceptible. In the first place, I wish the families had been numbered as well as the genera; it gives a more systematic appearance to the work, and assists the reader in understanding "what is what." For the same reason I wish that the primary divisions of the orders had been designated by some name (such as tribe, section, &c.), instead of arbitrary marks, such as "§." The synonymes are liable to the following ambiguity: e. g. we have "Byrrhus, 1. Pilula, Lin. ater, Ill. v." Now, does this mean that the B. àter of Illiger is a variety of the B. pílula? or that the B. pílula was considered by Illiger as a variety of his B. àter? I would next ask how it happens that we have such entries as this: "Elmis, 11. nitens, *Mull.* cupreus, *Step.*" Why did Mr. Stephens give the name of cùpreus to this insect, and then adopt that of nìtens? Both these are cases which frequently occur, and stand in need of explanation. When

Mr. Stephens publishes the second part [which, according to the *Entomological Magazine*, No. iv., he will do "in the autumn"], I hope he will give a table of the authors he quotes, as his abbreviations are not always intelligible. An index of the genera, and a condensed table of the characters on which the larger divisions of the orders are founded, would also form valuable additions. — *H. E. S. Evesham, Worcestershire, July* 21. 1833.

We have announced, in p. 363., that Mr. Curtis is preparing for the press a second edition of his *Guide to an Arrangement of British Insects*, and beg to join H. E. S. in petitioning both Mr. Curtis and Mr. Stephens not to omit supplying to their respective works an index of the genera: the thing is far from useless to many who merit the help of such a leading string: not to be egotistical, to ourselves for one. The following remarks, by a correspondent, bear a mutual relation to these two works, and so we may properly introduce them here. We only wish that they were of a kind likely to be more useful and agreeable to our readers in general. — *J. D.*

Mr. Curtis, at page 461. of the last number of his excellent *British Entomology*, has published, what appears to me, a most unjustifiable attack on Mr. Stephens. He there says, "he" (Mr. Stephens) "has not contented himself with having corrected it" (the second edition of his *Nomenclature*) "from my *Guide*, and copying column after column from it, but he has actually adopted the style and plan of my work." In what do the copy and correction consist? It must be in the arrangement, for it is the professed object of each work to include all the species named up to the time of publishing it. Let any one compare the arrangement of the first 20 genera of the first order, Coleóptera. In both editions of Stephens's *Nomenclature* it is exactly the same; except that Oncóderus (Leiochiton *Curt.*) is removed, and placed as genus 50, instead of 15, which is its number in the first edition, and which is also the situation, though not the number, which it holds in Curtis's *Guide*. The following comparison will show that the arrangement of the genera is totally different. The genera, marked by their numbers, stand in the following order in the respective books: —

Stephens.	Curtis.	Stephens.	Curtis.	Stephens.	Curtis.	Stephens.	Curtis.
1	10*	6	25	11	29	16	11
2	21	7	26	12	30	17	—
3	22	8	23	13	31	18	12
4	27	9	24	14	32	19	13
5	28	10	20	15	33	20	13*a*

* I must inform your readers, that, Mr. Curtis having introduced the Thysanùra and Anoplùra into his *Guide*, his genus 10 corresponds with genus 1 in Stephens's *Nomenclature*.

We will now take the first 20 of Stephens's genera in the order (6.) Hymenóptera (the last order yet published in Stephens's second edition). The first genus is the same in both, it is *Cimbex*, number 675 of Stephens and 453 of Curtis. The arrangement is the same in both editions of Stephens: —

Stephens.	Curtis.	Stephens.	Curtis.	Stephens.	Curtis.	Stephens.	Curtis.
675	453	680	458	685	472	690	464
676	454	681	461	686	472	691	465
677	455	682	460	687	471	692	466
678	456	683	459	688	462	693	467
679	457	684	473	689	463	694	468

So much for the genera. The arrangement of the species in both editions of Stephens's *Nomenclature* is very similar, and very different from the arrangement of them in Curtis's *Guide*, as far as I have compared them.

Will Mr. Curtis now say that Stephens has "copied column after column" from his book? If so, let him point them out, for I cannot find them; neither can I find the copied corrections, unless he refers to the genus *Cicindèla*. In the plan of the two works there is certainly a resemblance, but quite sufficient difference for any person, who is at all acquainted with entomology, to perceive, at first sight, that Stephens's second edition of his *Nomenclature* is not a second edition of Curtis's *Guide*. Mr. Curtis must not introduce the names of sections, of families, or the synonymes, which correspond with subdivisions of his genera; for, if he does, he may with equal justice be charged with copying from Mr. Stephens's *Nomenclature*. — *Charles C. Babington. Bath, August* 2. 1833.

Payne, J. H., Author of the "Cottager's Guide": The Apiarian's Guide; containing Practical Directions for the Management of Bees upon the Depriving System. 8vo, 80 pages and 2 copperplates. London, Simpkin and Marshall, 1833.

The result of nearly forty years' experience; and, although we possess no apiarian skill, we cannot doubt of the value of the book, for we know the author, and know that he, in his own neighbourhood (Bury St. Edmunds), is deemed an authority on the subject of bees. His own hives we have frequently seen, and they always seemed admirably managed. The greatest matter of surprise to us is, that, so intimately familiar with the subject as is the author, he could yet so curb himself as to condense the amount of his experience and his reading into so concise a space.

For curing the sting of a bee the author notices the

popular prescriptions, and adds one which he himself has discovered; this we shall extract: — " . . . . . for, notwithstanding every precaution, persons who are much amongst bees occasionally meet with a sting. The method I have of late adopted, by which the pain is instantly removed, and both the swelling and inflammation prevented, is, to pull out the sting as soon as possible, and take a piece of iron, and heat it in the fire; or, for want of that, a live coal (if of wood the better, because it lasts longer), and hold it as near to the place as I can possibly endure it, for five minutes: if from this application a sensation of heat should be occasioned, a little oil of turpentine, or Goulard cerate, must be applied. I have found that the more prompt the application the more effectual the cure."

Of the plates, the first exhibits hives and other apiarian apparatus. The second plate is devoted to the exhibition of " Nutt's newly invented hive, for obtaining honey without destroying the bees;" and chapter xvii., the last in the book, is applied to a description of this hive and its parts, and the using of it.

The *Apiarian's Guide* is a thin volume for the price of four shillings; half a crown would have been an ample sum.

Nees von Esenbeck, Th. Fr. Lud., Phil. et Med. Dr., in Universitate Friedericia Wilhelmia Rhenana Professor: Genera Plantarum Floræ Germanicæ Iconibus et Descriptionibus illustrata. Fasc. 1. 8vo. Bonnæ ad Rhenum, 1833.

The cheapest and best work on the subject of the generic characters of plants which we have ever seen. We have noticed it in some detail in the *Gardener's Magazine* for August, p. 451., but it would be a loss to the botanical readers of this Magazine not to be informed of its existence. The first fasciculus illustrates and describes the genera *Pinus*, *Picea*, *Abies*, *Larix*, *Cupréssus*, *Thuja*, *Juníperus*, *Ephedra*, *Taxus*, *Bétula*, *Alnus*, *Cárpinus*, *Ostrya*, *Córylus*, *Quércus*, *Fagus*, *Castánea*, *Platanus*, *Salix*, *Pópulus*. To the illustration of the parts of fructification of each of these genera, which are twenty in number, one plate of figures and two pages of description are given. The analysis of the parts of fructification exhibited on the plates, well executed in lithography, is in admirable detail (at least very admirable in relation to the above genera, with the whole of whose parts few are intimately familiar), insomuch that the plates average 20 figures each. The London bookseller who has this work resides in the Strand: his name, which is German, we cannot remember.

Main, J.S., A.L.S. Author of "The Villa and Cottage Florist's Directory," &c.: Illustrations of Vegetable Physiology, practically applied to the Cultivation of the Garden, the Field, and the Forest; consisting of Original Observations collected during an Experience of Fifty Years. Small 8vo, 328 pages, 62 woodcuts. London, 1833. 8*s.*

A copy of the table of the contents of this work will best portray its scope: this copy we give. "Vegetation, elements and structure; organisation, vegetable life; distinctions of vegetables in the Acotyledòneæ, Monocotyledòneæ, and Dicotyledòneæ; organic structure of dicotyledonous plants; sap, seat of vegetable life, origin of buds, appendages of the stem, causes of barrenness; application of physiological knowledge to sowing, transplanting, propagation, pruning and training; cross impregnation, vegetable food, diseases of vegetables, insects destructive to plants, the felling of timber, grubbing, longevity of trees, conclusion." On some of the points in physiology the views of the author are quite peculiar; and, among the facts adduced in relation to these views, and to all parts of the subject, there is much of original and interesting matter. The author, in his preface, thus speaks of his own performance: — "The work will be found a compendium of the discoveries and best authenticated facts which have appeared in the writings of others; and which have been *proved* in the practice and experience of the writer, or in that of his contemporaries, during the last fifty years. He trusts that new matter enough will be found to justify the publication; and though but a rough sketch, which, from his very limited knowledge of chemistry, he has not been able to fill up as he wished, still he entertains a hope that, such as it is, it may receive amplification of an abler pen, and accomplish his aim of rendering vegetable physiology better and more generally understood."

A Lady: General Observations on Vegetation, translated from the French of C. F. Brisseau-Mirbel; to which are added numerous and extensive Notes: intended to inspire young persons with a taste for Botany, by presenting to them a bird's-eye view of the whole Vegetable Kingdom. Small 8vo, 104 pages. London, 1833. 3*s.* 6*d.*

We value this little volume for our own pocket, as a useful remembrancer of many very interesting facts in "Botanical Geography" (as this is the theme, and one of the titles, of the book), but cannot see that it can be enjoyed by young persons, or any other persons who have not previously paid

considerable attention to botany. The copious technical notes invite the reader to botanise as he proceeds, and so understand what he reads about; but this is surely too retrospective a business for many readers to engage in; and, again, it would be more comprehensively done by a diligent use of a good introduction to botany, as Dr. Lindley's. We applaud the lady writer's translation, and think it useful and agreeable, but only to those who both are prepossessed with many botanical conceptions, and have not the means of access to the original work.

Henslow, J. S., M. A. Professor of Botany in the University of Cambridge, and Secretary to the Cambridge Philosophical Society: On a Monstrosity of the common Mignonette. 4to, 8 pages and 2 plates. Cambridge, 1833. A separate copy, for private distribution, of the Essay, as printed in the "Transactions of the Cambridge Philosophical Society," vol. v. part 1.

The flowers of the common mignonette, or of any species of *Reseda*, will be seen, on observation, to be very peculiarly formed. Analogies in botany are the clues to knowledge, as, when analogous instances are collected, one gathers a principle that fits the whole of them: this is knowledge, this is power. Well, the flowers of the resedas, or mignonettes, have a structure to which no obvious analogies are known. On this structure Dr. Brown, in the *Appendix to Major Denham's Narrative*, and Dr. Lindley in his *Introduction to the Natural System of Botany*, have published opposite views; and Professor Henslow's paper embraces the points in dispute between them, and settles them in favour of Dr. Brown's view. The two were these: — Dr. Lindley considered "the flowers of a *Reseda* to be composed of an aggregate of flowers very analogous to the inflorescence of a *Euphorbia*. Dr. Brown, on the other hand, maintained the ordinary opinion, of each flower being simple, and possessed of calyx, corolla, stamens, and pistil."

Professor Henslow has portrayed 38 figures of the condition of the monstrosity he met with, and described these conditions in detail, and in relevance of the question previously extant.

Fitton, William Henry, M.D.V. P.G.S. F.R.S.: A Geological Sketch of the Vicinity of Hastings. 8vo, 100 pages, with a plate and woodcuts. London, Longman, 1833.

On the 5th of July we first caught sight of a copy of this work, which, although doubtless sent us as soon as published,

had been slipped into a wrong part of our bookcase, and, therefore, up to the time named, overlooked. We much regret this; not that so excellent a work, and from such an author, can remain unknown through our silence, but we are ever anxious to show ourselves alive to the attention of our friends, and to supply to our subscribers the earliest information of works likely to conduce to their gratification and service. This work is one such; and a friend of ours, eminent in geology, has pronounced it excellent.

We shall quote from the book one paragraph, which propounds, in relation to geology, a universal principle, a canon of the science. It is elegantly written; as is the whole book, where the subject matter allows it: —

"We shall use the term vicinity, with much greater latitude than it commonly receives. The essence of geology consists, in fact, in *general* views, and one of the best accomplishments of the geologist is mobility; for the features of the globe are on so vast a scale, and the facts to be brought together lie often so wide apart, that it is only by great activity in observing, and by very careful inference from what we see, that good results are to be hoped for. The best gift, therefore, that could be offered to the learner would, perhaps, be, the power of transporting himself at will to distant places, and of floating above the surface of the earth, at such a distance as to seize upon the general features, and contemplate their relations at his ease; descending, from time to time, for the purpose of studying the coast sections in detail. In the mean time, he must be content to use the more humble conveyances of common life; and, with their aid, to make the best approach he can to this desirable ubiquity of mind and body. His progress in geological knowledge and discovery will be proportioned to his success in the attempts, and he may obtain some measure of his zeal from his alacrity in attending to these recommendations."

ART. II. *Literary Notices.*

MR. JENYNS is preparing for publication *A Manual of British Vertebrated Animals.* It is intended that this work shall contain accurate descriptions and measurements, taken, as far as possible, from recent specimens, of all our indigenous mammalia, birds, reptiles, and fishes. The domesticated, naturalised, and some of the extinct species will be likewise included, but distinguished from those which may be considered as true natives, by a difference of type. Under each

species, reference will be given to three or four good authors, and a few remarks added illustrative of its habits. The whole will be arranged systematically, and in conformity with the most approved views of modern naturalists. It is expected that the work will not exceed one volume 8vo.

Part I. of *The Transactions of the Zoological Society of London* is now ready, at the Society's House, in Bruton Street, for delivery to the members; to whom its price, with its plates coloured, is 14*s.*; plain, 12*s.* The price to the public, coloured, 19*s.*; plain, 16*s.* A few proofs, on India paper, of the plates of animals have been taken off, and may be had, in sets, by members only.

Illustrations of the Natural History of Jamaica. "The Jamaica Society have information that H. T. De la Beche, Esq., a scientific gentleman connected with the island, is superintending a work to be called *Illustrations of the Natural History of Jamaica*, in which he will be assisted by the most eminent persons in England, provided the necessary objects for examination and illustration can be obtained. The work is to be published in parts. A work of this kind has long been wanted; and the Jamaica Society is, therefore, very anxious to give all the assistance in its power, and requests gentlemen of the colony to take every opportunity of collecting specimens of birds, beasts, fish, reptiles, and insects, as well as minerals and plants. Every specimen will be sent to England by the first opportunity, if sent for the purpose [of illustration], and every specimen which the owner wishes to have again, will be carefully restored, after being properly examined and described." (*Kingston* (*Jamaica*) *Chronicle*, June 14. 1833.)

We received the above transcript on August 18. 1832, from a writer signing himself "A Jamaica Proprietor," with a request that we would print it. We have till now delayed doing so, in the expectation of farther information on the matter. None has, however reached us. "A Jamaica Proprietor" added a notice of some useful services which he had heard that "the Jamaica Society" has performed, and remarked, "but they keep it all to themselves. However anxious some proprietors may be to know what is going on there, they can, absolutely, hear nothing. I understand some specimens of copper ore, found in Jamaica, were sent home two or three years ago for examination, but I never could hear from what part of the island they came, or in what rock found, or any thing of them. A tradesman of Kingston advertised, some years ago, various marbles for chimney-pieces, the produce of the island; but I never could

find from what quarter they came, nor did I ever see a specimen of them, or hear any account of them."

The Parent's Cabinet of Amusement and Instruction is a work published in monthly numbers, at 6*d.* each, which deserves notice in this Magazine, from several of the numbers, of which ten are published, containing subjects of natural history. The subjects are those which youngsters most usually encounter, as caddis worms, dragon flies, whirligig beetles, &c.; and of these, and the process of their transformation, woodcuts are given. Into the other subjects, also, woodcuts are introduced. "The object of the conductors of this work is, to provide a periodical supply of instructive reading for young people, in so attractive a form as to be, at the same time, a source of amusement." We think they succeed, and have no doubt that they find that they do: we only object that their numbers are not cheap at 6*d.* each; for, although woodcuts are introduced, the catholicism of their work would enable them to sell more of it for money.

Of The Library of Entertaining Knowledge, a part, on "Vegetable Substances used in the Arts," is to be published on September 1., and another part on October 1. These two additional parts complete this subject. On March 1. 1834, one part, and on April 1. 1834, another part, on "The Faculties of Birds," are to be published: they will complete the subject. At each of the following dates, October 1., November 1., and December 1., 1834, a part, on "Birds," is to be published.

Monographia Generum Aloes et Mesembryanthemi, Iconibus illustrata, by the Prince de Salm Dyck, is being prepared for publication by Messrs. Arnz and Co., of Düsseldorf. There is to be a monograph on the aloes, and another on the mesembryanthemums; but both works are to be published together, in half-yearly numbers. Each number of the work on aloes is to contain lithographs of 24 species, and its price, with the prints uncoloured, is to be 10 francs; with them coloured (only one leaf and some petals), 20 francs. Each number of the monograph on mesembryanthemums is to contain prints of 36 species; and its price, with the prints uncoloured, to be 15 francs, with them coloured (some leaves and petals), 30 francs. Subscribers can, at their expressed request, be supplied with copies with the prints completely coloured. It must be gratifying to botanists to perceive that the prince has at length resolved to give us the benefit of that intimate acquaintance with the above most interesting genera, with which his extensive cultivation of living plants of them have enriched him. The prospectus states that,

although every care will be given to produce faithful and sufficient figures, the extravagance of large plates, the colouring of every leaf and petal, &c., will be avoided.

Sowerby's small edition of the English Botany, whose plan and scope were indicated in Vol. V. p. 707., progresses steadily. The numbers, 1*s.* each, are now published once a fortnight. Twenty-four numbers are now extant.

Of Baxter's Figures and Descriptions of one Species of every genus of British Plants, in monthly numbers, each containing 4 species; price, with the plates coloured, 1*s.*, uncoloured, 6*d.*; thirteen numbers have been published; and a new and improved edition of the earlier numbers commenced, in which the descriptive matter is remarkably improved, and augmented from one page to two.

Algæ Damnonienses, or *Dried Specimens of Marine Plants*, principally collected in Devonshire; carefully named according to Dr. Hooker's *British Flora*. The first volume is now ready: it contains specimens of 50 species, prepared and sold by Mary Wyatt, dealer in shells, Torquay.

Mrs. Wyatt has succeeded, of late, in preparing these in a more scientific manner than previously. A second volume will be ready soon after Michaelmas, and will be sold to the purchasers of the first volume at the price of that, to others, at a fourth more.

The Fossil Flora of Great Britain, by Dr. Lindley and William Hutton, F.G.S. No. ix., price 5*s.* 6*d.*, being the first number of vol. ii., was to be published on July 1. 1833: to be continued every three months.

Illustrations of the Botany and other Branches of the Natural History of the Himalayan Mountains, and of the Flora of Cashmere, are in preparation, by J. F. Royle, Esq., F.L.S., &c., late Superintendent of the East India Company's Botanic Garden at Saharunpore. The plates, or prints, according to the specimens which are distributed, will be coloured lithographs of a quarto size. There is every prospect of this work's being found rich in perfectly original information; and this character, and the fine lithographs of the subjects described in it, are likely to render the work a valuable addition to the literature of natural history.

The Bulletin de la Société Géologique de France does not seem to be so well known in this country as it deserves to be. Its title sufficiently intimates that it is a register of the proceedings of the Geological Society of France; and of these, as contained in the 10 parts published, forming two volumes and the half of a third, which have been sent to us, we may give some notice in an early number. We cannot tell if the

Bulletin be purchasable in England, or if it be sold at all; if not, it ought to be. In April last we were informed (but too late for giving the information in our May Number, and illness prevented our doing so in the July one) that of

The Memoirs, or Transactions, of the Geological Society of France, the first part, or half of the first volume, was then nearly finished. The work is of quarto size, and the first volume is to contain 25 plates and maps. The first part, or half volume, will cost, to members, 3 francs; to purchasers who are not members, 10 francs. The following memoirs had, in April, been printed: — Lill upon Gallicia, with a map and sections; De la Beche on Spezzia, with a map; Vivioni on fossil plants of Stradella; Poreto on the Tortonese country; Reynaud on Corsica; Tournal on the igneous rocks of the Corbières; Botta upon Lebanon; De Beaumont upon the lignites of the tertiary basin of Northern France; Steininger on the fossils of the Eifel; and others.

From the same obliging correspondent we received some information on

The Geological Society of France, which we may as well give in this place. It is this: — "Our Society is increasing; we are already 230 members: Prince Christian of Denmark has lately joined us. We are in correspondence of exchange with 40 different learned societies or individuals publishing periodical works. Our collection is also increasing rapidly, and contains upwards of 5000 specimens. Our extraordinary general meeting will, this summer, probably take place in September, at Clermont in the Auvergne, a capital place for a geological congress. We are in hope of a full attendance of persons devoted to every branch of the natural sciences."

The London Natural History Society have fixed the amount of the subscription at 1*l.* per annum, to be paid quarterly in advance; the admission, 5*s.* Any person wishing to become a member is requested to apply by letter (post paid) to Mr. Ogilvie, 10. Gloucester Street, Queen Square, who will furnish him with copies of the regulations, and any other information he may require. The institutors of this Society have been prompted to form it, in the conviction that none of those already existing in London "afford sufficient and general facilities to the student, at a reasonable expense." The Society's objects are, the "attaining of mutual improvement in natural history, in all its branches, by means of meetings, excursions, and the formation of a library and museum."

SHORT COMMUNICATIONS.

Birds.—The Honey Buzzard (Fálco apivórus L.) *in Ireland; and some Facts on its Habits.*—At a meeting, on July 23. 1833, of the council of the Belfast Natural History Society, Mr. Wm. Thompson, V. P., stated, that, on the 11th of June last, a fine female specimen of the honey buzzard, which is unrecorded as having ever before occurred in Ireland, was, when in company with a similar bird, most probably the female, shot by Robert George Bomford, Esq., in his demesne of Annadale, in the vicinity of Belfast; and who, on being informed of the rarity of the bird, had most handsomely presented it to the Belfast museum. Mr. Thompson, who saw the specimen when fresh, related that the bill and forehead were covered with cow-dung, in such a manner as to lead him to suppose the bird had, in that excrement, been searching for insects. On examination of the stomach, which was quite full, it was found to contain a few of the larvæ, and some fragments of perfect coleopterous insects; several whitish-coloured hairy caterpillars; the pupæ of a butterfly, and also of the six-spot burnet moth (Zygæ`na filipéndulæ); together with some pieces of grass, which, it is presumed, were taken in with the last-named insect, it being on the stalks of grass that the pupæ of this species of Zygæ`na are chiefly found. Mr. Thompson remarked that this insectivorous food must, to the honey buzzard, have been a matter of choice, the bird being in the full vigour of its powers, and the district in which it was killed abounding with such birds as, were they its wished-for prey, it might have easily captured and destroyed.

[*The Chiffchaff is the Sýlvia rùfa of Latham, not the Sýlvia hippolàis of Bechstein.*] — Mr. Thompson likewise mentioned, that, having read an article in the second number of the *Field Naturalist's Magazine*, from the pen of the editor, entitled "The chiffchaff proved to be the Sýlvia rùfa, hitherto confounded with the S. hippolàis of the Continent," he had this day visited Colin Glen, the principal haunt of the chiffchaff in the neighbourhood of Belfast, for the purpose of obtaining the bird, and comparing it with the description there given. On this occasion, a specimen was fortunately procured; which, on examination, proved, as Mr. Thompson had anticipated from Professor Rennie's admirable elucidation of the species Sýlvia

hippolàis and rùfa, to be the latter bird. In consequence of this result, the Sýlvia hippolàis of Bechstein must now be erased from the catalogue of birds of the north of Ireland (and, he has little doubt, from that of Ireland generally), and the Sýlvia rùfa of Latham be inserted in its place. Mr. Thompson could not, however, omit stating that his own observations forbade him to coincide with Professor Rennie in the remark that Temminck (whose description is evidently intended to be general) is "undoubtedly in error" when he describes the "habite" of the Sýlvia rùfa to be "les grands bois, particulièrement dans ceux de pins et de sapins [extensive woods, especially pine and fir forests]:" it being chiefly in extensive plantations and among pines and firs that he has himself seen the bird; although, like Professor Rennie, he has also known it to appear in other localities, and has occasionally observed it to frequent trees of other kinds than those mentioned by M. Temminck.

[*The Willow Wren* (*Sýlvia Tróchilus*) *is more numerous in the North of Ireland than the Chiffchaff.*] — Mr. Thompson remarked, that the chiffchaff is not by any means so widely dispersed over the plantations of the north of Ireland as the willow wren (Sýlvia *Tróchilus Latham*); the latter bird being fully as abundant there as he has ever found it to be in any part of England or Scotland, or of the many continental countries he has visited. Mr. Thompson thus noticed the S. *Tróchilus*, on account of Montagu's statement, that its migration "does not extend far to the west in England, as it is rarely met with in Cornwall," having recently again appeared in the edition of his *Ornithological Dictionary* edited by Professor Rennie, as well as in Mr. Selby's invaluable *Illustrations of British Ornithology;* and from which it might be inferred that Ireland, owing to her still more westerly situation, is not included within the range of the willow wren's migration. — *Belfast, Aug.* 6. 1833.

A Pair of Eagles, I am sorry I cannot state of which species, were observed, previously to Christmas of 1832, upon Brandon rabbit warren, in Norfolk, about which place they had remained some time, and committed unwelcome havoc among the rabbits. The warreners made several unsuccessful attempts to shoot them, but at length both were caught in large iron traps each baited with a rabbit. One of the eagles, it is reported, after becoming entrapped, removed the trap, of seven pounds' weight, by its efforts, to the distance of twenty yards, and was even after this taken alive. It is said that its wings measured seven feet in extent. Their roosting-place was found to be in a plantation of fir trees in

the neighbourhood; and the ground around the trees on which they roosted, it is said, was found covered with the skins of rabbits. Brandon Warren is about thirteen or fourteen miles from Bury St. Edmunds. I wish some correspondent who saw the captured birds would tell us their species, and what additional authentic facts he knows respecting them. — *H. T. Bury St. Edmunds, March* 1. 1833.

Cygnus Bewickii. (Vol. V. p. 72. 700.) — I am much inclined to think that the identical specimen of this swan that was taken upon the coast of Northumberland had been for some time previously in my possession. About five or six weeks before the time at which it was met with, four or five wild swans alighted in the river Ettrick, where one of them was shot, and, one of its wings only having been broken, captured. I learned afterwards that its companions, after the shot, flew down the valley for some miles; but, finding they had left their friend, they returned, and flew round the place to try and get him along with them. The wounded swan was sent to me, and I put it into a large pond surrounded by trees, and fed it; but it preferred the pondweed [*Potamogèton*] and *Myriophýllum* [most probably *M. spicàtum*], with which the place was full, and seemed not much disconsolate for nearly a week. We observed that the bill and form of the head seemed somewhat different from those of the tame species, and that while swimming it carried its head more as a goose does, that is, with the head and bill horizontal, and not with the graceful arch of the common swan. Cold weather came on, and snow, and then it became restless, and one day a friend who was residing with me, while walking out, met with its track among the snow, and followed it for more than a mile, and brought it back. Two mornings after this we observed its track to the river and back again to the pond. It had done this for the purpose of reconnoitring; for the next morning its track was again traced to the river; but it never returned, and was never more seen. I made enquiries not only down the Yarrow, but, by means of fishers and others, all the way down to Kelso, thirty miles from where it entered the Yarrow, and could obtain no account of it, which I must have done, had it been shot or taken, for it could not use its wings in any manner. Of course it must have passed Kelso in safety, and without doubt would reach the sea. I afterwards saw, from a notice (I think in this Magazine, but I cannot find the place), that a swan with a broken wing had been taken on the coast of Northumberland, of a new species, and called *Cygnus Bewickii*; and upon comparing the time with that at which mine went down the

Yarrow, something less than a month had intervened. As soon as I had ascertained that mine was away in the manner I have described, I concluded that it would reach the sea, at the latest, during the second night, concealing itself by the banks among underwood during the day. — *W. L., Selkirkshire.*

P.S. The following winter I had another swan sent me, that I am inclined to think is of the same species. It was one of twelve or thirteen that rested for a while, as they often do, in St. Mary's Loch; and it also was shot at, and had a wing broken. It could not be taken, and the others left the loch. For nearly a week it was lost sight of, until a shepherd ascertained, by its footprints in the snow, that it regularly ascended a high hill in the morning, and returned to the water to feed during the night. He accordingly tracked it, and found it sitting on the very top of the hill, and secured it by the help of his dogs as it was making for the loch. It is, I believe, still alive, and in the possession of Robert Pringle, Esq., of Clifton, M.P. for Selkirkshire. — *W. L. Feb.* 25. 1833.

Geese from the Netherlands shot on the Trent. — Just before I left Derbyshire, five geese had been shot upon the Trent, with brass collars round their necks, which stated that they had come from Baak, near Zutphen, in Guelderland. Sir G. Crewe is to have one of them; but I have not seen them at present. I had heard that they are of the species called the laughing goose [*Anser erythropus Flem.*]. They were perhaps alarmed at the noise of the bombardment at Antwerp. — *Andrew Bloxam. Rugby, near Dunchurch, January* 1. 1833. (*In a Letter to the Rev. W. T. Bree, Allesley Rectory, Warwickshire.*)

A Duck that had strayed from Denmark (?) *shot in Sussex.* — "As some people were shooting in the parish of Trotton, in Sussex, they killed a duck in that dreadful winter 1708–9, with a silver collar about its neck, on which were engraved the arms of the king of Denmark." (*White; in the Letter to Daines Barrington dated Feb.* 12. 1771.) — *J. D.*

Notes on, and a Description of, the Black-headed Gull (*Larus ridibundus*), *as the same has been observed near Southminster, on the Coast of Essex; also a List of the Birds seen, in the Course of Twelve Months, in the Neighbourhood of Southminster.* — The black-headed gulls make their appearance on this coast (Essex) about the third week in March; at which time the common gulls (*Larus canus*) cease to roam inland in search of food, the black-headed gulls supplying their place. On the first arrival of the black-headed gulls, the heads of

many are only partially coloured; by the month of May, the head assumes a deep rich mouse-coloured brown, in some specimens darker than others; but in no one instance, out of a great number which I have examined, has the head been approaching to black. From the month of April, last year, to August, I procured specimens in every month, and found them invariably of the same rich brown on the head. The following is a description of one killed in the month of July. It had no appearance of being a young bird: — Length 16 in.; breadth from tip to tip 38½ in.; bill 1¾ in., pointed and hard, and of a very rich puce or plum colour, darkest at the base; the inside of the bill a richer puce, approaching to lake; the head a rich mouse-coloured brown; irides hazel; eyelids red; the eye partially surrounded by a line of white feathers; the breast pure white (in one specimen it was of a delicate rose colour); back and scapulars pale lead colour; belly and tail pure white; wings lead colour, fading into white; the first two quill-feathers white, edged with black on both margins; the third, fourth, and fifth feathers black only on the outer margin; the legs and feet rich puce colour, the webs lighter: weight 8½ oz. I killed this specimen, while it was feeding on the *Pulex Cancer*, or flea crab, in one of the saltwater ditches which communicate with the sea. In the months of May and June, they are very busy in the pursuit and destruction of the cockchafer. Their note is peculiar, resembling the broken caw of a young rook. About seven miles from me, in the Blackwater river, there is a low swampy island, of fifty acres, where these birds resort to breed. From 10,000 to 12,000 eggs are annually taken thence, and sold at 4*d.* a dozen. I last year visited the place at the full time of their breeding, and I found the nests thickly strewed about; and the eggs laid on a little sea-weed, and seldom more than three in a nest, sometimes four. The egg is of a dirty olive green, spotted with a darker green. The parent birds fly around, and within three or four yards of, those disturbing them. Among the whole mass I saw no black heads: I am of opinion that they never attain that colour. The eggs, when dressed, are eaten cold; the colour of the yolk is deep orange; they are very strong, though considered a delicacy by the marsh gourmands. The fat of the bird is of the same deep hue. In the month of November they leave this coast, or, at least, never journey inland with the common gull. It is by no means a shy bird, but a very noisy one, and defends itself stoutly when wounded. In the bird figured by Bewick, the head is black, and the white circle of feathers around the eye is wanting; but the shape

and appearance are good. The bird figured as the "*grande mouette blanche*" is evidently the same gull in its winter dress, or a young bird during the summer months. It is by far the most numerous of the gull tribe on this coast. I subjoin

A List of the Birds seen by me, within the last Twelve Months, in this Neighbourhood. — Sparrow hawk; kestrel, male and female; hobby, very destructive to larks; short-eared owl (I was told by the servant that a bird with horns was sitting on the top of a tent bed. When it was captured, I was delighted to find it was a specimen of this rare owl. I suspect, from my proximity to the sea, and from the season of the year, that he was a new comer. When I had thoroughly examined him, I let him go. It was only during a quiescent state that the horns were visible: they appeared like single feathers, though they consisted of many); white owl, brown owl, red-backed shrike, raven, hooded crow, rook, jackdaw, magpie, jay, blackbird, thrush, missel thrush, fieldfare, redwing; starling, in immense clouds in the marshes; cuckoo, hedge sparrow, redstart, redbreast, nightingale, pied or common wagtail, yellow wagtail, yellow willow wren, whitethroat, wren, golden-crested wren, wheatear, whinchat, green woodpecker, nuthatch, greenfinch, bullfinch, bunting, yellow bunting or yellowhammer, reed bunting, sparrow, chaffinch, goldfinch; linnet, in immense flocks on the sea shore; skylark; *Alaúda campéstris*, on the sea shore; woodlark, titlark, greater titmouse, blue titmouse, cole [query, coal] titmouse, marsh titmouse, long-tailed titmouse, swallow, martin, swift, wild pigeon, ringdove, turtle dove, partridge, quail, landrail, golden plover, lapwing; grey plover (Tringa *Squaturòla*); dunlin, purre, curlew, woodcock, snipe, jack-snipe; redshank, it breeds on the edge of the marshes; whimbrel, grey lag goose, white-fronted wild goose, brent goose, black duck, wild duck, wigeon, pintail duck, teal, black-backed gull (*Làrus marinus*), herring gull (*L. fúscus*), laughing gull (*L. ridibúndus*), common gull (*L. cànus*), tern, water hen or gallinule, sprat loon (*Colýmbus stellàtus*), goosander (*Mérgus Mergánser*), oyster-catcher, kingfisher; heron (*Ardea màjor*). Of the heron, I have counted twenty-three standing together in the marshes. I omit one bird, which I have twice seen so closely that I cannot have mistaken it, the purple sandpiper (Tringa *marítima*); but, till I have acquired a specimen, I cannot pronounce upon it certainly.

The Water Shrew (Vol. V. p. 79. 298.) is common in the ditches about this place: several have come under my notice. —*Walter Henry Hill. Southminster Vicarage, Essex, May* 6. 1833.

[*A Notice of an Individual of the Great Black-backed Gull*

(*Làrus marìnus*), *in its first Year's State* (*pronounced to be so by an able Ornithologist, to whom we have submitted Mr. Lees's Communication and characteristic Drawing*), *killed near the City of Worcester, on some Day between January* 20. *and* 27. 1833.] — It measured nearly 3 ft. in length, and more than 6 ft. in the full expansion of the wings. The whole plumage is mottled with brown and white; but the under parts are almost entirely white, the spots and markings being there very faint. The bill is of a darkish horn colour. The legs and feet, when the bird was killed, were of a pure snow white, but are now faded to a dull horn colour. The irides were dark reddish brown. It is evidently the Wagel gull of Pennant (*Arctic Zool.*, vol. ii. p. 453., and *Brit. Zool.*, vol. ii. p. 247.; and Bewick's *British Birds*, vol. ii. p. 196. of my edition), now considered to be the first or second year's young of the *L*àrus marìnus. It agrees tolerably well with Bewick's short description; and his cut, although it exhibits the neck rather too short, is not a bad representation. [Mr. Lees had, farther, identified the bird, in detail, with some qualifications, with Stephens's description of the *L*àrus marinus (Shaw's *General Zoology*, vol. xiii. part i. p. 186.), and with the cobb (*L.* marìnus *L.*) of Rennie's *Montagu's Orn. Dict.*, p. 93. — *J. D.*]

Mr. Flinn of this city, who killed the specimen upon which I have been thus remarking, gives me the following account of its capture: — It was scared from the Severn on the side of Pitchcroft, a little above Worcester, by some bargemen, and flew into a meadow on the other side of the river, a little above the Dog and Duck public house. The bird being pointed out to a friend who was with Mr. Flinn, he fired, and broke one of its wings, upon which a spaniel was detached to seize the gull, who was attempting to escape. Immediately, however, upon the dog's approach, the gull seized it by the nose with its powerful beak, and shook the animal with such fury, that it was glad to make a precipitate retreat. Mr. Flinn's friend now approached, when the gull instantly fastened on his thigh, and was with difficulty dislodged. Mr. Flinn himself now came up, and felled the bird to the earth with a stout stick, but it almost instantly rose again, and, darting on Mr. Flinn's arm, furiously assailed him; nor was it finally killed without considerable trouble.

This species, according to Montagu, "is not very plentiful." He states, on the information of fishermen, that it breeds on "the steep Holmes, and on Lundy Islands in the Bristol Channel," from whence, most probably, it journeyed up the course of the river to this neighbourhood.

The Spoonbill (*Platàlea leucoròdia* L.) — In Weaver's museum, Birmingham, there is a specimen of the spoonbill, which was killed a few years ago, near Malvern, in this county; and I have been assured by a gentleman of this city, whose attachment to ornithological pursuits is very great, that, between twenty and thirty years ago, there was a spot on the Severn, between Powick and Upton, in this county, which was at that time known as the resort of spoonbills, though they have not been now seen there for some years. The specimen in Weaver's museum was probably the last straggler.

Coccothraústes vulgàris Fleming. — A male and female were shot in a field near this city in December last. — *Edwin Lees. Worcester, January* 31. 1833.

The black-backed gull (*Làrus marìnus L.*) is one of the species which Mr. Hill enumerates, in p. 452., as occurring on the coast of Essex. — *J. D.*

The Swallow, a capricious Architect. — My brethren "eccentric" have, no doubt, together with myself, been led to admire the wonderful instinct with which the various species of the feathered race are gifted by nature for the formation of their respective domiciles. The nest declares at once the name of its architect, from the peculiarity of material, construction, and situation; the former of which is always well-suited to the latter, and all admirably contrived with a view to security or secrecy.

Although the winged architects, for the most part select positions whose natural advantages materially facilitate and assist the work of art, yet we occasionally observe instances where the usual and obvious rules for choosing are strikingly disregarded, and where mere capriciousness seems to instigate the builders. My object, at the present moment, is, to introduce to my readers one of the whimsical exceptions just alluded to, a swallow, which during the past summer constructed its dwelling in a summer-house at East Woodhay. The situation chosen was the following. One of the sticks used for pegging down the straw thatch protruded into the interior a length of 6 or 8 in., and around this stick my friend the swallow contrived to plaster the muddy roof from which the whole fabric was suspended. The upper part of one side of the nest touched a rafter in one point; but, with the exception of this slight abutment, the whole tenement depended from the stick. On visiting the summer-house subsequently, I found that the interesting nest had disappeared, and concluded that the weight of the young swallows had been too great for the fragile support, and that the whole had fallen

together. However, upon enquiry, I learned, to my annoyance, that the gardener had displaced the poor bird's domicile, disliking tenants who were not over-cleanly in their occupancy.

Since writing the above, I have become acquainted with another singular instance of peculiarity in a winged architect, of the same tribe, relative to the position of its nest; and as plain matter of fact from my pen will be more interesting than ill-imagined fiction, I shall forthwith commit it to paper. In the summer of 1830 a pair of swallows commenced their nest upon the crank of a bell wire, in the passage of a farm house at Crux Easton; the one end of which opened into a little garden, the other into the kitchen, and the door of which, towards the garden, was usually left open. The passage was 15 or 18 ft. in length, and the bell wire nearly at the extremity towards the kitchen. The farmer and his wife were so much pleased with the sociability and confidence of their new inmates, that they not only allowed their muddy domicile to remain unmolested, but were particularly careful that free ingress and egress should be always afforded through the garden door. The nest was completed, and a brood of young swallows reared, which took wing.

In the autumn of the same year the farmer, returning from shooting, with his gun loaded, thoughtlessly discharged it at a swallow, which he killed. The circumstance passed without comment, until the summer of the following year; when, from the absence of his old favourites, it occurred to him that the poor bird so wantonly killed must have been one of the pair.

In the summer of the present year, 1832, a pair of birds, the offspring probably of the former occupants, reared in the passage, were again observed frequenting their old haunt. They first attempted to fix their nest against a cupboard door immediately over the door leading into the kitchen; and the farmer's wife fearing it might be shaken down, from the closing or opening of the door (for it was partly open when the nest was begun), drove a nail beneath, to secure it in its position. However, the swallows did not approve of this interference: they forsook their nest, and commenced a second over the kitchen door; but this they could not secure. The thought now struck the farmer, that if the nest of 1830, which still remained on the bell wire, were removed, the birds would adopt their old situation. This was accordingly done. The pair immediately profited by the farmer's suggestion; a nest was completed, and an egg deposited in the short space of four days from the commencement of the new work. While

the business of incubation was going forward, the farmer's sheep-shearing was accomplished, and the usual supper given to the labourers in the kitchen; but, notwithstanding the confusion and smoke, the constant opening and closing the door, the parent bird never moved from her nest. The hay-making feast arrived when the young birds were hatched; and again, amid the noise and confusion, the old swallows unremittingly waited upon their offspring. The nestlings took flight; but, until the period arrived for migration, they constantly returned to the passage for the night. At the beginning of the evening they perched on the edge of the nest; and, as the night advanced, as if for additional warmth, they sunk down into its interior. As the season advanced, and they became full-feathered, they deserted the nest altogether, and roosted on the bell wire. Here they perched during the conviviality of the harvest supper, perfectly regardless of the uproar; and here I saw them perched for their night's repose, when visiting Crux Easton, on an evening in the middle of September. — *A Friend of C. P.'s. Surrey, March* 6. 1833.

By what harmless Means can Martins and Swallows be induced to cease building and breeding in the Places in which they have been long allowed to build and breed? — Sir, Locality appears to be so strong in the swallow, that you can scarcely drive them away from an old establishment. Chicherley Hall, Bucks, having, for several years, been neglected, free opportunity has been given the birds to stick up some hundreds of nests in a season under the cornice of the mansion. Last year I tried to scare them away by nets, feathers, gas tar, destroying their nests, &c.; and all to no purpose. As I do not wish to kill the little creatures, yourself or some of your readers would confer an obligation by informing me how I am to drive them away. I am, Sir, yours, &c. — *William Whiddon, Gardener. Chicherley Hall, Bucks, Feb.* 28. 1833.

This query was contributed to the *Gardener's Magazine*, to which work we hope some lover of swallows will enable us to transfer *a brief prescription* for Mr. Whiddon's practising. The swallows spoken of are, doubtless, of the window species, that is, martins; and the above remarks couple themselves with those of R. Y., in p. 153., on the "pertinacious perseverance of the martin in renewing its nest in one place." — *J. D.*

Amphibious Animals, — *A Place chosen by Frogs for Shelter through the Winter.* — I found, last winter, several frogs lying in holes in a bank by the roadside. They were buried about 6 in. below the surface, and 3 ft. or 4 ft. from the level

of the ground. There was a pond beside the road, about 20 yards from where I found them. The frogs seemed in a languid state, but began walking as soon as I took them out of the ground. — *E. S. T. March*, 1833.

Communications on this subject will be found in Vol. II. p. 103. 208. 289., Vol. IV. p. 147.; and others, contributive to the history of the common frog, in Vol. II. p. 103. 209. 289., Vol. III. p. 326., Vol. V. p. 84. 291. 490., Vol. VI. p. 206.; on other species of frog, there are notices in Vol. I. p. 284.; *Rana arbórea L.*, Vol. I. p. 479.; *Rana esculénta L.*, Vol. V. p. 104. — *J. D.*

The Natterjack in Norfolk. (p. 185.) — The natterjack (*Bufo Rubeta Fleming*) was tolerably abundant on the estate of the late Dr. Rigby, at Framlingham, near Norwich, which is a high ground, with some marshy spots. Several specimens have been captured at St. Faith's [? St. Faith's Newton bogs]; and I caught one on the loose sand in the chalk pit near the lunatic asylum, Thorpe [near Norwich]. — *Samuel Woodward. Norwich, March* 26. 1833.

Geology. — *Serpents not naturally destroyed either by Hedgehogs or Mice; the natural Incarceration of Toads, &c., in Trees and Stones; and the Process of Formation in Meteoric Stones, not yet accounted for.* — Sir, Dr. Buckland has given us the account of an experiment made by confining together a hedgehog and a snake, wherein the former, in process of time, killed the latter, and partially devoured it; and it is hence inferred, that one purpose of the hedgehog, in the economy of nature, may be, to thin the earth of these reptiles. I am sorry to confess that, to me, at least, the experiment proves nothing. The circumstances under which they were placed were forced and unnatural; and, even by Dr. Buckland's account of the matter, the hedgehog had to be goaded to the deed. It seems to have destroyed the snake as an invader of its repose, and *hunger* impelled the hedgehog to make a sorry meal on the body of its enemy; for there was nothing else for it to eat. I have paid some attention to the natural habits of the hedgehog, and had always supposed that it roamed about at nightfall and at night for its prey: at this period have not snakes retired into the innermost recesses of their narrow windings, and the question is, how the hedgehog is to get at them? A few weeks ago, a serpent was caught among the ruins of Whitby Abbey. I had seen it for several days under a bell glass, and it appeared very lively; it was a specimen of the Coluber *Berus L.* A mouse was introduced to it as food; but in the following morning the viper was found dead, and partly eaten. Will

it be said that serpents are the natural food of mice, or that the mouse hunts out for snakes to kill and eat them?

I consider the experiments of that eminent and excellent philosopher in reference to his cerement of toads [described in Nos. xxv. and xxvi. of Jameson's *Journal*], &c., with a view to disprove the *incontrovertible fact* of living toads and lizards having been found in cavities of the solid stone at considerable depths, and without the slightest intercommunication between their dormitory and the atmosphere, to be, if possible, still more inconclusive. I have a toad in my possession, preserved in spirit of turpentine, taken from a cavity of the solid rock upwards of 200 feet deep; the space was quite sufficient to contain the body of the animal, and the gentleman who presented the specimen to me saw it alive 48 hours after its detachment from the rock. The whole of the scepticism on this question arises from the *difficulty of accounting for it;* but a well-accredited fact *must be believed*, whether we can account for it or not. This enquiry has much of the complexion of those on the phenomenon of the fall of meteoric stones. Who among us now disbelieves the latter well attested and confirmed fact? and in the whole circle of science I know not one of more difficult solution, or one which has more displayed the vagaries and eccentricities of the human intellect; such as, that they are lanched from a volcano in the moon (Wilkin, &c.), iron created in the air (Brande), a zone or girdle of these whirling round the earth (Brewster), &c. I fear I must say, that much of this scepticism proceeds from the fact, that the phenomenon of living toads, &c., being found in the core of the solid rock, disturbs the speculations and reveries of some geologists touching the age of our planet, and the non-existence of animal life at an early period of its history. The sepulture of the animal, there can be no doubt, was contemporaneous with the formation of the rock which entombs it. The abundant evidence which I have collected on this subject leaves no doubt on my mind whatever; and I have lived to see too many geological hypotheses overturned, to be led astray by the *ignes fatui* of geologists. Their facts are delightful, valuable; their reasoning (?) sometimes sets common sense at defiance, and not unfrequently wears an air of the ludicrous. I am, Sir, yours, &c. — *J. Murray. Jan.* 20. 1833. [We add some instances of animals found incarcerated. — *J. D.*]

At Orgon, in France, a toad and two muscles have lately been taken out of the bottom of a deep well, sunk in the rock, and reopened after having been filled up for 150 years. One of the muscles and the toad are still preserved alive in

the water in which they were found. (*Newspaper.* Its name and date have not been preserved.)

A toad, of a dark slate colour, in a living state, was lately found in the centre of a huge mass of rock at least 50 ft. below the surface of the earth, by some workmen who were digging for coal near Bristol. The animal was very lively at first, but expired soon after being exposed to the air. (*Morning Herald*, Jan. 18. 1823.)

A few weeks ago, some miners, at the Rough Hills colliery, discovered, at the depth of 150 ft. from the surface of the earth, in a solid piece of ironstone, a small toad, which, on exposure to the air, exhibited symptoms of animation; and, being put into water, lived about three weeks; growing to nearly double its size when first released from its confined cell, which was just large enough to contain its body. (Copied, from the *Shrewsbury Chronicle*, into the *Bury and Norwich Post* for Dec. 21. 1825.)

While some workmen were splitting staves in the town of Royalton, in this state, last week, a frog was found in the timber, 6 in. from the outside. The tree was perfectly sound, except the space occupied by the frog, which was just wide enough to admit its body. There were thirty layers of wood between where the frog lay and the bark of the tree. The frog appeared lively; and evinced considerable joy on its release from confinement, by the free use of his limbs, which had been held so long in *durance vile*. (*Newspaper.*)

A Toad enclosed in the Wood of a Tree.—Live toads may crawl any where when young, or get entrapped when asleep, or in a dormant state, by the closing up of fissures in the rocks, or by the swelling of a tree. I myself once cut a live toad out of a growing tree, when pruning it, four feet from the ground; the toad was but a little one, about the size of half a walnut shell, like one about half a year old, yet it must have been there at least five or six years, as the wood had grown over it to full an inch and a half in thickness, exclusive of the bark. The place I cut it out from was an unsightly protuberance, the effect of bad pruning. Its lodging-room was beautifully polished on the inside, either, as some supposed, from its rough skin acting on the wood like a burnishing file or sand-paper; or rather, as I supposed, from the creature licking with its tongue the juices of the tree, which probably were sufficient to support animal life in such a confined state.—*John Howden. July 5.* 1829.

A Bat found within the Timber of a Tree.—A man engaged in splitting timber for rail-posts, near Kelsall, in this county, a few weeks since, discovered, in the centre of a large

pear tree, a living bat, of a bright scarlet colour, which he foolishly suffered to escape from fear, being fully persuaded (with the characteristic superstition of that part of Cheshire) that it was a "being not of this world." The tree presents a small cavity in the centre where the bat was enclosed, but is perfectly sound and solid on each side. (*Chester Courant.* Date not preserved.)

Perhaps by "of a bright scarlet colour," of a bright red brown is rather meant; unless it be supposed that the wood of the tree had produced some dyeing effect on the fur of the bat. —*J. D.*

A Bird's Nest found within the Wood of a Tree. — Lately, when two men were sawing a larch tree upon the estate of Lynedoch, they discovered a bird's nest with eggs in the centre of the trunk. It must have remained in that situation for a considerable time, as the aperture by which the parents had obtained access to the nest was entirely closed up by the bark of the tree. (*Morning Herald*, June 15. 1825.)

Chalk in Belgium. — The occurrence of true chalk in Belgium has been observed, and noted by Omalius d'Halloy; also, along the Meuse, opposite to Visé, near Maestricht, by Dr. Fitton (*Proceedings of the Geological Society*, No. 14. p. 162.). On reference to the maps of Simon Schropp of Berlin (*Geognostiche Karte von Deutschland und den Umliegenden Staaten*, 1826), I see no locality marked to the eastward of Aix la Chapelle; but I have observed a chalk pit on the right of the chaussée, which is much elevated above it, between Bercheim and Cologne; and I am told it underlies the plastic clay at Aldenhofen, and near Steinstras. The roads there are macadamised with true chalk flints, and the plastic clay may be traced on the uplands all the way from Aix to Cologne, especially before arriving at Juliers. As it is a matter of some interest to geologists, to trace the connection of the true chalk with the Maestricht beds, and the tertiary formations above them, the notice of this locality may be of some little service, especially as I believe it to be the first mention of it. M. Wolff of Spa has not marked it on his *Carte Géologique du Département de l'Ourte et des Environs.* — *W. B. Clarke. Parkstone, Jan. 9. 1833.*

The Lava of Niedermennig, employed for Millstones by the Romans, found in Fragments in England. — The following passages are taken from Dr. Hibbert's recently published and most able work *On the Extinct Volcanoes of the Basin of Nieuwied.* They occur at p. 236.: — "The lava of Mennig was conveniently worked by the Romans. . . . It was in chief request, on account of its hardness and other qualities of

durability, for the architecture of bridges.* ... Another purpose for which the lava of Mennig became quarried was suggested by the familiar use which the Romans had made of a similar rock in their own volcanic country, for the construction of portable millstones or hand-mills.... So soon as it was known that a quarry had been opened in the country of the Ubii, and that a stone might be procured resembling such lavas of Italy as were adapted to the purpose of millstones, the demand for it in the Roman stations became general. An intelligent antiquary and naturalist, W. C. Trevelyan, Esq., of Wallington, has informed me that he procured a portion of a Roman millstone, composed of the lava of Mennig, from the remains of a villa in Northumberland, near the Hunnum of the ancients. In the Roman station also of Aldborough, in Yorkshire, the Isurium of Ricard, the portable mills which have been found show that the same use was, in other places, made of the lava of Mennig." To which is added in a note, — "My friend, Mr. Trevelyan, whom I have to thank for this curious information, presented me with a small specimen, broken off from a millstone found near the Hunnum of the Romans, which I am fully persuaded may be referred to the peculiar lava of Mennig."

I am glad to have an opportunity of adducing an additional testimony to this curious fact. In the autumn of 1822, I found, among the diluvial gravel in the neighbourhood of Godmanchester, in Huntingdonshire, two or three small fragments of porous lava, one side of which appeared to have been ground into a smooth surface. As they were evidently portions of a mass which had been employed in some artificial work, and seemed to have been used in a mill, I made enquiries of different millers, but could not find that such a material was ever employed: I therefore presumed that they were diluvial, and added them to a collection I was then making.

Since then, I have visited the volcanic district of the Rhine three times; and in these excursions I have seen the Niedermennig lava *in situ*, as well as at Andernach in the shape of millstones. At the first glance I was convinced that the

* The lavas, trachytes, and basalts of the Rhone have been extensively used in architecture. Dr. Hibbert quotes the old Roman bridge at Engers, and the present bridge at Trèves. I may add, that the cathedral of Cologne is built of trachyte, from the Drachenfels and Wolkenberg in the Siebengebirge; and perhaps that rock cannot be more successfully studied, as to its contents, than in the walls and pillars of that splendid church, for the half polish they have received exhibits the minerals very perfectly.

fragments found at Godmanchester were identical; and subsequent comparison has confirmed the resemblance. Several other fragments I have since met elsewhere. One I found on the banks of the Stour, near Cattawade Bridges, in the parish of Brantham, Suffolk, which contained an injured morsel of Haüyne, one of the minerals named by Dr. Hibbert (p. 124.); and there are traces of other minerals in another fragment found at Stratford, in the same county. Previously to the appearance of Dr. Hibbert's work, the idea of their arrival in England by means of the Romans had occurred to me; and I made a note of the kind in my common-place book. It is to be remembered that Godmanchester was not far from a Roman station, and that the Romans were established at Colchester, only a few miles from Cattawade; and that at Stratford (about three miles from Cattawade, up the river) has been placed the station "*Ad Ansam*," though I have little doubt, that, whatever *Ad Ansam* may mean, it is wrongly stated that the Romans were established at Stratford; for the distance in the *Itinerary of Antonine*, and other considerations, would lead me to think that Lawford, which is on the height of the Essex side of the Stour, opposite to Cattawade, suits the position assigned better than Stratford. There is some mystery in the word Cattawade: local authorities, village gossips, and others, derive it from the tradition of a cat which there crossed the salt water. It appears to me, however, to have acquired its appellation from having been a *vadum*, where some of the auxiliary troops, probably Catti, whom Claudius brought over from Gaul, when he established his guard of veterans at Camelodunum, or Colchester (vid. *Tacitus*, *Agricola*, xiii.), crossed the head of the estuary. The Catti got their name from *catte*, the old German word for the animal, whom they resembled in character. This digression belongs to the history of the millstone lava. — *W. B. Clarke. Parkstone, May* 21. 1833.

Native Sulphur in the County of Northumberland. — Some years ago I found minute crystals of sulphur accompanying sulphuret of lead (galena), and apparently resulting from the decomposition of the latter mineral, in a vein at Redpath, in this neighbourhood; a notice of which appeared in Brewster's *Journal* for 1826, vol. v. p. 375. I have since found beautiful, though minute, crystals of sulphur, accompanied by carbonate of lead, in cavities in galena, raised from a vein at Hartington, also in this neighbourhood. — *W. C. Trevelyan. Wallington, Newcastle on Tyne, Sept.* 22. 1832.

Several Skeletons of Elks have been found in the Neighbour-

hood of Killaloe; one lately, by some labourers digging marl for manure. They said it was perfect, and lying on its side; but in their hurry, and from thinking it of no value, they broke it up, and threw away all the bones, except the head and antlers, which they brought to a gentleman of my acquaintance. I went afterwards to see the place: it was in a valley parallel to, and at about half a mile's distance from, the Shannon. It had lain about twelve feet beneath the surface, under a bed of marl of about three feet thick, over which there was about nine feet of bog earth. When the bones were first taken up, they were quite soft; but they hardened on exposure to the air. The length of each horn is about five feet, and the greatest breadth of the blade one foot. The centre of the bed of the Shannon is marl, with great quantities of small shells throughout it. This marl is raised during the summer by the farmers, and forms a very fine manure. — *T. K. Killaloe, Sept.* 21. 1832.

We have been informed that the fossil elk of Ireland is found in numbers in the strata of the northern part of the Isle of Man. — *J. D.*

METEOROLOGY. — *Lunar Rainbow.* An instance of this phenomenon occurred at Plymouth a few evenings ago, about 11 o'clock. It remained distinct about two minutes, during which time, as seen from Morice Square, it appeared to extend almost completely across the harbour in a north-west direction; the moon shining brightly in an opposite direction. — *J. Sept.* 1832.

Remarkable Meteor seen from Norwich, Dec. 19. 1832. — On the evening of the 13th Dec. 1832, at five minutes past six o'clock, as I was passing out of Norwich, in a south-west direction, my attention was arrested by a falling star, as I conceived it to be, descending obliquely from the west towards the east. It however increased in size and brilliancy, assuming the appearance of a splendid meteor; and, prior to its becoming extinct, its rapidity was apparently accelerated, and a distinct rushing noise was heard. The train, contrary to my preconceived notions of such phenomena, did not result from the rapidity of its motion, but was, *bonâ fide*, a train of sparks; as towards its close there appeared a double line issuing from the sides of the luminous body, and connected with the original line, forming an acute angle. The colour was similar to that of the planet Jupiter (which appeared just above its line of progress), and its apparent diameter one fourth of that of the moon's body. After the disappearance of the meteor, I watched the train of sparks which continued for about the space of fifteen seconds. — *S. Woodward. Norwich, January* 7. 1833.

MISCELLANEOUS INTELLIGENCE.

Art. I. *Retrospective Criticism.*

Corrections. — In Vol. IV. p. 267. line 13., for "pupæ," read "pupa." In Vol. VI. p. 150., in the "*locality for the kingfisher*," for "Cauford, Dorset," read "Canford, Dorset." In p. 181. line 14., in the criticism on Mr. Moggridge's account of a "singular subsidence of the chalk measures near Lower Meudon, near Paris," for "nearly," read "marly." In p. 209. line 22., for the translation there given of the Latin quotation, substitute, as more accurate, this: "A bad cause will be made worse by defence." In p. 333., for "*d*, larva," read "*c*, larva." In p. 335. line 10., erase the word "it." In p. 369. line 17., the quotation ends with the word "*Biography*." In p. 380. line 20., after "of my paper," insert "[p. 116—120.]" as, without this, it seems that the paper was published in the *Ent. Mag.* not this Magazine. In p. 384. line 20., for "with eggs in," read "with eggs in it." In p. 384. line 22., for "building," read "breeding."

Mr. Audubon. [*Mr. Waterton in reply to Mr. Audubon, jun.*, p. 369.] — Extract from a paper written by the elegant biographer of Wilson, dated July 20. 1831: — "The reason why Swainson did not write the work" (alluding to the *Biography of Birds*), "as told me by himself, was, that Audubon insisted upon his own name being given to the world as author! Mr. Swainson, upon this, very properly declined having any thing to do with the affair. — *G. Ord.*"

The above requires no comment from me.

It is somewhat singular that Mr. Audubon, jun., should complain (p. 369.) of what he calls my "attacks" on his father, when he has taken no notice of the momentous charge which Dr. Jones brought against his father in the *Franklin Journal*; a full account of which is to be found in the *Mechanics' Magazine* for March, 1832, p. 404. In the *Franklin Journal*, the veracity of Mr. Audubon, as a naturalist, is called in question in the most unqualified manner. Now, Mr. Audubon being in England at the time the charge was made against him, and "unable to answer for himself," how comes it that Mr. Audubon, jun., did not complain of the attack during his

father's absence? and immediately step forward to assure the Americans that his father, on his return to his own country, "would be quite able to prove the correctness of all that he has said on the natural history of America?"

When I deem it imperative on me to make comments on a printed work, I never stop to enquire about the author's residence; and I take this opportunity to inform the public, that, whenever I may find any passage in an author which tends to invalidate the correctness of statements in the *Wanderings*, I shall buckle on my armour without loss of time.

In 1832, I learned, for the first time, that Mr. Audubon had given, in Jameson's *Philosophical Journal*, a new theory concerning the faculty by which the vulture traces its food. Finding that new theory diametrically opposed to what I had written of the vulture in the *Wanderings*, I forwarded to Mr. Loudon's Magazine [Vol. V. p. 233—241.] a minute account of my observations on that bird; being fully aware that, if Mr. Audubon's new theory were allowed to stand, my statement in the *Wanderings* must necessarily fall to the ground.

Some time after this, Mr. P. Hunter, a gentleman who, it seems, is a most fervent admirer of Mr. Audubon, sent a very copious extract from the new theory, which had appeared in Jameson's *Journal*, to be inserted in [Vol. VI. p. 83—88. of] this Magazine; requesting, at the same time, that the works of Audubon "might be allowed to speak for themselves." This was quite as it ought to be. But, pray, are those works to have the privilege of *speaking for themselves*, evidently to my utter condemnation as a correct ornithologist; and *I be supposed to hold my tongue*, because, forsooth, Mr. Audubon "has returned to the forests of America, and is unable to answer for himself?"

If Mr. Audubon, junior, feels alarmed for his father's reputation as a naturalist, at the menacing attitude I have assumed in defence of my own book (bless the bantling!), I would recommend to him either to refute my arguments, or send over an express to his father to come back from America without loss of time, and mount guard over his own *Biography of Birds*; which shall feel the weight of my arm in earnest, if the son returns me sarcastic thanks a second time. He might add in the express, that a person who signs himself R. B., in Mr. Loudon's last Magazine [p. 372.], is doing that which will make his father, on his return, exclaim, "Oh, save me from my friends!" — *Charles Waterton. Walton Hall, July* 6. 1833.

Mr. Audubon again. — A person who signs himself R. B.

[p. 372.] insinuates that envy and jealousy have instigated me to blight Mr. Audubon's fair fame. Fair fame! Has R. B. not read, in Mr. Audubon's introductory address to his *Biography of Birds*, that Philadelphia had refused him honours, which Liverpool freely accorded? Has this mysterious remark caused no misgivings in the anxious breast of R. B.? In publicly accusing me with "endeavouring to deprive the solitary wanderer of that patronage, the expectation of which is the only hope that can cheer his labours," is R. B. too dull to have perceived, in this Magazine [Vol. III. p. 449., Vol. VI. p. 83—88.], that I was under the absolute necessity of defending [Vol. V. p. 233—241., Vol. VI. p. 162—171.] my own statement of the powers of scent in the vulture, on account of what had appeared in Jameson's *Journal?* and that, as Mr. Audubon's works had been brought forward [Vol. III. p. 449., Vol. VI. p. 83—88.] to speak for themselves, my easiest mode of defence, at the distance of four thousand miles from vultures, was, to point out the errors and absurdities which those works contained? Is R. B. so rash as to trumpet Mr. Audubon's "high credit" as a naturalist, while there is his name attached to an account of a rattlesnake swallowing a large American squirrel *tail foremost?*

In lieu of taxing me with an attempt to blight the fair fame of his friend, would it not have been more prudent in R. B. to have sent a letter to America, and gently suggested to his friend the propriety of his immediately noticing the attack of Dr. Jones? hinting, at the same time, that, if nothing be done in that quarter, the public will have too much reason to refuse credence to future productions from the pen of Mr. Audubon.

R. B. evidently wishes us to believe that Mrs. Audubon corrected her husband's manuscripts, for he tells us that Mrs. Audubon is well qualified to correct them; and he lets out that Mr. Audubon could not speak English at the age of seventeen. Now, Mr. Audubon, junior, tells us [p. 369.] indirectly that it is Mr. Swainson's "firm conviction, arising from personal intercourse, and the perusal of original manuscripts, that Mr. Audubon, and no other person, is the *bonâ fide* author of the *Ornithological Biography*" (query, were the manuscripts written in French?); and Rennie, who is a scholar and a professor, seems evidently of the same way of thinking; for he counsels us to "read the works of Audubon." By the by, Mr. Audubon himself talks of being on a "trading voyage," and speaks of a "counting-room." With these avocations, added to his total ignorance of our language at the age of seventeen, he must be, indeed, a man of parts, to write

so correct and elegant an English work (as far as language goes) as the *Biography of Birds.*

And, now a word for myself. R. B. remarks [p. 370.], "how would Mr. Waterton's *Wanderings* appear, if subjected to the test of ridicule, or even the severe ordeal of sober criticism?" I answer, that the *Wanderings* have already passed under the keen pens of the *Edinburgh* and *Quarterly Reviews.* Still, if R. B. feels inclined to try them by the ordeal of his own ridicule or sober criticism, I here promise that I will answer him to his heart's content.

I must now transcribe a mischievous statement from the "observations" of R. B., in the last Magazine [p. 371.]. He says: — "Mr. Waterton travelled from his own rich plantations in Demerara, surrounded by his slaves and attendants: Mr. Audubon was a solitary wanderer in the forests of America, often dependent on his gun for support. While Mr. Audubon is exposed to dangers and privations, and looks forward to the patronage of the public for his sole support and reward, Mr. Waterton is tranquilly seated in a magnificent English mansion, surrounded by paternal acres" (Mr. Audubon tells us that he had paternal acres in Pennsylvania), "and endeavouring to deprive the solitary wanderer of that patronage, the expectation of which is the only hope that can cheer his labours. Look at this picture, and look at that!" Ay, reader, look at it; and then glance your eye over what follows, to the confusion of R. B.

I never possessed a slave in my life, or any part of a plantation. From 1807 to 1812, at intervals, I administered to the estates of an uncle, and others; during which period, the yellow fever and tertian ague kept giving me frequent hints that there was not much pleasure to be expected from being "surrounded by slaves and attendants." In March, 1812, I bade farewell, for ever, to those estates; and have never once been on them since that time. I ascended the Demerara, with my friend Mr. Edmonstone, as far as the postholder's; where we parted, and he returned home. There I hired six Indians, and took with me a negro belonging to my uncle; and we proceeded into the heart of the wilds, in quest of the Wourali poison, Lake Parima, &c. When game failed us, which was often the case after we had got into the open country, we lived upon cassava. On the setting in of the rainy season, we all got a severe inflammatory complaint, except the negro; and I found it necessary to bleed all hands, myself, of course, the last. Some time after this, I was seized with dysentery, having lived nearly three days on mouldy cassava sprinkled with Cayenne pepper,

and the fruit of the coucouaite tree. Perceiving that life was ebbing fast, I asked the negro if he thought that I could struggle through till daylight. "Ah! massa," said he, "you go dead in four hours more." "Then," said I, "when you see me quite dead, throw my body out of the hammock, and try to get back to the settlements." At this time, our hammocks were suspended from stunted trees of miserable foliage, a foot deep in water. The rain was falling in torrents; while the painted sheet, which I usually carried with me, afforded little or no shelter: it had been rent and torn in a hurricane, about a week before, on the top of a hill.

Contrary to all expectations, nature rallied within me. Six weeks after this, through orders misunderstood, I lost my Indians; but the Portuguese, who had brought me and my negro servant up from Fort St. Joachim to the river Pirarara, succeeded in procuring me three Carib Indians, with whom we could only converse by signs. Luckily for me, my six Indians had all fallen sick, by being reduced to the necessity of eating unwholesome food: I fell in with them, at a small settlement of three huts, when I least expected ever seeing them again. They were lying disabled in their hammocks, whilst I myself was a mere skeleton, with four bad sores on my legs and body, caused by the stings of venomous insects. I was so wayworn, sick, and changed, that they scarcely knew me on my return to the house of Mr. Edmonstone; and three months elapsed before I could carry a gun. In 1820, I was eleven months in the forest, and never once tasted flesh or fish all that time, or had a shoe or stocking to my foot.

I studiously avoided mentioning this, and much more, in the *Wanderings*, lest they should savour too strongly of self. Still, it does not follow that R. B. is to be allowed to trump up with impunity a malicious account to serve his own ends. Indeed, he seems partly aware of his rashness, by remarking that he has undertaken to write upon a subject "foreign to his own views." Were there no friendly lips near, to whisper "*Ne sutor?*"

I trust I have now made it clear that my only object, in attacking works which bear the name of Audubon, was to defend my own account of the vulture, which had been in print some years before the works alluded to had made their public appearance.

Aware that I have put the patience of the reader to the test, by saying things of myself which I never intended should be told, I beg to present to them a few remarks on the habits of the jackdaw [p. 394.]. — *Charles Waterton. Walton Hall, July* 7. 1833.

On Corollas being perforated by Bees [instanced in Vol. IV. p. 93. 479., Vol. V. p. 74. 86. 753.]. — I can only observe, that I have repeatedly stood a considerable time, and called others also, to witness the fact in my own garden, more especially when the humble bee has been actively employed in piercing the bases of the blossoms of the common honeysuckle (Lonicera Caprifòlium *L.*); and although the L. sempervìrens *Ait.* grows along with them, its blossoms generally remain untouched. — *P. J. Brown. Thun, Canton of Berne, Switzerland, April* 5. 1833.

Drósera rotundifòlia does sometimes, although rarely, expand its Blossoms, as represented in the Encyclopædia of Plants, and in this Magazine in Vol. V. p. 110. 758., *and* Vol. VI. p. 178. — Drósera rotundifòlia and D. ánglica are abundant on two marshes, one about three, the other six, miles from my residence. Although I am constantly exploring these spots, I have never found the blossoms expanded at the former station, which is on the same level as ourselves, viz. 1900 English feet above the sea; but at the latter, which is, perhaps, 500 or 600 ft. higher, I have occasionally detected beautiful specimens. C. P. (Vol. V. p. 110.) should sketch the plant on the spot, as the flowers close as soon as placed in the vasculum, and I have never been able, by any treatment, to coax them to a renewed display of their loveliness: the only way to obtain specimens for the herbarium, is to be provided with a small book of blotting paper, to receive them at the moment of their being gathered. — *Id.*

In relation to the Question of the Irritability of the Glandular Hairs on the Leaves of the Droseras, as controverted in Vol. IV. p. 135., Vol. V. p. 26. 491. 755., Vol. VI. p. 177, 178. — The near relationship between Drósera and Dionæ`a had, many years since, suggested to me the probability of the glandular hairs of the former possessing irritability. Many and varied have been my attempts to detect it, but hitherto without success. — *Id.*

Swiss Habitat of Scheuchzèria palústris and Càrex heleonástes. — If I could have the pleasure of conducting your excellent correspondent Mr. Bree to these marshes, his practised eye might detect what mine have failed to notice; and I should hope to point out to him some plants, among others the rare Scheuchzèria palústris and (still rarer) Càrex heleonástes, which might afford him a momentary consolation for the loss of his "charming boggy meadow," of which he, in Vol. V. p. 200., speaks in terms which made my fingers tingle with increased anxiety to shake him by the hand. — *Id.*

Scheuchzèria palústris L., besides its Swiss habitat, is now known to exist in two British ones; namely, in "Leckby Car, a peat bog, near Thirsk, Yorkshire," as stated by J. E. L. in Vol. IV. p. 26. 27.; and "in Bomere Pool, near Shrewsbury," as discovered there by Mr. Babington, and recorded in Vol. VI. p. 368. — *J. D.*

Additional Remarks upon the Crinoideal Remains, lately discovered in Irish Limestone, and figured at p. 126. — Sir, Perhaps you may deem the subject of the present communication of sufficient importance to allow me the use of a few more pages in your Magazine for the purpose of its further elucidation. If the discovery be new, if these remains have, hitherto, been unfigured and undescribed, the subject, surely, is worthy of further investigation; and some geologist residing in the neighbourhood of Cork, whence the specimen was derived, may find it worth his attention to search the limestone of this locality closely, as, by such search, he may probably be able to render certain what now, I think, remains somewhat dubious.

Mr. Gilbertson (p. 281.) says, — "I send you a plate of Miller's Cyathocrinites tuberculàtus, to which Mr. Conway's specimen must be referred;" and Mr. Woodward (p. 281, 282.) observes, — "I think Mr. Conway may rest assured that he is not in possession of the lily encrinite. In the first place, the forms of the columns do not agree: in the former, it is smooth; in the latter are observed alternate large and small joints or vertebræ. Neither do the ossicula, or bones of the pelvis, arms, &c., agree in size or number.... On looking to Miller's interesting work on *Crinoidea*, we find, in his Cyathocrinites plànus, a greater degree of resemblance."

In order to elucidate the subject, I have endeavoured to re-construct a perfect animal (*fig.* 56.); a perilous undertaking, perhaps; from the ruinous specimen in my possession; and I have accompanied it with a figure (*fig.* 57.) of Cyathocrinites plànus, from Miller, by way of comparison; and I certainly think it is impossible, even upon the slightest glance, to confound them together.

Miller's work is now before me; and, in giving the specific character of Encrinites moniliformis, he says, "the column formed of numerous joints, alternately, as they approach the pelvis, larger and smaller. On the pelvis, formed of five pieces, adhere laterally the first series of costæ, on which the second series of costæ is placed, succeeded by the scapulæ, from which the ten tentaculated arms or fingers proceed." (Miller, p. 37.) Of the Cyathocrinites he says, — "A round or pentagonal column. On the summit adheres a saucer-

shaped pelvis, on which are placed, in successive series, five costal plates, five scapulæ, and an intervening plate. From each scapula proceeds one arm, having two hands." (Miller, p. 85.)

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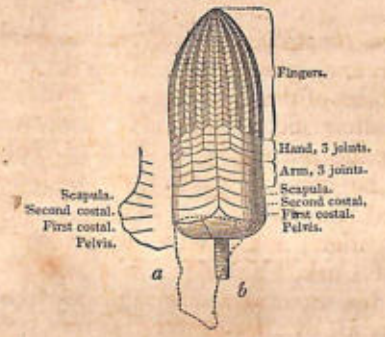

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Now for the comparison. The lily encrinite (Encrinites monilifórmis) is to be furnished with a pelvis, two series of costæ and scapulæ, and from each scapula is to proceed two arms: the Cyathocrinites is to have a pelvis, one series of costal plates and scapulæ, and from each scapula one arm alone is to proceed. Now, if the reader will have the goodness to refer to the accompanying illustrations, he will find my specimen (*fig.* 56. *b*) agree thus far, in the number of bones, with the Encrinites monilifórmis; while, on the other hand, it has one series of costal plates too many to range with Cyathocrinites. It has also two arms placed upon each scapula, like the encrinite; while the cyathocrinite has but one. Miller further informs us that, in Cyathocrinites plànus, "the scapulæ ... have a horse-shoe-like impression, on which is inserted the first arm joint, to which the cuneiform joint of the arm articulates."* (Miller, p. 87.) If the reader will refer to *fig.* 56. *b* and *fig.* 58., he will find that in this portion of my specimen there is one supernumerary bone, if we wish to make it a cyathocrinite. So much for the number of bones. Now for their forms. But, perhaps, the reader will allow me first to explain my method of reconstructing my specimen, so as to form *fig.* 56. *b* of the present illustrations. If he will have the goodness to refer to the figure at p. 126., I will endeavour to explain the process by which I proceed. The "gradually diminishing portion," which, in my former communication [p. 125—128.], I

* This does not appear to be the case with Cyathocrinites tuberculàtus: here the arm rests upon the entire surface of one scapula

referred to as attached to the pelvis, I now consider as extraneous matter, and have, therefore, rejected, merely pointing out its situation and form by a dotted line. From beneath this mass are seen to project two small angular bones, one on the extreme left, and the other in the centre; these I consider to be the exposed part of the pelvis. On the right will now be found three large bones slipped out of their places, and evidently being the first and second costal bones, and the scapula. These bones lie in a horizontal line across the figure. Attached to one side of this scapula, and in a perpendicular line through the centre of the figure, will be found three other bones, necessarily those of the arm; and upon the upper bone of this series (the cuneiform bone of the arm) is evidently placed the hand. The other portions are too imperfect to be made out; and the fingers in the illustration have, therefore, been supplied by analogy. I think I can safely appeal to the judgment of the reader as to my not having used trickery in the reconstruction of my specimen. I think I have made use of no materials but such as were evidently placed before me; and I think I have used them fairly and rationally. I have not moved them from their relative situation unnecessarily. I have neither added to, nor taken from, their number. The number of bones, and their forms, I have endeavoured to preserve most scrupulously: all that I have altered is their relative situations: and I think I have gone on by a process of regular and simple analogy, in giving them their several positions. My object is to illustrate truth, not to support theory. But I am almost forgetting myself: we are now to consider the forms of the bones. The scapula, in the encrinite, is destined to support two arms, and therefore must, of necessity, be of considerable breadth in proportion to its height. In the Encrinites moniliformis, as figured by Miller, I find this proportion to be as one to three; and it is exactly the same in my specimen. It follows, also, of necessity, that the costal bones should have a width proportionate to the scapula in the encrinite, because the scapula rests immediately and entirely upon the costal, and the second costal upon the first. In the cyathocrinite, on the contrary, this necessity does not exist; for the scapula rests, not upon a costal bone, but upon the lateral faces of two costals; and, besides, there is, in this species, an interscapular bone, so that the proportion in width between the scapulæ and the costæ is not necessary. In the Encrinites moniliformis I find the proportion between the height and the width of the costæ to be as one to five; and in my specimen it is as one to four. In the Cyathocri-

nites, on the contrary, the width and height, both of the scapulæ and costæ, will be found to be nearly equal. The relative position of the bones in the cyathocrinite and in my specimen is shown in *figs.* 58. and 59. Here, it will be observed, that in my specimen (*fig.* 58.) the base of the second costal rests entirely upon the surface of the first, and the base of the scapula covers the whole superior surface of the second costal; and this is their position in the encrinite. In the cyathocrinite, however, the scapula rests, by lateral planes, upon two costæ, as represented in *fig.* 59.

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Having thus pointed out the resemblance between my specimen and the encrinite, I am bound, in justice, to point out also in what it differs. The outline of the Encrinites moniliformis will be found in *fig.* 56. *a*, showing the difference between it and my specimen in the form of the bones. This difference arises from certain tubercular swellings or projections of each of the costal bones and scapular plates of the encrinite, which causes them to project over, and in some measure conceal, its base. There are no such projections in my specimen. Again, the encrinite differs from mine in having "several thinner joints succeeding the first arm joint." (Miller, p. 42.) Lastly, Mr. Woodward points out the form of the vertebral column as differing, in my specimen, from that of the encrinite. I much question if any great importance ought to be attached to this: it certainly is not a sufficient ground for constituting a specific difference. It will be observed that Miller speaks of the vertebral joints as alternately larger and smaller as they approach the pelvis: and for a considerable distance from the pelvis, in my specimen, the column is hid or destroyed. But if the reader will refer to Miller's work, he will find Cyathocrinites plànus figured with the joints of the vertebral column of uniform size; while the column of C. tuberculàtus is represented with the joints alternately larger and smaller: so that Miller evidently did not consider this of sufficient importance to found upon it a specific difference.

I think I have now fairly stated wherein my specimen agrees with and differs from the Encrinites moniliformis; and I think I have clearly demonstrated that it cannot possibly be referred to the genus Cyathocrinites. I think that its analogy to the Encrinites moniliformis is so close, so much

more so than to any other class of the Crinöidea, as described by Miller, that it must be ranged in that genus; and if it cannot be allowed to be that identical animal, I certainly think it must be a "species nearly resembling it" (Bakewell's *Geology*, 4th edit., xxxvi.), and one that has not been included in Miller's *Monograph*, and one which has not hitherto been figured or described.

I have made no allusion to Mr. Cumberland's figures in the *Geological Transactions:* the comparison which I have instituted between my specimen and Miller's Cyathocrinites will altogether hold good in reference to Mr. Cumberland's figures, as it respects the number and proportion of the bones. I am, Sir, yours, &c.— *C. Conway. Pontnewydd Works, July* 30. 1833.*

P. S. Since the above remarks were committed to paper, I have received Mr. Gilbertson's plate, and this renders it necessary that I should add a word or two. Is the animal represented in this plate, and also in Mr. Cumberland's figures in the *Geological Transactions*, a Cyathócrinus or not? I much doubt it. My reason for doubt is this: — Mr. Cumberland's figure (vol. v. plate 3. fig. 1.) has two arms proceeding from each scapular bone, and so has also Mr. Gilbertson's: Miller gives but one in every instance. Mr. Gilbertson's specimen, like my own, has also too many bones in the arm, and one series of costal bones too many, to range with the Cyathocrinites; and their relative situations are not the same as those given by Miller. Do not these three figures (Mr. Gilbertson's, Mr. Cumberland's, and my own), by whatever names they are to be distinguished, form a regular and uninterrupted series between the genus Encrinus and Cyathócrinus? They appear to me to pass into each other, if I may so speak, in the following order: — Encrinites moniliformis, my specimen, Mr. Gilbertson's, Mr. Cumberland's, and then Cyathócrinus. I merely suggest this for the reader's consideration. — *C. C.*

* It appears, from certain remarks made in p. 273., that a note which I appended (p. 126.) to my former communication upon this subject gave offence to some Bristolians, and more particularly to Mr. Richard Smith. I take this opportunity of saying that I had not the most distant intention of offending when I penned that note; nor can I yet perceive that there is any thing offensive in it. Why Mr. R. Smith should feel so exceedingly warm upon the subject I cannot divine, but he certainly let his zeal outrun his discretion upon the occasion; for I can assure him that, at the time he accuses me of trespassing unnecessarily upon the time of the curator, I neither knew that gentleman personally, nor even by name. To Mr. Stutchbury's [the curator's] politeness, attention, and liberality, both before and after the publication of the note, which I am sorry to find was taken offensively, I can most cordially bear testimony. — *C. Conway.*

In p. 128., at the end of Mr. Conway's first communication on this interesting subject, we remarked that "An able geologist earnestly advised us to procure a specimen of the 'limestone,'" as he was desirous to satisfy himself, by actual inspection, whether the rock in which the crinoideal remains had been found were truly limestone. To our application for specimens Mr. Conway obligingly answered by a prompt and liberal supply. Specimens have been submitted to our friend, the geologist spoken of, who has subsequently reported on them as follows.—*Cond.*

Sir, In reply to your enquiry respecting the limestone you sent me a specimen of, in which the supposed lily encrinite was found by Mr. Conway, I have no hesitation in stating that it is identical with many of the beds of nearly black mountain limestone in North Wales, Yorkshire, and Westmoreland; it contains the characteristic fossil of mountain limestone, the Prodúctus. The well-known black madrepore limestone, as it is commonly called, is represented by black chert in one of the specimens, but the embedded madrepore preserves its calcareous character. Mountain limestone is very extensively spread over the inland counties in Ireland; but in that country it chiefly occupies comparatively low ground, in what has been called *the great limestone valley of Ireland.* In England and Wales it forms mountains of great elevation and magnitude. In one of the specimens of Irish limestone there are several disjointed articulations of a stem of what, I suppose, Mr. Conway considered the lily encrinite; the articulations do not form circular discs, as in the stem of the lily encrinite, but are angular, having either five or six sides; as they are partly embedded, it is difficult to determine which: they are not stellular, like the discs of the pentacrinite. It is not easy to discover, from the drawing of Mr. Conway, in p. 126., whether the stem is rounded or angular. The muschelkalk in which the lily encrinite is found in the eastern departments of France, and in Germany, bears a much nearer relation to lias limestone, both in its mineral and zoological characters, than to mountain limestone. Its geological position is below the upper red marl and sandstone, which separates it from lias: its thickness, in some parts, is more than 600ft. The muschelkalk has not hitherto been found in Great Britain or Ireland. I have not seen any specimens of the lily encrinite in which the arms were not completely folded; but, as this could not be their common position when the animal was living, they must, in their unfolded state, have resembled, in general appearance the encrinite of which Mr. Conway has, in p. 126., given the drawing. Yours, &c.—*R. B. August*, 1833.

A Correction of the Correction in p. 381. *of the Trilobites figured in* Vol. III. p. 287., *without the identifying Letters of Reference to their Names and Sources.* —

c *b* *a*

a, Calymène variolàris, from Dudley limestone. *b*, Calymène Blumenbàchii, from Dudley.
c, A'saphus Debùchii, from Dynevor Park, South Wales.

This correction completely supersedes that mistakingly given in p. 381. Of the A'saphus Debùch*ii* a second and fine specimen is figured in Vol. II. p. 109.: it was derived from a quarry in Radnorshire. — *J. D.*

ART. II. *Queries and Answers.*

ANTS conveying in their Mouths other Ants of their own Species. (p. 287.) — During last summer, myself and a friend saw, while walking through Penge Wood, the black ant instancing the fact which H. B. has, in p. 287., described, and asks for confirmation of. Each ant had one of its fellows in its mouth, rolled up like a ball, and the carriers were moving to and fro in considerable numbers. The sight was quite new to my friend and self. — *William Fowler. June* 13. 1833.

In answer to the query of H. B. of Blois (p. 287.), respecting numbers of the great black ant [*Formica herculànea?*] seen conveying their companions in their mouths, I would state, that I have witnessed the same thing in the wood ant (*F.* rùfa), in the large woods on the banks of the Wye, where this species abounds. On one occasion, I, and some friends who were walking with me, stopped to observe a host of wood ants, all travelling in the same direction, and each with one of its own species rolled into a circle, and carried without its making any resistance. We repeatedly robbed different ants of their prey: they seemed confused from losing it; but, as soon as it was again presented to them, immediately resumed the task of carrying it onwards. I endeavoured to trace them to their nest, but failed, as they entered a thick dry stone wall which formed the boundary of the wood. I can only surmise that the ants which were carried were prisoners taken in a conflict with some neighbouring enemy. Those that were

trudging on with their loads seemed but little inconvenienced by the size of them. A few years since, I measured a piece of birch twig carried by one of this species of ant. The piece of twig was nearly 6 in. long, and as thick as a moderate-sized knitting-needle: this the ant held by its smaller end, and so bestrode that its legs were on the opposite sides of the piece of twig, the larger portion of which trailed behind the legs of the ant. In this manner the ant worked the stick up a considerable ascent: it seemed a task of much labour; but he scorned assistance, though many of his tribe offered it. — *Walter Henry Hill. Southminster Vicarage, Essex, May* 6. 1833.

Sphéx sabulòsa. — Just in the manner in which the wood ant carried its six-inch length of birchen twig does Sphéx sabulòsa, or an insect for which this name has been told me, carry a large caterpillar; that is, it slings the body of the caterpillar lengthwise under its own body, and plies its legs and feet on the opposite sides of the caterpillar. As the *S.* sabulòsa is an insect of strength, and with rather long legs, it can proceed with its prize at great speed. When the caterpillar happens to be one of the kind which is wholly green, it renders the dark-coloured Sphéx and its movements the more conspicuous: of these, a jerking of its wings, and vibrating of its graceful antennæ, both motions as if in exultation, are notable. The soil on which I have seen Sphéx sabulòsa is not very sabulose (gravelly), but is dry from elevation, and friable from tillage. *S.* sabulòsa delights to forage in the scorching sunshine of the hottest days of summer; its energies seem then excited to their full vigour. On the habits of this insect some very interesting facts are published in Gill's *Technological Repository* for October, 1828. — *J. D.*

A Query on an interesting Fact on the Pùlex arboréscens. — While I was amusing myself by examining some animalcula in my microscope, in June, 1832, I observed, among the rest, one of the *P*ùlex arboréscens having three young ones contained within its transparent shell. They were perfectly distinct, and very lively. I should be glad if any of your correspondents will inform me whether they are the young insect then unproduced, or whether the insect has the power of receiving its progeny again within its shell as a place of refuge, in the manner of the female kangaroo. — *L. E. Reed. Tiverton, March* 15. 1833.

The Colour of the Flowers of the Species of Prímula, and of some other species in the order Primulàceæ.—By what method of drying, or by what means, can it be preserved in dried specimens? — *Wm. Gardiner, jun. Dundee, April* 6. 1833.

Remarks on some Statements respecting the Inland Seas of Southern Europe. — In the second section of Férussac's *Bul-*

letin (August, 1830) are two short articles (No. 113, 114.) on some supposed changes in the level of the sea. The former (No. 113.) is an abstract from the *Edinburgh New Philosophical Journal*, for September, 1828 (p. 336.); the latter is the substance of a paper by Dr. K. C. Schmeider, in Kastner's *Archiv für die gesammte Naturlehre* (vol. xviii. p. 332.), which originally appeared in a small brochure, entitled *Etwas zur Erläuterung über physikalische Neuigkeiten*, not, however, much known. I place, as follows, some remarks from each of these papers, which I am at a loss to reconcile: —

From No. 113. *p.* 169. — "L'on sait qu'à *basse marée* la Mer Rouge est à 8m. 12′ *plus basse* que la Méditerranée, et à haute marée à 9 mèt. 9′." [It is known that the Red Sea at low tide is 8 mètres 12′ lower than the Mediterranean, and at high tide 9 mètres 9′.]

From No. 114. *p.* 170. — "La Mer Rouge est *plus haute* que la Méditerranée parce qu'elle est plus remplie d'eau par la marée d'Océan Indien." [The Red Sea is higher than the Mediterranean, because it is more filled with water by the tide of the Indian Ocean.]

From No. 113. *p.* 169.— "La *Mer Sud* paraît être 7 mètres *plus élevée* que l'Atlantique, d'après M. Humboldt." [The South Sea appears to be 7 mètres more elevated than the Atlantic Ocean, according to M. Humboldt.]

From No. 114. *p.* 170. — *Le Golfe du Mexique* est à 20 pieds *plus haute* que la Mer du Sud, parce que les vents alisés chassent l'eau dans le golfe," &c. [The Gulf of Mexico is 20 ft. higher than the South Sea, because the trade winds drive the water into the gulf, &c.]

As a parallel passage, I add this, from Mr. Lyell's *Principles of Geology* (vol. i. p. 293. 1st edition):—"It is supposed that the Red Sea maintains a *constant* elevation of 4 or 5 fathoms *above* the Mediterranean, at all *times of the tide*." At any rate, one of the statements in the *Bulletin* must be incorrect; and which that is, the editor has not stated.

There is another observation in No. 114. which I do not understand. Dr. Schmeider, speaking of the Mediterranean, says:—*L'évaporation continuelle* et l'état isolé de cette mer en ont rendu ses eaux *moins salées*." (p. 170.) [The continual evaporation and the isolated condition of that sea have rendered its waters less salt.] Dr. Marcet (*Philosophical Transactions*, 1819) says, "The Mediterranean contains rather larger proportions of salt than the ocean;" and Mr. De la Beche (*Manual*, 2d edition, p. 5.), after quoting Dr. Marcet, adds, "The superior saltness of the Mediterranean, though an inland sea, is attributed to the *evaporation of its surface*, which is

supposed greater than the quantity of fresh water with which it is supplied."

The above article (No. 113.) states, "La Mer Caspienne est à 325 pieds au-dessous de la Mer Noire." [The Caspian Sea is about 325 ft. lower than the Black Sea.] No. 114. adds, "Engelhardt a tort de prétendre qu'elle a *baissé de* 200 *pieds*, et perdu ainsi 30,000 milles carrés de surface." [Engelhardt is wrong in saying that it has sunk 200 ft., and thus lost 30,000 square miles of surface.]

Professor Lyell (vol. i. p. 320.) says, "The level of the Caspian is lower than the Black Sea by *more than fifty feet*." Again: "The Caspian is *one hundred and fifty feet* below the level of the Sea of Azof" (vol. ii. p. 163.); and, "the lowest parts surrounding the Caspian Sea are *three hundred feet* below the level of the Euxine." (vol. iii. p. 271.)

The Hon. Mr. Strangways (*Geological Transactions*, vol. i. p. 39. 2d series) states the difference to be 54·2 *toises*.

Again: Mr. Lyell says, "The Mediterranean occupies only 79,800 square leagues." No. 114., that "La Mer Méditerranée a 900 milles de long, et occupe 400,000 milles carrés." [The Mediterranean Sea is 900 miles long, and occupies 400,000 square miles.]

No. 114. adds: — "La mer Caspienne a 145 milles de long, et 45 de large: donc sa surface est de 6000 milles carrés. . . sa profondeur est 300 pieds." [The Caspian Sea is 145 miles long, and 45 broad: therefore its surface is 6000 square miles: . . . its depth is 300 ft.]

Now, Malte-Brun (Brussels edition, vol. ii. p. 129.) says, "Elle a une longueur de 275 lieues, et une largeur de 41 lieues à l'endroit le plus étroit; mais de 100 lieues à l'endroit le plus large. . . . La *profondeur* de cette mer est peu considérable, excepté l'extremité méridionale, où une sonde de 380 toises n'a pas atteint le fond." [It has a length of 275 leagues, and a breadth of 41 leagues at the narrowest part, but of 100 leagues at the broadest. . . . The depth of this sea is but inconsiderable, except at the southern extremity, where a line of 380 toises did not reach the bottom.] Mr. Hanway found no bottom near the shore with a line of 450 fathoms. (*Pole-hampton*, iii. 231.)

Farther on, Malte-Brun (vol. iii. p. 343.) gives to the Mediterranean 131,980 square leagues of surface, at 25 to a degree, and to the Caspian 18,600; while, including the Sea of Azof with the Black Sea, he assigns to them 23,750 square leagues. He says also (vol. i. p. 357.) that the Red Sea is *higher* than the Mediterranean, and that the Black Sea is *higher* than the ocean.

Having brought together these variable statements, I must leave them to be reconciled by some one who has more leisure than myself. The foreign measures named (in No. 114.) are the *German mile*, which is equal to 4 and a fraction English miles; the *league* of the value of 25 to a degree; the *toise* = 6·395 English feet; and the *mètre* = 39·371 English inches.

It may be that the action of volcanoes and earthquakes, not uncommon in the Caspian and its vicinity, occasionally and partially alters, from time to time, the depth, extent, and level of that and the adjoining seas (see Lyell's *Geology*, vol. i. p. 320. &c.; and Dr. Daubeny, *On Volcanoes*, p. 300.); but the above statements require some other correction. — *W. B. Clarke. Parkstone, May* 23. 1833.

An Ore which acquires a white Incrustation. — I have in my cabinet a specimen of iron which exhibits a phenomenon, with the cause and nature of which I am quite unacquainted. I have no doubt that it is iron; since, when to a solution of the ore I had applied a solution of prussiate of potash, the liquid was instantaneously coloured blue. Specimens of this ore, when kept for some time undisturbed, on being opened out were covered with a white incrustation, having the appearance of minute crystals. Can any of your readers account for this circumstance? — *J. E. L. Richmond, Yorkshire, August* 4. 1832.

It is impossible to say, from the above description, what ore of iron is alluded to; nor is the phrase "opening out" properly explained. Most likely "the specimen" is a mass of radiated or of hepatic pyrites (sulphuret of iron), very common, in the radiated form, in some beds of the chalk formation, as at Cherryhinton, near Cambridge, Godstone, Surrey, &c. When exposed to the air, the oxygen unites with the sulphur; and a white silky efflorescence, or "minute crystals," result from the decomposition. A coating of varnish will preserve the specimens, and prevent "the disease," as it has been called, spreading to other minerals in the cabinet; a precaution sometimes not altogether unnecessary. In the London clay, on the Suffolk coast, there are immense quantities of pyritous wood; from the decomposition of which, at Walton in Essex, great quantities of copperas used to be manufactured. In the gault at the brick kilns, near the Ely entrance to Cambridge, I have seen the pyritous balls, which abound there, partially decomposed; presenting, in the same mass, crystals of selenite, which have resulted, as in the Oxford clay at Shotover Hill, from the pyrites. — *W. B. C. Parkstone, May* 31. 1833.

THE MAGAZINE

OF

NATURAL HISTORY.

NOVEMBER, 1833.

ORIGINAL COMMUNICATIONS.

ART. I. *Observations on the Nomenclature of Divisions in Systematical Arrangements of the Subjects of Natural History, more particularly in reference to "Some Remarks on Genera and Subgenera, and on the Principles on which they should be established; by the Rev. Leonard Jenyns, A.M. F.L.S.;" published in* p. 385—390. By EDWARD NEWMAN, Esq. F.L.S. &c.

Sir,

IN submitting a few remarks on the establishment of divisions in natural history, I beg to disclaim all idea of disputing with Mr. Jenyns the views he has so ably set forth. My sole object in writing, at a moment when his luminous paper is fresh in the minds of your readers, is, that I may entwine a few light thoughts of my own around his more solid and valuable ones, as the humble and dependent vine clings for support to the limbs of the giant oak.

Among the excellent observations which are presented in the commencement of the learned gentleman's essay, the following appears to me to be particularly valuable:—"All groups bearing the same title should be groups of the same value." I could wish Mr. Jenyns had gone still farther, and had shown how very remote this is from being the case at present, in any of our arrangements. If we dip, in ever so cursory a manner, into the orders Fèræ *, *Accipitres*, and Coleóptera, as established by Linnæus, we shall find that each of the first two contains closely allied animals, which possess a habit and character common to them all; while the

* Since differently named: *Carnassiers* of Cuvier. The contents of the groups are but little altered.

last contains about fifty groups, each equal to the whole of either of the others. We find in it the terrestrial, the aquatic, and the amphibious; the carnivorous, the granivorous, and the graminivorous; the gregarious and the solitary; the slothful and the active: we find, in fact, in this one order of insects, every variety of form and character discoverable in all the orders of the class Mammàlia, let the systematist multiply these as he will.

The principal object of Mr. Jenyns's remarks seems to be, to depreciate the present mode of subdividing groups; a mode by which it frequently happens that two groups, for instance, two genera, standing in a catalogue side by side, are evidently of very different value, because the characters by which the more valuable group is defined are generally equally applicable to the less valuable *: as an example, Mr. Jenyns gives Emberìza and Plectróphanes †; the latter genus being much more confined than the former, and clearly of subordinate value. "Plectróphanes," I quote Mr. Jenyns, "agrees with Emberìza in its most essential characters, but, at the same time, offers one or two peculiarities, by which it is distinguished from the more typical species of that genus." It has a long hind claw, and is, in running, flying, and the form of its wings, essentially a lark: it can, therefore, scarcely be retained in the same genus with the common bunting, the reed bunting, and the yellow-hammer. The next instances are *T*étrao, from which *L*agòpus has been separated; and *P*érdix, from which *C*otúrnix has been taken. *L*agòpus and *C*otúrnix possess the characters of the original groups, but differ in having, in addition, one or two characters which the other species have not. "How, then," says Mr. Jenyns, "with any show of regard to the true principles of classification, can we consider them," namely, *L*agòpus, *T*étrao, *C*otúrnix, and *P*érdix, "as so many distinct genera in the family of *T*etraónidæ?" How, indeed! and, to avoid so incorrect an appreciation, the learned writer would, if I understand him correctly, consider *T*étrao and *P*érdix as genera, and *L*agòpus and *C*otúrnix subgenera of each respectively. Here you observe, Sir, a deviation from harmony is pointed out, and a plan proposed by which to restore that harmony. Let us examine how far this has been done; how far the difficulty has been conquered. If *P*érdix is a good and natural genus, and contains twenty species, and one of these species is a good and natural subgenus, and may be with propriety

* I do not mean to assert that Mr. Jenyns gives this precise reason, but the *fact* is as I have stated.

† Emberìza nivàlis *L.*, the snow bunting.

divided from it, what becomes of the nineteen remaining species? If you divide a genus into two parts, what can those parts be but subgenera. It matters not that one part contains nineteen species, and the other part one only: the genus is divided, the divisions cannot be genera; and by whatever name we may please to designate those divisions, the original objection as to their unequal value, at least so it seems to me, remains of as much force as ever. Let us now enquire how those minor genera originate. Some one, in describing a genus of twenty species, is struck by some very decided character in one bird, and instantly seizes on this character, and makes his bird a genus, even though he leave nineteen species in the old genus, and have only one in the new. The question now becomes, What should he have done? and here Mr. Jenyns can help us. He remarks of Emberìza, *Tétrao*, *Pérdix*, *Árdea*, &c., — "each includes several smaller and more subordinate groups." Why, then, I would ask, hesitate about dividing them? Why object to Plectróphanes, *Lagòpus*, *Cotúrnix*, and *Nyctícorax* being rendered genera, when several other such genera might be instituted? In short, instead of singling one bird out of twenty for the type of a new genus founded on a particular character, should not the describer rather revise the whole group, consult all the characters, and ascertain whether it is not divisible into half a dozen genera, each having as good sound characters as the single bird whose peculiarity, from its prominence, had struck him so forcibly? What, then, becomes of the Linnæan genus? I would reply, it becomes a family, and these its divisions are true genera.

On the subject of subgenera, I must add my own opinion, of however little weight it may be, to the list of those already expressed, in decided opposition to the adoption of them. They are objectionable, on the ground that the generic name must be retained; and thus the memory is burthened with three names, instead of two, for every species: for, I believe, it is admitted that the generic name must be employed both in speaking and writing. I know of no instance in which it has been dispensed with. How needlessly cumbrous it would be to say, Emberìza Plectróphanes nivàlis! For common comfort, one of these must be dismissed: if the first, Plectróphanes becomes a genus; if the second, it ceases to be a division. As to the use of letters or signs, I would enquire, how we are to apply them in conversation, or even in writing? Are we to place them between the genus and species, thus, Emberìza † nivàlis? In the present state of the science, there are three courses open to us: first, to write Emberìza

Plectróphanes nivàlis; secondly, Emberìza † nivàlis; and, thirdly, Plectróphanes nivàlis. In the latter instance, which I conceive to be infinitely the best, Emberìza becomes a family. *P*érdix and *T*étrao appear equally entitled to the same rank.

Touching all divisions, whether such really exist in nature, or whether they are exclusively of our own inventing for purposes of convenience, those now in use appear partly referable to nature, partly to human invention. As instances, in Mammàlia the union of cetaceous fishes with the genuine tetrapods [quadrupeds], though borne out by a few decided anatomical concords, has always appeared to me exceedingly unnatural; for what, in those, has become of the hinder extremities, so constant in the terrene Mammàlia? Again, the union of the marsupial animals, also, on a single anatomical concord, appears excessively artificial. The class Birds appears natural; but the division Scansòres, as resting on a single character, appears artificial. All this requires a master's hand to remodel; it is a subject well worthy of Mr. Jenyns's close attention.

We find a number of birds alike in external appearance, and alike in habit: that is, they eat the same food; they fly and run in the same manner; they build their nests in the same places, and of the same materials; they lay eggs of the same shape and colour; they seek each other in love; they reproduce their like, and their offspring again reproduce their like; indeed, the same round of reproduction goes on unaltered for ages, probably since the first creation of the kind. Such a group is, properly speaking, a species; and is, I believe, universally admitted as such. When we find two, three, four, or more of such species closely resembling each other in the conformation of their characteristic and variable parts, also in food, mode of running, flying, and nearly in size (this last is of considerable importance), yet differing in some slighter characters, as the disposition of colour, the song, &c., then a group formed of these species is a genus: as examples, *F*ringílla cœ`lebs and Montifringílla; *F*ringílla doméstica and montàna. The willow wrens, and many other little groups, are natural and decided divisions; and if genus be, as I should think it ought to be, the next division after species, then these are genera. *F*ringílla, *M*otacílla, Emberiza, *T*étrao, *P*érdix, *A*rdea, &c., are higher divisions, because they each include six or eight such groups: these, then, are families. A group of such families is an order, as Grállæ, *G*allìnæ, &c.; and a group of such orders a class, as *A*ves.

Allow me, Sir, in conclusion, to express a hope that our

instructors in this and every other branch of natural history will, in the exposition of their views, use as much simplicity and clearness as they possibly can. The object of their labours is to reveal science to our delighted eyes, not to hide her from us by drawing a veil of mystery over her face. Mr. Jenyns's style is clear, open, and manly in the general; but he has here and there fallen into the error of using expressions not generally understood, as "true philosophical principles," "neglect of these principles," and many other well-sounding passages, conveying no meaning. I know, from my own feelings, that philosophical, clear, sound, correct, natural principles or views mean one's own views, or views that coincide with one's own; while, by unphilosophical, indistinct, unsound, incorrect, artificial principles, we simply mean the opinions of others when in opposition to our own. The scientific readers of papers of this kind set the right value on these expressions; but the beginner meditates thus: "True philosophical principles! ah, I must enquire what this means. What a deal I have to learn!" Had Mr. Jenyns written thus: — "genera constructed on *my own* plans, which are these," &c., the student would have been led on by the hand to knowledge as a plain affair; but "philosophical principles," like a Gorgon's head, are petrifying. The application of these observations is intended to be by no means confined to the excellent communication on which I have ventured thus to comment. The learned writer, in the present instance, appears to have fallen, through inattention, into the unmeaning common-places alluded to, rather than advanced them as conveying definite ideas.

The errors in this communication are manifold. While writing it, I have been engaged in an occupation, to which natural history is the very antipodes; and he who does two things at once, does neither well: let this be my excuse.

I am, Sir, yours, &c.

Deptford, September, 1833. EDWARD NEWMAN.

ART. II. *Considerations pertaining to Classification, in relation to the Essay* (p. 385—390.) *of the Rev. L. Jenyns on this Subject.* By EDWARD BLYTH, Esq.

Sir,

YOUR excellent contributor Mr. Jenyns, in his endeavour (p. 385—390.) to elucidate his views on systematic arrange-

ment, has not, it appears to me, selected an apposite example of that subordinancy of groups for which he contends, in adducing, in p. 387., Plectróphanes *Meyer* as so decidedly subordinate to Emberìza *L.* It is in the museum only that these two groups so strikingly assimilate; the living Plectróphanes resembles much more closely the lark genus, *Alaúda*. Indeed, with the exception of the beak, which is certainly of the true and peculiar bunting form, there is really no resemblance whatever between Plectróphanes and Emberìza. It would, however, be almost superfluous to add a single word to the admirable remarks, on this subject, of that excellent ornithologist Mr. Selby; and it is perfectly indispensable that they be read in connection with this question. Mr. Selby has founded his remarks on the affinities of the genus Plectróphanes upon the two then known species; but, since he wrote, the P. pícta *Swainson*, from the banks of the Saskatchewan, has been added; and the *Fringílla* grámmica *Say* has, by Sir William Jardine, been also placed, but with a mark of doubt, in this genus.

Mr. Selby, in addition to his contradistinction of the technical characteristics of the birds of the genera in question, contrasts also their "habits and manners;" and, on the latter subject, we may gain some farther information from C. L. Bonaparte, who, in his description of the Plectróphanes lappónica, has remarked that they "live in large flocks; and are of so social a disposition, that, when separated from their own species, or when in small parties, they always join company with the common lark of Europe; or, in America, with some of the different snow birds;" and that "the Lapland longspur, like the larks, never sings but suspended aloft in the air, at which time it utters a few agreeable and melodious notes." The latter author, however, makes one observation that will serve to qualify Mr. Selby's remark that they "never perch." "Contrary to what is generally supposed," says C. L. Bonaparte, "they are observed to alight on trees as well as on the ground, notwithstanding their long and straight hind nail." It is here worthy of being noticed, that not one of the many authors who have described these birds mentions a single point of resemblance between them and the Emberìza, except in the one instance of the form of the bill; which latter, however, would seem to intimate a resemblance in the nature of their food. The general habits, the song, the mode of progression of the longspurs, all are totally at variance with those of the buntings; and are all as strikingly in accordance with those of the larks. It would therefore, perhaps, be more proper to say that Plectróphanes agrees

with *Alaúda* (rather than with Emberìza) in its most essential characters; but, at the same time, offers one or two peculiarities, by which it is distinguished from the more typical species of that genus. (See p. 387.) Surely, the single circumstance of a resemblance in the make of the bill ought not to outweigh every other consideration, or we should have confusion, indeed, in the arrangement of the smaller soft-billed birds: *Anthus*, in that case, might be considered a subgenus of *Sylvia*.

The principle of small divisions seems now to be almost universally adopted in every department of natural history: there is merely a difference of opinion as to the names by which these divisions are to be distinguished. I cannot but think that every distinct and natural group, however small, that is easily distinguishable from every other by marked characters and habits, should be further distinguished and known as such by a particular name; and that it would be more simple and convenient to consider every group that is thus named as a distinct genus. A regular and natural gradation of divisions, or groups, of greater and greater value, might very easily be established. The several orders might each be divided into large general divisions, distinguished by the terminating syllable *dæ*: thus, for example, the order *Accipitres* might be arranged into three of these general divisions; Falcónidæ, comprising the mass of diurnal birds of prey; *Strígidæ*, containing the owls; and *Vultùridæ*, the vultures. These, again, might be divided into smaller groups, distinguished by the termination *næ*. Of these, the first major group, Falcónidæ, would contain several: such as the *Aquilinæ*, or eagles; the Falconìnæ, or falcons; the *Asturìnæ*, or hawks; the *Milvìnæ*, or kites, &c.; each of these containing several genera. In the same manner, the major group or family *Tetraónidæ* (cited, in p. 387., by Mr. Jenyns) might comprise, among other minor groups, the sub-families *Tetraònæ*, containing the genera *Lagòpus*, *Tétrao*, Bonàsia, &c.; and *Perdiciànæ*, comprising the several genera of francolins, partridges, and quails. It would be useless to multiply examples; so simple a method of arrangement cannot require much explanation: and I have very little doubt that this is the system of classification which will eventually prevail. A vast deal of additional information, however, on the habits and mode of life of various exotic groups is necessary before this system can be carried fully into effect. As yet, the primary grand divisions, or orders, in ornithology are by no means finally established.

Tooting, Surrey, Sept. 23. 1833. E. Blyth.

A BOTANICAL correspondent long since sent us an essay on the convenience and advantage which would result from rendering the names of the natural orders uniform in their termination, and those of the divisions of the orders uniform among themselves too, although distinct in termination from the names of the orders. He proposed that the orders should end in *aceæ*, and the divisions of them in *ineæ*, and that as much as possible of the generic term which might be selected as the root of the name chosen to represent either the order, or the division of it, should be retained to precede and coalesce with the above terminations. Our correspondent has argued, that by this mode one would know, at sight or sound, not only whether an order, or a division of one, were spoken of, but also the genus which was typical of the order, or the division of it, mentioned. The essay states, that the names of the orders "terminate indifferently in *les*, *des*, *aneæ*, *ineæ*, *omeæ*, *eleæ*, *uleæ*, *oreæ*, *ideæ*, *theæ*, *chieæ*, *cheæ*, *reæ*, *oneæ*, *rieæ*, *inæ*, &c., besides *aceæ* which is here maintained to be the proper termination: and this incongruity of nomenclature is preserved without any reason or apparent necessity. The names of the suborders are liable to the same objection of nonconformity with each other: for example, *eæ*, *ieæ*, *ideæ*, *ineæ*, *inæ*, &c., besides *aceæ* the legitimate property of the primary orders, are their adopted terminations; thus rendering it impracticable for those persons who have not a great stock of hard terms at command, to know, when they hear or see any of these names, whether it be the name of an order or of a subdivision." As the essayist has not affixed his name to his essay, we cannot quote it in conjunction with these his remarks. Dr. Lindley, in his just published *Nixus Plantarum*, noticed in p. 505. of the present Number, has designated all his groups of orders by terms which correspond in ending uniformly in *ales*. — *J. D.*

ART. III. *Remarks on the Spring of* 1833.
By the Rev. W. T. BREE, M.A.

Sir,

WE have had again, this year, another very late spring, after an unusually mild and open winter. This occurrence, having taken place now two years in succession, makes me almost begin to doubt whether (contrary, certainly, to what *à priori* we should be led to expect) a backward spring is not to be looked for as the usual consequence of a mild winter.

I have said that the spring of 1833 was a very late one;

and facts fully bear out the assertion: May-day presented fewer signs of returning summer than I scarcely ever witnessed at that period of the year. Not a leaf was to be seen upon the trees, the very buds were scarcely bursting; even the horsechestnut was bare, its fat luxuriant buds not being in a more advanced state of vegetation than I have sometimes known them at the end of March. No swifts had yet appeared with us; no azure blue nor orange-tip butterfly. Copious warm rains fell on the 1st of May and a few following days, and were succeeded by the most delightful summer weather; which, of course, brought forward vegetation with extraordinary rapidity. Trees, which, at the beginning of May, were (as I have said) bare and destitute of leaves, had, by the middle of the month, not only acquired their broad and perfect foliage, but that foliage had likewise assumed its full dark summer tints. *Rh*ododéndron pónticum was in full beauty by the 17th; lilacs and laburnums, some time before. By the 21st, I had no less than four or five species of single British roses in bloom in the garden; the late-leafing trees and shrubs, the ash, walnut, mulberry, acacia (Robín*ia* Pseùd-*A*càcia *L.*), and althæa frutex (*H*ibíscus syrìacus *L.*), were also in verdure. On the 29th, I observed a field of grass cut for hay at Bedworth, six miles from Coventry: an unusually early instance of haymaking in this part of the country. The cockchafers (which were not numerous this season) had nearly disappeared by the end of May; and, early in June, the rhododendrons were entirely faded and gone by. May, in short, this year, seemed almost to have usurped the place, and assumed the character, of June; realising, to the full, all that the poets feign of the "merry" month. I am not quite sure, indeed, that the cuckoo did not miscalculate the season, and mistake the one month for the other; for it was observed, in this neighbourhood at least, that he had become slack in his singing, and was but little heard during the hot weather in the latter part of May, though later in the season, before he became entirely silent, he resumed his song again with considerable vigour. On the whole, the spring of the present year may be regarded as at once both a late and an early one. Judging by the appearances of nature in the beginning of May, we should pronounce the spring to be a very backward one; judging by a like criterion in the middle and end of the month, a very forward one. The following calendar, extending only through the three months of April, May, and June, may, perhaps, furnish some additional facts in illustration of the above remarks.

April 2. Willow wren (Sylvia *Tróchilus*?) sang.—3. Blackcap sang. — 6. *Cáltha palústris* flowered; and lesser pettychaps (Sylvia hippolàis? [now the S. lòquax of Herbert, it would seem: see p. 521.]) sang. —7. Plum tree flowered. — 16. Young rooks heard in their nests. — 17. Cherry tree flowered. — 19. Pear tree flowered. — 21. Redstart sang*; and many wasps appeared.† — 22. Vanéss*a* I*o*, Póntia nàpi, *Mel*ítta fúlva, and swallows (*Hi*rúndo rústica) appeared; fieldfares last seen.‡ — 23. Wild cowslip flowered; martins (*H.* úrbica) appeared. — 24. Wryneck and nightingale sang; common snake appeared; blackthorn flowered. — 28. Cuckoo sang.§ — 29. *Scílla nùtans* flowered. — 30. *Cardámine* praténsis flowered.

May 4. Hippárchi*a* Ægèri*a*, Póntia ràpæ and brássicæ, and least dragon fly appeared; Stellària *Holóstea* flowered. — 5. Polyómmatus Argìolus, Póntia cardámines, and Panórpa commùnis appeared. — 6. *Verónica Cham*æ`drys flowered. — 7. Apple tree flowered. — 9. Swifts appeared.‖ — 11. Horsechestnut flowered. — 12. Libéllula quadrimaculàta appeared. — 13. Libéllula depréssa and puélla appeared; Convallària majàlis (wild) flowered. — 15. Cockchafers appeared. — 16. Hawthorn flowered; Hippárchi*a* Megæ`r*a* appeared. — 18. Vanéss*a* Atalánt*a* and *E*phémera (grey May-fly) appeared. — 21. Melitæ`*a* Euphrósyn*e* appeared.¶ — 22. *Sc*arabæ`us auràtus appeared. — 23. Libéllula æ`nea appeared.

* The redstart had been seen and heard by another observer, in this neighbourhood, on the 7th of April.

† It is generally supposed that each wasp that is seen in the spring becomes the founder of a nest, the progeny of which comes forth in the summer and autumn. How is this notion to be reconciled with the fact, that, although these insects appeared this spring in far greater abundance than usual for that early period, we have yet had next to none during the summer? I have not, I think, observed a single wasp this year among the ripe gooseberries, which, in general, are so much infested by them. Up to the present day (August 15.), I have only seen one wasp's nest in the parish or neighbourhood. An abundant flight of spring wasps, therefore, is no sure earnest of a corresponding summer flight. We have yet much to learn concerning the natural history of these insects.

P.S. *Oct.* 19. It is proper to state, that, later in the season, viz. in September, wasps became more plentiful; though it was by no means an abundant year for them.

‡ The fieldfares this season failed to resort to my ivy trees, which they commonly make their favourite haunts in the spring. [See Vol. V. p. 593.]

§ The cuckoo was heard by others some days previously.

‖ Notwithstanding the weather of the first week in May was so genial and propitious, the swifts, it seems, did not take advantage of it, but were late in their arrival. We had an unusually scanty supply of them about this village and immediate neighbourhood, and they seem to have taken their departure early. I could only see two here on the 1st of August, and have not observed one since that day: a pair were observed by others, near the village, some days later.

¶ This species had evidently been out on the wing some time before.

— 24. *Scarabæ`us* hortícola appeared. — 25. *Ephémera* vulgàta appeared; elder tree flowered. — 29. *Vi*búrnum *O*'pulus and *Ro*̀sa canìna (wild) flowered. — 30. *Vi*cia sylvática (garden) flowered. — 31. *My*osòtis palústris (wild), Digitàlis purpùrea (wild), and *Ro*̀sa spinosíssima (wild) flowered; Chrỳsis ignita appeared.

June 1. Hippárchi*a* Janìr*a** and Hepìalus hùmuli appeared; *Ro*̀sa Don*iána* (wild) flowered. — 4. Acacia (Robín*ia* Pseùd-*A*càcia) flowered. — 5. *O*'rchis maculàta and bifòlia flowered. — 8. Wheat in ear; I`no státices appeared. — 9. *Ro*̀sa arvénsis (wild) flowered; Pygæ`ra bucéphala appeared. — 10. *P*halæ`na (*Pý*ralis) urticata appeared. — 14. Glowworm shone. — 19. Pónti*a* cardámines last seen. — 24. Cuckoo last heard. — 28. *P*halæ`na chærophyllàta appeared.

I am, Sir, yours, &c.

Allesley Rectory, Aug. 15. 1833. W. T. Bree.

Art. IV. *Notice of the Habits of a Cynipideous Insect, parasitic upon the Rose Louse (A'phis ròsæ); with Descriptions of several other parasitic Hymenóptera.* By J. O. Westwood, Esq. F.L.S. &c.

Sir,

The family Cynípidæ, corresponding with the Linnæan genus Cỳnips, is remarkable for the singular powers which the insects composing it possess of distorting various vegetable substances, by raising tubercles and warts, of various sizes and forms; or, as they are termed, galls. These are the result of wounds made by the female fly in depositing her eggs in the plant; the internal substance of these protuberances being destined for the support of the future grubs. These galls, which are often of a surprising size when compared with that of the minute creatures which produce them, have attracted the attention of naturalists of every age, as well as of the merest observer of nature from early childhood. Indeed, it is (or, at least, was, in that part of the country where I received the early part of my education) one of the venturesome feats of our schoolboy days, to mount to the topmost branches of the oak, for the purpose of getting oak galls (or, as we termed them, oak apples) to stick in our caps on that joyous half-holiday,

> "The twenty-ninth of May,
> Royal-oak Day."

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* The earliest appearance of this insect that ever came to my knowledge: for the most part, it is seldom seen before the middle or end of June: once only I have noticed it so early as the 7th, and once on the 9th.

How these galls are formed is a question not yet solved; although some ingenious, and some, even among the latest, very untenable theories have been proposed for its solution. Into this question, however, I do not here propose to enter.

In the modern systems of insects, we find this family, notwithstanding its habits of feeding, in the larva state, upon the vegetable matter contained in galls, introduced into a series of families, all of which are parasitic upon other insects in the larva state. This, at first sight, and with the knowledge only of facts hitherto recorded, appears very unwarrantable, in respect to the natural relations of these groups; and yet, when we examine the general structure of the gall flies (and more particularly the neuration [nerving] of the wings, articulation of the antennæ, and peduncled abdomen), it is very evident that, notwithstanding their diversity in habits, the gall flies are more nearly allied to these parasitic families than to any other hymenopterous insects: whilst the facts subsequently detailed establish the correctness of these views, and open an interesting field of enquiry into the natural relations of affinity and analogy of the aberrant hymenopterous groups; into which, as being too dry for more general readers, I also refrain from entering.

In the autumn of 1832, Mr. Stephens (*Entomologiæ Britannicæ cultorum magister*) mentioned to me, that having, during the preceding summer, placed a quantity of aphides, which appeared to be ichneumoned (to coin the term), in a pill-box, he found, on examining it some months afterwards, a quantity of small dead gall flies; the interior of the bodies of the aphides having been entirely consumed.

Being anxious to obtain farther particulars relative to so interesting a point of natural history, I carefully examined the rose lice for some time, in the early part of last summer (1833); and, on the 20th of June, I was rewarded by observing a small cynipideous insect, similar to Mr. Stephens's, in the act of depositing an egg in the body of an aphis, considerably larger than itself. So intently was it occupied, that I was enabled to cut off the sprig, to carry it into my study, and to examine the insect, when there, with a lens of a quarter of an inch focus. On its withdrawing its ovipositor from the body of the aphis, upon which it was at the time engaged in depositing an egg, it had not far to travel to find another nidus for the reception of another of the germs of its future progeny, since it took its station on the back of the aphis next to the one from which it had just dismounted. I observed that it invariably placed itself with its head looking towards the head of the aphis, even if it ascended in the contrary direction. When once mounted, it kept its station as firmly as the

most expert jockey could do, even upon the Tailor of Brentford's horse; since the unfortunate aphis, like that irritated animal, immediately commenced kicking and rearing, at least upon its *fore* legs; jerking the extremity of its body about in all directions, and attempting to dislodge its enemy with its antennæ and legs, but in vain: the little creature carefully avoiding the blows of these limbs, and throwing its own antennæ over its back close upon its wings. At length, as though resigned to its fate, the unfortunate aphis ceased the struggle; and the victorious parasite, like the victorious god of old,

> "Hunc Deus arcitenens, et nunquam talibus armis
> Ante, nisi in damis, *capreis*que fugacibus usus;
> Mille gravem telis, exhaustâ pene pharetrâ,
> Perdidit effuso per vulnera nigra veneno." *

The ovipositor was introduced into the back of the aphis in a perpendicular direction, until the body of the Cỳnips touched that of the aphis; in which position it was retained about the space of a minute, and was then withdrawn. It then proceeded to another rose louse, pricking it in the like manner; and so on, until it had deposited all its eggs. I observed at least twenty or thirty aphides thus attacked whilst under my examination. A few aphides, however, seemed not to regard the parasite, nor to feel the wound; and I observed, that, although in general it only pricked an aphis once, in one instance the operation was repeated four or five times on different parts of the body of the same aphis. Previously to mounting upon an aphis, it applied the terminal joints of the antennæ to some part of the body of the latter, as the legs, antennæ, or generally the hinder part of the abdomen; thereby appearing to gain information whether it had been previously punctured or not.

The aphides seem aware of the presence of their enemy, since, although undisturbed by the motions of their neighbours, no sooner is one of them touched by the antennæ of the parasite, than it sets off kicking and creeping out of the way as fast as it can; the parasite often following, overtaking, and mounting upon it. When this is the case with the larger winged individuals, the Cỳnips, after a long and successful chase, is compelled to dismount; being unable, from the upright position of the wings, to reach the back of the insect with its ovipositor. I afterwards observed several of

* That is, at least entomologically, "the sting-bearing fly, belonging to a group hitherto supposed to be employed only in pricking oaks and *willows*" (the old poet was, doubtless, a botanist, and alluded to the *Sàlix càprea* of later writers), "transfixed, with its ovipositor, the body of the vanquished aphis; causing it, in the end, to die by the deadly matter introduced into the wound."

the female parasites similarly employed; but have not yet traced the developement of the insects to the perfect state.

As it cannot be doubted that diversity of habits necessarily implies diversity of structure (the reverse of the proposition being equally tenable), I carefully examined this fly, which proves to be a nondescript; and, independent of the necessary variation in internal organisation, its antennæ, wings, &c., differ from those of the type of the genus Cỳnips: and hence, in conjunction with its habits, I form it into a distinct genus or subgenus, under the name of

ALLO'TRIA * *Westw.* Thorax ovatus; scutello elevato, basi transversè depresso; abdomen thorace minus, late ovatum; antennæ ♀ corpore longiores, filiformes, 13-articulatæ; alæ magnæ, cellula costali 1, basali

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* *Allotria*, estranged; from its habits being at variance with those of the rest of the family. The following sketch of the family Cynípidæ may not be deemed useless: —

Abdomen cultriforme.	Antennæ ♂ 15- ♀ 13-articulatæ				IBA'LIA	1.
Abdomen plus minusve obovatum. Antennæ	♀ 14- ♂ 15-articulatæ. Alæ	magnæ, areola submarginali parva trigona distincta			CY'NIPS	2.
		obsoletæ			N. G. *Stephi*	3.
	♀ 13- ♂ 14- 15-articulatæ.	triangularis, at nervo, versus alæ basin extenso, fere obliterato			FIGI'TES	4.
	Areola 2da submarginalis	omnino obliterata. Antennæ ♀	breves apice crassiores	sensim incrassatæ	EUCOI'LA	5.
				artic. 3 ult. maximis	KLEIDO'TOMA	6.
			longæ filiformes.	pedunculatum	ANA'CHARIS	7.
			Abdomen	subsessile	ALLO'TRIA	8.

1. Ibàlia (*Latr.*) Ságaris *Pz.*; 1 species, *B*ánchus cultellàtor *Fab.* — 2. Cỳnips *Lin.*; between thirty and forty British species. Cỳnips quércus fòlii *Lin.*, &c. The nerves enclosing the small submarginal cell are of equal thickness. — 3. *G. N.* Steph. Cat. Cỳnips áptera *Fab. Coquebert.* — 4. Figìtes *Latr.* Antennæ of the males long, filiform, and 14-jointed; of the females shorter, and gradually thickened to the tips; the scutellum large, with two basal excavations, and obtuse at the tip. Fig. scutellàris *Rossi, Latr.*, &c. —5. Eucoíla *Westw.* Antennæ of the males 15-jointed; scutellum with three excavations; the basal joint of the abdomen is very short, and clothed with white pile at the tip. Jurine has confounded this and the preceding under the name of Fígites: several species, including Eucoíla crassinérva *Westw.* Nigra nitida; antennis piceis; pedibus anoque castaneis; femoribus obscurioribus; nervis alarum crassissimis fuscis. Long. 1¾—2 lin.; Ensham. — 6. Kleidótoma *Westw.* Scutellum at the base with a broad excavation; with the apex tubercular and 1-excavated: several species, including Kl. psilöides *Westw.* Nigra nitida; antennis fusco-nigris; pedibus castaneis; femoribus piceis; nervis tenuibus. Long. ¾ lin.; Ensham. — 7. Anácharis *Dalman.* Antennæ in the males 14-jointed; scutellum with two rudimental excavations. Divisible into two sections. A, Abdominal peduncle one third of the length of the abdomen. Sp. 1. An. eucharöides *Dalm.* ♂ ♀. B, Peduncle not more than one fifth of the length of the abdomen. Sp. 2. An. rùfipes *Westw.* Nigra; antennis concoloribus; subtus in ♀ pallidioribus; pedibus testaceis; tarsis fuscis; alis pallidis; nervis fuscis. ♂ ♀. Long. 1¼ lin. Sp. 3. An. fumipénnis *Westw.* Nigra; antennis piceis; alis fumeis; nervis nigris; pedibus fulvo-piceis; tarsis obscuris. Long. 1 lin. — 8. Allótria *Westw.*, described above. I do not know the Cỳnips ediogáster of Panzer, which Mr. Haliday has formed into the genus Ónychia.

1 triangulari, marginali 1, hâc nervum brevem (cum nervo longitudinali connexum) postice emittenti.

Thorax ovate; scutel raised, transversely depressed at the base; abdomen smaller than the thorax, and broadly ovate; antennæ in the females rather longer than the body, filiform, and 13-jointed; wings large, having 1 costal, 1 triangular basal, and 1 marginal or radial cell; the last emitting, at its hinder part, a short straight nerve, which is united to a longitudinal nerve.

Spec. 1. Allótr. víctrix *Westw.* Nigra, nitida; capite fulvo; antennis fuscis; basi pedibusque totis ochreo-testaceis.

Longitudo corporis lineæ ¾. Expansio alarum 2 lineas.

Black, shining; head fulvous; antennæ dark brown; the base and the entire legs being ochreous.

As heretofore, I conclude by describing a few other singular parasitic Chalcídidæ and Proctotrùpidæ, first requesting the student to erase the name of Gastracánthus, which I have proposed in p. 121. (Latreille having employed it for a genus of spiders), and to substitute that of Hetróxys*, having the same signification; also to correct the characters of Cephalonòmia, described in p. 420, which has 12- not 10-jointed antennæ in both sexes. The figure of these organs in the magnified representation of the insect is correct.

Ceraptero'cerus *Westw.*, Encýrto affinis; differt præcipue, antennis maximis latis, planis (antennas Cerápteri referentibus); nervoque stigmaticali apice nervi costalis remoto.

Differs from Encýrtus in the very large, broad, and flattened antennæ, which somewhat resemble those of the coleopterous genus Cerápterus (whence the derivation of the generic name); and in the stigmal nerve being placed at some distance from the apex of the costal nerve.

Sp. 1. Cerápt. mirábilis *Westw.* Niger, vertice, thoracisque dorso aureo-viridibus; mesalis† vel alis anticis nigris, singulo maculis 8 (formâ variis) albis ornato; pedibus nigro ochreoque variis.

Long. corp. 1 lin. Expans. alar. 2 lin. Prope Londinum et Cantabrigiam.

Black, with the crown of the head and the back of the thorax golden green; the wings black, each having eight white spots of different form, legs varied with black and ochre. Near London and Cambridge.

Dero'stenus‡ *Westw.*, Closterócero affinis. Caput magnum; antennæ

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* *Hētron*, the abdomen, and *oxys*, acute.

† The designation of the limbs attached to the respective thoracic segments, by prefixing the terms *pro*, *meso*, or *meta* to the name of the organ intended to be designated, according to its attachment to the prothorax, mesothorax, or metathorax, is an improvement for which we are indebted to Mr. Haliday. Hence, the anterior wings, being attached to the mesothorax, must be termed the mesalæ, and not proalæ. Setting aside the barbarous nature of these compound Latin and Greek names (which may be remedied by employing the terms medithorax and post-thorax), an objection, however, exists against their general adoption; namely, that entomologists are not agreed as to the names to be given to the primary divisions of the thorax. See Kirby and Spence's *Introduction*, vol. iii. p. 531.

‡ *Derē*, the neck, and *stenos*, narrow.

9-articulatæ, in medio crassiores, articulis 3 ultimis clavam parvam subconicam formantibus; collare capite et thorace multo angustius; abdomen thorace minus, longe pedunculatum, spatuliforme, depressum; tarsi tetrameri.

Head large; antennæ 9-jointed, the 4th, 5th, and 6th joints the broadest, hairy, the three terminal joints forming a small attenuated mass; collar much narrower than the head and thorax; abdomen smaller than the thorax, with a long footstalk, depressed; tarsi 4-jointed.

Sp. 1. Derόst. gémmeus *West.* Nitidus; capite thoraceque splendide igneo-cupreis, hoc postice æneo; abdomine æneo, maculâ magnâ baseos albidâ; antennis fuscis; pedibus subalbis; alis immaculatis.

Long. corp. 1 lin.. Exp. alar. 1¾ lin. Habitat prope Ensham, Aug. 1826, &c.

Head and thorax of a splendid fiery copper colour, the latter brassy at the extremity; abdomen æneous, with a large basal whitish spot; antennæ brown; legs whitish; wings unspotted.

Myrmecomo'rphus* *Westw.*, ad Gonatópides pertinere videtur. Caput oblongo-rotundatum depressum antice tuberculatum; ocellis nullis; antennæ corporis longitudine, 10-articulatæ, cylindricæ, articulo primo capitis longitudine; thorax capite duplo longior; alarum rudimentis vix conspicuis; collari fere quadrato; abdomen magnum ovatum; pedes crassi; tarsi antici haud raptorii, postici longissimi; palpi max. 3-, labiales 2-articulati.

Head rounded-oblong, depressed, with a frontal tubercle; ocelli none; antennæ as long as the body, 10-jointed, cylindric, and filiform, the first joint as long as the head; maxillary palpi 3-, labial 2-jointed; thorax twice as long as the head; rudiments of wings scarcely visible; collar nearly square; abdomen much larger than the thorax, ovate; legs thick; the anterior tarsi not raptorial, the posterior long.

Spec. 1. Myr. ruféscens *Westw.* Rufo-ferrugineus, obscurus, subpubescens; antennis pedibusque paullo pallidioribus.

Long. corp. 1½ lin. Dorking; G. R. Waterhouse, Esq.

Brick-coloured red, not shining, subpubescent; with the antennæ and legs paler.

Gona'topus (*Ljungh*) sepsoïdes *Westw.* Niger, nitidus; facie antennarumque basi flavidis; capite postice abdominisque macula basali fulvis; pedibus sordide ochreis, tibiis anticis concoloribus; femoribus anticis basi, intermediis lineâ inferâ, posticisque summo apice supra, piceis; tarsis apice fuscis (♀ aptera, thorace binodoso).

Long. corp. 1½ lin. Habitat apud Blackgang Chine, Insulæ Vectis.

Black, shining; face and base of antennæ yellow; hinder part of the head and basal spot of the abdomen fulvous; legs dirty ochre, anterior tibiæ being of the same colour; the base of the anterior thighs, a line on the under side of the intermediate thighs, and the upper side of the posterior at the tips, pitchy; tarsi brown at the tips. Isle of Wight, Aug.

Gonátopus (*Ljungh*) oratórius *West.* Rufo-testaceus; abdomine, oculis, verticeque, nigris; antennis nigris basi flavidis; tarsis apice fuscis (♀ aptera thorace binodoso).

Long. corp. 1½ lin. Habitat prope Ripley, com. Surrej.

Palish red; the crown of the head, eyes, abdomen, and antennæ black; the latter yellow at the base; tarsi brown at the tips.

Gonátopus (*Ljungh*) Ljúnghii Westw., cum Gonátopo *formicário* *Ljungh* (nec Drymus *formicárius* *Latr.*), ut a Dalmanno descripto in

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* *Myrmica*, a genus of ants, and *morphē*, form; from its ant-like form.

Analecta Entomologica, fere notis omnibus convenit, at tibiæ anticæ subtus lineâ nigrâ sunt notatæ.

Long. corp. 1¾ lin. Habitat Wimbledon Common. An species distinctâ?

Nearly resembles Gonátopus *formicàrius*; but the anterior tibiæ have a dark line on the under side.

Antæ'on? (*Jurine*) excisus *Westw.* Niger, obscurus; capite antice (subtus antennas) angulariter producto, postice valde emarginato; antennis nigris, articulo primo brevi; alis hyalinis, stigmate nigrescenti angusto; pedibus obscure testaceis; coxis totis femoribusque (nisi basi et apice) nigro-piceis, pedibus posticis obscurioribus, ♂.

Long. corp. 1⅛ lin. Expans. alar. 2¼ lin. Habitat prope Cantabrigiam, Jul., 1833.

Black not shining; the lower part of the face angularly produced in front; the hinder part of the head deeply emarginate, the posterior angles acute; the antennæ black, with the basal joint scarcely longer than the second; wings hyaline, with a blackish very narrow stigma, the stigmal nerve running nearly to the tip of the wing; legs dirty testaceous; the entire coxæ and thighs (except at the base and tips) pitchy black, the hinder legs the darkest.

I am, Sir, yours, &c.

J. O. Westwood.

The Grove, Hammersmith, Sept., 1833.

Art. V. *Illustrations in British Zoology.* By George Johnston, M.D., Fellow of the Royal College of Surgeons of Edinburgh.

15. Plumula'ria Cathari'na. (*fig.* 61.)

A specimen of this feather coralline, so large and perfect as that selected for the present illustration, rarely occurs; but smaller specimens are not uncommon in Berwick Bay; and I have seen the same from the Frith of Forth, in the collection of my friend Dr. Coldstream of Leith. It has been hitherto confounded with the Plumulària pinnàta or setàcea of Lamarck, which have the same outward habit, and rival it in delicacy and beauty; but the minuter characters are so dissimilar, that no doubt can be entertained of the distinctness of these species from one another.

Dr. Fleming, in his *History of British Animals*, has reduced Pl. pinnàta and setàcea to one species; and I adopted this opinion in my catalogue of the zoophytes of North Durham, published in the *Transactions of the Natural History Society of Newcastle* [and noticed in this Magazine, Vol. V. p. 702.]. I am now satisfied that, in so doing, I was in error; and, with a view of correcting this error, but more especially of pointing out with greater precision the distinctions between the species under consideration, I will here subjoin their characters: —

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1. Pl. pinnàta *Lamarck.* Stem simple, erect, plume-like, pinnate; pinnæ alternate, slightly arched, three originating from each joint of the stem; cells unilateral, uniserial, rather distant, campanulate, leaning; the mouth wide and entire.

2. Pl. setàcea *Lamarck.* Stem simple, slightly waved, plume-like, pinnate; pinnæ alternate, arched, one originating at each ringed joint; cells very remote, campanulate, with an even margin; vesicles elliptical, axillary.

3. Pl. Catharìn*a* Johnston. Stem simple, erect, plume-like, pinnate; pinnæ opposite, erecto-patent, bent inwards; cells uniserial, distant, campanulate, with an even margin, and intervening tooth-like cells; vesicles solitary, scattered, pear-shaped, stalked. (*fig.* 62.)

Plumulària Catharin*a* grows in deep water, attached to old shells, gravel, &c.; or, as in the present instance, to the

Ascídia conchílega. It is of a white colour, and very delicate; expanding like a fine feather, and rising from 1 in. to 4 in. in height. The main stalk is always simple, and the branches or pinnæ are generally so; but sometimes they become compound. They are always opposite; and, instead of being arched, they bend inwards, so as to render the general form of the coralline concave on a front view: an appearance produced by their originating, not from the sides, but from the anterior face of the stem. The stem itself is straight or slightly bent, tubular, jointed, pellucid, filled with a granular fluid matter; and, in which it differs from its congeners, bearing cells, there being always one at the base and between the insertion of the pinnæ, and generally another on the naked interval between them. Between the cells there is a series of minute tubular or tooth-like cells, visible only with a high magnifier. The ovarian vesicles are produced in summer: they are stalked, shaped like a pear or vase, solitary, scattered, and always originating at the base of a polype cell. The little polypes were visible within their cups; but, although kept in fresh sea-water, they never ventured to protrude their tentacula, or to relax themselves sufficiently to permit their being described.

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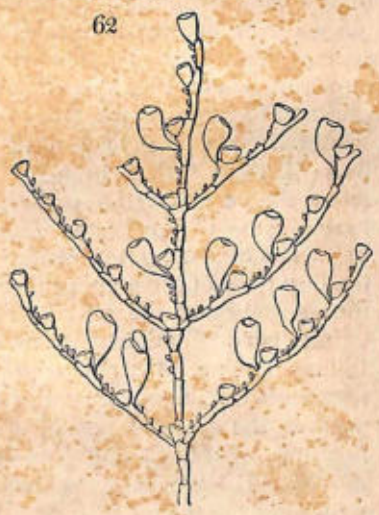

The specific name, so far as I am aware, sins against no rule of nomenclature; and I have a peculiar pleasure in affixing to so elegant a species the Christian name of the lady to whose pencil the reader is indebted for the present series of illustrations [begun in Vol. V. p. 43.]: and if he has taken any interest in them, or shall find them of any service in his researches, he will not grudge me my pleasure; far less will he attempt to rob the lady of the compliment, such as it is, and which has often been bestowed where it was less merited.

Berwick upon Tweed, Aug. 1. 1833.

ART. VI. *Facts in relation to the Reproductive Economy of the Mistletoe* (*Viscum álbum* L.). By the Rev. J. S. HENSLOW, A.M., King's Professor of Botany in the University of Cambridge, &c.

Sir,

As every thing connected with the history of the mistletoe is interesting, I send you a slight sketch * (*fig.* 63.) of a fact, which I have just noticed in the mode of its propagating on a tree to which it has become attached. The specimen was cut from a crab tree in the botanic garden, particularly infested with this parasite; and, as it seemed impossible to suppose the numerous plants which were upon it could all have originated from seeds scattered over the surface of the bark, I examined a branch; and found that a connection existed between some of the plants upon it, by means of dark green strings extending from one to another through the substance of the bark. These strings gave off other portions of a lighter colour, at right angles to their own direction, into the woody part of the tree. I should think, therefore, that there can be no doubt of the mistletoe being propagated somewhat in the manner of those terrestrial plants which, like the potato, possess rhizomata, or underground stems, from whose surface young plants are developed at intervals.

I am, Sir, yours, &c.

Cambridge, Aug. 20. 1833. J. S. HENSLOW.

IN relation to the habits and to habitats of the mistletoe, but not farther connected with the above most interesting discovery respecting the reproductive economy of this plant, some notices will be found in Vol. II. p. 294., and Vol. V. p. 48. 503. and 505. Some facts on the conditions exhibited by some young plants of mistletoe, raised from seeds in the Oxford Botanic Garden, have been recently published in Baxter's *British Flowering Plants*. — *J. D.*

* *a*, Plant of mistletoe. *b b*, Strings (or rhizomata?) given off by the plant, into the substance of the bark. *c*, Sections of roots descending from the removed portion of *b* into the wood of the crab tree. *d*, Young plant, originating in a string, similar to *b*. *e*, Section of a root of a plant as large as *a*, penetrating the wood.

REVIEWS.

ART. I. *Catalogue of Works on Natural History, lately published, with some Notice of those considered the most interesting to British Naturalists.*

VARIOUS Contributors: Transactions of the Zoological Society of London. Vol. I. Part I. 4to, 90 pages. With the plates coloured, 19*s.*; to Fellows of the Society, 14*s.*: with the plates uncoloured, 16*s.*; to Fellows, 12*s.* London, 1833.

The contents of this first part are entitled "Transactions," not "The Transactions," of the Zoological Society; by which foreigners and others will please to understand that the contributions to science herein published are but a small portion of the communications, and discoveries, and passing notices, on subjects of zoology, which the Zoological Society has been the means of eliciting, evolving, and accumulating. Abstracts of the more numerous results of the Society's labours are periodically published, in octavo, under the title of *Proceedings of the Zoological Society;* and these form a useful store of notices on subjects of zoology.

In the *Transactions*, the part before us shows that the intention is to pursue, explicate, and illustrate more fully and completely the descriptions and anatomical analyses of those animals which, from their rarity, peculiarity of structure, or from presenting other sources of interest to the zoologist, may merit and command more elaborate and detailed treatises than it is within the scope of the smaller work, the *Proceedings*, to receive.

Part I. of the *Transactions* contains the following essays:—

1. On the M'horr antelope; by E. T. Bennett, Esq. F.L.S. Sec. Z.S. The external characters of the animal are given in detail: and numerous considerations on its relations to the Antílope *Nánguer* and Antílope *A'ddra*. Mr. Bennett characterises it as distinct from both these, whose contradistinctive characters he also gives. A plate of the A. *M'hórr* follows.

2. On the Nervous System of Béroë píleus *Lam.*, and on the structure of its cilia; by R. E. Grant, M.D. F.R.S. &c. Dr. Grant "found this little animal floating with myriads of minute Equòreæ, and other Medusàriæ, in the harbour of Sheerness. It constitutes the genus Pleurobràchia of Dr. Fle-

ming, and the Eùcharis of Péron and M. Blainville." The anatomy of the animal is very interesting, as are the relative remarks which it has elicited from the writer. One of these is: — "I am inclined, therefore, to believe, that, although nerves have not hitherto been shown in the Acalèpha, they will be found even in the simpler forms of Medùsæ, which I have shown elsewhere to be affected by light, as well as in Actíniæ, *Hy*dræ, and Furcocércæ." To those who may be anxious to examine this elegant creature for themselves, it may be well to quote, that the boatmen of Sheerness "seemed to be familiar with it under the name of the spawn of the sea egg, which it somewhat resembles in its globular and ribbed form." "Its longest diameter is about 6 lines, and its breadth about 4 lines." Magnified figures of the animal, and of its cilia and nerves, are given. "The cilia of this beroe are the largest I have yet met with in any animal."

3. Observations on the laws which appear to influence the assumption and changes of Plumage in Birds; by Wm. Yarrell, Esq. F.L.S. and Z.S. This paper is one which every ornithologist must read. The facts it includes, and the conclusions it derives from them, are very interesting. We shall not attempt an abstract of them, lest we should not do them justice; nor have we the requisite space. We may quote what appears to be the universal principle in the actuation of all the changes specified and remarked on; namely, the "feathers are influenced by constitutional power [that of the bird's constitution], and their colours affected as the secretions alter under constitutional changes." We much value the description of the anatomical structure of a feather, and notice of the process of developement and sustentation of feathers as this process is effected and maintained in the body of the bird. We should like to see this subject prosecuted in still greater detail, and illustrated by engravings; as we have often felt there is enough in a feather to warrant it.

4. On the structure and characters of Loligópsis, and an account of a new species (L. guttàta *Grant*), from the Indian seas; by Dr. Grant. The anatomy of the animal is explained in great detail, and is illustrated by figures.

5. On the characters and description of a new genus of Carnivora, called Cynictis; by W. Ogilby, Esq. A.M. F.L.S. &c. "The name Cynictis, by which I propose to distinguish this genus, is intended to express the double relation which it bears, on the one hand to the dog, and to the *V*ivérræ [weasels, &c.], generally, on the other." The dental structure and the external characters are described in detail; and a plate is given.

6. On the *Chinchillidæ*, a family of herbivorous Rodéntia,

and on a new genus referable to it; by E. T. Bennett, Esq. F.L.S. and Z.S. Mr. Bennett reviews the published histories of the previously known animals of this family; and adds a third genus, "which," he states, "I have no hesitation in regarding as new to science; although, if my conjecture as to the origin of the animal be correct, it has been repeatedly noticed by travellers for a period of nearly three hundred years." The name for the genus is Lagòtis; for the species, Cuvièr*i*. It is called Lagòtis "from the peculiarly lengthened form of its ears [*lagōs*, a hare, and *ous*, *ōtos*, an ear]; and Cuvièr*i*, to the memory of the illustrious Cuvier." Its characters, external and anatomical, and those of habits also, are given in great detail, and contrasted with those of the previously known animals of this "family." Plates of the animal, its stomach, and skeleton, are added.

7. On the sacculated form of stomach in the genus Semnopithècus *F. Cuv.*; by Richard Owen, Esq. F.Z.S., assistant conservator of the museum of the Royal College of Surgeons in London. This is an elaborate and very useful contribution to the stores of the science of comparative anatomy. The animals with whose stomachs the author has compared that of the Semnopithècus, are the kangaroo, a large bat of the genus Ptéropus, P. rubricóllis *Geoff.*, and the sloth (Brádypus). The concluding remark is: — "To those who are more especially interested in investigating the natural affinities of the animal kingdom, it must be highly gratifying to find the Quadrùmana [four-handed animals] manifesting new instances of relation to genera which the immortal Linnæus considered to be so closely connected with them." Two plates are added.

8. Description, with some additional particulars, of the A'pteryx austràlis of Shaw; by Wm. Yarrell, Esq. F.L.S. and Z.S. This communication collects and presents all the information at present acquirable respecting this most singular bird, whose very existence has been questioned. Mr. Yarrell has minutely described the characteristics offered by Lord Stanley's specimen (originally Dr. Shaw's, who figured it in his *Naturalist's Miscellany*), the only one known; and has quoted, from "the accounts of several travellers," interesting information as to the native places of abode, &c., of this most singular bird; of which a figure is given. This done, we may, with Mr. Yarrell, "fairly indulge a hope" that steps will henceforth be taken "to supply the deficiencies which at present exist in our knowledge of the natural history of the apteryx."

9. On the anatomy of the Sepìola vulgàris *Leach*, and an account of a new species, S. stenodáctyla *Grant*, from the

coast of Mauritius; by Dr. Grant. This communication is, in relation to its subject, of the same character as the one above, No. 4. It is illustrated by a plate of figures exhibitive of the very interesting conformation of the animal's organs.

10. On a new genus in the family of *Córvidæ*; by Mr. John Gould, F.L.S. "Three species of a natural group of birds forming part of the family of *Córvidæ*," and "natives of eastern Asia," and nearly allied to the magpies, are, by Mr. Gould, grouped into a genus, to which the name Dendrocítta is applied. The paper exhibits their characters, generic and specific; and their affinities and synonymes. One of the three, Mr. Gould has "reason to believe, is new to science;" and this, of which a charming figure, from Mr. Gould's own pencil, is given, is denominated D. leucogástra. The second, D. sinénsis, is the *Pica* sinénsis of Gray; and the third, D. vagabúnda, is the *Pica* vagabúnda of Wagler.

Jardine, Sir *William*, Bart., F.R.S.E. F.L.S. &c.: The Natural History of Monkeys. Foolscap 8vo, 230 pages, 31 coloured plates, some woodcuts, and a portrait and memoir of Buffon. It forms vol. ii. of The Naturalist's Library. London and Edinburgh, 1833. 6*s*.

The spirit of the treatise is an exhibition of the systematic characters, both external and anatomical, which the monkeys, &c., at present known and written upon, have been found to exhibit.

These notices of structure and affinities it is attempted to relieve and enliven, throughout, with amusing facts and incidents, selected from authors of credit, who have written on the habits and amusing manners of these animals. The habits and manners and the pictures may satisfy curious and general readers; while the considerations exhibited on the systematic relations of the animals may gratify and satisfy naturalists. The "Memoir of Buffon" will, doubtless, prove of interest to both parties.

The natural order Quadrùmana "contains two great families, *Simiadæ* and Lemùridæ." The present volume treats exclusively of the *Simiadæ*; and at the end of the volume is given that which should, according to our apprehension of the systematic bearing of the book, have been placed in front of it; namely, a "Synopsis of the *Simiadæ*," which is, in page 200., thus spoken of: — "We refer to the Synopsis for the numbers and characters of the species which have been authentically described. It has been compiled from the works of Geoffroy, Humboldt, Spix and Martius, and Desmarest."

"The remaining family of the Lemùridæ we shall endeavour to illustrate in a future volume."

Lindley, Johannes, Phil. Doct., Prof. Lond.: Nixus Plantarum. 8vo, 28 pages. London, 1833. 1*s.*

The previous labours of botanists have effected the denomination of most of the plants discovered, and the collection of these into small groups termed genera, and the genera again into groups called orders. The orders, which are about 280, have also been distributed into about three classes; the uniformity of the structure of vegetables not affording more general differences than would supply the characteristics of about this number of classes. In this case the student found himself, although able to determine to which class the plant he might be examining belonged, bewildered among the numerous orders comprehended in that class; and the characters of all which orders he must examine, ere he could be quite certain of the order to which his plant belonged: that is, on the assumption that, when he commenced the examination, he had not the slightest idea of the approximate relations of his plant. With the systematic arrangements of plants in this state, it is obvious they were incomplete; and although, from the progressive nature of human knowledge, they must ever remain so in the abstract, it is gratifying to witness the contribution towards their amendment and completion which the little pamphlet before us supplies. In it the orders are grouped together into clusters or nixuses, according to their agreement in some essential condition of structure; in other words, according to their affinities; and the author finds that in numerous instances the orders suggest, by their approximations, a circular arrangement, and that in the clusters or nixuses in which the affinity is most strict, the orders are more usually five in number. A group of orders forms what is termed a nixus; a series of nixuses, usually here again about five, forms a cohors; a collection of cohorts, in most cases five, forms a subclass; and a conjunction of the subclasses constitutes a class. This is the course of the system of synthesis; the system of analysis, by which the student must test and investigate, is in just the reverse course. Having determined the class, subclass, cohors, and nixus which include his plant, the reference of it to the one of the orders within that nixus to which it belongs will not be difficult; and thence he will proceed in a farther deduction of its identity, until he attain the genus and species, if these be described, to which his plant appertains.

Dr. Lindley, in the nomenclature of his nixuses (we must use this term), has preserved a convenient uniformity: they all end in *ales*, as Rutales, Geraniales, Myrtales, Violales. This device distinguishes the name of a nixus at once from that of

an order or a suborder; as, although the names of the orders are not uniform among themselves, nor those of the suborders among themselves, not one of either kind, so far as we recollect, ends in *ales*.

Castle, Thomas, F.L.S. of Trinity College, Cambridge, M.R.C.S. &c.: A Synopsis of Systematic Botany as connected with the Plants admitted into the Pharmacopœias of London, Edinburgh, and Dublin; accompanied by a Planisphere, showing at one view the Class and Order of the Medical Genera, according to Linnæus and Jussieu. Quarto, 17 pages. London, 1833. 4*s.* 6*d.*

An elaborate and ingenious production, and worth its price to medical students.

Daubeny, Dr., Professor of Chemistry, Oxford: Specimen of a proposed Index to the Oxfordshire Flora; indicating the particular Station of each Plant, as well as the Geological Character of the Spots in which it has been found. Pamphlet, 8vo.

The plan of the index is applicable to similar observations on plants everywhere. The plan is this: — Provide a table of perpendicular parallel columns, and inscribe at the head of each column one of the several conditions of station and habitation which your researches and observation may discover to appertain to the plants of your neighbourhood; place the names of the plants in the left hand column, and opposite them insert the conditions of station or habitation of the plants in one or other or more of the columns, according to the appropriate inscription of each. The conditions of station which Dr. Daubeny has, in his *Specimen*, adopted, are those proposed by De Candolle; namely, aquatic, those of freshwater marshes and very wet places, of meadows and pastures, of cultivated soil, of rocks, of contiguity to dwelling places, of forests, of thickets and hedges, parasitic. Dr. Daubeny's columns of habitation are five, and are inscribed — "In calcareous rocks, viz. in gravel, as near Oxford; in calcareous rocks, in oolite, as on Bullingdon Green; in calcareous rocks, in chalk, as near Henley; in argillaceous, as in the Oxford and Kimmeridge clays; in arenaceous, as in the Woburn and Shotover sands." If tables similar to the one sketched were practically filled up in a number of localities (and there is no reason why they should not be in every locality), they would be the means of amassing a body of information most interesting in itself, and of exceeding value in relation to the subject discussed in our last (p. 424.) by Mr. Hewett Watson.

Boubée, Nerée, Professeur à Paris: 1. Géologie Populaire à la portée de tout le monde appliquée à l'Agriculture et à l'Industrie. Paris, au Bureau du Nouveau Bulletin d'Histoire Naturelle, Rue Guénégaud, No. 17., 1833. pp. xvi, 236, plate.

2. Deux Promenades au Mont Dore pour l'Etude de la question des Cratères de Soulèvemens; formant la première livraison de la quatrième série d'Itinéraires du Cours complet d'Etudes Géologiques par des Leçons et par des Voyages. Paris: au Bureau du Bulletin, &c. &c. pp. 100, 3 plates.

3, 4, 5. Bulletin d'Histoire Naturelle. 3me section, Nouveaux Gisemens de Mollusques et Zoophytes. 6me section, Palæontologie. 7me, Géognosie et Géologie. Paris, chez Levrault, Rue de la Harpe, No. 81.; Strasbourg, même maison; Toulouse, chez Vieusseux.

The *name* of this author bears a different meaning in English to what he attaches to it in France, as the above titles demonstrate. But truly he must be an *odd fish* if the device of No. 1., in which we trace the profile of a philosopher, be equally the representative of M. *Nerée* Boubée and the *Nérite* whose name it bears.

M. Boubée is evidently a man of industrious and persevering habits; and his labours, if productive of no very beneficial consequence to his pupils, obtain for him the praise of an active and a well-intentioned teacher.

The *Bulletin d'Histoire Naturelle* is a kind of fac-simile of M. Férussac's greater undertaking; and, like it, embraces every variety of subject connected with the study of natural science, but, unlike it, is confined to France. The materials are classed in eight sections; and every subscriber may make choice of any section. The work is published in the 18mo form, in livraisons of one or two double sheets. It will be comprised in 8 vols. Besides this, a series of seven Itineraries (of which one is before us, article 2.) will be added, embracing the seven divisions of France.

The *Deux Promenades au Mont Dore* is a fair specimen of this part of the work. It is pleasingly written, and is quite unencumbered with unnecessary scientific terms. Indeed, in some places, as at p. 32, 33., where the professor begins, "Quelle rose n'est mêlée d'épines! quelle espérance ne peut être trompée!" &c., the work assumes the character of an imaginative journey. However, the peculiar features of the district are well delineated.

The *Géologie Populaire* is a concise summary of the principal doctrines now received into the science: but we observe that the professor has adopted some notions respecting

the "cause of the universal deluge," which we had supposed now exploded; such as the change of polarisation of the globe; the unlucky rencontre of a stray comet and our mother earth, by which the said comet was dashed in pieces, and aerolites were called into existence. This universal deluge he makes anterior to those partial deluges, of which that of Moses is one. The work is very well calculated to sustain its designation, "*à la portée de tout le monde*," but it does nothing more. The "*Geotechnical*" part is, generally speaking, well arranged.

Before we conclude this necessarily brief notice, we must observe that M. Boubée undertakes a course of geological study, partly by lectures at home, and partly by scientific journeys into different parts of France, in spring and autumn, a custom adopted with success in this country, by Professor Henslow, though we do not think any one has ever thought of undertaking such a course on a large scale, or in an extended journey. Our university professors might turn the hint to good account. We know nothing more delightful than a long vacation journey with such men as Whewell, Henslow, Sedgwick, or Buckland.

Crichton, Andrew: History of Arabia, Ancient and Modern; with a comprehensive View of its Natural History. In 2 volumes. Foolscap 8vo, 928 pages, with a map, and 10 engravings by Jackson. Edinburgh and London, 1833. 10*s*. The two volumes form vols. xiii. and xiv. of the Edinburgh Cabinet Library.

Seventy-four pages are devoted to the natural history, and take cognisance of the more general and obvious subjects in this department; as "comparative fertility of different districts;" "vegetables, fruit trees, wild animals, domestic animals, birds, reptiles, fishes, insects, shells, coral banks," &c. Regret is expressed that these notices could not be rendered more definite and rich in information; but "as few travellers, comparatively, have visited Arabia, it cannot be supposed that its natural history has been very minutely investigated."

ART. II. *Literary Notices.*

WE have had the pleasure to learn that Mr. Newman is engaged in the preparation of *A Translation of Cuvier's Règne Animal*. We are right glad that he has undertaken such a task, and anticipate much interest and instruction from his performance of it.

A work entitled *The Naturalist's Poetical Companion; with Notes selected by a Fellow of the Linnæan Society*, is announced for immediate publication; in foolscap 8vo, and at 5*s*.

Of Gould's *Birds of Europe* the sixth part is just published.

Of *The Natural History of the Humming-Bird*, by Sir W. Jardine, Bart., it is announced that a second volume "will be published before or about November."

A volume on the Parrots, to contain "representations of 35 of that splendid and amusing tribe," is in preparation by Sir Thomas Dick Lauder, Bart., and Captain Brown: the engravings by J. B. Kidd, Esq. The size foolscap 8vo, price 6*s*. This is intended to be the first of a series of volumes by the above authors, and which are to be entitled, in common, *The Miscellany of Natural History*.

Of Hewitson's *British Oology*, the thirteenth number, or the first number of the second volume, has been lately published. The author has "recently visited Norway; a considerable portion of the north-west coast of which he has traversed purposely to add rarities to his work."

Part i. price 20*s*. of Royle's *Illustrations* (see p. 445.), has appeared. It is in 4to, and contains 10 coloured lithographs, which exhibit 15 plants, and one animal, the Lagòmys alpinus *Desm*. The text in the present Part does not describe these.

A Journal of Botany has been commenced by Dr. Hooker. It is to form a new series of his well-known and far-famed *Botanical Miscellany* (which is just terminated, and forms three volumes, royal 8vo, with 150 plates), but to differ in being of demy 8vo size (instead of royal 8vo), and in its price being 7*s*. 6*d*. (instead of 10*s*. 6*d*.). It is to be published in quarterly numbers, each of which is to contain 8 plates, and 4 of these are to be coloured.

Of *Les Recherches sur les Poissons Fossiles*, of Dr. Louis Agassiz, the first livraison was, by a prospectus dated "Neuchâtel, le 10. Mai, 1833," and now (Oct. 17.) received, to appear on Sept. 1, 1833. The geological evidence and arguments suggested by the fossils are to receive full elucidation. The work is to comprise the description of five hundred extinct species of fish, and to be published in 12 livraisons, of which each, price 24 French francs, is to consist of from 10 to 15 sheets of text in 4to, and 20 plates in folio. Dr. Agassiz states that the work will cost him so much, that he shall not distribute for sale a single copy. Persons willing to subscribe, are to address direct to himself.

No. x. of Lindley and Hutton's *Fossil Flora of Great Britain* contains a series of most interesting "Remarks upon the origin of coal."

SHORT COMMUNICATIONS.

The Swiss Peasantry foretell the Termination of their Winter by the Condition of the Weather on the Second of February, and the Actions of the Wild Bears on that Day. — In Vol. IV. p. 469. Mr. Bree contrasts the opinions of the English peasantry with those of the Pisans (as mentioned by Mr. Spence, p. 264.), relative to the meteorological anticipations which may be founded on the state of the weather on the 2d of February. The Swiss peasantry agree most with the English, as they are of opinion that, when that day is cold and cloudy, the winter is within a fortnight of its close; but that, should it be fine and sunny, the cold returns, and continues six weeks. In this land of superstition, no maxim of this sort can be unconnected with the marvellous; and their creed, in the present instance, affords a striking example of confounding cause and effect. They believe that the bears, which have passed the winter in caverns in the different mountains, always come out to reconnoitre on the 2d of February; and that they, if the weather be then cold and winterly, return contentedly for another fortnight; at the end of which time they find the season sufficiently advanced to enable them to quit their quarters without inconvenience: but that, if the weather, on the 2d of February, be fine and warm, they sally forth, thinking the winter past; but on the cold returning after sunset, they find their mistake, and retire again in the sulks, without making a second attempt until after the expiration of six weeks; during which time we poor bipeds are doomed to experience all the inclemencies consequent on their want of urbanity. Thus the Swiss peasantry, instead of attributing the retirement of the bears to the effects of the cold, make the cold to depend on the seclusion of the bears. When I first heard this account, I considered it a joke, but soon found that it is firmly believed by a large proportion of the peasantry; who, indeed, place the most implicit faith in stories compared with which the above is truly rational. — *P. J. Brown. Thun, Canton of Berne, April* 5. 1833.

Mammiferous Animals. — *Notes on the Canadian Porcupine* (*Hystrix dorsata*). This animal is common in the least cultivated districts of Canada, and is occasionally met with in the neighbourhood of Quebec. It is very thick in pro-

portion to its length, and is remarkable for the shortness of its spines; the longest, which are situated on the back and near the tail, being little more than three inches in length. The whole body is covered with a very thick brown fur, with lighter-coloured coarse hairs intermixed; and on most other parts of the body except the back, the spines are so buried in the fur as to require a close examination to distinguish them. The spines are strong, but very loosely attached, so as to come off with a very gentle force. The length of the body is about 18 in.; of the tail, 5 in. or 6 in. It lives in holes near the roots of aged trees, and is diffused over a great extent of country, extending as far north as Hudson's Bay. It is considered rather a delicacy by the natives of the countries it inhabits. — *E. H. Greenhow. North Shields, June* 1. 1833.

The Beaver (*Cástor Fiber*). — Beavers were once common in the little rivers of Lower Canada, but, as the country has become settled, they, together with other wild animals, have become scarce, and have left off assembling in villages [or collections of houses built by themselves], but now live solitarily in holes on the wooded banks of secluded rivers. — *Id.*

Musk Rat (*Mús* zibéthicus). — The musk rat is one of the commonest of Canadian animals, being as common there as water rats are with us. It lives in excavations on the banks of little brooks and rivers; and these excavations are always concealed by a bush or clump of shrubs. Its habitation is neatly constructed, being made quite smooth on the inside, and always so contrived as to be out of reach of the water. The animals live in pairs during the summer season, but, I believe, congregate through the winter, living in common abodes like the beaver, which it also resembles in its outward appearance, though it is much smaller. They are rarely seen by daylight, but towards the dusk come out of their holes to feed; and at this time the Canadians hunt them with dogs trained for the purpose. They are covered all over with a very soft fur, except on the tail, which is broad, and covered with scales, intermixed with a very few scattered hairs. The tail has a strong musky odour, which is common, though in a less degree, to the whole animal, whence it derives its name. The fur is rather valuable, being similar to that of the beaver, and much more easily obtained. — *Id.*

Canadian Dog. — There is a variety of dog common in Canada, which seems peculiar to that country. It resembles the Newfoundland dog, inasmuch as it has half-webbed feet, and is fond of the water. It is about the size of a pointer, and is strong and hardy. On these accounts it is commonly

used by the inhabitants for purposes of draught; vegetables and other country produce being brought to market in little carts drawn by one or more of these dogs. It is not uncommon in the populous districts about Quebec to see children drawn in little cart-like carriages by a couple of them; and it is really surprising to see with what speed they drag one of these vehicles along. — *Id.*

The Water Shrew (*Sòrex fòdiens* L.). — Since the rediscovery of this interesting little animal in England, by Mr. Dovaston [Vol. II. p. 219.], many instances have been recorded [Vol. II. p. 399. 483., III. p. 90. 188. 236. 471., V. p. 79. 298., VI. p. 452.] of its occurring in various parts of the country. The species is not rare in this neighbourhood; and I suspect that, if sought for in its proper localities, it will be found more or less distributed throughout the kingdom. — *Edward Blyth. Tooting, Surrey, Sept.* 23. 1833.

The Oared Water Shrew, Sòrex rémifer Yarrell (Vol. V. p. 598.), *is not rare in the Neighbourhood of Glasgow.* — Our information respecting the smaller quadrupeds, even of our own country, is still very imperfect, and doubtless several of them are still unknown to us. The Sòrex rémifer has not yet been recognised as a native of Scotland, although it appears to be by no means uncommon in the neighbourhood of Glasgow. Last autumn I was so fortunate as to procure three specimens of this shrew, all of them from different situations. Although it is decidedly a water shrew, all the specimens were found at a distance from any pool or considerable body of water. It is unnecessary to give any description of this animal, as my examples agree precisely with the account of the Sòrex rémifer given by Mr. Yarrell in Vol. V. p. 598. I will only remark, that the snout is exceedingly flat (resembling in this respect that of the Chrysocholìris capénsis), a circumstance which at once distinguishes it from the common water shrew (Sòrex fòdiens *L.*). The specimens from this vicinity agree with those described by Mr. Yarrell in being smaller than the French ones mentioned by M. Geoffroy St. Hilaire.

The discovery of this species as a native of England is due to Dr. Hooker, who found it in Norfolk, and his specimen was afterwards figured by Sowerby, in his *British Miscellany*, under the name of Sòrex ciliàtus. Dr. Hooker, to whose kindness I am much indebted in having free access to his library, the only one on natural history in this town, at once recognised my specimen as being in every respect similar to the water shrew which he had procured in Norfolk. — *John Scouler, M.D. Glasgow, July* 25. 1833.

Birds. — *The Great Bustard.* (Vol. III. p. 515., Vol. VI. p. 150.)—This bird formerly was frequently seen at Icklingham in Suffolk, Brandon Heath, and the open fields of Norfolk; but has not been observed in the first place for some years. The last seen there was a hen bustard, sitting on six or seven eggs. She, unfortunately, was disturbed by a farmer, who secured the bird by throwing a casting net over her; but she pined for a short time and died. Bustards are, however, still occasionally seen in the grounds of the Duke of Grafton, at Easton, and on the heaths between Thetford and Newmarket.

The method which was usually adopted by the sportsman desirous of shooting this shy bird is dressing his head with boughs, and walking by the side of a stalking horse decorated in the same manner, until he arrive within gunshot. I have never heard that the breed has been domesticated. The late Duke of Queensberry had three pinioned on his lawn at Newmarket; and J. Wastall, Esq. had one for a long time in his garden at Risby, in Suffolk. In a wild state, they live on grain and insects, and (according to Shaw) on rats and field mice. They breed among the corn in summer, and in autumn form coveys or flights of about three or four brace. Their flesh is much esteemed by sportsmen. — *N. S. Hodson. Abbey Grounds, Bury St. Edmunds, Jan.* 2. 1833.

The Little Bustard (*Otis Tetrax* L.). (p. 141.)— A fine specimen of the little bustard, a bird very scarce in this country, was lately shot near Caxton, in this county. It is in the possession of the Cambridge Philosophical Society. — *Cambridge Chronicle, January* 18. 1833. [*Henry Turner.*]

The Peacock a Narcissus.—The late Baron Ternaux decorated his grounds at St. Ouen, near Paris, with splendid looking-glasses, which reflected the varied landscape, and produced a very fine effect. One day, the gardener found one of the peacocks before the glass, with his tail displayed, and apparently contemplating himself with great satisfaction. The gardener let him remain there until he went round the grounds; he returned in a few hours, and found the peacock still before the glass. He now drove him away, but he as constantly returned.—He at length took him to the aviary; but the peacock, as soon as he could get out, went back to the mirror, refusing all food for the delight of contemplating himself in the glass. The baron at last suffered him to remain, ordering food to be placed for him near the glass; but he did not touch it: and, on the third or fourth day, the bird of Juno was found lying dead before the glass. A second peacock, which had never seen the mirror, was brought, that it might be observed whether the effect would be the same;

when it was found that he was as proud of viewing his own image as his congener: and, to prevent his meeting a similar fate, he was not allowed access to the grounds.

The above anecdote was communicated by the baron himself, on his last visit to London, to the narrator. — *J. B. London, June* 28. 1833.

We are without proof whether the Narcissuses, or peacocks, stayed at the glass to admire the semblance of their own persons, or in the hope of adding the peacock pictured therein to their list of friends or list of enemies. Very familiar is the fact, that a game cock may, without much difficulty, be excited to defy and peck at the semblance of himself in a looking-glass. The instance which I have seen of this fact was shown me, one evening, in a room, by candlelight. — *J. D.*

Enmity between the White Swan and the Black Swan. (p. 139. 278.) — Sir J. Byerley has, in p. 139., described the aversion evinced by a widowed male black swan from a "most beautiful white female swan," that had been procured to console him. In the *Mirror*, vol. x. p. 318., is an interesting and well told account of two white swans killing a solitary black one that had been placed with them on the water in the Regent's Park. The two whites pursued the black one "with the greatest ferocity, and one of them succeeded in grasping the black one's neck between its mandibles, and then shook it violently. The black swan with difficulty extricated itself from this murderous grasp, hurried on shore, tottered from the water's edge a few paces, and fell, to die. Its death appeared to be attended with great agony; it stretched its neck in the air, fluttered its wings, and attempted to rise from the ground: after about five minutes of suffering it made a last effort to rise, and fell dead with outstretched neck and wings. Its foes never left the water in pursuit, but continued sailing with every feather on end, up and down towards the spot where their victim fell, and seemingly proud of their conquest." — *James Fennell. London, April*, 1833.

The Egyptian Goose (A*nas ægyptìaca*). (Vol. V. p. 565., Vol. VI. p. 12.) — Three individuals of this beautiful bird were killed at Campsie, about seven miles from Glasgow, in the month of November, 1832. A gamekeeper, who had not seen such birds before, killed two of them, which proved to be females, but the male escaped. He was sent back to the same place, to watch the return of the male, who soon appeared, in search for his companions, and was also shot. From the extremely perfect state of their plumage, it is not probable that they had escaped from confinement; but it is more likely that they had been wandering about for a considerable period. — *John Scouler, M.D. Glasgow, July* 25. 1833.

Grey Phalarope. (Vol. V. p. 729.) — This bird, although common in the arctic regions, is but a rare visiter in this vicinity. A beautiful mature specimen was shot at Largs last winter. — *John Scouler, M. D. Glasgow, July* 25. 1833.

Acts of the Heron (Vol. II. p. 206., V. p. 57. 192. 678., VI. p. 452.), *and of the Peahen.* (Vol. III. p. 146., V. p. 383.) — There is a small fishpond, sheltered by shrubs and wood within 150 yards of the dining-room windows of West Ella, the seat of Rickard Sikes, Esq., about six miles from this town (Hull). On the afternoon of Sunday, Sept. 1. 1833, a heron (*Ardea màjor L.*) was, for the first time, observed to descend and quietly to take up a station on the edge of the pond, which was full to almost the overflowing of its banks, from the quantity of rain which had fallen on that and the previous day. The evening was cloudy, and well calculated for fishing. In less than ten minutes from the time the heron alighted, he was observed to have some animal struggling on the ground, which he was evidently attempting to kill, by frequently repeated blows of his beak: before, however, he accomplished this, he was disturbed, but succeeded in carrying off his prize. In a few minutes he again returned to his former station. On this occasion he did not succeed so quickly in finding game; but, with a full share of that patience so proverbially great in all good fishermen, he perseveringly kept his ground, in a state of perfect quietude, for, I should think, upwards of half an hour. He then changed his fishing ground to one a few yards distant, still carefully keeping in the shade. Here he was soon successful, and was observed suddenly to strike the water, to raise himself a few feet above it, and then to alight on the gravel walk with his second prize, which he immediately set about killing, by repeated blows of his beak, as on the former occasion. The most singular part of the transaction, to me, however, now occurred. A peahen feeding at a short distance from this scene, and no doubt attracted by the struggles of the prey, and the blows of the heron, approached, and appeared either to dispute the prize with the heron, or to assist him in depriving it of life; but which, it was impossible to distinguish, with any degree of accuracy, from the distance at which I stood; and, unfortunately, before this could be distinctly ascertained, the combat was interrupted, and both the heron and the peahen driven from the prey, which proved to be an eel, of about a foot and a half in length, left still alive on the ground.

It is a common opinion in this part of the country, that the pea fowl is the natural enemy of the serpent tribe; and, I believe, on that account, as much as for the beauty of his

plumage, he is often kept by gentlemen on their estates, greatly to the annoyance of the gardener, who often complains of the great destruction he causes in the flower-beds. If this be really a well established fact in the natural history of the bird, it is possible that the peahen, on this occasion, may have mistaken the eel for a serpent; and, in this way, we can easily account for its dispute with the heron: but I do not find that either Buffon or Bewick mention this peculiar trait in their history of the bird; therefore I should be glad to learn if any one has ever witnessed this peculiar characteristic. — *M. Chalmers, M.D. Hull, Sept.* 6. 1833.

The Species of Thrush, whose Migration is described by W. L. of Selkirkshire, in p. 218., *is the Redwing* (*Túrdus iliacus* L.) — The species of thrush, whose habits and manners W. L. has, in p. 218., accurately described, and which he has conceived to be a species "not generally noticed by naturalists," is merely the common redwing, a resident species in the extreme north of Scotland and in the isles, and a regular winter visiter in South Britain. I cannot, however, admit (with W. L.) that their music equals that of the mavis, or song thrush (*T. mùsicus L.*): they have, undoubtedly, one or two very pleasing and mellow notes, but their song in general is certainly very inferior to that of the *T. mùsicus*. A flock of these birds lingered in this neighbourhood, last spring [1833], until the close of the first week in May: thirty or forty of them were in the habit, every fine morning, of congregating on a large spreading oak, growing in the middle of a field; and used to pour forth their strains, in concert, for hours together. The same habit may likewise be sometimes observed in the song thrush, during the first months of the year, only the assemblage is never so numerous. A small flock of redwings were observed here on the 6th of September, this season (1833); earlier, by three months, than the first appearance of this species in 1832. They have, however, not been noticed since. — *Edward Blyth. Tooting, Surrey, Sept.* 23. 1833.

The Habits of the Jackdaw. (p. 394.) — I can bear testimony to the accuracy of Mr. Waterton's observations on the friendly and uninterrupted intercourse which exists between the rook and the jackdaw. Near Denney Abbey, the remains of an old monastery in Cambridgeshire, are a number of old pollards, hollow through age, which have been allowed to remain on account of the young wood which their crowns produce, and which is used for making partition fences, dead hedges, &c. Adjoining these pollards is a grove of elm trees, on which the rooks build and rear their young, while the jackdaws rear theirs in the sheltered cavities of the pollards. The latter and the

elm trees have been known by the name of the Jackdaw Grove longer than I can remember, and continue to retain it.

Doubtless, it is well known that the jackdaw can be domesticated. He frequently is; and a playful, merry, mischievous little fellow he becomes. One that was hatched in the grove before mentioned came into my possession as soon as it was fledged, and I kept it for more than twelve months. I fed it with cheese-curd, which, as a cheese was made in the family on most days, I could readily procure. Jack soon became the favourite of the family, and "fared sumptuously every day." When he had become able to fly, he would follow me or any of the family into the garden, or anywhere near the house. Many a time has he perched on my shoulder, and amused himself by preening the side of my head, and sometimes giving me a nip on the ear; and then he would call out "Jack!" lustily, and put his powdered head knowingly on one side, and look in my face as if to see how I liked it. The garden was his general haunt; there he would amuse himself for hours looking for insects. Earwigs and spiders were his favourite food. I recollect his leaving my shoulder, and pouncing upon a large spider and its white bag of eggs or young. The jackdaws from the tower of the village church frequently flew round in circles, and seemed, by their calls, to invite him to join their society; but Jack could not be persuaded to leave his abode. Still Jack, although he made our house and outbuildings his home, was not against visiting his neighbours. Many a thimble, portion of thread, a spoon in one or more instances, or anything that was portable, has Jack purloined from the adjoining cottages, and concealed under the moss that grew on the thatch of the barn. Jack, by this means, got a very ill word, and if any little thing was missing, he was sure to be accused. The ladder has been raised, his hoard searched, and the lost goods returned. Jack was a very early riser, and would imitate the human voice. Early one morning in harvest, Jack had made his way through a broken pane of glass into a lodging-room, and Jack, finding the leg of one of the lodgers uncovered, gave it a peck. The man got up swearing vengeance, but Jack made good his retreat. Not long after this, I lost sight of poor Jack. I heard some years afterwards, that an aunt of mine had caught him, and wrung off his head. —*John Denson, senior. Waterbeach, September* 25. 1833.

A Magpie the Tips of whose Mandibles crossed each other in the manner the Sides of the Letter x *do*, that is, decussated, was, during part of 1831 and 1832, kept, by Mr. Douglas, of the Swan Inn, Kensington Gravel Pits. The decussation

only occurred in a small length of the tip of the mandibles, and but little, or not at all, hindered the bird from feeding. It died in 1832 or 1833, but the death of it was imputed to some one's having given it, in incautious kindness, meat that had been salted, instead of meat free of salt. — *J. D.*

The Blackbird renders important Service to Man in the Destruction of the Grubs of the Cockchafer. — Sir, In the month of August last, I was struck with the rather unusually large assemblage of blackbirds which frequented my garden; eight or ten were frequently to be seen together; and one morning I counted thirteen at the same time hopping about and chattering on the grass plot before the house. Their visits were usually paid about eight o'clock in the morning, and continued to arrest my attention for perhaps ten days or a fortnight. The birds directed their operations more especially to particular spots on the grass plot, which they stocked up with their bills, till the turf, which changed colour, and was supposed to be dying, became almost bare in patches, and was quite disfigured by the refuse roots of grass, &c., which were left littered on the surface. Indeed, such was the rough and unsightly appearance which the glass plot presented in consequence, that hints were even thrown out that the blackbirds ought to be destroyed; for *they* had been repeatedly seen in the very act of disfiguring the turf, and the whole mischief was of course, from first to last, attributed to them. Suspecting what might be the object of the bird's research, I turned up a piece of turf with the spade, and found it almost swarming with the cockchafer grubs of various sizes; and this circumstance confirmed my suspicion that it was for the purpose of feeding upon these larvæ that the blackbirds had made such havoc of the grass plot. They performed in short, in this case, precisely the same service by destroying the cockchafer grub, that the rooks are so well known to do. (p. 142.) The turf, I should add, soon regained its wonted verdure, the injured patches being scarcely to be distinguished from the rest of the grass plot. Here then we have another instance of the "utility of preserving birds on farms and in orchards and gardens." (p. 143.) The above fact also confirms me in the opinion that birds which subsist for the most part on vegetable food do not confine themselves to that diet, but prefer to mix along with it some animal food likewise. There was plenty of fruit in the garden, gooseberries and currants, which are so much to their taste, when the blackbirds chose to be at the pains of stocking up the turf in order to devour the cockchafer grubs. And yet I have heard the blackbirds called "a most pernicious race." They do, I admit, eat

fruit; no doubt of it: but the injury they commit in this way is more than compensated by the good services they perform in another; and I think, on the whole, we should be no gainers by destroying them. Were any of our common birds (or, indeed, other animals) to multiply to an unusual extent, and increase out of due proportion, they would immediately become a pest and a nuisance; on the other hand, were they to be annihilated, and the race to become extinct, or nearly so, we should soon miss their services, and be equally inconvenienced, because in either case the balance of nature would be destroyed. I am, Sir, yours, &c. — *W. T. Bree. Allesley Rectory, March* 14. 1833.

A remarkable Variety of the Peewit was shot last winter in the county of Kildare, Ireland. It had been observed, for some days before, in a flock of peewits; and, having attracted attention, from the difference of its plumage, it was followed till it was procured. Its colour, both above and below, is of a dark cinereous grey, almost approaching to mouse colour; the scapulars are glossed with dark green reflections, as in the common one, and tipped with white. The crest is only 1 in. long, instead of 2½ in., the usual length. The only differences which I could observe in its shape are these: — The bill a trifle longer, and hardly so broad; the bone of the forehead, which, in the common one, forms almost an angle with the top of the head, is, in the present one, lower, and more evenly rounded: the head is also a little broader between the eyes. The neck seems longer, as also do the thigh-bones; but, as it was preserved when it came into my possession, it is impossible now to determine this point with any accuracy. It was preserved by Mr. J. Wall, who has the charge of the museum of the Dublin Society, Kildare Street, from whom I procured it. I take this opportunity of recommending him strongly, as the best preserver of foreign or native birds that I am acquainted with. — *T. K. Toomavara, Ireland, Oct.* 4. 1833.

Instances of Feathers found in the Stomach in the larger Species of Grebe. What End in the Economy of Digestion do these Feathers subserve? — In Vol. V. p. 733. a remark occurs as to the food of the larger grebes, and the circumstance of their stomach being generally filled with feathers. Two instances of this case came to my notice last winter. On December 8. 1832, one was brought to me which had been shot on Lough Derg, on the Shannon; a female, and, I think, a young one, of the Pódiceps rubricóllis. It weighed 20 ounces. On opening it, I found the crop and first stomach perfectly empty; but the second stomach, or gizzard, was quite full of feathers, and one or two back-bones of some small fish. Again,

on January 21. 1833, I procured another grebe from the same vicinity : it proved, on dissection, to be a female also, and was, I think, from its plumage and weight, the female of the great crested grebe (Pódiceps cristàtus). It weighed 2 lbs. 8 oz. The stomach of this also was empty, and the contents of the gizzard precisely similar to the contents of the gizzard of the former one. I examined the feathers each time as accurately as I could, and feel convinced that, in each bird, they were from its own body. In p. 409. of Rennie's edition of *Montagu's Ornithological Dictionary* a similar notice occurs. Temminck also mentions it, in his *Manuel d'Ornithologie*, as peculiar to the grebes : and, again, in p. 320. of vol. iv. of the *Zoological Journal*, we again find the fact among Mr. Yarrell's notes on comparative anatomy. Of what use in the economy of the bird this extraordinary circumstance is, it must be difficult to conjecture. Perhaps the feathers may assist the digestion of the food, and this be the purpose for which they are swallowed. Some of your readers may be able to state whether the larger grebes are ever found without feathers in the stomach? An answer to which question may assist in solving the difficulty. — *T. K. Toomavara, Ireland, Oct.* 4. 1833.

A Dabchick choked by a Bullhead Fish. — A gentleman at Cowbridge last week found, in a meadow belonging to him, through which runs a river, near the river's bank, a dabchick, dead, with the head of the fish stuck in its throat, while the fish's tail still protruded beyond the bird's beak. (*Morning Advertiser*, Feb. 14. 1833.) — *James Fennell.*

Rose Ousel (*Pástorròseus* Tem.) *shot near Dublin.* — There was shot, on the 20th of last July (1833), close to Dublin, a female of that very rare bird, the rose ousel (Pástor ròseus *Tem.*). I saw it at Mr. Wall's, to whom it had been sent for preserving. It was opened with great care. The eggs were small, and not distinct : it had, therefore, probably finished laying, as the season was so far advanced. The gizzard was muscular, and, from its contents, its food seemed to have been cherries; parts of the skins were very visible : no stones of them, however, remained, if it had ever swallowed them. The inside of the gizzard and mouth were stained a bright pink ; I suppose, from its food. — *T. K. Toomavara, Ireland, October* 4. 1833. [See also in p. 12. and 150.]

The Hawfinch. (Vol. I. p. 374., III. 176. 435, 436., V. 582. 734., VI. 81. 454.) — Eight individuals, four males and four females, have lately been shot by the gardener at Daylesford House, near Chipping Norton. The first was killed on January 31., and the last on February 16. 1833; the others in the interval. They had frequented the hawthorn bushes

and shrubberies near the house for some time; and others had been seen, but were not killed. On February 21., another male was brought to me, shot at Chastleton, a village about three miles from Daylesford House. I have preserved all these birds. Upon examining their stomachs, I could find nothing but the kernels of the pomes or fruits (unbotanically called berries) of the hawthorn bushes which they had been frequenting.—*T. G. Chipping Norton, Oxon, March* 6. 1833.

Notices of the occurrence of the hawfinch in Ireland are given in Vol. V. p. 582. note ‡, p. 734.; Vol. VI. p. 81. The remarks in Vol. V. p. 582. note ‡, describe the structure of this bird's powerful bill, and are valuable. Mr. Hewitson states, in his *British Oology*, t. 43., that his friend Mr. Doubleday, during May and June, 1832, discovered several nests, with eggs, of this bird in Epping Forest; "in some instances in bushy trees, at the height of five or six feet, and in others near the top of firs, at an elevation of twenty or thirty feet." Mr. Hewitson adds, — "This bird has before been said to breed in this country, but the instances are very rare, if not altogether doubtful;" overlooking, possibly, the instance given in our Vol. I. p. 374. by T. F., who describes the nest and eggs as he observed them. — *J. D.*

The Chiffchaff Pettychaps (*Sylvia loquax* Herbert), *and the Rufous Pettychaps* (*S. rufa* Latham). (p. 447.) — I have, in the *Field Naturalist's Magazine* [for Oct. 1833, p. 423—447.], endeavoured to extricate the several species of Sylvia, as the genus is now very properly restricted to the pettychaps or willow wren group, from the confusion in which they have been involved. I should not, therefore, have here offered the following observations on this subject, had not Professor Rennie's paper (published in the *Field Naturalist's Magazine* for February, 1833) on the Sylvia rufa and S. hippolais of the Continent been, in p. 447., adduced as a correct elucidation of the species of this genus.

The common chiffchaff of this country (S. loquax *Herbert*, S. hippolais *of other British authors*) is a distinct species from the S. rufa; and perfectly distinct also from the S. hippolais of the Continental writers. I have now before me specimens of all three; but the skins of the two latter, unfortunately, have been taken from individuals that had died in the cage, and are, in consequence, so much injured, that it is impossible to draw up from them a minute technical description; the specific differences between them are, however, very obvious.

The Common Chiffchaff (*Sylvia loquax* Herbert) most closely resembles the willow wren, or garden pettychaps (S. *Trochilus* of authors, but might, from its charming melody, be more

fitly named S. melòdia), but may, at once, be distinguished from it by the *dark brownish black* colour of the legs and feet, by the comparative shortness of the wings, by its smaller size, and by the general darker and more brownish hue of the plumage. Although it is the smallest of the three common British species, the tibia bone of the leg is longer than that of either the wood wren (S. sibilàtrix), or the willow wren (S. *T*ròchilus *auctorum*, S. melòdia? [*Blyth*]). This bone, I may here observe, is shortest in the wood wren; which last species has also the gape of the mouth considerably wider than in any of the others. The chiffchaff chiefly inhabits woods; and though it has been said by most authors to haunt particularly the neighbourhood of firs and other evergreens, I think it will be found that the individuals which frequent such situations will turn out to be of the species S. rùfa, confounded hitherto with the other, from the similarity of their notes. The common British chiffchaff seems to be entirely overlooked by Continental writers, unless (what, indeed, is not improbable) one of the birds alluded to by M. Temminck as varieties? of S. rùfa may refer to it.

The Sýlvia rùfa is a rather smaller species than S. lòquax, and of a shorter make; the ridge of the bill is more depressed, and the legs and feet are of a *very pale* colour; the general hue of the upper parts, which in the chiffchaff are tinged with greenish, in the rufous pettychaps incline toward a slightly reddish brown, and the under parts have a faint but decided tinge of russet; the only indication of the prevailing characteristic colour of the genus being a little greenish yellow under the wing. I am sorry that the injured state of my specimen prevents me from giving a more minute description of this bird; but sufficiently marked characters are here mentioned to distinguish it easily from the chiffchaff. I have hitherto searched in vain for the species in this part of Surrey, but am nevertheless strongly inclined to suspect that it will be established ere long as a regular summer visitant to the fir districts in the south of England. The young in their nestling plumage, I am informed, are of a dull ashy brown; those of S. lòquax are much more beautiful than the adult birds, the upper parts being of a livelier green, and the whole under parts with the eye-streak being of a uniform fine pale yellow: the eggs, however, of these two species are hardly to be distinguished.

[*Sýlvia hippolàis* Temminck and Bechstein.] Mr. Gould, in his valuable work on the *Birds of Europe*, has said that M. Temminck has, probably by mistake, reversed the synonymes of his S. hippolàis and S. *T*ròchilus. It does not,

however, require much acumen to perceive that M. Temminck's description of S. hippolàis will not accord with either of these species, as described by British authors, and that the difference between their measurements is very much greater than that between those of the chiffchaff and the willow wren. A specimen of Temminck's bird (the S. hippolàis *Tem.* and of Bechstein, S. polyglótta of Viellot and Ranzani, *le grand pouillot* of Cuvier, Hortícola polyglótta * *Blyth*), is now in my possession. It is of about the size and shape of a blackcap (*Ficédula atricapílla* †): the bill is large, and formed much like that of a nightingale; longer, and not quite so thick, and the rictorial bristles are smaller and less conspicuous than they are represented at page 52. of the *Field Naturalist's Magazine.* Temminck has accurately described its plumage; and if, in addition, he had merely mentioned that it was a fine songster, an immense deal of confusion would have been prevented. Its nest, a fine specimen of which is in the collection of Professor Rennie, is of a most beautiful and solid construction, and differs essentially in character from that of any other known European warbler. — *Edward Blyth. Tooting, Surrey.* [For figures, &c, of three sylvias, see Vol. III. p. 519.]

A Canary Bird (*Fringílla canària* L.) *which was situate near a Gas Lamp, and would, on Music being played, sing at Night.* — I have often, in my evening walks to Blackness, been delighted by listening to a bird of this species, whose cage is hung opposite a brilliant gas light, pouring forth its gleeful melody responsive to the soldiers' bugles, as loudly and as merrily as if the sun were shining. — *Wm. Gardiner, jun. Dundee, April* 6. 1833.

The Materials of the Nest of the Common Wren (*Troglódytes vulgàris*), Vol. I. p. 344., Vol. III. p. 568., Vol. V. p. 738., Vol. VI. p. 172. — Though the nest is most generally constructed of moss, with a lining of feathers and hair, yet the materials are varied with the locality. In dry sandy banks it is composed of dried moss, mingled with fibres of grass; in mossy braes among furze, of moss and decayed straw; on the branches of trees, of moss and lichens; and in clefts of rocks, of dried leaves, similar in colour to the stone.—*Id.*

Birds' Nests in singular Places. (Vol. V. p. 286. 289. 735., Vol. VI. p. 32. 68. 140. 154. 454.) — As a parallel case with that recorded in p. 455., it may be mentioned, that Mr.

* See the *Field Naturalist's Magazine* for May, 1833, p. 204. I was, however, wrong there in stating that Temminck's S. hippolàis did not refer to this bird.

† For an arrangement of the British warblers, see the *Field Naturalist's Magazine* for October, 1833.

Barnes of Swindon, in Wiltshire, bears testimony to the fact of a swallow building in a bed-room regularly occupied, and upon the heel of a shoe hung up therein. The young ones were there hatched, and, according to a statement in the *Dorset Chronicle*, August 8. 1833, had not at that date left the nest. — *W. B. Clarke. Parkstone.*

On Martins and Swallows, the instances given are in Vol. V. p. 285. 735., Vol. VI. p. 32. note *, 454. 524. That, in p. 455., of swallows building, in two successive years, their nest on the crank of a bell-wire, in the passage of an inhabited house, and rearing their young there, is very remarkable. — *J. D.*

A Snow Bunting's Nest not in the Skull of an Esquimaux. (p. 154.) — Since I sent the note on this subject, I have found the original memorandum, of which I had only an imperfect recollection. As I quoted from memory, I fell into a mistake; and I beg you to allow me to correct it, though it is at the expense of the coincidence which I endeavoured to establish, too accurately, between the skulls of Tom Otter and the Esquimaux. "Captain Lyon, in his attempts to reach Repulse Bay in 1824, found some natives of Southampton Island who possessed arrow-heads and knives made of dark-coloured flint: these were found also over the grave of *a child*, on the *neck* of which a bird [the snow bunting] had built its nest. See Lyon's *Voyage*, p. 68." If these are not the words of Captain Lyon, they convey his meaning. — *W. B. Clarke. Parkstone, July*, 1833.

A Pair of Redstarts built their Nest in an inverted Flower-pot (p. 34.), at Wherstead Lodge, near Ipswich, about 4 or 5 years ago. The pot appropriated by this pair was one of the kind used in the forcing of sea-kale (*Crámbe marítima L.*); consequently their nest was, from the larger orifice in the bottom of this kind of pot, more conveniently accessible than in the instance described by Mr. Bree, in page 34. — *Henry Turner. Botanic Garden, Bury St. Edmunds, Feb.* 26. 1833.

The Robin's Confidence in Man. (p. 68.) — As an instance, additional to that described in p. 68., I may mention, that, early in 1832, a pair built their nest, and reared their young, on a pot of strawberry plants, placed to be forced in a hot-house belonging to Mr. Trevethan of this town. The pot stood at the back of the hot-house, and near the glass. The nest was so tightly fitted in and worked to the plants, that, although the pot was frequently, in all the different conditions of the nest, taken down to satisfy the curiosity of visiters, and then replaced, still its contents were not injured.

The Robin has built and hatched early in 1833. — A perfectly finished robin's nest was accidentally destroyed on January 14th, 1833; and, on the 7th of February, 1833, a nest of young robins was found in some ivy: both nests in this garden. I think these were very early. Were they not? — *Henry Turner. Botanic Garden, Bury St. Edmunds, Feb.* 27. 1833.

Plan proposed for introducing new Breeds of Birds into this Country. — Sir, The difficulty and expense attendant on bringing birds alive to this country from distant places being so great, I think the attempt to introduce the eggs in a state fit for incubation well worthy of trial. Several precautions will be found necessary. 1st, The eggs must be kept fresh, by the total exclusion of air. 2dly, The temperature must be kept uniform. 3dly, The eggs should be submitted to as little motion as possible, and the smaller end of the egg should be placed downwards. In order to succeed, I would recommend that the eggs should first be coated with gum arabic, and, when dry, with spirit varnish. The first would be sufficient, if total absence of moisture could be secured. The varnish can be removed by spirit of turpentine, without affecting the gum arabic, as the latter is not soluble in the spirit. Water will afterwards remove the gum. The eggs, when prepared, should be packed in a box of pulverised charcoal, taking care that the eggs are placed with the small end down, and not in contact with each other. The box should be kept continually with the same side up. It would, perhaps, be better if the box were suspended in the cabin. All these precautions may appear troublesome; but they are trifling, compared with the constant attention required by live birds. I have suggested this plan to the secretary of the Zoological Society; and it would afford me much pleasure to learn that a fair trial had been made. A circumstance which some years ago was mentioned gives me sanguine hopes of its success. It was, that some eggs sent to India, simply covered with a coating of gum arabic, had been hatched there with success. Should any of your readers happen to know facts of successful incubation after the eggs had been kept for considerable periods, I hope they will communicate them to the public through your Magazine, as they would materially strengthen the opinion I entertain on this subject, and perhaps induce a more extensive trial of the plan. I am, Sir, yours, &c. — *Charles M. Willich. London, Oct.* 11. 1833.

A variety of the partridge bantam, which is of a ginger colour, has legs devoid of feathers, and, from these characters, and the beauty of its proportions, is much admired, is kept,

at Bury St. Edmunds, by Mr. Hodson (see p. 140.) and by others there. I twice sent thence eggs of this variety, in the one instance packed in bran, in the other in sawdust, closely secured in a box, by stage coach, to Waterbeach, near Cambridge. The hens in reserve for sitting on them sat upon them to the hazarding of their lives, and in neither case was one egg hatched. The eggs, when sent, were fresh; and we attributed their abortion to injury possibly occasioned to their contents by the shaking incident to the mode of conveying them. Subsequently a male and female were transported thither in a basket, and thus the object desired was effected. — *J. D.*

Reptiles. — *Of the Chameleon* (*Lacérta Chamæ'leon* L.) (Vol. II. p. 469., Vol. III. p. 188. 232.) a painting or coloured drawing (perhaps not well executed) is placed, as a sign, in the window of Franklyn, silk dyer, 46. Spital Square, Spitalfields: it is a significant symbol of the changes which a dyer can effect in the colour of the objects of his art. — *J. D.*

Of the Natterjack Toad (*Bufo Rubèta* Flem.) (p. 185. 457.) I have found several specimens on Tooting Common, Surrey. — *Edward Blyth. Tooting, Surrey, Sept.* 23. 1833.

Natterjack. — Sir, In reply to an enquiry which I saw in your Magazine, some months back, about the natterjack, I may observe, that it is the common toad of this neighbourhood, being found in our gardens, by roadsides, in Greenwich Park, on Blackheath, &c.: in the last locality it is very abundant. Your correspondent may catch a dozen in an hour in any of the gravel pits with which the heath abounds. It breeds every year, in a shallow pond, just opposite the Blackheath entrance to Greenwich Park. I am, Sir, yours, &c.—*E. N. D. Sept.* 1833.

There is but one Species of Viper or Poisonous Reptile in England. It is the *Coluber Bèrus Lin.*, or more properly the *Vipera Bèrus*. The red viper of Mr. Strickland (p. 399.) is the young of it. I have just received a specimen from the Rev. Mr. Bird, agreeing in every respect with Mr. Strickland's. Mr. Bell, who is by far our best reptilist, has been good enough to examine it, and confirms this statement. If Mr. Strickland intends to describe any of the ophidians, he will, perhaps, be obliged to me for the information that the number of scuta varies with age, sex, and every casualty; the Linnæan species, therefore, unless clearly defined by other characters, are valueless. — *E. N. D. Sept.* 1833.

What are the Colour and Appearance of the Young of the Common Viper (*Vipera vulgàris* Flem.)? — I have been endeavouring all this summer (1833) to procure one, and in July succeeded, as I had thought. It now appears to me that it was

an individual of the species [red viper, *Cóluber chersèa Lin.*] described in p. 399., although it was brought to me by an old experienced viper catcher. As it was, unfortunately, in rather a putrid state, I, not suspecting that it presented more than the usual appearance of the young of the common species, after examining it in rather a cursory manner, threw it away. Its length was 9 in., and the colour and markings coincided exactly with those described of the red viper (*Cóluber chersèa L.*), by Mr. Strickland, in p. 399. It was killed in Coombe Wood, Surrey. I have been informed that

A Black Species of Viper exists in the west of England. — *Edward Blyth. Tooting, Surrey, Sept.* 23. 1833.

On the "New species of British snake, *Cóluber dumfrisiénsis*," described and figured in Vol. II. p. 458., about which I have (for the sake of bringing correlative things together) asked in Vol. VI. p. 401., a remark by the Rev. L. Guilding is lying by; which, till now, has been overlooked.

This is probably the young of *Cóluber Nàtrix* just hatched. The scales may not assume their perfect form till the casting off of the first exuviæ. — *L. Guilding. St. Vincent, May* 1. 1830.

Fishes. — *Fishes possess an audible Voice.* — Sir, That fishes have a distinct voice, *out of water*, as stated by Mr. Thompson (Vol. III. p. 147.), there can be no doubt. Thus, the herring, when first caught by the gills, and lifted out of water, has a shrill note, somewhat like that of the mouse. The gurnard will continue to grunt like a hog for a considerable time after it is caught and lies at the bottom of the boat. In early life I used to join some of my companions in fishing out at sea, with the deep-sea line, and the latter phenomenon was a very familiar one.

If my engagements, during the summer, allow me, I may send you an account of a very interesting fish, found where the inmates are remarkably tame, in connection with the tame fish we read of in ancient story, and the question whether fish, devoid as they are of external ears, do or do not hear by means of some internal auditory organ. — *J. Murray. Jan.* 20. 1833.

See Vol. V. p. 311, 312., for a notice of the sounds uttered by the *Trìgla Hirúndo, T. lỳra, T. Cùculus*, and *T. Gurnárdus*. — *J. D.*

Facts in the Habits of the Gold Fish (*Cyprinus auràtus* L.) *and Silver Fish* (*C. auràtus var.*). — Happening to be at Derby in the autumn of 1830, I then visited the show rooms of the Derbyshire Spa manufactory, belonging to Mr. Hall, where I noticed several glass globes in vases, containing gold and

silver fishes. Mr. Hall conducted me to a large marble basin or pond in his garden, containing a number of the same kind of fish. A fountain played into the basin; and, notwithstanding the undulation of the water, its surface was nearly covered with a green weed of a very fine texture, which Mr. Hall informed me he had often endeavoured to eradicate, but without success. He, therefore, suffered it to increase: and soon found the advantage of it; for it seemed to encourage the growth of a small vermilion-coloured worm, upon which the fish fed; and they in a short time afterwards spawned. Mr. Hall stated, that, at this period, he was most anxious to obtain information respecting the economy of this class of fish, so that he might promote the increase of their number in the best possible manner; but all his endeavours were fruitless, as he could not meet with, in any book or treatise, a satisfactory account of the subject; wherefore he resolved to commence studying them himself.

In watching the progress of the spawn, he discovered that the fishes not only fed upon the vermilion-coloured worms, but preyed upon their own young fry; which induced him to remove as many of the latter as he could catch, and place them in glass globes, with a small quantity of the before-mentioned weed in each. The young fish grew rapidly, but diminished in number; when, upon investigation, it was ascertained that the larger devoured the smaller of these young broods, and those only escaped who could defend themselves against the attacks of their voracious adversaries. To remedy this, he selected others, nearly equal in size, and placed them in separate glasses: after which, the fish increased in growth and strength; and there appeared no diminution, as heretofore, in their numbers. Mr. Hall collected some of the vermilion-coloured worms from the weeds in the large marble basin, and, in my presence, threw them into each of the glass globes containing gold and silver fishes about half grown: these instantly darted at the vermilion-coloured worms, and swallowed them with avidity. — *Henry Straiton. Enfield, Jan.* 31. 1833.

These facts are interesting. The addition of the generic and specific names, both of the "green weed of a very fine texture," and "the small vermilion-coloured worm," would increase the value: and these can, doubtless, be acquired by submitting a specimen of the plant and of the worm to persons versed in these objects. The plant is probably a species of *Conferva*, or of some allied genus. On the history of the introduction of the gold fish, and the variety of it, the silver fish, as also on their habits, useful information is given in

Vol. III. p. 478., in reply to a query on the subject in Vol. II. p. 102. In addition to J. T.'s (Vol. III. p. 478.) notice of the occurrence, in some individuals, of a tail differing in structure from that usual to the species, I may state, that, in the end of 1832, I saw, in an aquarium in Messrs. Loddiges's nursery, Hackney, several gold and silver fishes; and, amongst them, one (I find I have not noted the colour; but this does not matter) with a double tail-fin; that is, two fins connate, or apparently connate, at their upper edge: for these, as the fish swam, exhibited the figure of the capital V inverted. Similar instances, I have since been told, are not rare. I have heard it stated that the multiplication of gold and silver fishes is much promoted by the frequent admission of a portion of warm water into their place of residence; as had been accidentally discovered from the refuse water of a huge boiler, in use for some purpose, having been allowed to frequently pass warm into a pond in which gold and silver fishes were then kept. — *J. D.*

The Tunny (*Scómber Thýnnus* L.). — This Mediterranean fish is said to occur not unfrequently on the western coast of Scotland. The only specimen, however, which I have heard of was taken in the Gairloch, nearly opposite Greenock, in July, 1831. It had entered the lake in pursuit of herrings, got entangled among the nets, was sent by the fishermen to Glasgow, and is now deposited in the Andersonian Museum. This specimen exceeded the average size, being nine feet in length. — *John Scouler, M. D. Glasgow, July* 25. 1833.

The Bonito (*Scómber Pélamys* L.). — This tropical fish was taken in the Frith of Clyde, in July, 1832. Dr. Fleming mentions, on the authority of Mr. Stewart, that another specimen was taken in the Forth. — *Id.*

The Toothed Gilthead (Bràma *Ràii*). — This fish is not uncommon on the west coast of Scotland; at least I have seen several individuals from the Frith of Clyde and from the Argyleshire coast. This species appears to be very much annoyed by intestinal worms. In a specimen which I dissected, about eight or ten worms were found in the muscular texture. They were several inches in length, and of considerable size. Rudolphi says that it is rare to dissect a gilthead in which the white worm (Gymnorhýnchus réptans) is not found. — *Id.*

The Piper (*Trìgla lyra*). — According to Dr. Pennant this fish is frequently found on the west coast of England; while Donovan says it is very rare. It is not unfrequently to be seen in the Glasgow market, and fine specimens may be procured, measuring 2 ft. 4 in. in length, and weighing 7 lbs. — *Id. Oct.* 4. 1833.

[See, in Vol. V. p. 312., a notice of the occasional occurrence of the *Trìgla lỳra*, on the coast of Cornwall.]

The Streaked Gurnard (*Trìgla lineàta* Lin. and Cuv., T. *adriática* Fleming). — This fish occurs, though rarely, on our coasts. — *Id. July* 25. [It has been discovered on the coast of Cornwall also. See Vol. V. p. 312.]

Opah (*Lámpris guttàtus*). — A specimen of this very rare fish was taken in the Clyde, at Helensburgh, several years ago. Unfortunately there was no naturalist on the spot, and it fell into the hands of a bird preserver, who daubed it over with gold and silver leaf. It has since been deposited in the Andersonian Museum along with part of the other animals which I have enumerated. — *Id.*

Sòlea variegàta has been found at Rothsay, by Mr. Ewing. — *Id.*

Enormous Sturgeon. — There was caught in a stake net, near Findhorn, Scotland, on Tuesday, a sturgeon, 8 ft. 6 in. long, 3 ft. in circumference, and weighing 203 lbs. It was immediately packed in ice, and sent by the Brilliant steamboat to London. (*Berrow's Worcester Journal*, July 18. 1833.)

The Leptocéphalus Morrisii Pennant, taken at Slapton, near Dartmouth, Devonshire, on April 29. 1833. — Sir, One of our Slapton fishermen brought me, on Monday, the 29th of April, 1833, a small fish, to all appearance dead, which he had carried in his pocket wrapped in brown paper for three hours. After I had held it in my hand for about a minute, examining it, symptoms of life appeared, and then the little animal was placed in a tumbler of salt and water, where it survived its incarceration in brown paper for several hours. Its appearance was most pleasing, from its semi-transparent and silvery hue, and graceful motions: the prominent eye, with a pearly pupil and dark blue or black iris, was strikingly beautiful.

Upon examination, I found my little captive to be, if not an odd fish, at all events a rare one: the Leptocéphalus Morrísii, or Morris's, so named by Pennant, in the *British Zoology*, in honour of the discoverer, Mr. Morris. Mr. Pennant's figure and description are neither of them so accurate as it is to be wished they were; and therefore I shall endeavour, in this communication, to rectify them. I am no artist, and therefore cannot boast of the finish of my drawing, but I can vouch for its accuracy. (*fig.* 64.)

The Leptocéphalus belongs to the Linnæan order A'podes, being destitute of ventral fins. It is, moreover, an osseous fish, with the fins supported by cartilaginous articulations. The gill cover is concealed by the skin, which is protruded forward under the chin, as I have endeavoured to represent

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in my sketch. Mr. Pennant calls the gill opening large; to me it appears small. The head is small, but not resembling that of Mr. Pennant's figure, and straight with the line of the back. From the nose to the back of the skull is one fourth of an inch long: the eye large, prominent, and the pupil of a bright silvery or rather pearly lustre, with broad dark prussian blue iris. The body is $5\frac{1}{4}$ in. long, one eighth of an inch thick, and seven sixteenths of an inch deep from the back to the belly. It is compressed laterally in a remarkable manner; pellucid, bright, and silvery. The lateral line is straight, and decussated at acute angles by oblique striæ. The dorsal fin does not, as Mr. Pennant describes and figures it, extend the whole length of the back, but commences at $2\frac{1}{2}$ in. from the point of the nose, and unites at the tail with the anal, which latter fin commences $3\frac{3}{4}$ in. from the tip of the nose: they are both very low, and delicately thin. The pectoral fins, which were overlooked by Mr. Pennant, are minute and cartilaginous: caudal and ventral fins none. It appears to me nearly allied to the launce (Ammódytes *Tobiànus*), which abounds in our bay (Start Bay). — *Henry Vietz Deere. Higher Start House, Slapton, near Dartmouth, Devon, June 5.* 1833.

Sir, Since sending to you my communication of the 4th inst., I find, by referring to your Magazine, Vol. V. p. 313., that I have been anticipated in my figure and description of the Leptocéphalus Morrísii, in a paper by your learned ichthyological correspondent, Mr. Couch of Polperro, Cornwall; but his figure is less perfect than is desirable, as you will perceive by comparing my description and figure with the figure given in your Magazine. (*fig.* 65.) In Vol. V. p. 742., I find further remarks on this species of fish, by the same correspondent.

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He entertains no doubt of its being the Leptocéphalus Morrísii of Fleming; but thinks it sufficiently distinct from the genus Leptocéphalus of Pennant, from the discrepancies pointed out by me in my description. I have little doubt but that Pennant's fish was the same as mine; but he had not an opportunity of examining it in so recent a state as my specimen, whereby he could not discover the pectoral fin, which is so extremely minute as not readily to be detected, without close examination, even in a fresh specimen.

The inaccuracy of his figure, regarding the dorsal and ventral fins, might arise from the error of the engraver, as your figure is not much better in that respect, originating from the same cause. Your correspondent states that he possesses a specimen, with a description and figure, of another species of Pennant's genus Leptocéphalus, wanting the pectoral fin. He would much benefit his favourite science by communicating them to the scientific public through the medium of your widely circulating Magazine. On turning to p. 200. of Fleming's *British Animals*, I find that he refers to a memoir of the late Colonel Montagu concerning the fish, in the *Wernerian Memoirs*, vol. ii. p. 436. xxii. 1.— *Henry Vietz Deere. June* 7. 1833.

Molluscous Animals. — *Mýtilus polymórphus.* This curious muscle, which appears to thrive equally well in salt or fresh water, is said to be a native of the Danube, but may now be considered as a naturalised species. It was first noticed by Mr. Sowerby, who found it in the London docks: and lately it has been found in vast abundance in the Clyde and Forth canal, towards its eastern extremity; and thence plenty of living specimens have been communicated to me by my brother, Mr. A. Scouler. — *John Scouler, M. D. Glasgow, Oct.* 4. 1833.

Coleopterous Insects. — *Figures of the Six British Species of the Linnæan Genus Cicindèla.* — The names and distinguishing characteristics of them are obligingly supplied by a correspondent versed in entomology : —

Fig. 66. *a*, *C.* sylvática. Purple-black above, with three cream-coloured markings on each wing-case, of the size and shape represented in the figure. Beneath, dark metallic resplendent green. Taken on heaths in Suffolk and Surrey.

Fig. 66. *b*, *C.* marítima. Purple-brown above, with three cream-coloured markings on each wing-case, of the size and shape represented. Beneath, resplendent metallic green. Taken on the sand of the seashore on the coast of Kent, &c.; at Shellness in abundance.

Fig. 66. *c*, *C.* hýbrida. Resembles the last, except in the shape of the central mark : the difference is well shown in the figure. Taken near the seashore, Lancashire, &c. (This *is C.* hýbrida of the Linnæan cabinet.)

Fig. 66. *d*, *C.* sylvícola. Resembles the last, except in being considerably greener on the upper side. But a single British specimen is known.

Fig. 66. *e*, *C.* campéstris. Dull green above, with five or six cream-coloured spots on each wing-case. Beneath, brilliant green. A very common insect in sunny situations.

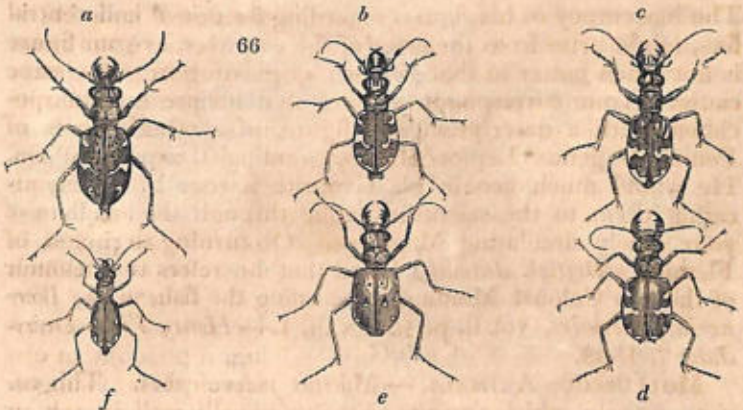


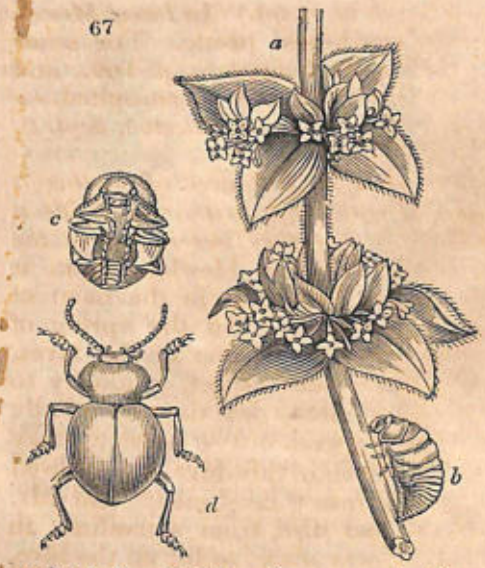
Fig. 66. *f*, *C.* germánica. Dull green above, with lateral cream-coloured spots; much smaller and narrower than the others. Taken in abundance at Blackgang Chine, in the Isle of Wight; also, occasionally, in Berkshire and Kent.

The *Cicindèlæ* are the most active and rapacious of the carnivorous beetles; they run and fly with singular ease and rapidity, and devour an amazing number of smaller insects: they are also remarkable for the brilliancy of their colours and the elegance of their shape. The Rev. Mr. Kirby has not ineptly called them the tigers of the insect race. The woodcut represents each species of its natural size. Yours, &c. — *E. N. D. Sept.* 1. 1833.

Some of the synonymes of the above species, and the name of a seventh British species, will be found in p. 554.; facts on *C.* campéstris in p. 201. — *J. D.*

The Catchweed Beetle (*Timárcha tenebricòsa*). — I have met with this beetle on Blackheath during March, and found it on Sept. 2. 1832, upon Old Oak Common, Wilsdon. A friend captured several specimens on Feb. 26. 1833, on Wimbledon Common. — *James Fennell. March*, 1833.

On the Metamorphosis of the Bloody-nosed Beetle (*Timárcha tenebricòsa* Megerle, *Chrysomèla tenebricòsa* Fabr.) — The study of botany is so closely connected with that of entomology, that it seems almost impossible to pursue the one without the other. In our search for plants in their native situations, our attention is incessantly attracted by the infinite variety of insects, feeding, sporting, lodging, &c., on them in almost every stage of existence. During rambles, which these objects of observation have rendered delightful, I have not unfrequently met with the larva of an insect, feeding on the leaves and flowers of the crosswort (*Gàlium* cruciàtum, *fig.* 67. *a*), and



the yellow ladies' bedstraw (*G. vèrum*), and have been till lately unable to ascertain its name, either from books or entomological friends. Early in June last, I collected fourteen specimens in a lane between Bolton and Thurnscoe, near Doncaster, determining, if possible, to observe their changes. The larva in question (*b*) is of an oval shape, soft, with six feet near its head, and with two prolegs at the extremity of the body, which assist it in climbing from one leaf to another. Its colour is of a deep metallic green. All, with the exception of two, which I put into spirits of wine, fed most voraciously on the cross-wort, and, at the expiration of ten days, buried themselves in some earth, which I had placed, for that purpose, in a large plant pot. In this state they continued till August 18., when I perceived a perfect beetle (*d*) emerging from the earth, which I immediately recognised to be the bloody-nosed beetle (Timárcha tenebricòsa). Upon examining the earth in the plant pot I found others in the pupa state (*c*) with the elytra only partially formed, and with the green slough attached to them; there was also a perfect beetle ready "to burst triumphant from the tomb." This, as well as the pupæ, was of the colour of Indian red; but upon immersing them in spirits of wine, they assumed the usual purple-black of the beetle, when it has been exposed some time to the atmosphere.

Respecting the habits of this insect, it may not be uninteresting to add, that Kirby and Spence, speaking of the means of defence of insects, mention that this beetle, when molested, ejects from its mouth drops of a reddish fluid, which will stain paper of an orange colour, and from which circumstance it probably derived its common appellation. (*Introd.*, vol. ii. p. 247.) They also notice the singular cushions on its feet, by the aid of which it is enabled to adhere to the trailing plants of Gàlium, on which it feeds, and by which it can support itself against gravity. (*Id.*, p. 321.) The eggs of this insect

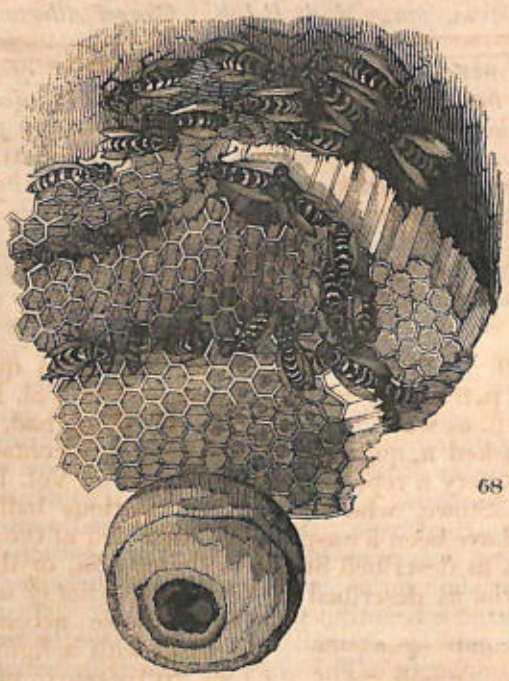
are of an orange colour. (*Id.*, vol. iii. p. 99.) In *Insect Miscellanies*, p. 8., it is called the catchweed beetle. For other particulars respecting it, Marsham's *Coleoptera*, p. 169., and Donovan's *Insects*, vol. viii. plate 276., may be consulted. — *Edward Wilson, jun., M.A. F.L.S. Chapel Allerton, Sept.* 9. 1833.

Hymenopterous Insects. — *Two Instances of finding a Nest and Individual of the Wasp Véspa británnica inside a Beehive; accompanied by the Death of the Bees in one of the Instances.* — At the residence of Thomas Hewlett, Esq., at Harrow, bees are kept, and Mr. Hewlett is in the habit of watching their motions and operations. In the spring of 1831, Mr. Hewlett observed the bees of one of the hives, which was stationed in a south-eastern aspect, gradually to decline in their usual activity, and after a few days to wholly cease their operations; although, a week or two previous, they had been in full vigour. Underneath this hive lay strewed several dead bees, in apiarian phrase "dead men," and Mr. Hewlett, imagining that they had died from starvation, an event not unusual in the spring, was about to lift up the hive, when a large wasp flew forth.* He, in consequence, desisted from lifting up the hive just then, that the marauding wasp might be watched back. It shortly returned, and re-entered the hive, and was now guarded until it again issued forth, when it was slain on its exit. On raising the hive, Mr. Hewlett discovered a beautiful globe-shaped nest depending from the honeycomb by a small stem, with three larvæ or grubs in the bottom of it. The wooden board on which the hive stood was covered with dead bees, and many dead ones were adhering to various parts of the comb, in which there was plenty of honey for the subsistence of the colony. The wasp was, in this case, not preserved; but the wasp's nest, with a portion of the honeycomb from which it depended, and the dead

* The hornet, or some species of wasp, would seem to have been a powerful enemy to the domestic bee even in Virgil's time, on the assumption that his "crabro" is, if not the *Véspa Crábro* of modern naturalists (we have, however, never heard this doubted), at least some species of *Véspa*, or wasp. His "crabro" seems to have been the most formidable of the insect enemies of bees: —

——— "Nam sæpe favos ignotus adedit
Stellio, et lucifugis congesta cubilia blattis:
Immunisque sedens aliena ad pabula fucus,
Aut asper crabro imparibus se immiscuit armis;
Aut durum tineæ genus: aut invisa Minervæ
In foribus laxos suspendit aranea casses."
Georg. iv. 242—247.

bees sticking to this portion, were; and they are now (carefully protected by a glass shade fixed over them) in the possession of Richard Whitfield, Esq., of St. Thomas's Hospital. The latter three objects are intended to be exhibited in our *fig.* 68.,



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which, owing to the engraver having deputed a person unversed in objects of natural history to take the drawing, is an uncharacteristic cut. The dead bees are rendered in the similitude of live wasps; and the wasp's nest, the primary and only essential object for exhibition, has been deemed a subordinate matter, and, as a subsequent inspection of the nest has shown us, has not had justice at all done to it. The nest is truly an elegant object. We will repeat here, from Vol. III. p. 94., the figure of that of *Vé*spa campanària, and remark that the nest in Mr. Whitfield's possession is rather a sphere flattened at the poles, than one lengthened at the poles as in *fig.* 69.; neither does its central wall protrude as in *fig.* 69. Its walls, concentric, are four, and surround four chambers. The central chamber is near an inch in diameter in its most bellied part; and the remaining chambers are each about a quarter of an inch wide; making the entire diameter of the nest nearly or about two inches. The bottom of the central chamber is occupied by three or four,

perhaps more, angular cells, formed, as it were, into a circular table set out in the middle of the chamber. The cells and walls of the chambers, that is, the whole nest, are composed of an admirable fabric resembling finely textured grey paper.

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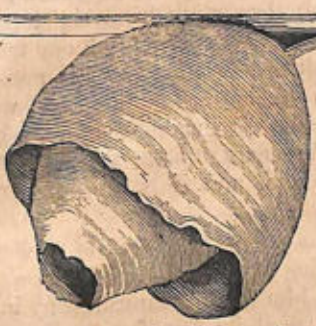

Fig. 69. is one given in illustration of a query put in Vol. III. p. 94., and which is answered in Vol. III. p. 195., and p. 476. as well. Besides this, H. Gunt had, in Vol. II. p. 404., asked a query on "a curious ball containing bees." To this query a reply is communicated in Vol. III. p. 195., by Wm. Stowe, who deems the "curious ball containing bees" to have been a wasp's nest, either that of the *V.* holsática *Fabricius*, as described in Rees's *Cyclopædia*, or that of the *V.* campanària, as described in Knapp's *Journal of a Naturalist*.

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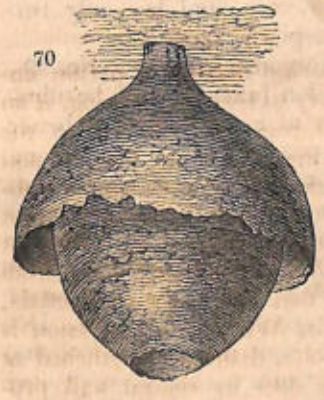

Wm. Stowe accompanies his remarks with a figure of a nest (*fig.* 70.) of one or other of these insects, which he himself had once found "adhering to the ceiling of a veranda, which was overgrown with the purple clematis" (*Clématis Viticélla L.*). This figure, in farther elucidation of this interesting subject, we also here repeat.

Mr. Hewlett did not, as has been already remarked, preserve the individual wasp by which the nest was fabricated, and which was slain on its exit from the beehive. Under these circumstances, it might be a subject of doubt what was the particular species of wasp from which the nest was derived, had not, very fortunately, a second nest, of the same kind, been this spring secured, also by Mr. Hewlett, and, with it, the wasp by which it had been constructed. The

circumstances are the following: — "On May 22. 1832," says Mr. Hewlett, "we had a swarm of bees. For some weeks previous to this an empty hive had stood on the shelf which was above the resting-place of our hive, and on removing this for the purpose of hiving the swarm, a wasp flew forth, leaving its nest depending from the top of the hive. This nest resembles, in every respect, the one taken last year, and which Mr. Whitfield has now in his possession. We watched carefully, in the hope that the wasp would return; nor were we disappointed: in about half an hour it came back, and we were fortunate enough to catch it. We soon killed it by prussic acid, and it is now in Mr. Whitfield's possession."

The wasp Mr. Whitfield has been kind enough to lend us; and, on submitting it to Mr. J. D. C. Sowerby for illustration, we solicited him to communicate any information he could respecting it; and he has favoured us with the following remarks: — "The wasp before me, represented in *fig.* 71., appears to be a large female of *V*éspa británnica which had just commenced her operations towards establishing a colony in the empty hive, in the same way that those females of the common wasp (*V*éspa vulgàris), which survive the winter, are accustomed to do in a hole in the earth. *V.* británnica is nearly as large as the *V.* vulgàris, but wants the black spots upon the joints of the abdomen, and has only two yellow spots upon the scutellum in place of four."

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In the *Penny Magazine* for November 10. 1832, No. 39., p. 317., is an interesting description (attempted to be illustrated by an ill-executed woodcut of a profile, and a better one of a section) of a wasp's nest pendent over a bog, from a branch of a willow tree. It is not stated by which species of wasp the nest had been constructed; and the writer speaks as if not aware of the existence of more than one species, as he says, "I have seen many [nests of wasps], but all, with this exception, situated in banks, walls, or the ground; but never suspended above the surface, or exposed to view." Mr. Dovaston, in "Chit-chat, No. II." p. 6. of the present Volume, pleasingly tells us, that "last summer a female wasp planted on the ceiling of the piazza of his house, and rapidly increased, her colony, who suspended their flaky ball of streaky olive papery folds close to the door; yet was no person stung or molested all the season." — *J. D.*

V*éspa campanària.* — At a friend's house at Maida Hill, I lately met with the nest of a colony of *V*éspa campanària

suspended from the roof of a balcony, and directly over the entrance to the sitting-room from the garden. These insects worked at the nest and completed it, notwithstanding it was in sight of every person in the room, it being also a common sitting-room. — *William Fowler. June* 13. 1833.

What is the Name of the Species of Wasp described below, which had built its Nest suspended from the Forks of two or three contiguous Branchlets of a Pear Tree? — That it is not the *V*espa holsática, you will see at once by the sketch of the nest that I enclose [this, and the sketch of the insect, an entomologist has pronounced to be of the *V.* holsática], drawn from a specimen I found in a pear tree in a nursery-man's grounds at Brixton. I cannot find any account of the precise species in Shaw, Kirby and Spence, Rennie, or Griffith's *Cuvier*. In the 39th number of *The Penny Magazine* there is a slight account of a nest of the same form, and which, I have no doubt, is by the same species of wasp as mine. The writer has not described the wasp, and evidently considers the nest the work of the common wasp. The wasps, however, are very different in form and markings, as you will perceive even from the imperfect drawing of a dead specimen; nor does it appear at all likely that an insect would so change its usual place of security. I regret I am too ignorant to describe the wasp scientifically; but of all those wasps, prints of which I have been able to obtain, the *V*espa holsática most nearly resembles my specimen, although the nests are so different. The nest in my possession, whose builder's name I wish to learn, offers the following dimensions: — Shape somewhat that of an inverted egg or pear. Around the centre, 19 in.; depth inside, 8 in. The comb fell out, which was 3½ in. in diameter. It adhered to the top of the nest by the whole of the upper part of the comb; not by a central pillar, as is the case in the nest of the *V*espa holsática. Part of the comb broke in two; and the lower part was, by accident, lost. All the pupas were covered with a little dome of paper, and were placed in separate circles from [those of] the maggots. The comb contained about 400 cells. The largest-sized wasp in the nest measured nearly three quarters of an inch, and very much resembled Shaw's *V*espa británnica; two palpi having one joint each, and then dividing into two branches, which had each three joints. The greater number of the wasps were of a smaller size; scarcely half an inch long. In one I observed a curious bifid tongue, covered apparently with minute spines. The antennæ of each of the pupas, before the wings were disclosed, were exceedingly long, reaching more than half the length of the pupa. After the

nest had been taken from the pear tree, the wasps commenced building another; but my pleasure in watching them was quickly stopped by an ignorant person's destroying the whole of the wasps. — *Anon. Brixton, August*, 1832.

See the notices of hanging bees' nests in Vol. II. p. 254. The late Rev. L. Guilding has, in a collection of remarks from him lying by us, the following observations : —

It is much more probable that the clay-like nests were those of the *T*érmites often found high in trees.

The Wasps of Tropical America often, too, suspend their pensile Nests from the Branches of Trees. — One now before me, in my study, is bigger than my head, and contains many firmly built chambers communicating by a hole running up the side. Though constructed of paper mortar, they are very hard. Some idea may be formed of these *natural hives*, from the 50th plate of Leach's *Zoological Miscellany*, vol. i., which represents the small nest * of *V*éspa británnica. In the tropics, these little hives are formed by various genera, and vary much in form and solidity: sometimes they are flat, having all the cells on one side, perfectly exposed. I have seen small wild honey-making bees sent from Tobago. They were put into a square box covered with glass, and lodged their honey in rude waxen cells, like our English humming bees. I fear they did not thrive, as they were evidently much troubled by the necessity of blocking up their doorway with wax, to keep out the intrusive ants.— *Lansdown Guilding. St. Vincent, May* 1. 1830.

On " A curious Ball containing Bees," described in Vol. II. p. 404, 405., Mr. Guilding offers, also, this remark : —

It was probably the nest of *V*éspa británnica figured by Leach in his *Zoological Miscellany*. Here I have seen bees make use of the ovate clay nests, built by vespoid insects. — *L. Guilding. St. Vincent, May* 1. 1830.

[On pendulous nests of wasps see also the *Field Naturalist's Magazine* for October, p. 447—449.]

Lepidopterous Insects. — *Singular Variety of Hypercómpa domínula.* (*fig.* 72.) — Sir, I send herewith a very extraordinary variety of the scarlet tiger moth (Hypercómpa domínula *Stephens*), which has been forwarded to me by Mr. Weaver of Birmingham; who informs me that it was taken, along with other specimens with the usual markings, near Whittlesea Mere, by Mr. Brown of Peterborough. The upper wings are entirely of a dark glossy metallic green, resembling almost the

* *Apiarium* is the old term applied to bee-stands: *alveare* may be confined to the *artificial* hive; while *alveus* may designate those bodies formed by bees and wasps themselves from their own resources.

beautifully changeable tints exhibited on the feathers of a magpie's tail, and differing but slightly in colour from the groundwork of the same wings in ordinary specimens; but, in the place of the usual cream-coloured markings, the primary wings are ornamented with corresponding obscure irregular black blotches, of a darker hue than the rest of the surface. The inferior wings are black, with an irregular red mark towards the centre of each, and a tinge of the same colour towards the base. These two wings are not uniform, the red mark both in the centre and at the base predominating far more widely on the left than on the right side. The body is red, with a black stripe down the middle; the last two segments of the abdomen and the anus are black. It is a large specimen, the wings expanding full 2¼ in. To those who take pleasure in contemplating nature's frolics, the present variety cannot but prove interesting. I am, Sir, yours, &c. — *W. T. Bree. Allesley Rectory, June* 13. 1833.

Glæ`a rubigínea at Bromsgrove, Worcestershire. — Some years since, I captured there a remarkably fine specimen of this insect, which is now in the collection of J. C. Dale, Esq., as a small return for numerous entomological favours. — *Francis Orpen Morris. Charmouth, Dorset, Sept.* 1832.

Corrections and Additions to the List of "Butterflies which occur around Pontnewydd Works, Monmouthshire." (p. 224—228.) — To render my list of butterflies complete, I must plead guilty to the necessity of many of Mr. Bree's remarks (p. 375—376.). The English name of clouded yellow [p. 375.] must be substituted, in p. 224., for clouded sulphur. The latter is not in this locality; and, I believe, is reckoned as an English fly, upon doubtful authority. My Melitæ`a Dictýnna, in p. 225., is certainly a mistake; and I now beg to substitute for it M. Silène: and I cannot refrain from adverting to the exact and beautiful representation of it, as given in Wood's *Index Entomologicus*, plate iii. fig. 3. undersides. Polyómmatus Aléxis [p. 376.] I did not give, because I was not perfectly certain of its existence here; though I have every reason to believe that it is common. The figures in Wood's *Index* do not exactly agree with the fly which I take to be the P. Aléxis; and, unfortunately, he does not give the

underside: a deficiency greatly to be lamented, for it is very difficult to make out the different species of butterflies without an examination of the undersides. For what I have denominated Hespèria cómma [in p. 227. No. 32.] the reader will please to substitute Pámphil*a*? Sylvànus.

Now for my additions. I have, in p. 227., said that Hespèria málvæ (Thýmel*e* alvèolus *Wood*) was so scarce that I never captured but one specimen. Knowing, however, by this one specimen, that it was in my neighbourhood, I could not account for its rarity; and was, therefore, determined to make diligent search for its haunts. In the most delightful afternoon of May 18. 1833, I took a ramble through my usual butterfly ground, in order to observe what was going forward. I was unexpectedly gratified to find Hespèria Tàg*es* and Melitæ*a* A'rtemis in great abundance. I also saw a fine specimen of Sèsia *f*ucifórmis; and, as far as I could judge by seeing a fly only on the wing, Thècl*a* rùbi. As this last was a new discovery, I was continually on the look-out for it, but unsuccessfully; and of Hespèria Tàg*es* I only captured two specimens before the 4th of June. On that day (June 4.) I determined to take a walk over our mountain, to the valley where I captured the Argýnn*es* (Aglài*a*, Adíppe), in order to look out for something new, and also for the purpose of ascertaining whether the meadow of the mountain produced Eleócharis aciculàris or not. The day was beautifully fine, and the mountain air invigorating; the grass beneath my feet was thickly interwoven with the beautifully white blossoms of *G*àlium pusíllum; and the cottony tips of Erióphorum vaginàtum bent gracefully before the breeze. I am not perfectly certain that I procured specimens of Eleócharis aciculàris; but I think I did. I thus spent the morning; without fully accomplishing my wishes, but enjoying the circuitous flights of the lapwing, which frequently led me considerably astray, in a fruitless endeavour to discover its nest; or admiring the shuffling of the grouse through the heath, in her anxious endeavours to lead me away from her location. This passed the morning, until I found myself by the side of an old ruin, at the confluence of two mountain rills, the murmuring of whose pellucid waters had often before ministered to the increase of my enjoyment of the sunshine and the shade, as I have whiled away an hour in listlessness after several hours' fagging after butterflies. I know of no place more delightful among the mountains for lunching: I always make it such. The stream gurgles along through its stony bottom in a continuous murmur, whilst its precipitous banks are fringed and adorned with various spe-

cies of ferns; among the host of which, *Polypòdium Dryópteris* ranks as my favourite. The other brook winds its way through a steep but grassy valley; and, when it has joined the former torrent, it immediately conceals itself in a wood, which stretches from the mountain top to its very base. Before me, hill rose beyond hill in every fantastic shape; whilst, here and there, glimpses of rich mountain pasture burst upon the sight; surrounded on all sides by copses, and gracefully ornamented with beech. I have sometimes almost fancied that I could be poetical in such a spot: I have generally been tempted to spend too long a time there. On this occasion, after satisfying my eating propensities, I was up and doing; and was gratified to find, in the little mountain pastures before described, Hespèria málvæ in great profusion; but, as it was late in the season, my specimens were not good. In mounting the hill, on my return, I found a solitary specimen of Scabiòsa columbària *L.*, which, I find, Smith, in his *English Flora*, vol. i. p. 195., has described as "rare in Scotland and mountainous countries." Now, it is in the little valleys among the mountains that I find it solely; and, in the valley I have just been describing, in the greatest profusion. By the time I had reached the descent, at the opposite side of the hill, I had obtained a view of my own valley and house, stretched out far beneath my feet: I had begun to grow tired, and was not altogether satisfied with my day's work. As I was descending, a butterfly passed me; and, fancying it to be a new species, I called to one of my junior companions to pursue it. He followed it for a considerable distance into a rather extensive bog. Here, instead of the butterfly, something in the grass attracted his attention; of which he soon let me know, by shouting, with all his might, "Pinguicula!" I had walked over almost every bog in my neighbourhood before, in the expectation of finding the plant, and had given up the search as useless. Here, however, I found it (P. vulgàris), gemming the grass with its rich blossoms, in great profusion. By the time I had set a few specimens in my collecting-book, I found that my companions had grown impatient, and decamped, and had left me alone to my musings. As I was very listlessly dragging on after them, by a hedgerow of stunted beech, I was attracted by two small black moths, as I took them to be, that were pursuing each other through the foliage of the trees in endless mazes. As the finding of the pinguicula, so unexpectedly, had somewhat inspirited me, I immediately gave a shout, which arrested the progress of my companions, and brought two of them back to my assistance.

Before they arrived, however, I had captured two specimens of Thècl*a* rùbi; and before we left the place, which we did in about fifteen minutes, we had captured thirty. They appear to partake of the pugnacious habits of the other Thèclæ, particularly T. quércus; they are constantly pursuing each other through the trees, by which means their beauty is soon destroyed. They are, however, very easy of capture; for, when once they alight on the foliage, they may be approached very closely without being disturbed. Since this time, I have captured a few specimens of Polyómmatus I'carus, and one solitary specimen of P. Agéstis: thus making an addition of four species to my former list in p. 224—228.; namely, Thècl*a* rùbi, green hairstreak; Polyómmatus Aléxis, common blue; P. I'carus, black-bordered blue; and P. Agéstis, brown Argus. — *C. Conway. Sept.* 23. 1833.

P. S. Mr. Bree, if I understand his remarks aright, gives, in p. 376., P. I'carus and P. Aléxis as the same butterfly: Wood gives figures of both as different.

Polyómmatus Argìolus I took a specimen of, last August, at about a mile from this town, on the banks of the canal, and near orchards. — *L. E. Reed. Tiverton, March* 13. 1833.

Dipterous Insects. — *Congregations of Gnats or other Insects mistaken for Clouds.* — In Dr. Forster's *Encyclopædia of Natural Phenomena*, part i., containing the prognostics of the weather (p. 68.), there is the following account of a remarkable vapour that was seen to ascend from an elm tree at Clapton: — "On Sunday evening, August 11. 1805, I observed a very unusual exhalation from an elm tree at Clapton, in the parish of Hackney, the particulars of which are as follow: — Between six and seven o'clock in the afternoon, while sitting at tea, the sky being clear and the weather warm, and the wind south-east, we observed a column of darkish vapour, which appeared to arise from the top of an elm tree at some distance: it looked about two or three feet high. After it had continued a few seconds, it disappeared; and, after a few seconds more, re-appeared, and continued in this manner, on and off, for nearly half an hour, when it became too dark to distinguish it any longer. More particulars may be found in the *Gentleman's Magazine* for 1805, p. 816." Having more than once witnessed a similar appearance, and probably under circumstances more favourable than those under which the observer saw the one in question, which he has described with such minute and laudable fidelity, I have no hesitation in stating that this was not a vapour, but a vast assemblage of gnats, which, when seen at a distance, very

much resembles thin smoke or vapour, and the disappearance and reappearance were obviously caused by the wind's gently wafting them [or by their own voluntary dancing] "on and off" the spot where they were enjoying their aerial gambols. The first time I witnessed an appearance of this sort was on a still summer's evening in July; and, until I approached the spot, I felt sure it was vapour or thin smoke, which the stillness of the evening had rendered nearly stationary; but a close examination (which I was able to make) disclosed the fact. Kirby and Spence, in their *Entomology*, vol. i. p. 113., mention a similar appearance over the cathedral at Salisbury; and so strongly were the good folks of Sarum impressed with the idea that it was smoke, that fears were entertained for the safety of that celebrated structure. An appearance of this description was in Spenser's mind when he wrote the familiar stanza beginning "As when a swarme of gnats," &c. [See the relative part of this stanza quoted at length, Vol. V. p. 206.] Dr. Forster's *Encyclopædia* is an exceedingly useful and entertaining volume, and a recollection that it is recommended by you as such, has induced me to trouble you with these few remarks. Your constant reader, — *O. Clapton, March*, 1832.

Countless Numbers of Flies or Gnats dancing in a partly perpendicular Column. — In a walk, at eight o'clock in the fine evening of Sunday, July 14. 1833, in Kensington Gardens, I and two companions were induced to look up into the air by a humming noise produced over our heads; when, to our surprise, we beheld a column of flies or gnats, of 2 ft. or 3 ft. in diameter and about 20 ft. high. The upper portion of the column was curved to the east; and the whole column was, in consequence, of the form of the letter J inverted: the gnats in every part of the column were in most lively motion. I have said flies or gnats; for the lowest end of the column was beyond my reach, so that I could not obtain any by which to learn what they were: but flies are, I believe, rarely on the wing so late in any number. — *J. D.*

A Gnat observed to be fighting its Shadow. — My son observed, the other evening, a gnat, with speckled wings, fighting with its shadow upon the wall; and, as he moved the candle, the gnat followed the shadow. I have not been able to repeat this observation; but, if it could be frequently made, it might do much towards illustrating some points connected with the sight of these small animals. — *J. D. C. Sowerby. May* 27. 1833.

PLANTS. — *The Rarer Plants of the Neighbourhood of Wimborne; with Two Species found in Melcombe Park, and Four in the Isle of Purbeck.* — Sir, My time is generally too fully

occupied in my professional duties, to afford me much opportunity of prosecuting, as I wish, the study of natural history. I have, however, paid some attention to botany, and send you a list of the plants I have more rarely met with.

Those found within six miles of Wimborne are the following: —

Campánula *h*ederàcea	*Hyoscỳamus* nìger	*O'*xalis Acetosélla
Chrysosplènium oppositifòlium	*Hypéricum Androsæ'*mum	Pinguícula lusitánica
Dáphne Laurèola	*Leucòjum* æstìvum	*Ranúnculus* auricomus
Galánthus nivàlis	*Lysimàchia* vulgàris	Língua
Galeóbdolon lùteum	*Menyánthes* trifoliàta	Scutellària galericulàta
Genísta ánglica	*Nymphæ'a* álba	mìnor
Gentiàna Amarélla	*O'*rchis bifòlia	*Vinca* màjor, perfectly wild?
Helléborus víridis	*Orobánche* elàtior	

The two species found in hazel woods in Melcombe Park, whilst on a visit in the neighbourhood, are: —

Lathræ'a Squamària and Pàris quadrifòlia.

The rarer of those which I have collected in the Isle of Purbeck, are: —

Campánula Trachèlium	Sanguisórba officinàlis
Gentiàna Pneumonánthe	*Vaccínium* Myrtíllus.

From Smith's remarks on the habitats of Sanguisórba officinàlis, in his *English Flora*, vol. i. p. 218., it seems that this plant is seldom met with so far south. I am, Sir, yours, &c. — *John R. Rowe. Wimborne, Dorset, Sept.* 5. 1831.

In addition to the remarks on plants, which I have previously sent you, I would now communicate the following: —

On Leigh Common, about a mile hence, I have found the *Viola* palústris; and in a moist wood, about a mile to the north of Corfe Castle, in Purbeck, the Sanguisórba officinàlis; in the botanical works I have seen, these plants are said to be confined chiefly to the northern counties, and no such southern habitats given. I have found, in this neighbourhood,

White Varieties of the following Plants: — *Málva* sylvéstris, *Scílla* nùtans, *Erìca Tétralix*, *Erìca* cinèrea, *Ajuga* réptans, *Geránium Robertiànum*, Pediculàris sylvática, *Cichòrium Intybus*, Scabiòsa arvénsis, Erythræ'a Centaúrium.

Prunélla *vulgàris, of a pale Rose Colour*, prevails much in our chalky districts.

Cotylèdon Umbilìcus is very common on many hedge banks in this neighbourhood. I have seen, this season, some particularly luxuriant specimens in a hedge bank with a southern aspect; a great proportion of the plants were from 1½ ft. to 2 ft. high. The habitats given in our floras would not lead me to expect to meet with it in those situations in which with

us it so much prevails. Withering gives, as its places of growth, "old walls, roofs, and moist rocks;" Salisbury, "old walls;" Loudon, "shady rocks;" Smith, "on moist dripping rocks, and old walls in mountainous countries;" Lindley, the same as Smith; Hooker, "rocks, walls, and old buildings, especially in subalpine countries." — *John R. Rowe. Wimborne, July* 26. 1832.

The mention of the Isle of Purbeck prompts us to recommend our correspondent to search for the Rhynchóspora fúsca (*Schœ'nus fúscus Linn.*), which, according to a specimen in the herbarium of the Rev. H. Hasted, A.M., Bury St. Edmunds, was originally gathered *near* the Isle of Purbeck, by the Rev. Mr. Lightfoot. (See Smith's *English Flora*, vol. i. p. 53.) The only two additional habitats registered of this rare native are, "On Cromlyn Bog, near Swansea," where it was found by Mr. E. Forster; and "Near Killarney, Ireland," discovered there growing in bogs by Mr. J. T. Mackay, curator of the College Botanic Garden, Dublin. See this last gentleman's communication, in the *Gardener's Magazine*, vol. vii. p. 229, 230. — *J. D.*

Scabiòsa arvénsis L., *an entire-leaved Variety of, and a white-flowered Variety of.* — A correspondent, T. H., London, sent us, on Dec. 10. 1832, a specimen of S. arvénsis in its usual state (that is, with the radical leaves merely serrated, and successively increasing in dividedness, until the upper of the stem leaves are deeply pinnatifid), accompanied by another specimen, whose stem leaves, fourteen in number, are all undivided, and even their marginal serratures are small and inobvious. Both specimens were gathered in September, 1832, in an unfrequented coppice, at Hove, near Brighton, where, T. H. remarks, that he found several specimens of the entire-leaved variety. This fact deserves mention; for Smith, in *English Flora*, vol. i. p. 195., observes of S. arvénsis: — "Whole plant hairy; reported to be sometimes smooth, with all the leaves undivided; but this has not been seen in England." Here we have a variety, with entire stem leaves, found in England, although these leaves are not also smooth; for they, and the stem, and the peduncle, are as hairy as are all these parts in the S. arvénsis itself. In the *English Flora*, it is not stated that plants of Scabiòsa arvénsis are occasionally met with bearing only white flowers; or rather whitish flowers, for all the blossoms which I have seen have shown a tinge of flesh-colour on the white. Mr. Rowe enlists this variety in his above catalogue of white-flowered varieties of plants, found about Wimborne, Dorset. The Rev. George Reading Leathes dug up, several years ago, a wild plant of it, and gave it to the

botanic garden at Bury St. Edmunds, where the transplanted individual, or its root-borne progeny, has (until lately at least, but most probably still) flourished, and annually borne whitish (white, if you will) blossoms ever since. In July, 1832, I stubbed up, and transferred to a garden, part of the root of a plant of this variety, then very prettily in blossom, in a land of barley, green, spiked, and waving playfully, as if shrinking from the greeting kiss of every passing breeze. This plant was growing a few yards east of the road to Ely, at 2½ miles' distance from the town of Cambridge.

Smith, in his *English Flora*, vol. i. p. 195., ascribes an interesting property to the usually coloured blossoms of S. arvénsis, in these words: — "Flowers large and handsome, of a fine pale purple; changing to a most beautiful green, if held for a few minutes over the smoke of tobacco." This ascription is very true, as I have more than once proved. Some reader, who may be a chemist, will possibly, at his leisure, communicate an explanation of the process of this change. — *J. D.*

*Sphæ`ria fraxínea.* — In Vol. II. p. 171. is a communication from Electricus, respecting some phenomena attending Sphæ`ria *fraxínea*. This plant, which is the Hypóxylon concéntricum of Greville's *Cryptogamic Flora*, t. 324., but afterwards, in his *Synopsis Generum et Specierum*, p. 24., called Sphæ`ria concéntrica, is tolerably frequent, but not common, in this neighbourhood. I last year obtained several specimens; and, although I then observed the phenomenon alluded to, I did not make any particular remarks upon the subject; but on Saturday evening last I brought home two specimens, and placed them on the mantel-piece, and on the following morning they were covered and surrounded by the black powder, as correctly described by Electricus (Vol. II. p. 172.). I immediately placed some of it under the microscope, and at once determined it to be the seeds of the plant. It appeared, when highly magnified, to be composed of numerous rather long egg-shaped bodies, as figured by Dr. Greville in his *Cryptogamic Flora*, tab. 324. What electricity may have to do with the matter I cannot tell, this being a subject I am not sufficiently acquainted with; but it seems to me a mode of dispersing the seeds rather singular, though not more so than in many other cryptogamous plants. Look at the Trichiæ, which at first I had much difficulty in believing not to be animated; and at Sphæróbolus stellàtus, which projects its seeds to the distance of six or eight inches. I have only to say, that my plants of Sphæ`ria concéntrica have exhibited the same appearance every morning since I had them; and the

reason why there is *no powder* (*seeds*) *underneath* is, I pres
because in its natural state *that part is fixed to the tree, and
sequently no seeds can issue from it there.* The powder begi
be visible about seven o'clock in the evening. The fol
ing names all belong to this one species : — Peripherós
concéntricum, Gray's *Nat. Arr.*, p. 513.; Stromatosph
concéntrica, Greville's *Flor. Edin.*, p. 355.; Hypóxylon con
tricum, Greville's *Cryp. Flor.*, tab. 324.; Sphæ'ria concént
Greville's *Synopsis*, p. 24.; Stromatosphæ'ria concéntrica,
cyclopædia of Plants, No. 16360.; Sphæ'ria concéntrica, *E
clopædia of Plants*, No. 16425. Are these two last the s
plant? [They are.] I am, Sir, yours, &c. — *Daniel S
Bungay, July* 12. 1832.

P. S. — Since the above was written, I find that it is not
of a night that the seeds are emitted; for during the whol
yesterday (Wednesday) the seeds were issuing from
plants; at noon were distinctly visible; and this morn
(Thursday), the quantity of powder (seeds) is consider
larger, and extends to a greater distance (two inches) f
the plants. — *D. S.*

*The best Way to obtain a View of the Circulation of the
in Chàra vulgàris* (Vol. V. p. 349.) is as follows : — Ru
piece of the plant gently with a wet bit of leather, which
rub off some of the incrustation of dirt and lime with wh
this plant is usually invested, and which renders it opa
and injures it very much as a microscopic object : the rubb
will render it sufficiently transparent. A piece of the p
about a half or three quarters of an inch long should the
put between two pieces of glass, with a little water, but w
out being pressed so as to bruise the plant. I think a h
power is best, as no light is then seen but what comes thro
the stem of the plant. If the plant is pretty free from dirt,
sap will be seen ascending along the middle of the stem,
descending at the side. It has much the same appearanc
the circulation of the blood, but the globules are much fe
in number, and larger. It may be found rather difficult
first, to obtain a good view of it, but it well repays the trou
attending it. See Vol. V. p. 349. of this Magazine for a
ther account of it.

I would here just observe that I do not know of any
Animal which shows the Circulation of the Blood so well
very young newt. It is best seen in its tail, which is m
more transparent than that of the tadpole, and it has a m
greater number of veins and arteries in the same space, wh
much increases the beauty of the spectacle. — *E. T. S. Sep*
1833.

MISCELLANEOUS INTELLIGENCE.

Art. I. *Retrospective Criticism.*

Mr. Audubon and his Work, the "Biography of Birds:" Mr. Swainson in Reply to Mr. Waterton. — Sir, My name having been introduced, very unnecessarily, in your last Number (p. 464.), I am called upon to rectify the misstatement, no doubt unintentional, of Mr. Ord. In reply to the questions and enquiries of that gentleman, regarding the assistance it was expected I should have given to my friend Mr. Audubon, in the *scientific* details of his work, my reply was, that the negotiation had been broken off from an unwillingness that my name should be printed in the titlepage. I was not asked to write the work, nor did Mr. Audubon "insist upon his own name being given to the world as the author" of such parts as he wished me to undertake.

The query in p. 466. [on the style of language in the original manuscripts] may be briefly answered. I have read Mr. Audubon's original manuscripts, and I have read Mr. Waterton's original manuscripts; and both before they were published. I think the English of one is as good as the English of the other: but here the comparison ceases.

What all this has to do with a question regarding the smell of vultures, I must leave your readers to find out. Yours, &c. — *W. Swainson. Sept.* 17. 1833.

Mr. Audubon and his Work, the "Biography of Birds:" Mr. Audubon, jun., in Reply to Mr. Waterton. — Sir, Having left Mr. Swainson to correct the misstatement of Mr. Ord, permit me to make a few remarks on the rest of Mr. Waterton's attacks [reply to myself and R. B.] in your last Number (p. 464.).

Mr. Waterton deems it "somewhat singular" that I should complain of his attacks on my father, when I have taken no notice of the "momentous charge" brought by Dr. Jones against Mr. Audubon. Let us look for a moment to the manner in which this charge is made. The following extract is a fair specimen; those of your readers who admire such writing will find more of the same sort in the publication quoted by Mr. Waterton [the *Franklin Journal*]. The writer alludes to a paper, by Mr. Audubon, on the habits of the rattlesnake: —

"It is a tissue of the grossest falsehoods ever attempted to

be palmed upon the credulity of mankind; and it is a pity that anything like countenance should be given to it, by re-publishing it in a respectable journal. The romances of Audubon rival those of Munchausen, Mandeville, or even of Mendez de Pinto, *in the total want of truth*, however short they may fall of them in the amusement they afford ! ! ! " Will Mr. Waterton say *how such an article* can be answered?

As, however, some persons may credit Mr. Waterton and this anonymous calumniator, the following corroboration of the fact that rattlesnakes feed on squirrels confirms all that my father has said on this subject: —

" When Lieut. Swift, of our army, was engaged on a survey in Florida, in 1826, his attention was suddenly called to a group of his men, within about 100 ft. from where he stood. They had just killed a snake, which the men assured him they had seen seize a grey squirrel on the limb of a tree, about 15 ft. from the ground, and fall to the earth with it. When Lieut. Swift had arrived at the place, the snake was already killed, and much mangled. He did not examine it for the rattle; but his Florida hunters, who are as familiar with the appearance of the rattlesnake as we are with that of the chicken, told him that it was a rattlesnake." (*Featherstonehaugh's Journal*, Philadelphia, Nov. 1831.)

We will now see the reason why Mr. Audubon's first scientific honours were received in Liverpool rather than in America.

" Some of the friends of Wilson did not view with the most cordial spirit those evidences of transcendent merit which others willingly accorded to Audubon's drawings. Then arose the spirit of party, and with it malevolence. A few small minds, who knew little or nothing of nature, and who had officiously intruded themselves into this matter, endeavoured to make up for their want of knowledge on the subject, by excess of bad zeal. Opinions were industriously circulated, that Audubon had, in many instances, attempted to impose upon the credulity of the world, by inventing stories which had no foundation in truth, because they were contrary to the known habits of the animals they concerned; as if the habits of the animals of this vast continent could possibly be known to any other class of men, but that adventurous one, which, like Audubon, had passed their whole lives in observing them." (*Featherstonehaugh's Journal*, April, 1832.)

This bad feeling, like all others, whether on this or on the other side of the Atlantic, triumphed but a short time; for " The American Philosophical Society, Philadelphia, at a full meeting of its most respectable members, disregarding the

calumnies yet assiduously circulated by a few, elected him (Mr. Audubon) an associate, and subscribed for a copy of his magnificent work; and the society from which he had formerly been rejected paid him the same tribute of respect." (*Featherstonehaugh's Journal*, p. 461.)

Mr. Waterton will understand whether or not my father enjoys "fair fame" in America, by the following fact: — The government of the United States furnished Mr. Audubon with a vessel, in which, and with the boats and crew to assist him, he explored the Floridas, the Keys and Tortugas Islands, in the winter and spring of 1832. Mr. Waterton may further expand his mind on this subject, if he likes, by looking at American papers.

I think every one of your readers will join me in believing that my father is much better employed for the interests of science, in exploring Labrador, than in bestowing a thought upon his envious detractors.

Allow me a few words more, after returning my thanks to R. B. for his interest [p. 369—372.] in my father's good name.

Who was really the scientific assistant of my father, he has himself declared in his first volume: — "I feel pleasure in here acknowledging the assistance which I have received from a friend, Mr. William Macgillivray, who, being possessed of a liberal education, and a strong taste for the study of the natural sciences, has aided me, not in drawing the figures of my illustrations, nor in writing the book now in your hand, although fully competent for both tasks, but in completing the scientific details, and smoothing down the asperities of my ornithological biographies." (*Introduction*, p. 18.)

Ignorant of the science of natural history myself, I have enquired among the eminent scientific naturalists of the metropolis what Mr. Waterton has done to entitle him to assume the office of censor general; but the answers I have received are somewhat unsatisfactory. He has written, it seems, an amusing book; but whether of facts, or of fables, is differently believed. In this book he calls the American birds by their Indian names, being obviously unacquainted with those they have received from Buffon and Linnæus, so that what little information he gives of their manners is positively useless, until he publishes an Indian vocabulary. Finally, Mr. Waterton, professing to be learned in the ornithology of America, very complacently tells us (p. 163.) that "Azara is totally unknown" to him!

This, for an American ornithologist, is like an astronomer asking who was Sir Isaac Newton? Mr. Waterton, by this single admission, proclaims his own degree of intelligence: even I can inform this "learned Theban," that Azara, for

several years, explored the forests of South America, published four volumes, which have gone through three editions, on their natural history, described the habits and manners of the birds, gives us their Indian and their scientific names (although he affects, like Mr. Waterton, to despise system), and is, in short, the very first authority on these matters. Yet this is the author whose name even, setting aside his works, Mr. Waterton tells us, is "totally unknown" to him! I am, Sir, yours, &c. — *V. G. Audubon.* 121. *Great Portland Street, Sept.* 19. 1833.

[*Mr. Curtis in Reply to Mr. Babington's Defence of Mr. Stephens.*]—Sir, Mr. Babington having challenged me [in p. 437, 438.] to point out any part of Mr. Stephens's *Nomenclature* which is column after column like my *Guide*, I feel called upon to trouble you with a word or two on the subject. I will thank Mr. Babington to turn to Mr. Stephens's *old Nomenclature*, page 31., where, in the centre column, he will find "Ichneumon Auct. (105)," then to my *Guide*, column 76., and to Mr. Stephens's *new Nomenclature*, column 131. and the five following, and then compare the three, and I think neither Mr. Babington nor any impartial man will shut his eyes to the truth. But, Sir, this is not my ground of complaint; it is Mr. Stephens's copying the "plan and style" of my work so completely, that no one could, without considerable attention, ascertain that his new *Nomenclature* was not a reprint of my *Guide*: I therefore maintain that he has been cutting the grass under my feet. When I began the *Guide*, an idea struck me of having the columns printed alternately on opposite pages, which would render every copy equally useful for forming labels, and at the same time leave spaces for additions and memorandums; on this plan *no work* was ever before printed, and it gave my *Guide*, *primâ facie*, an appearance that distinguished it from all other catalogues; the genera also were printed in capitals, and numbered, as well as the species: in all these respects our works widely differed in the first instance; but not so now. Some idea of the plans of the several works may be formed from the following statement: —

Mr. Stephens's *old Nomenclature*. — Size 12*mo*. Columns *three* in each page. Genera in *small* type. Genera and species *without numbers*.

Mr. Curtis's *Guide*. — Size 8*vo*. Columns *two* in each page. Genera in *capitals*. Genera and species *numbered*.

Mr. Stephens's *new Nomenclature*. — Size 8*vo*. Columns *two* in each page. Genera in *capitals*. Genera and species *numbered*.

A portion of this may be further illustrated by following

Mr. Babington's plan of giving a tabular view of the three works.

Mr. S.'s *old* Nomenclature.	Mr. Curtis's *Guide.*	Mr. S.'s *new* Nomenclature.
Cicindela Auct.	10 CICINDELA. 1.	1. CICINDELA *Auct.*
sylvatica Lin.	1 sylvatica L.	1 sylvatica *Lin.*
hybrida Lin.	2 Sylvicola 1.	2 maritima *Dej.*
riparia Meg.	3 hybrida L.	hybrida *Lin.?*
aprica mihi.	riparia Ste.	3 aprica *Ste.*
sylvicola Meg.	aprica Ste.	hybrida *Dej.?*
campestris Lin.	4 maritima Dej.	(4 riparia *Meg.*)
germanica Lin.	5 campestris L.	5 Sylvicola *Meg.*
	6 germanica L.	6 campestris *Lin.*
		7 germanica *Lin.*

The novel plan of alternate columns, above alluded to, cannot, unfortunately, be shown in this comparison, although that is a very important feature. I shall now merely ask, which of the two columns bears the greatest resemblance in "plan and style?" and I think I may add, that every honourable man will acknowledge I have good cause for complaint, and am fully justified in the observations I made in a recent number of the *British Entomology* [p. 461.]. I am, Sir, yours, &c. — *John Curtis.* 57. *Upper Charlotte Street, Fitzroy Square, Sept.* 16. 1833.

Mr. Dale in Rebutment of Mr. Babington's Remarks, in p. 437, 438., *on Mr. Curtis.*— At p. 437., Mr. Babington accuses Mr. Curtis of publishing "what appears to" *him* "a most unjustifiable attack on Mr. Stephens," and asks "in what do the copy and correction consist?" and then says "he cannot find them." I will only request him to look again, and, for fear of mistake, I will point out columns 131, 132, 133, and 134., to the end of his first Part, which appears *to me* like a copy; and for corrections let him compare the genera 18. 55. 203. 260. 420. 629., and many others, of which no acknowledgment is given; and as, in "the plan of the two works there is certainly a resemblance," I think Mr. Curtis is quite justified in the step he has taken. — *J. C. Dale. Sept.* 1833.

Mr. Waterton's Plan of Preserving Specimens of Natural Objects from the Ravages of Insects, by imbuing them with the Poisonous Solution of Corrosive Sublimate in Alcohol. (V. 683. VI. 90.) — Sir, It is now some time since I was recommended by Mr. Waterton to make use of a solution of corrosive sublimate (hydrarg. oxymur.) in alcohol, to prevent the destructive effects of moths in my collection of British birds. I found the plan perfectly efficient, and I now invariably wash every fresh specimen before placing it among the others. The expense of the spirit is the only objection, and, no doubt, the true cause of its not being more generally adopted. Having suffered much from

the ravages of *Acari*, in my entomological cabinet, it struck me that the same solution I had in use for the birds might be applied to the insects. My fear was, that the extremely beautiful and delicate colours on the wings of various butterflies and moths might be wholly or partially destroyed. This fear, however, I find, is groundless, as the finest colours remain uninjured by the application. It is, however, highly necessary to be cautious in the strength of the solution that is used. As a general rule, one drachm of the sublimate, in fine powder, is sufficient for a pint of alcohol. To prove that it is the proper strength for use, Mr. Waterton's plan will be found very valuable. Dip a fine black feather into the solution, let it dry, then observe if there be any white appearance left on the feather; if there be, the sublimate is in excess, and more spirit must be added. This test should be repeated until no white appearance remains on the feather, and it retains its black glossy appearance. The best and easiest way of applying the solution to insects is to immerse them entirely in it for a second or two, holding them by the pin, and then dry them in a current of air. It may also be applied by dropping it on them from a camel's-hair brush, if you do not like to move the specimens; but, by this mode, the mixture does not so well get access to the abdomen, where it is principally needed. In some delicate specimens, it may be necessary to reset the insect when drying. Should any excess of sublimate be found on the specimen, the only way of removing it is by dipping the insect into pure alcohol. It may, perhaps, appear somewhat superfluous to some to trouble you with these remarks; but the fact is, that I have not yet met with any entomologist who has applied this simple remedy. All have been still using camphor, and still crying out against the "organs of destructiveness" of the *Acari*, although it is so long since Mr. Waterton made public this plan with respect to ornithological collections. Moveover, as regards expense, it will be a mere trifle in an entire cabinet of entomology. Hoping that this may be of use to some of your readers, I am, Sir, yours, &c. — *George H. Fielding. Hull, May* 27. 1832.

On the Subject of the Preserving of Insects in Cabinets, I agree with Mr. Waterton (V. 683. VI. 90.) on the superior efficacy of poisoning either the individuals or the atmosphere. In the latter method, I, however, fear that the use of oil of turpentine might be objectionable; as, in its purest state, its vapour deposits a clammy substance, which, in all probability, would eventually injure the specimens in the same manner as Mr. Bree's were spoiled by the exudation from the cedar drawers (Vol. V. p. 368.). Oil of lavender, although less fatal

to insects than oil of turpentine, is also very efficacious; when it is pure, its deposit is less considerable, but still may be sufficient to render the adoption of it dangerous. Oil of cloves is nearly free from this objection, but, notwithstanding its exceedingly strong odour, its destructive effects are comparatively feeble. Oil of thyme (oleum serpylli of the shops) is far more fatal than even oil of turpentine, and, perhaps, leaves less deposit than almost any other essential oil: it has, however, this powerful objection, that the cabinetmaker's art will scarcely enable him to construct drawers sufficiently tight to prevent the apartment being impregnated with its detestable odour. Many French entomologists, who denounce spirits of wine as unfit for any insects except the black Coleóptera, put into their collecting bottles coils of paper imbued with some drops of this oil; and on crossing the path of one to leeward, on a good scenting day, you may nose him two fields off. A good way to judge of these oils is to suspend in small wide-mouthed phials pieces of sponge, of equal size, each moistened with precisely the same quantity of oil, and after leaving them in a warm place for about a fortnight, the finger applied to the inside surfaces of the phials will readily detect the difference of the films deposited. Poisoning the individuals, in the manner described by Mr. Waterton, affords, no doubt, the most perfect security, but the operation requires time, which a great proportion of the lovers of the science may not have at their command. Godart proposes for lepidopterous insects the application of arsenical soap, a preparation which no one who can avoid it would be desirous to meddle with; he also recommends that individuals obtained by purchase or exchange, should perform quarantine in a tin lazaretto, with a little oil of petroleum. Although this attack on their olfactories might force the larvæ and beetles to break cover, and probably kill the pupæ, would it destroy the vitality of their eggs also? if not, the precaution would afford but temporary security. Notwithstanding the denunciations of my French friends, I have found spirits of wine, when properly diluted, unobjectionable for the collecting bottle, with some exceptions, which a short experience will point out (the insects which suffer most are all red and many delicate blue ones, and such as are covered with a glaucous powder); and in autumn, 1831, I resolved to try the effect of adding the smallest quantity of corrosive sublimate, which I thought might be sufficient to preserve the specimens immersed in the solution from the future attacks of insects. I had strong apprehensions on the subject of their flexibility and colours. My first experiments were, of course, comparative, and confined to common species;

experience gave me confidence, and I have hitherto been well satisfied with the result: the specimens have remained perfectly supple, and the colours not more injured than by simply diluted spirits. My experience not being yet sufficient to enable me to decide on the most eligible dose, I should recommend those who may feel inclined to try this plan to make their own observations; to pay attention to the quality of their sublimate; and at the same time not to take fright too hastily, as I was very near doing myself last summer, when, having put several specimens of Mylabris variábilis *Latr.* into a bottle, I found, a few minutes afterwards, the colours of their transverse bands nearly discharged. I caught some others which were killed by steam, without the slightest injury; and, considering the first as spoiled, I left them in the spirits, in order to try the effect of a longer steeping: at the end of a fortnight they were set, and miserable enough they looked; after two or three days the colour began to deepen; in three weeks' time they were not to be distinguished from the others; and at the present moment any slight difference that can be discovered is in favour of the poisoned ones. After all, I believe that the greatest security is obtained by frequent inspection, and the immediate application of a drop of solution of sublimate, to any individual who may show symptoms of having been attacked. — *P. J. Brown. Thun, Canton of Berne, Switzerland, April* 5. 1833.

Mr. Nicholson's Account of the Red Snow seen by him in Prince Regent's Bay. (Vol. II. p. 321.) — I have no doubt of his having given a faithful description of what he saw; but cannot for a moment suppose it to have been the genuine Protocóccus nivàlis. Assuming the latter to be the substance which imparts the red colour to snow, I shall not give an opinion as to its identity with what Captains Ross and Parry and Baron Wrangel found on limestone, &c., of which I know little but what is related in Dr. Greville's *Scottish Cryptogamic Flora;* but must protest against the auk's dung observed by Mr. Nicholson bearing any resemblance to the colouring matter found occasionally on the snow of the higher regions of the Pennine Alps. As my personal acquaintance with this latter is, however, very limited, it may be proper to detail my experience, in order to prevent my few observations from receiving greater credit than they are entitled to. The first time I was gratified with a sight of it was six or seven years since, during an excursion from the St. Bernard. When at a long distance from the convent, and at a considerably greater elevation, on crossing an extensive plain of snow, my attention was arrested by a spot strongly tinged with red, towards

which I directed my steps with no ordinary energy: it was, however, to no purpose; the red snow was upon a slope too steep to be ascended without cutting steps, an every-day occurrence in these situations; but, upon trying the experiment, it was found that, although the level snow was perfectly firm, the slope had become so much softened, by catching more directly the rays of the sun, as to be wholly unable to bear: I persevered until nearly up to the hips; but, finding that I should very soon be up to the shoulders, the attack was most reluctantly relinquished. I was, however, near enough to be able, by means of a small but powerful telescope, to obtain a good view of its general features, which were precisely similar to those of what I subsequently met with. After a lapse of two or three years (in the first week in August, 1829), when crossing the Col de la Seigne, which separates the Allée Blanche from the Tarentaise, about ten minutes after reaching the summit of the pass, I saw another rosy patch, on an elevated slope far away to the left; and which would have remained unnoticed had not the sun shone brightly on the spot. Here my humanity was put to the test. I was accompanied by two gentlemen, whom I had met with in Piedmont, and who, for the first time in their lives, had quitted the interminable plains and countless apple trees of "la belle France," as they call it. Relying on my experience among the mountains, they had agreed to accompany me without a guide; and it went against my conscience to impose upon their already wearied limbs a fagging though not a very long detour. The odds, however, were fearfully against them. Protococcos nivàlis to Frenchmen's legs was Lombard Street to nine-pence; so off I bolted, and they were too much out of their element to relish the idea of being left alone. When we reached the spot, which was not attained without severe exertion, our poles were placed upon the snow, upon them our knapsacks; and, while my companions were expatiating on the luxury of a delightful rest, I employed myself busily in examining, with a powerful portable microscope, various samples of the red substance. In the hopes of meeting with it, I had, previously to leaving home, read with much attention the full and interesting account given by Dr. Greville, in his *Scottish Cryptogamic Flora*, and examined the figures copied from Bauer and Wrangel by Nees von Esenbeck. Every thing I observed was confirmatory of what I read. I could trace no appearance of a pedicel, or of any granulous interior, although the microscope I used was sufficiently powerful for the examination of the sporidia of the smaller fungi. After waiting as long as was consistent with prudence, considering the long and wearisome descent of the

mountain which we had still to make; we emptied our brandy flasks, and, having rinsed them well with melted snow, filled them with the most highly coloured portions we could collect, with a view to future examination, and the gratification of absent friends. On arriving at our miserable quarters at Châlet Motet, the greater part of the surplus water was separated, so as to concentrate the whole of the colouring matter in one flask; proposing to arrange it better, on reaching more comfortable quarters, the next day. While busily employed for this purpose at Contamines, one of my companions, in combating the restiveness of a rickety table, contrived to lanch the cup, in which the colouring matter was collected, into the ashes of a fire, which we were happy to procure to dry paper for our plants and our own clothes, the latter not having quite recovered from the effects of a sharp squall we had encountered on the Bon Homme. Thus ended my short but interesting acquaintance with Protocóccus nivàlis. Now, no one who, having a map of Europe before him, casts his eye on the situation of the St. Bernard and Col de la Seigne, will imagine that a little auk, or an auk of any dimensions, ever yet found his way there; nor in situations like those in which I met with the red snow is it usual to see any bird, except occasionally an eagle or a lämmergeyer (Gypàëtus barbàtus). Mr. Nicholson does not mention the elevation at which he noticed the red substance on the snow; but, from the wording of his letter, I should imagine it not to have been considerable, as it was on the side of a "small hill" which "forms a gentle declivity towards the bay;" and Captain Ross speaks of the mountains as being only about 600 ft. high. Both the instances I observed were above the line of perpetual snow, which Ebel fixes for the Pennine Alps at 7800 French, or 8320 English, feet above the level of the sea; more than 2000 ft. of perpendicular height above the highest point reached by a few stunted plants of *Pinus Cémbra* and *P. Mùgho*, and beyond which would be found no other shelter for birds than occasional tufts of *Rhododéndron* ferrugíneum. Nor did what I saw bear the slightest resemblance to the effect which would be produced from the dung of birds; an effect, however, exactly described by Mr. Nicholson; viz. "scattered small masses surrounded by a lighter shade, produced by the colouring matter being partly dissolved and diffused by the deliquescent snow." The two instances I saw were altogether different from the above, and strikingly similar to each other: the first was on a surface strongly inclined, but apparently even; the second was on a slope forming a somewhat smaller angle, and in one of those undulations or slightly conchoidal

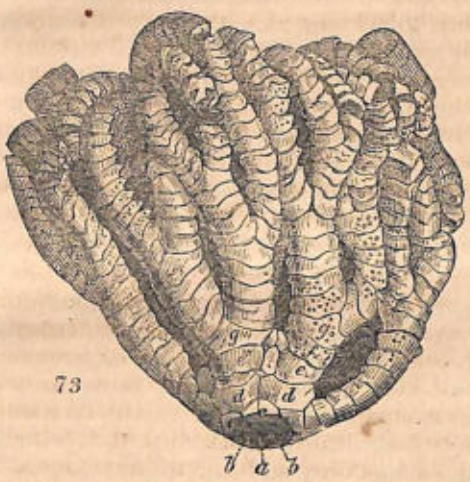
depressions so frequently met with in large masses of snow; the latter patch was probably 40 ft. long, and 8 ft. or 10 ft. broad; the former one, I think, somewhat smaller: both were tolerably uniform in colour, but occasionally assuming a greater intensity; not in small spots, but in portions of one or two square feet, without any appearance of a central nucleus; but evidently produced by the unequal softening of the snow, which had occasioned the colouring particles to be brought into closer contact in some places than in others. For a moment the idea suggested itself that the red substance might be the remains of lichens, which had originally inhabited the granitic summits, rising some thousands of feet above the enormous glaciers of the surrounding chains; but the supposition was untenable: no lichens which had become pulverulent in such a situation could have been borne away by the winds, and deposited, at the distance of some miles, in small patches, without leaving a trace on the surrounding snow; nor could they have offered the same uniform appearance under the microscope. The Anziendaz and Bovonnaz, which rise above Bex, differ, altogether, from the St. Bernard and Col de la Seigne; but, from the short passage cited by Dr. Greville from the work of Mr. Brown, I have not the slightest doubt of the identity of the substance met with on the latter and that found on the former mountains by M. de Charpentier and Mr. Thomas. — *P. J. Brown. Thun, Canton of Berne, Switzerland, April 5.* 1833.

On the Structure of the Flowers of the Mignonettes (Resèdæ). — Dr. Lindley has, in p. 12. of his *Nixus Plantarum*, just published, renounced the opinion he had previously made public, and adopted that published by Dr. Brown, which he had previously controverted. See Professor Henslow's treatise on the same subject, reviewed in our last, p. 441., where the opinions of Drs. Brown and Lindley are quoted. — *J. D.*

Mr. Bree's Correction, in Vol. V. p. 753., *of the Misnomer in* Vol. V. p. 574., *of Vanéssa urticæ and V. polychlòros.* — I present my sincere thanks to Mr. Bree for his correction. I had, as he supposes possible, somewhere seen the word "polychlòros" used as a generic name. — *W. Gardiner, jun. Dundee, April 6.* 1833.

The Crinoideal Remains found by Mr. Conway in Mountain Limestone from the Neighbourhood of Cork, Ireland, belong to the Genus Cyathocrinites, not to the Genus Encrinites (p. 126. 281, 282. 470.)—Sir, The plates which form the body of crinoidal animals are so much better developed in some specimens than in others of the same species, and the whole family is so imperfectly understood, that it is no wonder Mr.

Conway should doubt (p. 470.), his specimen being a cyathocrinite; but to prove that it is the Cyathocrinites tuberculàtus (of Miller), I have sent you another copy of the engraving (*fig.* 73.), with the plates which form the body more strongly



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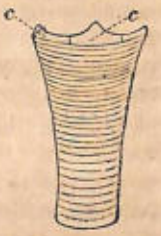

marked than they appear to the naked eye, but yet as accurately as the specimen, which is rather a distorted one, will allow. The line of dots from *a* terminates at the alimentary canal; that from *b* upon one of the five plates surrounding it, which form the pelvis; *c* is placed upon the costals; *d*, upon the scapulæ; *e*, upon the first joint of the arm, which, in Miller's figure of this species, is placed upon the upper surface of the scapula, and not, as in Cyathocrinites plànus, upon a horseshoe-like impression on the outside of it; *f*, upon the second joint of the arm; *g*, upon the wedge-formed joint of the arm, from which the hands, &c., arise. Aided by this explanation, you will, I think, be convinced, on comparing this engraving with the figure given of Mr. Conway's specimen, in p. 126., that they are of the same species. In that figure the whole of the pelvis, and nearly the whole of the costals, are hid by the column. Only one scapula, the plate which rests upon the column on the left, is in its natural situation. Joints of the arm, marked *e*, *f*, *g*, in the engraving (*fig.* 73.), occupy the place where another scapula ought to have stood, and have, in consequence, been mistaken by Mr. Conway for the costals of an Encrinus, upon which he has "reconstructed," or rather constructed, his specimen of a nondescript.

As I have not access to the *Geological Transactions*, I

cannot give an opinion on the specimen figured in them by Mr. Cumberland; but there is a figure of Cyathocrinites tuberculàtus in a work on fossils, by Dr. Goldfuss, to which I am unable to refer more particularly; and the author of *Crinoidea*, to whom my specimen was sent a short time before his death, says, "I beg to acknowledge the receipt of your instructive specimen of cyathocrinite."

As I have, I trust, removed all doubt respecting the genus of Mr. Conway's specimen, I beg to assure him that a desire to check the progress of error has alone induced me to controvert his statement; and that, were I wishful to lay claim to the discovery of the genus Encrinus in mountain limestone, it would be founded on specimens that have a much greater claim to it than the one in question.—I am, Sir, yours, &c. —*William Gilbertson. Preston, Lancashire, Sept.* 21. 1833.

P. S. The sketch (*fig.* 74.) of the superior portion of a column, with the pelvis and scapulæ attached, and perfectly free from the matrix, will show, better than any description, that Mr. Conway is in error in supposing his column to be covered with extraneous matter; and there can be no doubt that the columnar joints described by R. B., in p. 475., belong to Cyathocrinites quinquangulàris, and not to Mr. Conway's specimen. — *William Gilbertson.*

Fig. 73. is copied from an engraving sent by Mr. Gilbertson, inscribed, "Cyathocrinites tuberculàtus, found near Whitewell, in Bowland, by W. Gilbertson, Preston, Lancashire. J. D. C. Sowerby fec." — *J. D.*

ART. II. *Obituary.*

DIED, of cholera, in the afternoon of August 24. 1833, *Adrian Hardy Haworth, Esq.*, author of *Lepidoptera Britannica*, various works in botany, and other contributions to the promotion of natural history; to the cultivation of which Mr. Haworth had, through his whole life, devoted himself. As we are led to expect that a biographical memoir of Mr. Haworth will be published in the *Gentleman's Magazine*, we confine ourselves to registering the fact of his death, and to the indication of this clew to the particulars of his biography. In the *Gardener's Magazine*, the Number for October, 1833, (vol. ix.) p. 635 to 640., are some notices which show the intensity of Mr. Haworth's passion for botany. — *J. D.*

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LONDON:
Printed by A. SPOTTISWOODE,
New-Street-Square.

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