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THE
NATURALIST :

Journal of the Yorkshire Naturalists'
Union,

AND

GENERAL FIELD CLUB RECORD.

NEW SERIES.

EDITED BY C. P. HOBKIRK, F.L.S., AND G. T. PORPITT, F.L.S.

—
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Original Articles.

NOTES ON *RACOMITRIUM PAPILLOSUM*.

BY G. LIMPRICHT,
IN "FLORA," 1882, N. 13.—TRANSLATED.

Racomitrium papillosum, *Kindberg*; Warnstorf in "Hedwigia," 1881, n. 11. According to the text of this publication, it appears to be uncertain who really is answerable, as author, for this species. This form, recently published as a "distinct species" which should represent an intermediate form between *Racomitrium patens* and *Racomitrium sudeticum*, is, according to original specimens before me, the sterile form of *Grimmia elatior*, Br. and Sch., as it occurs in different stations in the Sudeten; on the Baliagora; in Scotland; Norway; and the Alps on much exposed rocks.

I have previously made the remark (in the *Kryptfl. von Schl.*: I. p. 160), that there are two forms of this species, and we also find that previous writers have had their attention drawn to this particular variety. Schimper referred this form to *Grimmia Schultzii*; C. Müller to *Grimmia funalis*; C. Hartmann earlier considered it as *Grimmia funalis* * *elatior*; and De Notaris (in *Syllab.* n. 333), distinguished it as *Grimmia funalis robusta*.

Sometimes it approaches nearer to *Grimmia Schultzii* (in this form it is generally fertile), sometimes it agrees more with *Grimmia funalis*, and in this form I only know it barren.

The possibility that both forms should be specifically distinct appeared to me to be inadmissible.

Hitherto, nothing has been published with regard to some of the characters of *Grimmia elatior*, and this omission appears to me to have led to the creation of *Racomitrium papillosum*.

The upper part of the leaf of *Grimmia elatior* consists of a double layer, our Silesian specimens even having three and four layers (hence the opacity of the cell structure), and both sides of the thickened leaf, as also the oval carina (as is seen by a cross section), are covered with semi-circular papillæ, rising from the lumen of the cell. In the fertile specimens from the Alps, this thickening extends over a smaller portion of the leaf, and the cuticle is as a rule smooth, but there are specimens now lying before me which show the papillæ, therefore I consider the dark-green mostly sterile Silesian form, and those of the north of Europe to be var. *pseudo funalis*. Schimper, in the "*Syn. ed. II.*" p. 259, has, in the accompanying note more correctly described the teeth of the peristome of *Grimmia elatior*, than in the text of the diagrams.

In *Grimmia Schultzii*, the papillæ are entirely wanting, and in the upper part of the leaf the margin only is composed of two or three layers. *Racomitrium patens* has on the back (on the under side) of the carina, two, three, and four longitudinal laminae, and *Racomitrium papillosum* is said to possess a "Nervus lamellosus," yet the original shows no trace of one, but its carina resembles exactly that of *Grimmia elatior*.

It has been customary, with regard to certain *Grimmias*, to speak of a furrowed carina, but we all now know that in these instances, as a matter of fact, they possess no furrow, but that the clear streak which the extended leaf shows in the median of its rib when you allow the light to fall through it (*i.e.* if you hold it before the light) has another origin.

In *Racomitrium patens* and *sudeticum* the leaves have a one-layered lamina, yet the leaf-margin of the first consists, in its upper part, of two or three layers, with the last one sometimes of two layers.

Grimmia funalis shows no papillæ, and only the upper leaf-margin consists of two layers.

The papillose nature of *Racomitrium protensum* has already been described by Lorentz.

In *Racomitrium canescens* the papillæ rest upon the lumen of the cells; in *Grimmia anomala* Hampe, on the contrary, upon the lumen, and also upon the cell-wall.

Grimmia elatior forma *subinermis asperula* (Sanio) Geheeb *Beitrage zur Moosflora des Westl. Sibirens* ("Flora" 1879, n. 30), *R. asperulum*, Geheeb, is doubtless the same form which has given occasion to the creation of *Racomitrium papillosum*.

NOTES ON SOME RARE BRITISH MOSSES.

BY JAMES CASH.

(Read before the Manchester Cryptogamic Society, 1st May, 1882.)

PALUDELLA SQUARROSA.

THIS moss was discovered by Mr. Wilson, at Knutsford, on the 16th April, 1832. He had been to Vale Royal, and crossed to Knutsford to observe the condition of the mosses previously found growing in the bog. This entry in Mr. Wilson's diary is the first mention made anywhere of *Paludella squarrosa* as a British moss: "Found a new bryum of the squarrose-leaved kind, very elegant, but barren." The next day

Mr. Wilson examined the new moss, which he believed to be *Bryum squarrosum*, Hedw. (*Hypnum paludella*, Web. and Mohr, 274): he "found it to possess terminal perichetia, with abortive pistilla." He was correct as to the species.

On the 19th of April Mr. Wilson wrote to Dr. Hooker, announcing the discovery of *Bryum squarrosum*, and enclosing specimens and drawings. Letters conveying the same information were written to other botanists, among the rest to J. De Sowerby, Mr. W. H. Harvey—then a young and enthusiastic botanist fast rising into note—and to Professor Henslow, of Cambridge University, not forgetting, either, one of the Lancashire artisan botanists, with whom he had frequent correspondence—John Martin, of Tyldesley. The moss, with others, was figured by Mr. Wilson for the second edition of *English Botany*. There is no doubt that the original station for *Paludella squarrosa* at Knutsford has been destroyed by drainage.

It may be interesting to note that *Hypnum nitens* and *Mnium affine*, both fertile, were found at the same time and in the same locality. The fertile *H. nitens* grew "not far from *B. squarrosum*, nearer the brook, on the other side of the path," and there was another station for it "near the fertile *H. stellatum*, more towards the mere, and rather nearer the brook." These words are quoted from Mr. Wilson's diary. They are too obscure to be of practical use now. Mr. Wilson appears to have searched the bog carefully for *B. squarrosum*, for he records, on the 10th May, 1832, that he was "unable to find any second station for it."

This, as far as is known, is all the information to be had about the occurrence of *Paludella squarrosa* at Knutsford. But ten years later, certain muscologists in Yorkshire made diligent and successful search both for this moss and for *H. Blandovii*. An interesting letter from Mr. Henry Ibbotson to Mr. Wilson, dated Gathorpe, near Whitwell, Mar. 1st, 1842, has been preserved, in which the writer says: "You have, I presume, received specimens of *H. nitens* and *H. Blandovii*, all the productions of a bog in this neighbourhood, from our respected friend Mr. Spruce, who informs me, upon your authority, that the same plants, together with *B. squarrosum*, grow in a bog in Cheshire, and that you suggested that our locality for the two former plants might also be likely to produce the latter. I have, therefore, been induced to examine the place very carefully, and am pretty well convinced that the plant is not there to be met with. A short distance, however, from this bog there is another which I never visited previous to Thursday last, when I found it to produce the same plants as the first

(with the exception of *H. Blandovii*), and, in addition, plenty of *B. squarrosus*, occupying the space of an acre at least. From the circumstance of your being the first discoverer of the plant in Britain, the intelligence of a new station being detected, with a few specimens therefrom (which I now enclose), may be interesting. I am sorry that I have not been able to find it in a state of fructification; but I shall frequently have opportunities of visiting the place, and as this may not be the proper season, I trust that I shall have the pleasure of finding it at some future time. . . . *H. nitens* will yield an abundant crop of fruit in this bog."

Of the present condition of the above-mentioned locality I am sorry not to possess any positive information. It is, however, understood to have been drained, and the rarities mentioned have been wholly or partially destroyed.

ON THE CLASSIFICATION OF BRITISH INSECTS.

BY S. L. MOSLEY, HUDDERSFIELD.

(Read before the Lanc. and Ches. Ent. Soc., April 24th, 1882.)

THE purpose of a classification of any objects—natural or otherwise, is, I need scarcely state, to bring together those which are nearest related. This is often not very difficult when we make a number of common centres, or represent the various divisions like the branches of a tree, all diverging from, and dependent on a common beginner or ancestor, which doubtless is the most natural way of arrangement; but we have not yet discovered any method by which this arrangement can be represented in a cabinet drawer, or a set of unseen cases, and we are placed at some disadvantage by being obliged to follow a linear arrangement, beginning at one point and ending at another. Such an arrangement must, as a matter of course, be more or less imperfect, because the various branched affinities cannot be adequately represented. However, there is a certain degree of perfection attainable, and it is possible to so arrange most natural objects as to show a more or less unbroken continuity from end to end.

The insect world forms a wide field for the ingenious mind to work upon, for while its members agree in certain particulars, they are so diversified in their structure and their habits, their similarities and dissimilarities are so constant and so numerous, that it has been a

task upon entomologists, from time immemorial to say, which is the most natural way of arranging these tiny creatures.

The first system worthy of note is that invented by Swammerdam, in which he divides insects into four primary groups as follows :—

1. Insects subject to a change of skin, but undergoing no change of form (spiders, lice, woodlice, and centipedes).

2. Hexapod insects subject to metamorphosis, having an active pupa, in which the rudimentary wings and wing-cases are exposed (bugs, dragon-flies, grasshoppers, and mayflies).

3. Hexapod insects undergoing metamorphosis, in which the pupa state is quiescent, either having the limbs enclosed in distinct cases (beetles, bees, wasps, &c., and part of the Neuroptera and Diptera), or covered with an entire case (butterflies, moths).

4. Hexapod insects undergoing metamorphosis, the pupa state having neither motion or wings, but enclosed in an ovate case (most Diptera and other insects).

This system which is based upon the form or condition of the pupa, is imperfect in splitting up closely allied groups. For instance, the Neuroptera and Diptera are each split and placed in two divisions.

Leaving the older and coming to more modern times we find another system of classification of winged insects propounded by Ed. Newman, and based upon the characters of the pupa, which is very similar to one propounded by Lamarek. Like Swammerdam, Newman makes four primary divisions, viz :—

1. *Amorpha*, in which the pupa has neither mouth nor organs of locomotion and bears no resemblance to the perfect insect (Lepidoptera and Diptera).

2. *Necromorpha*, in which the pupa has both mouth and organs of locomotion, but enveloped in several cases, and incapable of use (Hymenoptera, Coleoptera).

3. *Isomorpha*, in which the mouth and limbs are present and used (Orthoptera, Hemiptera).

4. *Anisomorpha*, in which all the before-mentioned characters are present, and some independent ones (Neuroptera).

This system, though presenting certain degrees of correctness, yet brings together insects of little affinity, and at the same time separates others which are nearly allied, like the Neuroptera and Trichoptera. It is likewise subject to many exceptions; we find necromorphous pupæ among the lepidoptera—the burnets, for instance. Some dipterous pupæ are locomotive; the Coleoptera, and especially the Neuroptera, present many striking exceptions.

Leaving now the classification according to the pupæ, we turn to that of arrangement by the affinities of the imago ; and while I would not take any *one* stage of the existence upon which to base a classification, but take the whole life-history into consideration, yet the imago should rank as of first importance, because we know most about that state ; and it is in that state in which insects are generally arranged for public examination.

The first classification based upon characters of the imago is that of Linnæus, and is founded upon the characters of the wings. His first division is, those having four wings ; the next, those with two wings ; and the third, those destitute of wings—which results in the following distribution of the different orders :—

- | | |
|----------------|----------------|
| 1. Coleoptera | 5. Hymenoptera |
| 2. Hemiptera | 6. Diptera |
| 3. Lepidoptera | 7. Aptera |
| 4. Neuroptera | |

After this came the system of Fabricius, founded mainly upon the characters of the mouth part, but when we see that it resulted in the crabs and lobsters being placed between the Neuroptera and the Lepidoptera, we may venture to dismiss it as unsuitable, at least for our present purposes.

We now come to the system of Olivier, in which the characters of both wings and mouth are used as a means of classification, which resulted in the following arrangement :—

- | | |
|--------------------------|---------------------------------|
| 1. Thysanura | 7. Hemiptera |
| 2. Parasita | 8. Neuroptera |
| 3. Siphonaptera (fleas) | 9. Hymenoptera |
| 4. Coleoptera | 10. Lepidoptera |
| 5. Dermaptera (earwigs.) | 11. Rhipiptera (bee parasites.) |
| 6. Orthoptera | 12. Diptera. |

The objection to this system is that it separates the Coleoptera and Orthoptera, which have both mandibulate mouths, and which are in other respects nearly allied. The Parasita, Hemiptera, Neuroptera, and Lepidoptera have also each two distinct classes of mouth organs.

At present I cannot but regard the characters of the mouth as insufficient for the distribution of the British insects into orders, although up to the time of Stephens, and in some instances up to the present, this mode of classification has been mainly adopted. In many of the various orders do we find both the haustellate and mandibulate characters, and if this rule be rigidly adhered to, it will result in the lepidopterous insects being placed in one division, while the larvæ

which produced them are placed in another, the imago having a haustellate mouth, and the larva a mandibulate one.

The following arrangement of the orders of British winged insects, I think, will meet all the requirements of a collection arranged for public inspection, viz :—

- | | |
|----------------|----------------|
| 1. Hemiptera | 5. Lepidoptera |
| 2. Orthoptera | 6. Hymenoptera |
| 3. Coleoptera | 7. Diptera |
| 4. Neuroptera. | |

Now let us proceed to consider these various orders more particularly, and see what relation they bear one to another. The class *Insecta*, I think, should be begun by the Apterous division, say by the *Anoplura* (lice). Going backwards, we pass on (out of the insects) into the mites, spiders, and crustaceans; and going forward we pass from the lice to the *Thysanura*, and from them to the

1st Ord., HEMIPTERA.—I place this order next to the Aptera, because their habits are somewhat similar, as regards the mouth and metamorphosis, and the wings of Hemiptera are very frequently either entirely wanting, or are only rudimentary. The order is generally divided into two sub-orders, sometimes ranked as distinct, but clearly so nearly allied as not to be distinctly separable.

Sub-Ord., 1. Heteroptera. 2. Homoptera.

The sub-order, HETEROPTERA, differs from the HOMOPTERA in having the basal part of their fore-wings leathery, and the tips membranous. It is divided into two sections—

Auracoriza, or land-bugs, living upon various kinds of plants, and sucking their juices; and

Hydrocoriza, or water-bugs, of which examples may be found in every pond, the water boatman being a well-known example.

This order is too extensive, and the species and genera too similar, to admit of further notice here.

The Homoptera are divided by Westwood into three primary sections :

- Sec. 1. *Trimera*, in which the tarsi are 3-jointed.
 „ 2. *Dimera*, „ „ 2 „
 „ 3. *Monomera*, „ „ 1 „

The Trimera include the family Cicadæ, of which we have, I believe, only a single species (*Cicada Angelica*) in Britain. In foreign countries

some of the species attain large size, and are remarkable for the development of their musical organs.

The second British family of the section is the *Cecropidæ*, which differs in having the antennæ three-jointed. It includes the well-known frog-hopper, developed from the cuckoo-spit insect (*Tettigonia spumaria*) and other allied forms.

The second section, DIMERA, includes the *Psyllidæ*, or jumping plant-lice; the *Aphidæ*, or green-fly; and the *Aleyrodes*, or snow-flies. These live by sucking the juices of plants, and some of them are very injurious to our growing crops.

The third section (Monomera), contains the coccus, or scale insects, of which we have some British species, and of which the cochineal and lac insects are exotic examples. The males have two wings, but the females are destitute of wings or other organs, and appear like a scale upon the stem of the plant they infest. The second section should be placed last, as they form a connection with the jumping Orthoptera.

Ord. 2, ORTHOPTERA.—That section or sub-order, which I place first, is the SALTATORIA, or jumpers; and the second, CURSORIA, or runners; the first connect them with the jumping Homoptera, and the latter, with the running Coleoptera.

The *Saltatoria* comprise the following families:—

1. *Achetidæ*, or crickets, of which the house cricket (*Acheta domestica*), and the mole cricket (*Gryllotalpa vulgaris*) are examples.
2. *Gryllidæ*, or grasshoppers.
3. *Locustidæ*, or locusts.

The second sub-order, the *Cursoria*, include the cockroaches (*Blatta*) and the earwigs; the latter being sometimes ranked as a distinct order, under the name of *Euplexoptera*.

Finishing the Orthoptera with the earwig, brings us to the next-of-kin, which appears to me to be the *Staphylinidæ*, in Ord. 3, Coleoptera; yet to suggest an arrangement of this order of insects with the Staphylinidæ at the head, I am afraid would be considered a very revolutionary measure by coleopterists. I am not sufficiently well versed in beetles to say what arrangement should follow, but the *Silphidæ* might come next, to which they are undoubtedly allied, from thence we might pass on to the types of the order, the *Carabidæ*.

Ord. 4, NEUROPTERA.—The passage from the Coleoptera to the Neuroptera is not so easy a matter, but as it is impossible to make an

unbroken line, it is not to be wondered that whatever arrangement we adopt, some breaks will occur. Perhaps among exotic species, the *Zermetina*, or white ants, would form the nearest allies to the beetles.

The British species will begin with the family PsocIDÆ, consisting of numerous minute insects found upon plants, and distinguished by the almost obsolete labial palpi, the 2-3-jointed tarsi, and long antennæ. They somewhat resemble the *Psyllidæ*, and are collected along with them, but the mouth part is differently constructed, consisting of jaws, and the neuration of the wings is differently arranged.

(To be continued.)

Short Notes and Queries.

NOTES ON THE FLORA OF HODDER-DALE.—In the *Naturalist* for Aug., 1881, I gave a list of plants observed by me in Hodder-Dale which are not included in the list on pp. 277-8 of "West Yorkshire." I have now to add the following, which have been observed by me this year:—*Gymnadenia conopsea*, *Habenaria chlorantha*, *Paris quadrifolia*, *Cryptogramme crispa* (on Catlow Fell), *Polypodium Phegopteris*, *Equisetum sylvaticum*, *Barbula tortuosa*, *Hypnum fluitans*, *Kantia Sprengelii*, *Scapania undulata*, vars. *speciosa* and *isoloba*, Nees. I may add that *Rubus Chamæmoris*, recorded as growing on "Bowland Flatts," is also to be seen on the southern side of the dale on Croasdale and Lamb Hill fells, &c.—
W. FOWLER.

EAGLE OWLS (*Buteo maximus*) BREEDING IN CAPTIVITY.—Early in April I was informed that the eagle owls at Roundhay were showing signs of nidification, so I at once proceeded to the Park, where I learnt that one egg had been found on the 17th April, among the rustic work inside the cage. A second egg was laid on the floor on the 19th April, but the bird forsook this egg, and it was afterwards presented to me by Mr. Todd, the owner of the noble birds. On the 20th the female scraped together some hay in the corner of the cage, and began to sit, but owing to the fierceness of the birds it was impossible to ascertain the number of eggs under her until the 22nd, when Mr. Todd saw a third egg. I again visited the place on the 29th April, and found the female still faithfully fulfilling the duties of incubation; and we began to entertain hopes of seeing a young eagle owl in down. The birds were exceedingly fierce and noisy when their nest was approached, their throats swelling to the size of a turkey's egg, and a tremendous hooting commenced, which was continued until the intruder retired. There are three owls in one cage. The two breeding birds were taken from their nest in 1878, and are four years old; the other is a female, and was captured on Rombald's Moor, near

Ilkley, in 1876. I left Leeds on the 1st of May, on a tour through the north-western fells, and on returning I was sorry to hear that some malicious person had broken into the room where the birds are kept, and carried off the contents of the nest, and thus put an end to our hopes and expectations. I doubt whether the rogue came off free without torn clothes and scratched hands. I examined two of the eggs; they were not the typical shape, but were similar in size and shape to the eggs of the common fowl. The one which was given to me contained a pale yolk. A larger and more convenient place is now being built for these large, noble birds, and we hope that next spring they will meet with better success.—WALTER RAINE, Leeds, July 10th.

THE NIGHTINGALE AT SCARBOROUGH.—I am informed by Mr. William Robinson, of Scarborough, who is quite familiar with the song of this bird, that he heard a nightingale singing near Oliver's Mount, on the nights of the 10th and 11th of May last. Until the publication of the "Handbook of Yorkshire Vertebrata," "five miles north of York" was stated, in books, to be the farthest north for this species. My investigations for the Handbook enabled me to prove that the bird occurred much further north, and to state my opinion that it was gradually extending its range northwards up the vale of York, and along the coast, and I found Baldersby Park, near Thirsk, and Flamborough Head were, so far as I could ascertain, its most northern outposts in Great Britain. Now Scarborough must be considered as such for the coast.—W. M. EAGLE CLARKE.

EXTRAORDINARY MORTALITY AMONGST DIPTERA.—As I was walking down Park-bottom road, from Elland towards Brighouse, yesterday evening, the road, under the trees, was thickly strewed with flies like the sample I enclose. They were nearly all dead, or about 1 in 100 living. What is the name of the fly, and the cause of the mortality? there were thousands.—C. C. HANSON, Greetland, near Halifax, July 13th, 1882.—[We submitted the flies to Mr. R. H. Meade, of Bradford, who replied as follows:—"The flies sent were specimens of *Bibio Pomonæ* Fab. Many of the species of this family (*Bibionidæ*) occasionally swarm in immense numbers, the cause of which is rather obscure. In the *Entomologist's Monthly Magazine* for November, 1880, Mr. Douglas has published an account of an immense swarm of flies which invaded a ship whilst at sea; these (some of which he forwarded to me), belonged to the same family though to a different genus (*Dilophus vulgaris*). The species of *Bibio* are said to feed, in the larva state, on the roots of grass, and seem to hatch out sometimes in great numbers at once.—Yours very truly, R. H. Meade, Bradford, July 5th, 1882."—Eds. *Nat.*]

BRITISH ASSOCIATION MEETING AT SOUTHAMPTON, AND LOCAL SCIENTIFIC SOCIETIES.—Mr. W. G. Fordham has sent to us a number of papers relating to the Conference of Delegates of Local Scientific Societies, &c., to be held as above, and we desire to call the attention of all our local societies and others generally, to the very interesting features referred to

in these papers, which cannot fail to be of value to all our societies. According to the new minute of the British Association, both the president and secretary of any local scientific society, *publishing transactions*, or in his absence, a delegate representing him, may now be temporary members of the general committee, provided that such representative be a *member* not an *associate* of the B. A., and notice must be sent to the general secretary before the meeting. Mr. Fordham, whose address is Odsey Grange, Royston, Cambridgeshire, will be glad to send copies of these papers to the secretary of any local society requiring them.—Eds. *Nat.*

OBITUARY.—By the death of William Talbot, of Mount Pleasant, Wakefield, which took place on Monday, the 22nd of May, Yorkshire naturalists have lost one of their most valued comrades and earnest fellow-workers. For some time past, his health had completely broken down, probably the result of his occupation, so that the sad event was, in a sense, not unexpected. By occupation he was a painter, and he filled the office of master painter to the Wakefield House of Correction so long as it was under the control of the West Riding Justices. On its being taken over by Her Majesty's Government a few years ago, Mr. Talbot was retired on a pension. In his leisure hours he was a keen and ardent naturalist, the special bent of his studies being in the direction of ornithology and entomology. In the latter science he formed an extensive collection of lepidoptera, but at the same time he did not neglect to collect specimens in other orders—particularly, hymenoptera, in which he materially assisted the late Mr. Frederick Smith, of the British Museum, both on his frequent visits to the Wakefield district, and by the collection of specimens for him. In ornithology Mr. Talbot will always be remembered for his admirable list of the "Birds of Wakefield," published in this journal, and afterwards reprinted as a separate work, copies of which he liberally bestowed upon his fellow-workers. His knowledge was sound, and his experience—the result of many years' field-work—was great. What he knew, he knew thoroughly, and he was never ashamed to confess his ignorance of what he did not know. Socially, he was emphatically one of "Nature's gentlemen," kind, courteous, and affable to a degree; a man whom it was a pleasure to know, and whose friendship was something worth having. Of the West Riding Consolidated Naturalists' Society we believe that he was virtually the founder, but at all events he took an active part in its formation, and throughout its existence he was one of its steadiest and most loyal supporters. He showed a like interest in the movements which led to its reorganization under the title of "Yorkshire Naturalists' Union," in 1877, and was unanimously selected as the first president of the Vertebrate Section of the Union, an office which he held for a year or two. We believe the last meeting of the Y.N.U. that he attended was the one at Barnsley and New Park Spring, on the 12th of June, 1880, since which date he has

been much confined to the house by ill health. Many are the pleasant days which his friends will recollect enjoying in his company, at Haw Park, and New Park Spring, and Woolley Edge, and many a pleasant place beside ; and it will be long before his place is adequately filled.

Rainfall for June.

	Height of gauge above sea level.	Rain-fall.	No. of Days	TOTAL FALL TO DATE.		Date of heaviest Fall.	Amount of heaviest Fall.
				1882.	1881.		
HUDDERSFIELD (Dalton) ... (J. W. Robson)	Ft. 350	In. 4·06	22	18·36	* 14·35	22	1·10
HALIFAX... (F. G. S. Rawson)	365	5·25	17	27·02	19·64	...	...
LEEDS ... (Alfred Denny)...	183	3·325	19	13·635	†10·515	22	1·060
HORSFORTH ... (James Fox)	350	3·780	23	15·760	‡14·073	22	1·090
BARNSELY ... (T. Lister) ...	350	3·93	20	14·35	10·77	26	0·66
INGBIRCHWORTH (do.)	853	4·78	20	20·79	15·51	22	1·46
WENTWORTH CASTLE (do.)...	520	3·21	20	15·04	12·98	22	0·85
GOOLE ... (J. HARRISON) ...	25	3·69	17	14·57	9·83	22	0·70
HULL (Derringham) (Wm. Lawton)	10	3·34	23	13·14	9·012	9	0·55

* This is the average to date for 16 years, 1866-81.

† Average of 28 years, 1853-62 and 1865-82.

‡ Average of 13 years, 1870-82.

Reports of Societies.

BARNSELY NATURALISTS' SOCIETY.—At the meetings July 4th and 18th, reports of the sectional meetings were read, also accounts of the local excursions, with the various plants, insects, and birds observed. The society has organised one excursion monthly ; the June one was to New Park Spring and Dearne Valley, rich in warblers, including the nightingale, and some plants not commonly distributed, as *Paris quadrifolia*, *Convallaria majalis*, *Nuphar lutea*, and *Hottonia palustris*. It is many years since the latter was found in the same valley, the railway workings having disturbed it ; the other two have only been re-discovered of late years. The ornithological observations were few, owing to Mr. Lister having recently been in London and neighbourhood, where the summer warblers were numerous. He counted eight nightingales within a small fringe of Epping Forest, in one hour's ramble ; near Colchester, Hampstead, Kew, and Chalford, they might be heard night and day. In Wakefield district it has been heard in three distinct localities. Other

migrants have been too numerous to keep account of. On the Dunford moors, the dipper and ring-ouzel (the last a migrant) were seen; the sparrow-hawk seen at Rockley June 10, Stainborough, July 8. The heron kingfisher, snipes, and lapwings, have been noted. Mr. Hailstone writes (July 15th)—“Eleven terns flew over Walton Lake from east to west.—T. L.

ILKLEY SCIENTIFIC CLUB.—At a largely attended and successful meeting of ladies and gentlemen of Ilkley and neighbourhood, held on the 12th of May last, it was resolved—after listening to addresses delivered on behalf of the Yorkshire Naturalists' Union by Messrs. C. H. Bothamley, F.C.S., and Wm. Denison Roebuck—to form a scientific club for Ilkley. Mr. F. W. Fison, M.A., F.C.S., was chosen as president, and Messrs. Vincent Taylor, B.A., and James Brodie, as secretaries. Vice-presidents were also chosen, and a committee including several ladies. Already a good number of members have been enrolled, and a fortnightly series of excursions are arranged for the summer months. The winter session is to be occupied by meetings for reading of papers, and exhibition of specimens.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Monthly meeting, June 26th, the president (Mr. S. J. Capper) in the chair.—After the transaction of the ordinary business, the Rev. S. Fletcher Williams read a paper on “Darwin and Darwinism,” which was listened to with great interest. Mr. Williams sketched the life of Darwin, described his personal characteristics as a man, and reviewed the Darwinian doctrine of natural selection. During the conversazione Mr. B. Cooke exhibited insects collected during a Whitsuntide excursion to Sherwood Forest, including the rare *Mordellistena abdominalis*; Mr. T. Von Sobbe, a box of European lepidoptera; Mr. W. Gardner, a box of Welsh mountain coleoptera; and the honorary secretary (Dr. Ellis), a smoky variety of *Abraxas ulmata* captured at Ince Blundell.

MANCHESTER CRYPTOGAMIC SOCIETY.—Meeting July 17th, Mr. Thos. Brittain, F.R.M.S., in the chair.—Mr. Ashton brought some fern fronds for identification, which came originally from Jersey, and proved to be a finely divided form of *Asplenium lanceolatum*. Mr. Stanley exhibited a number of hepatics from Derbyshire, recently gathered. Mr. W. H. Pearson read a few notes on *Conocephalus cornicus* and *Preissia commutata*, and exhibited specimens. The latter species had recently been collected by Mrs. Perrin, in Cheedale, and by Mr. Holt near Buxton. This rather widely distributed species is not recorded for Derbyshire in the London catalogue. Mr. Pearson also brought specimens of *Mylea Taylori*, with *colesules*, collected recently by Mr. Geo. Stabler in Mardale. Mr. J. W. Atkinson shewed specimens of a micro-fungus, *Nectria mammoidea*—a recent species not described in Cook's Handbook. The specimens had been found by him on the dead stems of furze at Bowness, Windermere, May, 1882.—THOS. ROGERS, Hon. Sec.

OVENDEN NATURALISTS' SOCIETY.—Monthly meeting, June 24th, Mr. J. Spencer in the chair.—The following botanical specimens, amongst others, were laid on the table :—*Trientalis europæa*, *Polygala vulgaris*, *Geum rivale*, *Luzula sylvatica*, *Pinguicula vulgaris*, *Rhinanthus crista-galli*, *Sanicula europæa*, *Myosotis palustris*, *Lactuea virosa*, *Lysimachia nemorum*, *Geranium pratense*, *Polypodium phegopteris*, &c.—JOSEPH OGDEN, Sec.

WAKEFIELD NATURALISTS' AND PHILOSOPHICAL SOCIETY.—On June 6th this society visited Woolley Edge, Woolley Hall Gardens, the Park and district, accompanied by representatives from Huddersfield and Heckmondwike Naturalists' Societies, and Wakefield Paxton Society. A fair number of specimens were collected in most departments, but none of them new to the district, or indicating any new feature of distribution.

MEETING, June 7th, the president (Mr. Joseph Wainwright, F.L.S.) in the chair.—Mr. Spurling exhibited the following from Haw Park :—Imagos : *M. hastata*, *T. biundularia*, *A. mendica*, *C. fluctuosa*, *B. rhomboidaria*, and larva of *O. antiqua* ; Mr. J. Toms, a quantity of fossil ferns from the coal measures in the neighbourhood ; Mr. J. Wilcock, several species of coleoptera taken the preceding day at Woolley ; the secretary, four species of beetles (alive), kindly forwarded him by Mr. G. T. Porritt, F.L.S., of Huddersfield, who had taken them at Wicken Fen, Cambridgeshire, including *Melosoma Tremulæ*, Fabr., *Chrysomela fastuosa*. Lin.—E. B. W.

Y.N.U. RAMBLE TO SNAITH.—The route taken by the coleopterists was by way of the cars to Pollington, where a few somewhat scarce northern insects were taken (particularly in the Hydradephaga) out of a drain across the fields. The umbriferous plants around Balne Pond were also very productive ; four species of Phyllotreta and two species of Donacia, with a number of others, were taken by sweeping. Among the stones along the banks of the Knottingley and Goole canal, a few specimens of *Clivina fossor* and *collaris*, with one specimen of *Drypta dentata*, Ross., were amongst the Geodephaga taken there. Along Hagg-lane to Snaith a number of good things turned up, including, at the latter place, *Chrysomela fucata*, Fabr., *Coccinella 14-guttata*, Linn. ; and at the former *Attelabus curculionoides*, *Gartrophyla polygoni*, Linn., *Cassida equestris*, Fabr., and *Pyrocroa serraticornis*, Scop. In all, 69 species were taken and two varieties.—E. B. WRIGGLESWORTH.

YORKSHIRE NATURALISTS' UNION.—The third meeting for 1882 was held at Scarborough on the 15th of July, for the investigation of the shore and neighbourhood, and permission had been given by Lords Downe and Londesborough to visit their respective estates. The following parties were formed :—1. Mr. Masee led a party to the rocks on the north beach, where numerous species of algæ were obtained. Had the weather been propitious, this party was to have spent some portion of its

time in dredging, for which purpose the Mayor had kindly placed his steam-yacht at its disposal. 2. A party led by Mr. W. Robinson proceeded to Raincliffe and Seamer Moor, to Forge Valley and Yedmondale. 3. The Rev. E. Maule Cole and Mr. J. H. Phillips led a party of geologists to Gristhorpe, returning by the coast. 4. Mr. J. H. Rowntree led a small party of entomologists to the cliffs at Barniston. At the general meeting the chair was occupied by Mr. Thomas Hick, B.A., B.Sc., one of the vice-presidents. On calling the roll it was found that members representing the following incorporated societies were present:—Barnsley, Dewsbury, Driffield, Huddersfield, Leeds, Ripon, and Scarborough. The list of new subscribers since the Snaith meeting included the names of Mr. George Winter, of Doncaster, and Mr. E. V. Thompson, of Scarborough. Mr. Geo. T. Porritt, F.L.S., proposed that the best thanks of the meeting be given to Messrs. Massee and Rowntree for their efficient services as local secretaries; also to the leaders of parties, and to Lords Londesborough and Downe for permission to visit their estates. Mr. Wm. Eagle Clarke reported, on behalf of Mr. Butterell, for the Conchological Section, that he and Mr. Ross had found 23 land and fresh-water shells, and about 10 marine shells. The best land-shells were *Limax marginatus*, *Helix nemoralis*, var. *hybrida*, *H. fusca*, and *Cyclostoma elegans*. The fresh-water species were—*Bythinia tentaculata*, *Planorbis albus*, *P. corneus*, and *Limnea stagnalis*; the land species, *Limax agrestis*, *L. marginatus*, *Zonites cellarius*, *Z. fulvus*, *Z. nitidulus*, *Z. purus*, *Helix aspersa*, *H. nemoralis*, ditto, var. *hortensis* and *hybrida*, *H. arbustorum*, *H. hispida*, *H. fusca*, *H. virgata*, *H. caperata*, *Bulinus obscurus*, *Clausilia rugosa*, *C. laminata*, *Cyclostoma elegans*; marine genera, *Littorina*, *Pholas*, *Patella*, *Purpura*, *Trochus* and *Chiton*. Mr. Porritt, for the Entomological Section, reported that the rain had considerably interfered with collecting operations, but that Messrs. J. H. Rowntree of Scarborough, N. F. Dobree of Beverley, and himself had taken the following, amongst others, on the north cliffs:—*Toxocampa pastinum*, *Gnophos obscurata*, *Strenia clathrata* (plentiful and very fine), *Pterophorus trigonodactylus*, and *P. osteodactylus*. Mr. Massee, for the Botanical Section, reported that, notwithstanding the unfavourable weather, the section did a fair amount of work; 350 species of phanerogams, and about 50 cryptogams, were collected or seen. Amongst unusual plants exhibited at the sectional meeting were *Lathyrus sylvestris*, *Epipactis palustris*, *Smilacina bifolia*, *Torrubia militaris*, *Mitruha paludosa*, and *Agaricus (Omphalia) oniscus*. The two last, discovered by Mr. Middleton, are new to the district, and, so far as is known, to the county. Mr. J. H. Phillips reported for the Geological Section, that the party (led by Rev. E. M. Cole, M.A., and himself) alighted at Gristhorpe station, near Filey, and walked to the summit of the lofty cliffs, where—after a pleasing survey of the coast—they descended to the beach, where there is a good display of the drift resting in descending order on the Calcareous grit, Oxford clay, Kelloway rock, shales, and false-bedded sandstones. These sections, more or less,

are continued to "Lou's" Nab. The millepore ridge of rocks, at low water, are seen in this bay to great advantage, but the advancing tide as we passed was fast submerging them. Passing round "Lou's" Nab, we quickly came upon the site of the great fault, which is here very perceptible. It is a remarkable dislocation. On the left of the line of fault, the lower part of the Oxford clay is opposed to the bottom of the calcareous grit on the right; whilst the Kelloway rock on the right meets the carbonaceous sandstones and shales on the left. The extent of the dislocation is about 140 feet. Just beyond, northwards, is one of the finest sections in the kingdom of the Calcareous grit, Oxford clay, and Kelloway rock; whilst the Cornbrash is shown at the base by a dwarf fringe of rocks near the line of high-water mark, with false-bedded sandstones and shales overlying the millepore bed. Owing to the advancing tide, we had but a brief period left us to hammer out of the cornbrash a few of its characteristic fossils. Gristhorpe Bay, with its island rock-plant beds, and bold cliffs, presents a fine study for the young and enterprising geologist, for its various strata consist of vast multitudes of shells, ferns, *Zamia*, *lycopodiaceæ*, and thin laminae of coal, and the plant-bed is full of fossils guarded by the millepore bed. Here our happy labours were compelled to be terminated owing to the tide, and a drenching shower of rain overtook us whilst ascending the cliffs above Cayton Waterworks; but the enchanting walk to Scarborough, with the fine bay on the one hand, and the bold headland of Oliver's Mount on the other, amply compensated for those little drawbacks. The imperfect specimens of fossils we were able to procure—and so very speedily—were *Avicula Bradenburiensis*, *Grevillia aviculoides*, *Othea*, *Myacetes recurvus*, *Ammonites convolvulus*. Mr. Wm. Eagle Clarke, for the Vertebrate Section, said nothing could be done on account of the weather, and the only birds noticed were the cormorant, blackheaded gull and various other gulls, sandmartin, swift, whinchat, stonechat, redstart, lesser redpoll, greenfinch, wheatear, and jay.—A vote of thanks to the chairman concluded the proceedings.—W. E. C.

BEVERLEY REPORT.—Not knowing of any previous record of the occurrence of *Tephrosia consonaria* in Yorkshire (see *Nat. VII.*, 206), I wrote to Mr. N. F. Dobree, asking him kindly to make inquiries respecting the insect named as that species at the Beverley Meeting of the Union. Mr. Dobree tells me (as I suspected) that the specimen was wrongly named, and was indeed a much commoner species. I have little doubt, also, that *Coremia munitata* should be omitted from that day's captures, as, even if it occurs at Beverley at all, May 29th would, I think, be too early for it to be on the wing. And were not the specimens recorded as *Tephrosia crepuscularia* really *T. biundularia*?—GEO. T. PORRITT, July, 1882.

[ERRATUM.—On p. 205, vol. vii., line 6 from bottom—for "dogger," read "marlstone of middle lias."]

Original Articles.

DARWIN AND DARWINISM.

BY THE REV. S. FLETCHER WILLIAMS.

Read before the Lancashire and Cheshire Entomological Society, June 25th, 1882.

WHATEVER view may be taken of the Philosophical theory that bears the name of Darwin, its strongest opponents freely acknowledge the candour of its author, and the force and ingenuity of the arguments by which it is supported. The publication, less than a quarter of a century ago, of the "Origin of Species, by means of Natural Selection," caused a revolution in the views held as to the origin of life. Fifteen years before that date, the "Vestiges of the Natural History of Creation," restated in an attractive form, the Lamarckian doctrine that existing forms of life have descended from pre-existing forms; and that work gave rise to a long and bitter controversy. This controversy had nearly spent itself when Mr. Darwin, avoiding the mistakes of the "Vestiges," came forward with his now celebrated theory, that existing forms have been gradually developed by "natural selection" and the "struggle for life;" or, as Mr. Herbert Spencer puts it, "the survival of the fittest." The re-statement of views that are as old as philosophy itself, supported as these were with great ingenuity of argument, and by the aid of a vast store of scientific information, most skilfully used, gave a fresh impetus to the controversy, and turned it into a new and unexpected channel. It was seen and felt that Charles Darwin was a man of no ordinary power. His views at once commanded attention, and attention soon grew into admiration or alarm, according to the views of those who studied them. There was one peculiarity in the controversy. Mr. Darwin wrote as a naturalist, and supported his hypothesis by an appeal to the well-ascertained facts of a department of knowledge in which he has probably an unequalled mastery, while most of the criticism was directed against the hypothesis, and left the facts untouched. Himself no controversialist, he continued unobtrusively to apply himself to the work of observation and the accumulation of further stores of knowledge, and allowed the din of controversy to expend itself without contributing to it a single word.* His letters

N.S., VOL. VIII., SEPT., 1882.

* There is no trace in his writings of the storm to which his doctrine gave rise, for he serenely went on with his self-appointed task, leaving the result to be decided, not under the hasty impulses of the moment, but with the calmer judgment of mature reflection.

at the time are said by Professor Asa Gray to testify that he viewed the public discussion with a sense of amazed wonder at an unexpected notoriety. Maintaining through it all the kindness, unaffectedness, and simple-heartedness which made him one of the most loveable of men, it is said that whenever he came into correspondence or contact with any opponent, he never failed to make a friend of him.

Looking at Charles Darwin simply as a man, how many times in England, in Europe, in America, can you match him? Simple-hearted as a child, singularly modest and unassuming, a man who may be taken as a model in his personal character, in his home life, in his life as a citizen,—a man who has made the single-hearted and clear-eyed pursuit of truth the one work of his life, and who has shown a singularly pure and unbiassed and unpartisan devotion to that truth. He did not seek to build up his own ideas or to glorify himself, but he looked calmly and dispassionately at the subjects with which he dealt, searching simply to find out the truth, and setting down the results in direct and lucid terms. I wish that those who claim to be holier than he, could really establish their right to stand on a level with him in this marvellous characteristic of the earnest, pure-minded seeker after truth. Even they must admit it is well that the change of lease in philosophical natural history which had to be made in their generation should have been dominated—though it has not been wholly controlled—by a spirit so truthful and single, and a judgment so calm and well-balanced.

Let me give an illustration of the extent to which he carried this. The "Origin of Species," his great epoch-making book, contains in itself the hint—more than the hint, the clear statement—of every single criticism that has ever been made on it. He overlooked, he covered up, none of the difficulties that stood against his theory. He put the weapons into the very hands of his enemies, and said, "See, here is this theory; such things make for it, such things make against it. Destroy it if you can." And this he said in no defiant tone, but only as one who should say, "If this be not a part of the eternal truth, it ought to be destroyed; and, though my life-work be lost as the result, yet I will help you in its destruction." How many men advocating moral, religious, sociological, political theories of any kind have ever been so utterly candid and fair as this? So much simply to indicate the kind of man he was.

Charles Darwin was born in Shrewsbury, in February, 1809, and when we look at his ancestry, and see the stock from which he

descended, we are compelled to think of him as a conspicuous illustration of one of the more important parts of his own theoretical and scientific work. Both his father and his grandfather were noted men of science; their fame, indeed, eclipsed by the greater brightness of his, and yet men noteworthy enough to be reckoned as helping to make up the scientific development of the life of England. All these—his grandfather, his father, and himself—were members one after another of the Royal Society of England: perhaps the only case in English history where men in the line of direct descent have been held worthy of that honour. His mother was a descendant of the family of the Wedgwood's, so noted in connection with the manufacture of pottery. Young Darwin received his preparatory education at Shrewsbury School, under Dr. Butler, afterwards Bishop of Lichfield. Thence he went to Edinburgh University, where he studied two years; where, so far as memoranda can guide us, he evinced a decided inclination for the study of Natural History, directing his attention more particularly to marine zoology, and where he read at least two papers on subjects connected with his favourite study, before the Plinian Society, which just then came into being. From Edinburgh he went to Christ College, Cambridge, where he graduated at the age of twenty-two. So far young Darwin had acquitted himself creditably, but with no special mark, at his various seats of learning: but now, another and different sphere of education presented itself, and Darwin embraced the offered opportunity.

In the autumn of 1831, a ship was starting on a voyage round the world; and that voyage has been made famous, and will be famous in all coming time, simply by the fact that the young man of twenty-two volunteered to accompany the trip in the capacity of naturalist. It was characteristic of the young man's zeal for the study of natural science that he served without salary, and paid a portion of his own expenses, on condition that he should have the right of making what use he pleased of the zoological, botanical, and geological collections. Under these arrangements, then, at the age of twenty-two, he sailed in the "Beagle," made a voyage round the world, and was absent from England for five years. Was that a time lost? It was a seed-time preliminary to a fruitful and precious harvest. In the progress of this voyage he was much struck by some peculiar relations that he discovered between the plant and animal life of the Gallapagos Islands, and similar life on the continent of South America; and then and there was planted the seed from which has sprung the great and mighty development of his thought,

which has changed, and is still more to change, the life of the world. After five years he returned, in 1836, nursing in his mind this fruitful thought, which, as I have said, was to be the seed of all his future life. He published several works as the result of the discoveries and observations made during this voyage. His "Journal of Researches into the Natural History and Geology" of the counties he visited, has been pronounced "the most entertaining book of genuine travels ever written," and it at once carried the author's name far beyond the comparatively narrow limits of scientific fame; but while this and subsequent publications prepared scientific circles to expect something good at his hands, there was no public trace yet, nor for years, of that which was to create an impression at once so deep, so wide, and so immediate.

In 1839 Mr. Darwin married his cousin, Miss Emma Wedgwood, grand-daughter of Josiah Wedgwood; and in 1842 went to live at Down, near Bromley, in Kent, where he resided throughout his subsequent life. He has had a family of seven—five sons and two daughters. Several of his sons have already acquired some distinction, having largely assisted him in the preparation of his works, and in the investigations on which they are based. More than one of them has made valuable contributions to science; and the eldest son, George H. Darwin, is an examiner for the Mathematical Tripos at Cambridge, and an occasional contributor to scientific and other magazines.

Darwin's life was remarkably uneventful so far as personal incidents of any special interest to the general public are concerned; but it may be said of him that in the recesses of his closet he was turning the intellectual world upside down. The dates of the production of his numerous works are the principal milestones to mark the period of his long and laborious career. The work he has accomplished could have only been got through by a most methodical devotion and the firmest determination of purpose. In a cursory and sketchy paper like this there is no room—and indeed for the present audience there is no need—to sketch even the outlines of that work on the direct lines of his theory, as contained in the series of volumes on "The Origin of Species," "Variations of Animals and Plants under Domestication," "The Expression of the Emotions in Man and Animals," "The Descent of Man," and "Selection in Relation to Sex." And still more space would be required to specify the topics and their treatment, which fill a subsidiary series of volumes, such as "The Fertilization of Orchids

by Insects," "The Movements and Habits of Climbing Plants," "The Effects of Cross and Self-Fertilization," "The Different Forms of Flowers," (viewed in referenee to their relation to insects), "The Power of Movement in Plants," and, lastly, "The Formation of Mould through the Action of Worms," published only a few months ago. In any adequate pourtrayal of Darwin's scientific productions all these should have particular mention, for they are very characteristic of his genius and of his methods. Since all the works I have mentioned have been brought out within twenty-five years, it might seem that their author had given most of his time to book-writing ; yet this would be wide of the mark. Darwin was pre-eminently an investigator—hardly less so in the production of the earlier than of the later works. But those of the second list are models of acute and pains-taking investigation, inspired and fertilized by ideas. The amount of prolonged observation, watchful care, and tedious experiment they have demanded, is as wonderful as the skill in devising simple but effective methods of research is admirable.

For the production of these results, one would say that genius and industry must have been seconded by abundant leisure and robust health. Fortunately Darwin could command his time ; but from the day on which he set sail for South America in the "Beagle" to the day of his death he was a suffering invalid, being, as it were, under chronic sea-sickness. We are told that the day in which he could accomplish two hours of work was counted a good one ; and there were very many in which nothing could be attempted.

Perhaps even more than method and concentration were required, especially in the case of a man who had devoted his life to such researches and studies as those on which Darwin's reputation rests. He could not have achieved the work with which his name is associated had he gone into the usual round and whirl of "society" ; this, so far as we can learn, he did not do. This does not imply that he was unsocial—far from it : Carlyle describes him as "a charming talker and companion"—but only that he did not throw away his time and energies upon companions or companionships of a trivial or dissipating nature. A friend who knew him well, writes :—"Darwin has to a large extent eschewed general society, in which he had learned that there was more of noise and pretence than of calm wisdom and substance, and has almost wholly kept himself apart from public appearance ; so much so, indeed, that you might search the journals of the last thirty years without often finding his name in

connection with the so-called great causes or "isms" of that long stretch of time." The same friend adds :—"This recluseness, while no doubt partly forced upon him by the exacting nature of the investigations he has been constantly carrying on, has been also due to some extent to a bodily infirmity under which he has laboured during the greater part of his literary career."

But, however Darwin may have been absorbed in his speculations, he was not left in undisturbed quietude. It could not be. He had to pay at least part of the price of greatness. If he would write and publish books which stirred the mind and heart of men in all parts of the world as with the sound of a trumpet, it was in the nature of things, and inevitable, that at least an echo should come back upon him. To say nothing of private praise from friends in all parts of the world, and, not least, from the United States, in 1853 the Royal Society awarded him their Royal medal, and in 1864 the Copley medal. In 1859 the Geological Society awarded him the Wollaston medal, while foreign Governments and societies have at various times acknowledged his distinguished services in various departments of scientific research and knowledge. In the November of 1877 the University of Cambridge rather tardily conferred on him the honorary degree of LL.D. At the dinner given at Cambridge the same evening in honour of the event, Professor Huxley, who replied for Darwin (now Dr. Darwin), referred, in pleasant badinage, to the University as reserving its highest honour until all other distinctions had been heaped upon Mr. Darwin, "that its own chaplet might crown the whole, and not be covered up." On the same occasion Professor Huxley spoke of Darwin as the foremost amongst men of science, with one exception, since the days of Aristotle. In the course of the same year Darwin received what must have been to him a more flattering compliment. On his sixty-ninth birthday he was presented with an album—a magnificent folio—bound in velvet and silver, containing the photographs of 154 men of science in Germany. These included many of the best known and most highly honoured names in Europe. He also received on the same occasion, from Holland, an album with the photographs of 217 distinguished professors and men of science in that country. In returning thanks for these unique marks of appreciation, Darwin wrote :—"I suppose every worker at science occasionally feels depressed, and doubts whether what he has published has been worth the labour which it has cost him; but for the remaining years of my life, whenever I want cheering, I will look at the portraits of my distinguished

co-workers in the field of science, and remember their generous sympathy."

It was in 1844, I believe, that Darwin wrote out a little sketch, which formed the foundation of "The Origin of Species"—not at all for publication, but simply as a nucleus, or crystallizing centre around which to group his observations, and to make the basis of his study. It was not till 1859 that he published the great work on which his fame will rest. And here is an illustration of that singular fairness and earnest search for truth to which I have referred. He did not leap into print with a guess; but, after he believed that he had found the truth concerning the life of the world and of man, he studied and thought and observed, and gathered new facts and new arguments for long years, that he might be *sure*, as far as it is possible to attain certainty, that he had attained the truth. As an illustration of this same spirit, which is really the spirit of science, and which I believe to be inherently and essentially religious, as all humble truth-seeking of necessity must be—take the case of Newton. Newton conceived his theory of gravitation, and for sixteen years studied and gathered facts, arguments, and illustrations, before he ventured to give it to the world. And Mr. Darwin would have waited and studied years longer than he did, had it not been for the fact that Mr. Alfred Russell Wallace (whose name will always stand as sharing the honour with Darwin), while exploring the islands of the Malay Archipelago, had come to the same conclusions and arrived independently at the same theories with Darwin. Mr. Wallace embodied his theory in a paper, which he forwarded for communication to the Linnean Society. And here I may notice a beautiful episode of scientific fairness. The nature of Mr. Wallace's paper having been ascertained by certain of the Fellows of the Society, who were also friends of Darwin, and who knew that for several years he had been elaborating and working out in detail the same theory, they arranged that a paper should be communicated by Darwin at the meeting of the Linnean Society at which Mr. Wallace's paper fell to be read, so that in this way the question of priority as to the authorship of the theory of "natural selection" might be left for future settlement. Mr. Wallace was entirely satisfied, and has handsomely admitted that Darwin had propounded the theory years before it had been suggested to his attention.

Darwin then wrote out and gave to the world his "Origin of Species." He had wrought more completely, much more grandly,

than he himself was aware. He found that his arguments and the clearness of his presentation had been so remarkable, that the world, in a brief space of time, considering the revolution involved, was converted to his theory.

(To be continued.)

ON THE CLASSIFICATION OF BRITISH INSECTS.

BY S. L. MOSLEY, HUDDERSFIELD.

(Concluded.)

The next family is the *Perlidae*, or stone-flies. In this family the fore and hind wings are of nearly equal length, and the abdomen has two antennæ-like projections at the end.

The third family is the *Ephemeridae*, or may-flies, distinguished from the last by the very short antennæ, the small hind wings, and by the long slender filaments at the extremity of the body, which are sometimes three in number.

The fourth family is the *Libellulidae*, or dragon-flies, well known to every collector of insects.

The fifth family is the *Hemerobiidae*, or lace-winged flies, of which *Chrysopa perla*, a pale-green delicate insect with metallic eyes, found in woods, is well known.

The family *Sialidae* consists of a few species, and have aquatic larvæ.

The family *Panorpidæ*, or scorpion-flies, have black spots on their wings, and the males are armed at the extremity of the body with scorpion-like pincers.

The second sub-order of Neuroptera, or distinct order, whichever you like to call it, is the Trichoptera, the well known caddis-worm flies. They are very similar in their appearance and habits, and seem all unitable under one general class.

Ord. 5, LEPIDOPTERA.—The Trichoptera seem to unite the Neuroptera with the Lepidoptera, and the transmission is most complete, if we begin the latter with *Acentropus niveus*, but this, as in the case of the Coleoptera, would no doubt meet with little favour from specialists, they are so accustomed to begin their cabinet with *Papilio Machaon*, that I am afraid it would be difficult to persuade them otherwise; yet *Machaon* can have no connection with any other

insect in any other order. It is the old Linnean idea of placing the type at the head. To effect an alteration of this kind needs no very great alteration in the arrangement of the various groups; the groups themselves need only be differently placed in relation one to the other, for some of them, like the *Geometrina* and *Tortricina*, are very natural, while others, like the *Nocturni*, are very unnatural, and require re-arrangement. In a short paper like this, where I can give only the merest outline of the system, it is impossible to go into minute detail; but whether the arrangement of the Lepidoptera be altered or not, the natural place of that order seems to be between the Trichoptera and the Hymenoptera.

Ord. 6, HYMENOPTERA.—The Hymenoptera are divided into two sub-orders, the TEREBRANTIA and the ACULEATA. The first family of the Terebrantia is the *Tenthredinidæ*, or saw-flies, and their larvæ at once suggest a very close relationship with the last order, the Lepidoptera. This class of insects is too well known among entomologists to need any description; the gooseberry grub is a very common example.

The second family of Terebrantia is the *Sircidæ*, consisting of but few species in Britain, similar to that large and attractive insect *Sirex gigas*.

The third family is the *Cynipidæ*, or gall-flies, of which we have many species in Britain, all of them small, and producing woody excrescences upon the leaves, bark, or roots of plants.

The next family consists of but a few species, small insects, and parasites upon cockroaches. They are remarkable for having a very slender abdomen springing from the back. The family is called *Evaniidæ*.

The family *Ichneumonidæ* is of large extent, though the insects comprising it, are generally comparatively small. Their general form is known to members of this Society either friendly or otherwise, perhaps too often the latter.

The *Chrysididæ*, or ruby-tailed flies, come nearest to the true bees and wasps, in the nests of some of which they are parasitic. The commonest species, *Chrysis ignitis*, may be found sunning itself upon walls in very hot weather, or dug from the nests of the sand wasps.

The second sub-order, ACULEATA, comprises the *Fossores*, sand and ground wasps, the ants, the true wasps, and the bees.

Ord. 7, DIPTERA.—The representatives of the bees among the Diptera will be found in the genus *Bombylius*, or humble-bee flies,

and these should succeed the last group of Hymenoptera, to which these, as well as the *Tabaniidæ*, assimilate in the structure of the mouth. Then follow the *Aniscidæ*, *Syrphidæ*, and other groups of this distinct order.

In making this rapid sketch, of what I should propose as an arrangement of insects, I have only been able to take the most skipping glance at the various orders, and point out, where and how one might be joined to another. I do it because I think there needs to be some settled and accepted arrangement of the various orders of British insects. The time is not far distant, I think, when entomology shall be an accepted science, and shall form a part of our national education, and then, if not now, will be demanded a classification of British insects. Typical collections are the things which will be found most useful in instructing young people in the mysteries of the insect world. And not only to them, but even to professed entomologists such collections are always of great utility. These collections should be formed in every public museum, in every scientific institution, and in every school, for a knowledge of the insect world is of far greater importance than much that is taught now under the name of education.

Short Notes and Queries.

LEPIDOPTERA IN IRELAND.—Having just returned from my usual holiday in Ireland, which I always spend in entomology, I send a few rough notes of my doings. I have to add the same sad tale as others. My object in choosing the end of June and the beginning of July was to take *B. furfurana* and a beautiful variety of *H. stagnalis*, but when I reached the hunting grounds they were all under water, and I only succeeded in capturing very old specimens of the former, and none of the *hydrocampa*. The only thing I worked at night was the flower of the woodbine, which is generally very attractive; but this year, with the exception of a few of the commonest moths, yielded little beyond *P. iota*, *V-aureum*, *festuca*, the latter terribly worn. *C. lichenaria*, which is generally fairly plentiful, was entirely absent, as also *Sesia bembeciformis*. I saw two types of *D. Barrettii*, taken at Howth, but I was not successful in my attempts there, as I came away, after a long day's work, with little or nothing. The strangest thing I saw was on July 3rd, about 11-30 a.m., *A. cardamines*, which seems to point to a second brood. Altogether the season seems to me to be one of the worst for entomologists, and we must only hope for "better luck next time."—G. C. B. MADDEN, Armitage Bridge Vicarage, Huddersfield.

Scoparia conspicualis AND *Acronycta alni* AT EDLINGTON WOOD.—This morning I received a few specimens of *S. conspicualis* from Mr. W. Prest, who had taken them near York. I did not previously know the species, but on opening the box, saw directly that it was perfectly familiar to me ; and on looking over my store boxes I at once picked out several good specimens, and some inferior ones. I took them certainly two, probably three years ago, in Edlington Wood, near Doncaster, where I am pretty sure I have seen the species each season since, but have always passed it over as a form of *ambigualis*. I am also inclined to think I saw it at Grassington on the Union's excursion there, the last Bank Holiday, but did not box a specimen. If any member brought away from there any doubtful *Scoparia*, I should much like to see it. On the 5th of the present month I found a larva of *A. alni*, on the upper side of an oak leaf in Edlington Wood. It has fed well, and is now evidently full grown, and about ready for spinning up.—GEO. T. PORRITT, August 17th, 1882.

ADDITIONS TO WEST-RIDING ALGÆ.—As far as I know, the following algæ which I have recently collected, are not recorded for the West-Riding : *Sirogonium sticticum*, K. ; *Cosmarium Holmieri*, Sundell, and *Staurastrum meriani*, Reinsch, from Shipley Glen ; *Ædogonium concatenatum*, Hass., and *Cosmarium leve*, Rabenh. from near Bradford ; *Zonotrichia fluviatilis*, Rabenh. from Malham ; and *Calothrix Wrangelii*, Ag., on rocks in the stream at Ingleton.—WM. WEST, Bradford.

ERRATUM.—At page 16, for “ Ion’s Nab,” read “ Yon’s Nab.”

Rainfall for July.

	Height of gauge above sea level.	Rain-fall.	No. of Days	TOTAL FALL TO DATE.		Date of heaviest Fall.	Amount of heaviest Fall.
				1882.	1881.		
HUDDERSFIELD (Dalton) ... (J. W. Robson)	Ft. 350	In. 3·00	* * 29	21·36	* 17·22	5	0·470
HALIFAX... (F. G. S. Rawson)	365	4·46	27	31·48	23·66	..	...
LEEDS ... (Alfred Denny)...	183	3·040	25	16·635	†12·991	13	0·340
HORSFORTH ... (James Fox)	350	4·640	28	20·400	‡17·228	7	0·470
BARNSELY ... (T. Lister) ...	350	3·02	25	17·37	12·17	6	0·43
INGBIRCHWORTH (do.)	853	4·44	30	25·23	19·30	2	0·64
WENTWORTH CASTLE (do.)...	520	3·49	23	18·53	14·31	6	0·50
GOOLE ... (J. HARRISON) ...	25	3·69	17	14·57	9·83	22	0·70
HULL (Derringham) (Wm. Lawton)	10	1·97	22	11·172	15·11	27	0·35

* This is the average to date for 16 years, 1866-81.

† Average of 28 years, 1853-62 and 1865-82.

‡ Average of 13 years, 1870-82.

** Have never had so many rainy days in one month before.—J.W.R

Reports of Societies.

BARNSELY NATURALISTS' SOCIETY.—At the meetings of August 1st, T. Lister in the chair, and August 15th, Dr. W. J. Lancaster, the president, in the chair, reports were made by the various sections. The monthly excursions were productive of good results, which will appear in the next quarter's "Transactions." The quarterly Transactions to the close of June 30th, were laid on the table to be presented to each member and corresponding society. It is a painstaking report. The entomological section reports an unsuccessful season on account of cold wet nights. The only moths worth reporting are *Cymatophora fluctuosa*, June 6th, at Lunn Wood; *Procris statices* found for the first time in this locality in a field adjoining New Park Spring, June 15th, by the secretary, W. E. Brady; *Cymatophora fluctuosa* again taken June 16th; *Asthena sylvata*, *Melanippe hastata*, *Numeria pulveraria* at New Park Spring; *Notodonta dictæoides*, *Venusia cambricaria* and two more *C. fluctuosa* at Wharncliffe. The botanical section (T. Rose, secretary), gives a long list of plants found, drawn up by Messrs. F. Batley and W. Hemingway, for which space cannot be afforded in the *Naturalist*. The geological section found in the beds of boulder clay of a dark tenacious character, re-exposed in the cutting of the Barnsley Coal Railway, at the bridge carrying over the Barnsley and Wakefield Road the following rocks:—Sandstones and shales with scratches, coals, do.—ganister, mountain limestone, silurian grits, limestones with remains of encrinital stems, greenstone, green slate several varieties, both much rounded and weathered, also Hematite iron ore. Specimens of all the above are in the museum. A bed of yellow clay has been observed at various points between Smithies and Roystone; the mass of granite at the latter place has been twice visited, being discovered by Professor Green. The following fossils were brought from the workings on the Hull and Barnsley Railway, near Brierley, *Sphenophyllum erosum*, *Annularia sphenophylloides*, and *Sphenopteris crenata*, an almost perfect frond of *Neuropteris gigantea* 17 inches long. An erratic block was observed at Lunn Wood, about two feet cube, one face glaciated, the material appeared to be ganister.—H. Wade, secretary. The vertebrate section, drawn up by W. Robinson, presents an elaborate report, some of the birds have already appeared in the *Naturalist*. Cuckoos have been plentiful, sixteen were observed.

BRADFORD NATURALISTS' SOCIETY.—Meeting June 27th.—Mr. Soppitt (vice-president), in the chair.—Mr. B. Spencer read a paper on "Plant Lore," and took for his starting point the following quotation from Dr. Clark, "The weeds of one country are the flowers of another." He first described what weeds are, and showed how under cultivation they can be improved in many ways. As an instance of this he took the corn poppy, which when cultivated becomes double. He described how plants will deteriorate to their wild state if cultivation is not kept up. One of the principal agents of the florist in cultivating plants is hybridizing, and

many of our most beautiful cultivated plants have been produced in this way, including the roses and geraniums. He concluded by giving a long list of our cultivated plants with the wild from which they are derived, and the locality where the wild plant grows. Mr. Soppitt showed a specimen of *Botrychium lunaria* from Shipley Glen. Rambles to Esholt and Ilkley were decided to be added to the syllabus for the next session.

MEETING on July 11th.—Mr. Wm. West gave a lecture on “Peat mosses,” and fully explained their structure, uses, and distribution, as well as the characters used in differentiating the species. A large number of species and their varieties were shewn in illustration of the lecture, together with a number of drawings showing their beautiful microscopical structure. The genus *Sphagnum* is a very characteristic one, the plants are always found in watery places, and it is almost entirely to their remains that we owe our peat formations. They are of great use also in the cultivation of our orchids and the transportation of living plants during long voyages. On our extensive moors they are of great use in preventing both floods and droughts. Mr. Bennett exhibited *Cakile maritima* and *Eryngium maritimum* from Skegness; Mr. Soppitt showed *Glaucium luteum*, *Calamintha acinos* and the Hollyhock fungus *Puccinia malvacearum* from Arnside; Mr. Stirling showed a number of fresh-water shells, among which were three species of *Planorbis* including *P. corneus*, *carinatus*, and *albus*; Mr. Firth reported having heard the grasshopper warbler, at Girlington; Mr. Rogers showed a photo-micrograph of the diatom *Arachnoidiscus ornatus*, magnified 400 diameters.

MEETING July 25th.—Mr. W. D. Roebuck, of Leeds, read a paper on “The Order Cheiroptera, or Bats.” He said that bats are the only mammals that can really fly, as in the case of the flying squirrel, and others, the supposed flight is merely a leap. He described how the development of all the organs of the bats is especially suited to their habits, and said that the most striking proof that they were really quadrupeds was their way of walking, which he described as shuffling along the ground with their thumb and hind-feet, and in some species the tail is also used in crawling on the ground or up the rough surfaces of trees. There are fifteen British micro-cheiroptera and all are insect feeders. He described the peculiarities of all the British species, and showed specimens of the following:—The lesser horse-shoe bat (*Rhinolophus hipposideros*) from Evestone, near Ripon; the noctule or great bat (*Vesperugo noctula*) from Masham, the pipistrelle or common bat (*V. pipistrellus*) from Harrogate, the long-eared bat (*Plecotus auritus*) from Pateley Bridge, the whiskered bat (*Vespertilio mystacinus*) from various Yorkshire localities. Mr. Bennet showed *B. callunæ*, &c., from Thorne and Rombald Moor. Mr. Terry exhibited *C. imbutata*, *A. fumata*, &c., from Witherslack. Mr. Firth, the following insects, taken in this locality, *P. comitata*, *M. galiata* and *N. mundana*. Mr. Carter shewed *Crambus margaritellus*, from Rombalds Moor, and *H. nymphæalis*, *P. stratiotalis*, *S. cembralis*, and *E. sam-*

bucalis, from Frizinghall, all of which are new to the district record list. Mr. Roebuck exhibited, on behalf of Mr. West, a number of shells including several rare species of *Pupa* and *Vertigo*.

MEETING August 8th.—Mr. Soppitt described the ramble of the Yorkshire Naturalists' Union to Grassington, which took place on Monday, August 7th. He described it as being a most enjoyable and successful ramble, and said that all sections were pleased with the number and rarity of the specimens they took. In entomology the principal capture was made by Mr. Butterfield who took a specimen of *M. excolita* this being the only specimen known to have been taken in Yorkshire. A great number of *Erebia Blandina* were taken in Upper Grass Wood, which is the only Yorkshire locality for this species. Mr. Soppitt found a parasitic fungus (*Xenodochnus carbonarius*) which was new to the district. Mr. Carter described a ramble from Ilkley to Grassington, and reported taking the following shells:—*Helix rupestris*, *H. hortensis*, and *H. lapicida*, and a number of beetles, including *Cyctorus rostratus* and *Carabus nemoralis*. Mr. Bennett read a paper on "Pneumatics," dealing principally with the air-pump. In illustration of the paper he showed a number of interesting and instructive experiments.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Monthly meeting July 31st, Mr. Benjamin Cooke in the chair. Mr. J. R. L. Dixon read a paper entitled "A Comparison between the Mechanism of Flight in Insects and Birds," in which he detailed the results of the interesting researches of Drs. Pettigrew and Marey on the subject of flight, and explained by diagrams the mode of action of the wings in insects and birds. During the conversazione a specimen of a hymenopterous insect (*Rhyssa persuasoria*?) recently captured in the insect-room of the Derby museum, was exhibited through the kindness of the curator, Mr. T. J. Moore. Mr. B. Cooke exhibited a specimen of an ant (*Myrmica levinodis*) which combined male, female, and worker, and which had been caught by Mr. Chappell in Dunoam Park.

YORKSHIRE NATURALISTS' UNION.—GRASSINGTON, AUG. 7TH, 1882.—The fourth meeting of the season was devoted to the investigation of Upper Wharfedale, more especially that portion of it which lies immediately round Grassington, Grass Wood, with its rich and varied fauna and flora, attracting the greater share of attention. The attendance was large, there being about 80 or 90 persons present from all parts of Yorkshire. The day was gloriously fine and sunny—true "Y.N.U. weather." Most of the visitors approached Grassington by way of Skipton, from which they drove the ten miles, while others drove from Ilkley, Cracoe, and other places; and several members investigated the district for a day or two previously. The district being one of which the fauna is as yet most imperfectly known, the local secretaries had previously prepared (in addition to the usual circular) a full summary of what they actually knew

on the subject. This paper appeared in the *Leeds Mercury* supplement of July 29th (it was afterwards reprinted in the *Young Naturalist*), and was of considerable utility in eliciting additional information. After the day's investigations were concluded, the meetings were held in the Devonshire Hall, at Grassington, the chair of the general meeting being occupied by Mr. Wm. Cash, F.G.S., of Halifax. The societies represented were—Bradford (2), Dewsbury, Halifax, Heckmondwike, Huddersfield (2), Ilkley, Keighley, Leeds (3), Liversedge, Mirfield, Ovenden, Scarborough, Wakefield, and York (St. Thomas's). Thanks were voted to Messrs. J. N. Dickinson of Leeds, C. H. L. Woodd, F.G.S., J.P., of Outershaw, Ven. Archdeacon Boyd, M.A., of Arncliffe, and the Rev. W. A. Shuffrey of Halton Gill, for becoming new subscribers. Thanks were then voted, on the motion of Mr. J. Brodie, to the local secretaries, to the Duke of Devonshire for permission to ramble over his estates, to the committee of the Grassington Mechanics' Institute for use of their hall, and to Mr. W. J. Ray Eddy, F.G.S., the Duke's agent, for his assistance and kindly co-operation. The sectional reports were then taken. Mr. G. T. Porritt, F.L.S., of Huddersfield, president of the Entomological Section, spoke on the lepidoptera to the following effect:—Twenty-four species of lepidoptera had been observed, including one quite new to the county; this was *Miana expolita* (captiuncula), taken by Mr. E. P. P. Butterfield, of Wilsden, Bingley. The very local *Erebia Blandina* was flying in great abundance on nearly all the grassy slopes in the High Grass Wood, and although hundreds must have been secured during the day, as many more might easily have been taken. Nearly all the specimens, too, were in splendid condition. The coleoptera were reported on by Mr. E. B. Wigglesworth, of Wakefield, secretary of the section. For the Botanical Section, in the absence of all its officers, Mr. John Jackson of Wetherby reported that the following species had been noticed, amongst others:—*Thalictrum flexuosum*, *Trollius europæus*, *Alsine verna*, *Sagina nodosa*, *Geranium lucidum*, *G. sylvaticum*, *G. sanguineum*, *Rhamnus catharticus*, *Vicia sylvatica*, *Prunus padus*, *Spiræa filipendula*, *Rubus saxatilis*, *Hippuris vulgaris*, *Sedum telephium*, *Saxifraga hypnoides*, *S. tridactylites*, *Parnassia palustris*, *Silaus pratensis*, *Pimpinella magna*, *Myrrhis odorata*, *Galium boreale*, *Asperula odorata*, *Carduus heterophyllus*, *Serratula tinctoria*, *Crepis paludosa*, *Gentiana campestris*, *Melampyrum sylvaticum*, *Primula farinosa*, *Epipactis palustris*, *Asplenium viride*, *A. trichomanes*, *Cystopteris fragilis*. There were also several Charas, which were not determined. A few fungi were observed by Mr. H. T. Soppitt, one of them—*Xenodochus carbonarius*—being new to the West-Riding flora. The other fungi were—*Agaricus rimosus*, *A. semiglobatus*, *Boletus flavus*, *B. subtomentosus*, *Stereum hirsutum*, *Phrymidium obtusum*, *P. mucronatum*, *P. acuminatum*, *Æcidium crassum*, *Æ. tussilaginis*, *Puccinia violarum*, *P. umbelliferum*, *P. compositarum*, *Lecythea lini*, and *L. saliceti*. The Geological report was given by Mr. Thomas Tate, F.G.S., of Leeds, president of the section. Mr. Tate's reports were

supplemented by Mr. Percy Lund, of Ilkley, who had spent the previous two days at Cracoe and Thorpe Hall, where he had found upwards of 50 fossils, including *Lithostrotion basaltiforme*, *Phillipsia seminifera*, *Productus giganteus*, *P. semireticulatus*, *P. scabriculus*, *P. Youngianus*, *P. margaritaceus*, *P. cora*, *Spirifer glaber*, *Streptorhynchus crenistria*, *Terebratula sacculus*, *T. hastata*, *Pleurorhynchus abseformis*, and *Orthis resupinata*. In Vertebrate Zoology, Mr. Clarke, the secretary of this section, made the report: The list of birds included 32 resident species and 18 summer visitors, the most interesting of which were the dipper, grey wagtail, common sandpiper, and curlew. A collection of local birds in the possession of Mr. F. Holmes, of Grassington, included the following additional species:—Stonechat, fieldfare, snow bunting, barn owl, tawny owl, snipe, dotterel, common tern, and teal. It also contained a specimen of the bittern, shot near Grass Wood about 1876. Another bird of this species was shot about the same time near Arncliffe. A pair of short-eared owls, shot upon the neighbouring moors, was seen in another house. In Mammalia, including information gleaned from the gamekeeper and others by Mr. Roebuck, there were about 16 species noted. These included a bat, the mole, hedgehog, shrew, fox, otter, weasel, stoat, squirrel, water vole, field vole, common rat, house mouse, hare and rabbit. In addition to these, the red deer may be included in the fauna, inasmuch as those in Buckden deer-park have existed there uninterruptedly from the time at which the deer of Wharfedale were walled in. The reptiles noted were the common lizard, frog, and toad. It was stated that there were no vipers in Grass Woods. For the Conchological Section, its president (Mr. Cash) occupying the chair of the general meeting, called upon Mr. W. Denison Roebuck to report, as follows:—During the day 39 species and varieties of mollusca had been collected, 16 of which were additional to the previously recorded fauna of the district. The best captures were the variety *gibbosa* of *Ancylus fluviatilis*, taken by Mr. Roebuck in the Wharfe at Deepdale Bridge, 15 miles above Grassington; *Zonites radiatulus* and *Clausilia laminata*, found in Grass High Wood; the varieties *tumidula* of *Clausilia rugosa*, *Nouletiana* of *Cochlicopa tridens*, and *lubricoides* of *C. lubrica*. The full list of shells is as follows, those marked * being new to the district list:—**Pisidium fontinale*, **Planorbis spirorbis*, **Limnæa peregra*, **L. palustris*, **L. truncatula*, **Ancylus fluviatilis*, *ditto var. *gibbosa*, *Arion hortensis*, *Limax agrestis*, **L. maximus* (one), **Vitrina pellucida*, *Succinea putris*, *Zonites cellarius*, *Z. alliarius*, *Z. nitidulus*, **Z. radiatulus*, **Z. crystallinus*, **Z. fulvus*, *Helix nemoralis*, *H. hortensis*, *H. arbustorum*, *H. rufescens*, *H. concinna*, *H. hispida*, *H. fusca* (one), *H. ericetorum*, *H. rotundata*, *H. rupestris*, *H. lapicida* (Kettlewell), *Bulimus obscurus*, *Pupa umbilicata*, *Clausilia laminata* (one), *C. rugosa*, ditto var. *dubia*, *ditto var. *tumidula*, **Cochlicopa tridens*, var. *Nouletiana*, *C. lubrica*, *ditto var. *lubricoides*, **Carychium minimum*. A vote of thanks to the chairman concluded a very pleasant and successful gathering.—W. D. R.

Original Articles.

CONTRIBUTION TO A LIST OF THE HEMIPTERA OF LANCASHIRE AND CHESHIRE

(THE NORTH OF LANCASTER EXCEPTED).

(Continued.)

BY BENJAMIN COOKE.

BRYOCORIDÆ.

Bryocoris pteridis, Fall. Hazelgrove; Pettypool, Cheshire.
Monalocoris filicis, L. Bowdon; Pettypool.

PITHANIDÆ.

Pithanus Märkeli, H. Schf. Manchester; Hazelgrove.

MIRIDÆ.

Miris holsatus, Fab. Rivington; Hazelgrove; Marple.
M. lævigatus, L. Manchester.
M. calcaratus, Fall. Southport; Bowdon.
M. erraticus, L. Manchester.
M. ruficornis, Fall. Southport; Cheshire coast.
Lopomorphus ferrugatus, Fall. Hazelgrove.
L. dolobratus, L. Manchester.

HARPOCERIDÆ.

Harpocera thoracica, Fall. Bollin Valley, near Bowdon.

LYGIDÆ.

Lygus rugicollis, Fall. Crosby by F. Archer. Rare.
L. pabulinus, L. Bowdon; Hazelgrove.
L. contaminatus, Fall. Common.
L. campestris, L. Common.
Liocoris tripustulatus, Fab. Aughton, near Ormskirk; Bowdon.
Orthops pastinacæ, Fall. Manchester.

PSALLIDÆ.

Plagiognathus viridulus, Fall. Bowdon; Hazelgrove.
P. arbustorum, Fab. Manchester; Bowdon; Hazelgrove.
Apocremnus ambiguus, Fall. Hazelgrove.
A. obscurus, Kirschb. Hazelgrove.
A. variabilis, Fall. Marple.

Psallus querceti, Fall. Southport.

P. salicis, Kerschb. Greenfield.

P. varians, H. Schf. Manchester ; Marple.

ONCOTYLIDÆ.

Macrocoleus Paykulli, Fall. Cheshire coast.

CAPSIDÆ.

Rhopalotomus ater, L. Hazelgrove.

Heterotoma merioptera, Scop. Bowdon.

Agalliaestes pulicarius, Fall. Southport.

Orthocephalus saltator, Hahn. Cheshire coast.

CAMORANOTIDÆ.

Camaronotus clavatus, L. Southport.

GLOBICEPIDÆ.

Globiceps selectus, Fieb. Southport.

DERÆOCORIDÆ.

Deræocoris infusus, H. Schft, Bowdon ; Pettypool.

D. bipunctatus, Fab. Common.

D. sexguttatus, Fab. Manchester ; Hazelgrove.

D. fulvomaculatus, De G. Bollin Valley.

PHYTCORIDÆ.

Phytocoris tilix, Fab. Manchester ; Bowdon.

P. dubius, Doug. Manchester, Pettypool.

P. dimidiatus, Kirschb. Bowdon.

P. divergens, Meyer. Hazelgrove.

LITOSOMIDÆ.

Litosoma diaphanus, Kirschb. Bowdon.

L. nassatus, Fab. Bowdon ; Hazelgrove.

IDOLOCORIDÆ.

Cyllocoris histrionicus, L. Rivington.

Idolocoris pallicornis, Fieb. Bowdon ; Hazelgrove ; Marple.

I. pallidus, Fall. Hazelgrove.

PHYLIDÆ.

Aetorhinus angulatus, Fall. Manchester ; Hazelgrove.

Sphyracephalus ambulans, Fall. Bowdon ; Hyde ; Hazelgrove.

Phylus melanocephalus, L. Marple.

P. palliceps, Fieb. Hazelgrove ; Marple.

THE *TRIP* OF THE SEASON: OR THE PHANTOM
CICADA.

BY A. H. SWINTON.

It is the 18th July, 1882, and I am sitting in a railway carriage listening to the reverberation of the steam-puffs adown the vacant vistas of a right royal deer park. Suddenly the sepulchral voices of two old cronies arise in the next compartment, where I had not hitherto perceived that any one was sitting. "Is this Lyndhurst Road, mum?" "It is, mum." "Looks fearful stormy, mum?" "It looks awful, mum." "Terrible for the schools out here, mum?" "It's fearful, mum."

Things at the worst are sure to mend, thought I. And here I am once again stretched on the green-sward beneath my magnificent old Hampshire oaks, eating my sandwich in the sweet country air, and reclining for a moment to watch the low scud drive along beneath a high-stretched curtain of thunder-cloud and blue. But hush! what can that be just now stirring over-head? Hark! hark! Tree! tree! And now again the sound comes, tree! Bless me, can that be the voice of *Cicada anglica*, alias *Melampsalta cicadetta*; said on German authority to be not unlike the sound of the jew's harp, or the two full E's of the new harpsichord. Am I awake or asleep? Tree! tree! most classical music, tree! tree! I will think no more about it; these harsh jay-like notes may have been the dying minstrelsy of the last of the *Cicada*, or the tender modulations of a bird voice inspired by so beautiful a sojourn. Where is the genius to bring a distracted entomologist the mirror and ring of *Canace*, so that he may learn what secrets yet lie hid high up among the thick leaves of the greenwood? Where are the imprecations to hurl at the head of that man of the future, that shall bring here his bricks and mortar to desecrate the home of the *Cicada*?

Lest I should go crazy, and rage like another Orestes, I prudently dismiss the *Cicada* from present thoughts, and join myself to a young gentleman who is evidently on the track of game. Hallo, Palamides! The bramble flowers are now swept for Fritillaries, and the grassy spots beat about for marbled whites. We cannot find a black *Paphia*, that forest gypsy. And the ground, too, proves decidedly damp. I am now fairly over my boots, and the children of the morass are holding carnival around.

Now two stately dragon-flies (*Cordulegaster annulatus*) rush rustling past me, and the diamond-headed green water-snake (*Tropidonotus natrix*) glides between my legs, and threatens to ascend my trousers.

Now a thrill of pleasure, the large footman moth (*Enistris quadra*) is clinging on within my net, and now the forest flies or clegs (*Hematopa pluvialis*) are all at me, driving me to desperation. My new acquaintance is telling me, I believe, that the best way to get to Rufus' Stone is to take the 'bus to Lyndhurst; and now an old tar, with both legs shot away, is beginning to narrate the bombardment of Alexandria. Bombardment of Alexandria, by Jove! It is positively four o'clock, and I must make a hasty retreat for the station.

What! exclaims my reader, and without even catching a glimpse of the *Cicada*? Nay, but then I saw it mentally. Can I not recall the second of June, 1871, and the happy moment when I watched the late Mr. Alfred Owen, seated at a deal table, in the little inn at Brockenhurst, engaged in setting a real *Cicada anglica*, with its drums a-sling, only just the day before beaten from the forest white-thorn. And then, besides, I knew something of its family history.

According to Dr. Hagen (*Stet. Zeit.* 1855 s. 66-91), the little English *Cicada*, now but rarely taken in the southern counties, extends throughout all Europe, and it is found as far north as the sixtieth degree of latitude, being captured in the neighbourhood of St. Petersburg, and occasionally at Kinekulle, in the south of Sweden; it has likewise been observed in Siberia, in company with what has been taken to be a dark variety (*adusta*), and a nearly allied species (*C. prasina*.) Dr. Hagan calls it the *Cicada montana*, of Scopoli, but it has been blessed with many appellatives. In the New Forest it is thought to breed among the fern clumps, where the pupa case has been noticed, and newly emerged specimens have been captured. In its time of appearance, general biology, and characters of colonization, it reminds the field naturalist strongly of the *Cicada hæmatodes* of southern Europe, from which species it has been nevertheless widely separated by descriptive writers. It is emphatically a bloody *Cicada*. I hope to listen for the sound of its jew's harp another year. *Vale!*
 Guildford, July 29th, 1882.

DARWIN AND DARWINISM.

BY THE REV. S. FLETCHER WILLIAMS.

(Concluded.)

I WISH now to pass to the review of just what it was that Mr. Darwin did. What was the contribution that he gave to the scientific thought of the world? We talk about "Darwinism" and "Evolution," but I am not far wrong in assuming that, outside of the students of it, few

persons have looked into it sufficiently to comprehend just what it means, and how much it implies. I propose, therefore, to state, as plainly as I can, just the particular thing which Mr. Darwin did, just what he contributed to the world.

The question that Darwin tried to answer is the same question that has always presented itself to the curiosity of man. For we must suppose that, however far back the period may have been when man first stood up conscious of himself as a personality—conscious of the fact that there was a wondrous world around him of which he was an inhabitant,—one of the first questions that would present itself to him must have been, Where did I come from? Who made these lights in this sky above me? By what process has the world come to be what it is? It is the same question exactly that every child, treading in the steps of a countless line of ancestors, is ready to ask of father and mother: Who made the tree, the dog, the cat? Who made the sun and moon in the heavens? *Who made me?* It is the oldest question of the world; and, until Darwin's time, nothing approaching a clear and rational and authoritative answer had been given.

We look on the face of the world, and we know that very marked changes have been going on. We have records of the past by which we know that now there are mountain chains where once they did not exist. We know that what are now islands—our own England, for instance—were once connected with the mainland; that the shape of continents has changed; that rivers have shifted their beds. We know that once, ages ago, other kinds of flowers, other kinds of trees and plants, grew where now present species and families and orders are holding their places. We know that, if we go far enough back, there was a time when man was not here—when the highest kind of life that was lived belonged to a lower order or type. It is inevitable, then, that until it can be answered, the one great question that men shall ask will be—Where did I come from? How did I come? By what power, and through what process, has this wonderful world been made as it is to-day?

I said that, before Darwin's, no adequate answer had been given. Consider for a moment what I mean. The only theory that had ever been heard by the questioning heart of man was that which is termed the "special creation theory." But, in the true significance of words, that is no theory at all. For what do we mean by a theory? A theory is a scheme of thought that attempts to account for certain facts. A theory must be built on facts. When we speak of creation, where are the facts? Did any human being, from the beginning of

human life, ever see anything created? Did any human being ever know of anything being created? Can any human being even imagine the process of creation? Can any human being even take the slightest step towards explanation of what creation means? Creation, then, is no theory; it is nothing more nor less than a confession of ignorance. When a little boy asks me who made the tree, and I say God made it; how did he make it? and I say, by his wonderful power he made it grow,—do I answer the child? Do I explain anything? It is another way (a specious, if a pious way) of letting the child see that I do not know anything about it. For the very question that is up for discussion is—How? By what process? Show me some force at work that is adequate to produce these results. That is the question concerning the world.

What does Darwin answer? Here it is only fair that I should say that Darwin is not the first man who has *guessed* in this direction. To find the first hints of a theory like this, we must consult Lucretius, Democritus, and one and another of the Athenian philosophers; but the wisest of them were only guessing. They showed no force, no law, that was capable of explaining the results. If we come down to modern times, we must give to such men as Goethe, Lamarck, and Saint Hilaire the honour of having been the morning stars of this sunrise represented by Darwin; for they also found some indications that looked in this direction. But the time was not yet ripe for them to put their fingers to the fruit. They did not find the true cause, the real force that could bring about the result.

We are now ready to understand just what Darwin did. He starts with the well-known fact that in every department of life there are hundreds and thousands, yea millions, of seeds and of young that never grow to maturity. Step into a field, and, if you know what is going on there, you will find thousands of little grass-blades starting that do not find room to grow, and are crowded out and perish. It is said that every cod-fish in the ocean lays so many eggs every year, that if they were all hatched, and the young should live to grow up, it would take only two or three years for the ocean to become solid full. How many apple blossoms are seen to fall and come to nothing? So, in every direction, Darwin recognised that which has come to be called the "struggle for life"—everywhere on the part of these individuals an attempt to grow. But only those comparatively few *do* grow which are adapted to their conditions, which are capable of finding room, air, food, light, dew, and rain. Those best fitted to live survive, and they are the ones that propagate offspring, and become the progenitors of those that follow.

The laws of heredity must be taken into account, and the laws of variation, which tend not only to reproduce the life of the parents, but along with this, a tendency to vary and be unlike the parent type. Now and then, some rare faculty, some new power, or sense, or organ, is developed or enlarged this way or that, which proves of advantage in the world-wide struggle for life. Do you not see, then, how naturally this type of life gains predominance? It is that which survives, and which in its turn produces offspring, and controls the future.

Darwin discovered and verified this law of natural selection, or what Herbert Spencer has called "the survival of the fittest"; showing that here was a power capable (only give it time enough) of producing the wonderful results that we see in the various forms of vegetable, animal, and human life around us.

Only give it time enough, I say. Here was the difficulty. This was the very thing that so long stood in the way of the world's progress in this direction. The world had been shut up in the narrow confines of six thousand years, and there was no room for any such process as this. So long as it was a part not only of man's religion, but of science, to believe the world had existed but six thousand years, any such theory was simply nonsense, because the causes which he demonstrated to be at work were utterly inadequate to produce such immense results in so brief a period of time.

But the study of the modern world was preparing the way for Darwin. He came in the very fulness of time, when the world was ripe for his thought. Geology had been at work, digging away at the crust of the earth, and asking the old questions; and just as by cutting through a tree trunk and counting the circles you can tell its years, so it was discovered that by digging away at the crust of the earth we could read the records of the world, whose age was written by the centuries themselves as they passed over it and left behind their foot-marks.

Prof. John Fiske, in a recent article in the *Atlantic Monthly*, has proved almost beyond question that man was living in Europe at least two hundred and fifty thousand years ago; and man is simply a blossom on the summit of the trunk of the century plant. Man is a *parvenu* of yesterday. Time, even so far as this world is concerned, reaches back millions and millions of years. And life has been on this old planet cycles and cycles of ages, creeping from the lowest forms with feeble foot, until at last its crown and culmination—man—has appeared. The thing, then, that Darwin did was to discover and

verify the existence of this force of *natural selection*, by which the process could be rationally explained.

We may conceive of life under the image of a great tree : from man clear down to the little globule of protoplasm, one common life, represented and summed up in root and trunk. Toward the bottom runs off a great trunk of the tree, and this represents the kingdom of fishes ; limbs, branches, twigs, leaves, representing genera, species, individuals. A little way above this, another limb branches out, and here is the reptilian life. A little above this is the bird-life of the world ; and above this again, the mammal life, of which the highest is the anthropoid, or manlike ape. Above this, the highest branch or outflowering of it all, is man, having, as nearest of kin, the anthropoid ape, but not his direct descendant in the sense that a child is produced from his father.

This, in a word, is Darwinism. I do not intend to discuss it. I have argued it at length in a paper which I had the honour and the pleasure of reading before the Literary and Philosophical Society in January last, and which has subsequently been published by the Council of the Society ; and I do not wish to re-traverse the ground. I confine myself on this occasion to narrative and exposition.

The scientific world was profoundly impressed both by Darwin's doctrine, and his method of supporting it. The theory was trenchantly criticised by many naturalists, who, astounded by its boldness or novelty, were not prepared *ex animo*, or without further consideration, to accept it ; and for this they are entitled rather to commendation than blame. The most notable of the scientific assailants was Agassiz, who made much of the candid admission of difficulties by Darwin himself, and who attacked the theory as resting on unwarrantable assumptions. But incredulity was soon followed by hesitation, and, in no very long time, by endorsement and acceptance by many eminent proselytes. A good many years have now elapsed since nearly everybody having any sort of claim to speak in the name of science, went over to " Darwinism," with or without reservations ; and, in the field of science, the victory of " natural selection " and " evolution " may be regarded as complete. Mr. Darwin himself might with propriety be described as to the last a Darwinian under reserve, for his mind was singularly open ; and, strange as it may seem, after all the noise to which his published writings have given rise, no man (as I have said) was ever less of a dogmatist or a bigot. He was pre-eminently an enquirer. As a tireless interrogator of nature by observation and inductive reasoning, he may be said to have fulfilled to its utmost

extent the ideal set up by Bacon. In process of time it came to be admitted, either tacitly or in express terms, that his hypothesis, after all, did not necessarily carry with it all the consequences it was at first supposed to involve ; and a common attitude towards it among those who were long its active opponents may be described as that of tolerant recognition or watchful neutrality. It is an established fact that, during the two-and-twenty years it has been before the world, the doctrine of the origin of species by means of natural selection has made a progress which, considering its novelty and its startling implication, is absolutely without a parallel. For it need hardly be said that the origin of species in this way raises a presumption in favour of the more comprehensive doctrine of evolution, with which also the name of Darwin, is inseparably bound up. Thus, while for fame and distinction he cared literally nothing ; while the one object he sought throughout life to attain was the truth ; while for this he laboured with a single-mindedness, a freedom from the bondage of pet theories and preconceived ideas, that are almost unexampled—he had, during his lifetime, what to him was undoubtedly the highest reward that could be bestowed upon him, in the ever-increasing acceptance of the theory he was the first to formulate by those best competent to form a judgment. That it is a final or complete revelation, he himself would have been the last to assert ; but he lived to see it accepted as an immense step in advance on a path in which for many centuries no progress had been achieved.

Antagonism to it came from another quarter ; and here also judgment has to be tempered with respect for the best or deepest opinions or convictions of the human heart. This class of critics, without pretending to much scientific knowledge, considered the Darwinian theory to be in direct opposition to the teaching of the Bible ; so it was fiercely assailed by the clergy of all churches, and for a long time Darwinism was regarded as synonymous with infidelity. The idea that vegetable, animal, and human life had been evolved from a few primordial forms, or perhaps from one, by a process of law, instead of each having been called into being by separate and successive acts of creation, was regarded as antagonistic to the principles of revealed religion, and the religious commotion was as loud and angry as was the scientific wrangle, and continued much longer. But, now, the theologians have practically come round to admitting that Darwinism is a tenable theory—a theory quite consistent with the divine origin and government of the world. So complete is the change which has taken place in the attitude of the Church towards it, that a religious

paper can now say, "The attitude of the great mass of religious dogmatism to this new philosophy was no less than scandalous." And yet there never has been a scientific man whose character and temper and manner were so little calculated to exasperate opponents, or create doubts about his single-mindedness, as Darwin's. Unfortunately he was not the first investigator whose conclusions are now universally accepted, who at the outset incurred the angry and vehement opposition of religious people, but surely he ought to be the last. Is it too much to hope that he will be the last? It seems barely possible that so striking an example of the tremendous mistakes into which pious men may fall regarding dangers to their faith, can fail to impress them with the necessity of greater caution and courage in their attitude towards the explorations of the physical universe which are now going on in every direction.

It ought also to put an end to the curious attempts of which we, every now and then, hear from religious bodies to make some kind of treaty between religion and science, in which each shall lay down certain limits beyond which it will agree not to go. All such schemes are based on the assumption which was applied to Darwinism—that there is some authority competent to answer for science, and decree where it shall stop and what it shall examine. There is no such authority; there never was, and never can be. Religious men can draw up creeds and confessions of faith on which they can agree to stand, and can trace the boundaries of their own beliefs, but a scientific man can do nothing of the kind. In fact, he is bound not to do it. Continued inquiry is to him a condition of progress. It is his duty to treat nothing in the physical field as beyond question. Science, too, does not mean what he believes, but what is,—and therefore he can never tell to-day what he may be compelled by new facts to believe to-morrow.

Another lesson which I trust theologians have learned from Darwin's career is, the folly and injustice of holding scientific discoverers responsible for what seem the probable moral or social consequences of their discoveries. Half the odium heaped upon Darwin was due to this. It was thought apparently by many alarmed souls that he ought to have kept the result of his enquiries to himself, lest it should unsettle some people's religious faith, or loosen in others the bonds of social obligation. It now appears by the confession of his revilers that, had he done so, he would have committed a great mistake, even from their point of view. They now acknowledge that what they thought were necessary or very probable consequences of his revela-

tions were not necessary or probable consequences at all; but, on the contrary, these revelations were a flood of light on "the world's great altar stairs"; that nobler theistic conceptions are furnished by the doctrine of creation by evolution than by the doctrine of creation by special *faits*. Thus, whatever judgment posterity may pronounce upon his genius and his work, it is already incontestable that in the field of science few, if any, men of our time have done so much to extend the bounds of actual knowledge; while in the fields alike of science and theology, no man has ever exercised so great an influence over contemporary thought, as Charles Darwin.

Rainfall for August.

	Height of gauge above sea level.	Rain-fall.	No. of Days	TOTAL FALL TO DATE.		Date of heaviest Fall.	Amount of heaviest Fall.
				1882.	1881.		
HUDDERSFIELD (Dalton) ... (J. W. Robson)	Ft. 350	In. 1·68	20	23·04	* 20·19	18	0·20
HALIFAX... (F. G. S. Rawson)	365	2·60	16	34·80	29·66	...	...
LEEDS ... (Alfred Denny)...	183	1·630	21	18·305	†15·468	18	0·360
HORSFORTH ... (James Fox)	350	2·150	19	22·550	‡20·366	26	0·320
BARNSELY ... (T. Lister) ...	350	1·93	16	19·30	15·81	30	0·28
INGBIRCHWORTH (do.)	853	2·56	17	27·79	24·23	22	0·43
WENTWORTH CASTLE (do.)...	520	1·97	17	20·50	18·36	30	0·29
GOOLE ... (J. HARRISON) ...	25	2·54	18	21·02	16·50	22	0·43
HULL (Derringham) (Wm. Lawton)	10	3·18	18	18·29	...	25	0·73

* This is the average to date for 16 years, 1866-81.

† Average of 28 years, 1853-62 and 1865-82.

‡ Average of 13 years, 1870-82.

Reports of Societies.

BARNSELY NATURALISTS' SOCIETY.—Meeting Sept. 12th, Mr. T. Lister in the chair.—The botanical section reported that all the flowering plants known in the district, except about 25, had been observed and dated. Amongst these were (Aug. 10th), *Gentiana Amarella*, *Inula dysenterica*, *Impatiens noli-me-tangere*, *Melilotus album*, *Sedum telephium*; 22nd, *Drosera rotundifolia*, *Hydrocotyle vulgare*. The vertebrate section reported many birds, amongst which were—Aug. 7, spotted flycatcher, coot, moorhen, magpie; 20th, wheatear, whitethroat, redstart, swift; Sept. 5, wild ducks, geese, three terns, snipe, green woodpecker, many sparrow-hawks, kestrels, magpie, ring ouzels—all by Mr. R. Creighton, of Hemsworth.

A letter from him on Sept. 11th records five herons, some of them young. He thinks they have bred in the woods by Hemsworth dam; if so, we may have another heronry. No doubt it will be protected by W. H. Leatham, Esq., M.P., as that at Walton was by Mr. Waterton. Sept. 8, sparrow-hawk and six terns; 10th, gold-crested wren, great, blue, and marsh tits, five herons, coots, moorhens, lapwings, three of swallow tribe. Last sand-martin noted on 11th, and two ring ouzels shot at Penistone.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Monthly meeting, Aug. 28th, the president (Mr. S. J. Capper) in the chair.—Mr. T. von Sobbe read a paper entitled “Our Holidays at Tunbridge Wells,” in which he detailed (and exhibited) the entomological captures made by himself and son in that neighbourhood during the early summer, concluding with some remarks on the general scarcity of insects during the whole of the present season. Mr. C. J. S. Makin read a paper on “Silk and Silkworms,” in which, after briefly sketching the history of sericulture from its origin in China to its introduction into England in 1685, he gave a detailed account of the life-history of several of the silk-moths which have, within the last few years, attracted the attention of silkworm breeders, such as *Bombyx Yama-mai*, *B. cynthia*, *B. pernyi*, *B. cecropia* (the silk-moth of the United States), *A. atlas*, &c. He illustrated his paper by specimens of each species, and by living larvæ (worms) of *B. mori*, *B. cecropia*, and *B. Roylei*.

MANCHESTER CRYPTOGRAMIC SOCIETY.—Monthly meeting, August, Dr. B. Carrington, F.R.S.E., in the chair.—Captain Cunliffe exhibited a beautiful series of mosses, mounted for microscopical examination. Some of the sections of the stems and leaves of *Sphagna* were excellent as scientific objects, and admirable as specimens of manipulative skill. Mr. William Jones, of Llandudno, sent a few freshly gathered mosses, from the Orme's Head, for distribution amongst the members. Mr. C. P. Hobkirk, F.L.S., editor of the *Naturalist*, sent copies of his paper on the development of *Osmunda regalis*. Mr. W. H. Pearson exhibited specimens of *Lejeunia calyptrifolia*, collected by Mr. C. Wild at Tyn-y-Groes; he also exhibited specimens of a sphagnum new to Europe, *Sphagnum sedoides*, Bridel, which had been found at Finisterre. A collection of lichens, which had been collected by W. H. Scholes in South America, and specimens of the male plant of *Radula germana* (Jack), collected by F. Rogers on Ben Cruachan, July, 1881, and *Radula commutata* (Gottsche), from the herbarium of Dr. Carrington, collected in the New Forest by C. Lyell, 1818, were exhibited by Mr. Pearson. Mr. Cunliffe exhibited a quantity of starch which he had obtained from the rhizome of *Pteris aquilina*, and stated that the starch grains of this fern differed considerably from the starch grains of *L. filix-mas*; the hon. secretary, a number of mosses recently collected in New Zealand. Dr. Carrington then read a short paper on the Manchester water supply at Eccles, where it had been the subject of some complaint in reference to its drinkable qualities.—T. ROGERS, Hon. Sec.

OVENDEN NATURALISTS' SOCIETY.—Mr. J. Spencer gave a brief description of some new discoveries which he had lately made in fossil botany. These included a new species of fossil aquatic plant, which differed from *Astromyelon Williamsoni* in the radiating plates of the bark being composed of three rows of cells, whereas those of the latter plant are only composed of one row of cells. He had also found another of these water-plants which differed from the others in having a vascular axis, whereas the other species have cellular axes. He had also made some more important discoveries in fossil fungi, forming interesting additions to our knowledge of these fossil parasites. But perhaps the most interesting addition to our knowledge of these coal-plants has been his discovery of a new species of fossil plant, forming a "link" between two well-known species. No two species of plants can be more distinct in their internal organization than the fossils known under the names of *Sigillaria vasculare* and *Lepidodendron Harcourtii*. The newly-discovered plant occupies an intermediate position between them. *S. vasculare* has a woody cylinder surrounding a vascular axis or pith, while *L. Harcourtii* has no woody cylinder, but it possesses certain peculiar vascular bundles, which proceeded from the pith to the leaves, which were small and numerous. The new plant combines within itself both these characteristic features of those well-known plants. This is one of those innumerable facts which support the great doctrine of "evolution," and which are continually forcing themselves upon the attention of scientific observers.

WAKEFIELD NATURALISTS' AND PHILOSOPHICAL SOCIETY.—Annual meeting, Sept. 6th, Mr. J. Wainwright, F.L.S., president, in the chair. Mr. E. B. Wrigglesworth, secretary, read the twelfth annual report, which stated that there had been no increase in the number of members, though the society had made steady progress during the past session. There had been twelve meetings. The lecture programme had been very successful, and the council thanked those who had taken part. The society had had three rambles during the year, which were well attended. They had kept in view the collection of information on the flora and fauna of the district, with the object of its ultimate publication; and a great amount of original matter was in the possession of the various sections, ready for the press. During the year the society had to deplore the loss of two of its oldest members—Mr. William Talbot and Mr. John Wilson. The Scientific and Fine Art Exhibition was opened Nov. 10th, 1881. Mr. J. Wainwright was re-elected president, and Mr. E. B. Wrigglesworth hon. secretary. A sub-committee was appointed to consider the question of procuring the old Town Hall for the purposes of the society.

YORKSHIRE NATURALISTS' UNION.—Wakefield, Sept. 9th.—The fifth meeting of the year was planned for the investigation of Haw Park and surrounding district, with Wakefield as the final rendezvous, but as on account of the game preserves the local secretaries were not able to obtain permission to work Haw Park Woods themselves, the area of

investigation was made to include a rather wider extent of ground, all, however, lying between Wakefield and Barnsley. Five routes were arranged, and for the most part carried out according to programme, although the attendance was not at all what it ought to have been in a rich district so convenient of access for the masses of the members of the West Riding societies. Mr. C. W. Richardson, one of the local secretaries, conducted a party which left Haigh station for Woolley Edge, Seccar Lane, and Woolley Hall, park, and gardens, returning from Crigglestone station. The other local secretary, Mr. E. B. Wrigglesworth, led a party which, starting from Darton station, visited Pye, Husband, Wind Hill, Cow-car and Haigh Hill Woods, and also returned from Crigglestone station. A party, led by Mr. J. Wilcock, and mostly conchologists, left Kirkgate station, Wakefield, proceeding by way of Belle Vue to Agbrigg, thence along the banks of the Wakefield and Barnsley Canal to Haw Park, and afterwards through Chevet Woods, returning to Wakefield by way of Sandal, Castle Hill, and Moat. Mr. J. L. Chaplin's party left Westgate station for Walton, from which they visited Berg and Greenside quarries, and afterwards keeping the high road through Winterset and Ryhill Pits, returned from Ryhill station. Mr. J. Wainwright, F.L.S., president of the Wakefield Society, and a small party, drove in the afternoon to Woolley Hall and Park. There were also a few members exploring the district on their own account, unconnected with any party. At 5-25 p.m. an excellent tea was provided in the Board School, Westgate, the sectional and general meetings being also held there. The chair of the general meeting was occupied by the Rev. Wm. Fowler, M.A., vice-president. It was found that the Barnsley, Bradford (2), Dewsbury, Doncaster, Heckmondwike, Huddersfield (Literary and Scientific Society), Ilkley, Leeds (3), Liversedge, Malton, Ripon, and Wakefield societies were represented. The individual attendance was very meagre, only about 40 or 50 members being present. The minutes of the Grassington meeting were read and confirmed. Thanks were voted to Sir Lionel Pilkington and Mr. G. B. Wentworth for permission to visit their estates, to the Wakefield School Board for the use of the Schools, and to the local secretaries, on the proposition of Mr. Thomas Lister. The list of new subscribers included Dr. Crowther and Mr. T. Stevens, both of Wakefield. Mr. Lister then handed in a notice of motion on behalf of Mr. W. E. Brady, the secretary of the Barnsley Naturalists' Society, to the effect that at an early meeting of the Union he should move, either personally or by deputy, the following resolution: "That having taken into consideration the large number of our members who, from commercial and other engagements, are unable to attend the Saturday meetings, and having further considered the objectionable effects which the prohibitory system now followed admittedly exercises upon the members thus debarred from attending an equitable share of the Union's meetings; this meeting recommends that in future one-half of the excursions and meetings of this Union should be held on Satur-

days, and the other half on some other days, and that the annual meeting should be held alternately upon Saturdays and Mondays, or some other day which may afterwards be shown to be of greater advantage." It was pointed out that the present practice of the Union was (at all events up to last year inclusive) to hold half the excursions on Monday and half on Saturday, and the chairman announced that the motion would come on for discussion at the annual meeting at Selby, next March. The reports of sections were then taken. Mr. Fowler reported on the plants, that, owing to the lateness of the season, and the fact that the coal measures (proverbially unproductive in plants) were the only strata visited, there was but a poor display of specimens. The most noticeable were *Chelidonium majus*, *Bidens tripartita*, *Littorella lacustris*, and *Sagittaria sagittifolia*. Mr. H. T. Soppitt then mentioned that Haigh proved to be a very productive place for fungi, of which he had collected the following:—*Agaricus* (*Amanita*) *vaginatus* Bull, *A. (A.) rubescens* P., *A. (Lepiota) granulatus* Batsch., *A. (Clitocybe) laccatus* Scop., *A. (Collybia) maculatus* A. & S., *A. (C.) tuberosus* Bull, *A. (Mycena) galericulatus* Scop., *A. (Stropharia) semiglobatus* Batsch., *A. (S.) æruginosus* Curt., *A. (Coprinus) radiatus* Fr., *A. (Panæolus) separatus* L., *A. (Galera) hypnorum* Batsch., *Marasmius peronatus* Fr., *Russula emetica* Fr., *R. ochroleuca* Fa., *Lactarius rufus* Fr., *L. glycosmus* Fr., *Paxillus involutus* Fr., *Hygrophorus psittacinus* Fr., *Boletus calopus* Fr., *Polyporus versicolor* Fr., *Dacrymyces stillatus* Nees, *Scleroderma vulgare* Fr., *Lycoperdon gemmatum* Fr., *Spumaria alba* D C., *Sphærobolus stellatus* Tode, *Ceuthospora phacidioides* Grev., *Puccinia hieracii*, *P. lapsani*, *Æcidium tussilaginis* Pers., *Coleosporium tussilaginis* Lev., *Trichobasis suaveolens* Lev., *T. rubigo-vera* Lev., *Melampsora betulina* Desm., *Pilobolus crystallinus* Tode, *Peziza calycina* Sch., *P. granulata* Bull, *Bulgaria inquinans* Fr., *Ascobolus ciliatus* Sch., *Helotium aciculare*, Fr., *Sphærotheca pannosa* Lev., *Erysiphe martii* Link, *Chætomium elatum* Kze, *Corticium sambuci* P. For the Geological Section, Mr. Thomas Tate, F.G.S., president of the section, reported as follows:—The district is situated exclusively upon the middle coal measures, ranging from the Barnsley coal seam, exposed south of Crigglestone station, up to the Havercroft rock, capping Ryhill. The chief seams are the Beamshaw, or Stanley Main, the Winter, or scale coal, and the Crofton seams, the latter seen east of Walton station on the Great Northern railway. The Woolley Edge rock makes a fine escarpment of coarse grit with quartz pebbles. As it approaches Wakefield, which stands upon it, this rock assumes a fine-grained flaggy structure. The Oaks rock also forms a prominent feature in the landscape, as at Heath Common. It is also exposed in the Agbrigg and Greenside quarries, and in numerous cuttings on the Midland railway. These fresh-water sandstones contain much drifted vegetation, usually fragmentary, so that good fossils could not be obtained. Specimens of estuarine, or fresh-water shells (*Myalina modiolaris*, *Anthracosia acuta*, *Anthracomya*), from the coal shales, were exhibited.

In the absence of the officers of the Vertebrate Section, Mr. Thomas Lister of Barnsley reported all three of the linnets, grey, green, lesser redpoll, two crested grebes, kestrel, three of the tits, ringdove, lapwings numerous, coots, moorhens, bullfinch, magpie. Migrants—redstart, whitethroat, blackcap, three of the swallow tribe, whinchat, wheatear, willow warbler last heard in song : total, 9 migrants, and 25 resident and water-birds. In the absence of the officers of the Conchological Section, Mr. H. Pollard, the secretary of the Leeds Naturalists' Club, reported that Mr. Wilcock's party had found 41 out of the 91 species and varieties which had been known to occur along their line of route, that though none of them were rare, some of them were very local in their range. The best captures included *Helix aculeata*, *Zonites excavatus*, *Z. fulvus*, *Z. nitidus*, *Vertigo pygmæa*, *Linnæa palustris*, var. *tincta*, *Neritina fluviatilis*, *Bythinia Leachii*, *Planorbis nautilus*, *Pisidium fontinale*, var. *Henslowana*, *Physa fontinalis*, and *Succinea elegans*. A search amongst a quantity of mud recently taken from the bottom of the Canal, yielded very good examples of *Anodonta cygnea* and *Unio pictorum*. For the Entomological Section its officers reported. The secretary, Mr. E. B. Wigglesworth, reported on the coleoptera that the following beetles were taken :—*Notiophilus biguttatus*, Fab., *N. rufipes*, Curt., *Carabus catenulatus*, Scop., *C. clathratus*, Linn., *Leistus ferrugineus*, Linn., *Calathus cisteloides*, Prz., *C. melanocephalus*, Linn., *Harpalus ruficornis*, Fabr., *Callidium alni*, Linn., *Anchomenus prasinus*, Munb., *Olisthopus rotundatus*, Pk., *Silpha rugosa*, Linn., *Necrophorus ruspator*, Er., *Colymbetes fuscus*, Linn., *Aphodius luridus*, Payk., *A. punctatosulcatus*, St., *Cryptorhynchus lapathi*, Linn., *Chrysomela polita*, Linn., *Otiorhynchus picipes*, Fabr., *Tachinus subterraneus*, Linn., *Staphylinus pubescens*, DeG., *Ilybius ater*, Er., &c., &c. The president, Mr. G. T. Porritt, F.L.S., reported on the lepidoptera, that *Nonagria fulva* had been found not uncommonly in a rough field at Haigh, and the larvæ of *Coleophora cæspitiella* were in thousands on the seeds of the rushes growing in the same field. Other species taken included *Tryphæna fimbria*, *Hydræcia nictitans*, and a number of tortrices. Hymenoptera were plentiful at Haigh and Woolley Edge. In connection with the business of the Vertebrate Section, the secretary remarked that he thought the Union could hardly visit Wakefield without in some way referring to the great loss it had sustained in the decease of Mr. William Talbot, author of "The Birds of Wakefield." The subject was continued by Mr. Lister, who spoke from a long friendship and intimate knowledge of Mr. Talbot ; by Mr. J. M. Barber, who referred to the fact that Mr. Talbot was the first to suggest the establishment of the W.R.C.N.S. (now the Y.N.U.) ; and by the chairman, who paid a high compliment to Mr. Talbot's worth, and stated that he knew much more than ever he professed to know. A reference to the forthcoming meeting at Pilmoor, and a vote of thanks to the chair, concluded the proceedings.—W. D. R.

Original Articles.

SPHAGNUM TORREYANUM, SULLIVANT, IN BRITAIN.

BY H. BOSWELL.

THIS moss, which appears in Braithwaite's Sphagnaceæ as *Sph. cuspidatum*, variety *Torreyi*, has heretofore escaped notice in Europe, but during a ramble this summer I fell in with it in the neighbourhood of Whitchurch, Shropshire, and it may be looked for in wet bogs in other parts of the country, when better known. Its aspect is that of very tall and robust *cuspidatum*, and it is doubtless rightly placed as a variety of that species.

My specimens agree exactly with American ones, and also with the figure and description of *S. Mendocinum*, in Sullivant's *Icones*, which Braithwaite unites to *Torreyanum*; but Ran and Harvey in their catalogue of the mosses of North America, treat the latter as distinct. It appears to have been found only in California, and I have not seen it, but probably specimens would show its identity with *Torreyanum*.

The most striking features are, the large size, very long stout stems, large triangular stem-leaves, and long semi-tubular branch-leaves.

Oxford, Oct. 12th, 1882.

NEW AND CRITICAL EUROPEAN MOSSES.

BY G. LIMPRICHT.

(Translated.)

IN the German magazine, "Flora," No. 13, 1882, are a few notes on some new and critical mosses, by Gustav Limpricht; as they are species nearly related to our British ones, a translation of Herr Limpricht's notes may be of interest, in calling the attention of our British muscologists to these species, which should be looked for here.

Hypnum (*Limnobium*) *styriacum*, n. sp.—Synoicous; in extensive, depressed, soft cushions of a sordid-, yellowish-, or golden-brown-green colour, stem filiform, very slender, up to 8 c.m. long, procumbent, rootless, almost simple or repeatedly furcate, at the base destitute of leaves; branches irregular, slender and flaccid, rootless; leaves loosely disposed, standing-off erect on all sides, almost spoonlike-concave, slightly longitudinally-plicate, from sub-cordate to ovate, with a slightly decurrent base, gradually narrowed to a somewhat reflexed lanceolate point, margin entire; nerve firm, furcate, the longest arm

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extending above the middle of the leaf; the leaf-cells above more rhomboid, in the middle of the leaf somewhat winding almost fusiform, yet proportionately always short and wide, at the base of the leaf rhomboid-hexagonal, in the angles of the leaf rectangular yet not concave; the large flower-buds rooting at their base contain both sexual organs, yet each are separate, and are surrounded by their own involucreal leaves, whereby the young flower-buds often appear to be only male; if, however, they are unfolded they show in the inside the rudimentary archegonia surrounded by the yet less developed perichætal leaves. All the involucreal leaves are nerveless, and of a looser cellular texture, the inner perichætal leaves erect, lengthened out lanceolately; drawn out abruptly into a moderately long point; pedicel about 1 c.m. long; capsule cernuous; operculum high conical, red.

A longitudinal section of the capsule shows between the operculum and the theca two large cells, which probably form the annulus, but whose character, as also that of the peristome and spores, can only be determined from the perfectly ripe capsule. The spores probably ripen in autumn.

Discovered by J. Breidler in four different stations, all in the neighbourhood of Schladming, in Styria, about 2000 metres high.

This species has already a previous history; my friend J. Breidler sent me the first specimens of it as *Limnobium palustre*, male, dioicous (?), and communicated to me that Juratzka held it to be *Hypnum palustre*. Schimper, on the contrary, had declared it to be an unknown *Limnobium* which he doubted belonged to *Hypnum palustre*. This new species is distinguished from all allied ones by its synoicous inflorescence. It possesses a certain similarity in habit to *Hypnum palustre*, it however shows, in a cross section of the leaf, shorter and wider cells, leaf-angles never concave, and a constantly stronger furcate nerve.

From weaker forms of *Hypnum cochlearifolium* it is easy to distinguish it by the form and pointing of the leaves.

Limnobium cochlearifolium. Venturi in Erb. crittog. Ital. series 11, Fasc. X. (1871); "Hedwigia," 1872, p. 71.

Of this species (as of many others) Schimper has, in the 2nd ed. of the "Synopsis," (1876) taken no notice, and consequently describes l.c. p. 778, a perfectly sterile plant from the Pyrenees, as *Hypnum Goulardi*, Schimp., n. sp., which belongs here. Venturi has himself, even in "Bryineæ ex regione italica Tirolis, Tridentina dicta," "Revue Bryol.," 1879, p. 62, placed before it Schimper's name (here written in error *H. Gounodii* and *cochleariforme*), but the

name *Hypnum cochlearifolium* possesses the priority ; moreover, Venturi (l.c.) had already described the fertile plant.

Since Geheeb, in "Flora," 1881, p. 296, has announced the discovery of *Hypnum Goulardi*, Schimp. for Germany, I hold it time to speak as I do lest the false name should become naturalised.

Geheeb remarks (l.c.) that he had observed on Breidler's specimens from Keeskar, female flowers, whereby the plant would be dioicous : but it is monoicous, as Venturi had already stated in the diagnosis. The specimen in the Erb. crittog. Ital. Venturi collected in the High Alps of Rabbi in the Tyrol. In my herbarium are also specimens from the Neunerspitz, near Innsbruck, legit Venturi, from the Myringer Alps, on the Ross Rogel, near Innsbruck, leg. F. Arnold (ex herb. Juratzka), from Keeskar, in the Obersulzbachthal ; Pinzgau leg. J. Breidler, and from the Guadenthal, near Döllach, in Carinthia, leg. J. Breidler.

Brachythecium Venturii. Warnst "Flora," 1881, n. 34. In J. Milde's "Bryologia Silesiaca" 1869, is a remark on *Brachythecium populeum* Br. and Sch., but which, through the mistake of the printer, has not been inserted in the right place, p. 335, but only upon p. 336 after *Brachythecium plumosum*. Had the author of *Brachythecium Venturii* taken notice of this remark, and compared the diagnosis of *Brachythecium amoenum*, Milde, "Hedwigia," 1869, n. 61, it would probably not have escaped him that the characters of his new form agree with those of Milde's species.

To be sure *Br. Venturii* should have, according to the description, strongly-nerved inner perigonal leaves, but in the specimen of the original from the hands of the author I find the inner perigonal leaves perfectly nerveless.

Milde called his plant, whilst he fell in with the view of Juratzka, l.c. "Bryol. Sil." a critical form of *Brachythecium populum*, Br. and Sch. ; a similar form (for never do even two individuals of the same variety agree) is *Brachythecium Venturii*, and if I also regard both plants as belonging to the circle of form of *Brachythecium populeum*, yet this form is far from being a collective species in the meaning of Warnstorff's "Monograph of the Sphagna."

Dicranum comptum, Schimp. Syn. ed. II. p. 97.—Dr. A. Sauter, the discoverer of this species, forwarded me specimens of the original for examination ; they, however, only consisted of a few stems. According to my view, this species shows no relation to *Dicranum longifolium*, with which the author of the species compares it, but to a form of *Dicranodontium circinnatum*, Wils.—a view which may be

arrived at from the comparison of the diagnosis of both species. Specimens agreeing in every particular have been also collected by J. Breidler from the classic station.

SEMERDALE :

NOTES ON ITS PHYSICAL FEATURES AND MOLLUSCAN FAUNA.

BY WM. DENISON ROEBUCK.

SEMERDALE, in the vicinity of which I spent my vacation this year, is—as Mr. Baker says—unique among the North Yorkshire Dales in its shape and character. One of the contributory valleys of Wensleydale, it differs entirely in its physical aspect from such as Coverdale, Bishopdale, Cotterdale, &c., all of which merge gradually into the main valley. Semerdale, on the contrary, is almost completely isolated : the hills which enclose it stand boldly out towards the Yore and approach each other so closely, near Bainbridge, as to leave but a very narrow outlet for the Bain river, which carries into the Yore the whole drainage of the dale. One consequence of the virtual shutting off of this little basin of not more than 20 square miles of country is that it contains one of the largest of the very few Yorkshire lakes, which, with the usual re-duplication of syllables all meaning the same thing, is called Lake Semerwater (Lake-Sea-Mere-Water). It covers some 105 acres and contains various species of fish, more especially bream. Trout are likewise abundant, especially in the affluents, as are also such smaller fish, as loach, minnows, &c., and crayfish swarm everywhere. The lake, which has but one outlet into the Yore (the Bain), is fed by numerous streams, the three most important of which—Cragdale Water, Raydale and Bardale Becks—unite before entering it. The mountains which guard Semerdale—of which Counterside, Wetherfell (2015 feet), Greenside (1852 feet), Fleet Moss, Cray Moss, the Stake (1818 feet), and Addleborough (1564 feet), are the chief summits—vary but little in height, and do not fall below 1600 feet until they reach comparatively near to the main river of Yore. Bainbridge, at the outlet of the dale, is 762 feet above sea level, so that the actual difference in altitude which the little basin presents is about 1000 feet. Geologically, so far as the imperfect maps at command can show, the formations represented are carboniferous limestone in the valley, presenting the usual characteristic “scars,” and Yoredale Rocks in the upper reaches of the tributary dales, while the

highest summits are capped by millstone grit. The point of junction between the base of the Yoredale rocks and the limestone below is well marked on all the streams, more especially at Park Scar on the Cragdale Water, by a series of beautiful waterfalls. The hills are covered with coarse grass, or bents, and are much used for pasturage. There is no heatherland, only very straggling plants of heather being to be found. The district—once the famous Forest of Raydale—is now moderately wooded, especially up the Raydale stream.

There is marshy ground at the foot of the lake, in which *Parnassia palustris* grows abundantly, and through which, for the first mile of its course, the Bain flows with a very sluggish and muddy stream, affording suitable stations for the growth of Potamogetons and the yellow water-lily. Its course is afterwards much accelerated, and at Bainbridge it dashes over shelving slabs of limestone, afterwards joining the Yore opposite Askrigg.

During the stay of myself and some friends at Bainbridge, which was our headquarters for the first fortnight of August, the vicinity of the lake and both its shores, together with the three tributary dales, and the slopes and summits of some of the hills, were visited. So far as natural history was concerned, the only observations made were upon the mollusca. Of other things I only recollect seeing specimens of the fish I have before mentioned, finding a specimen of *Cychnus rostratus*, and noting the water rat, peewit, magpie, dipper, frog, bull-head or miller's thumb, the small garden white, small tortoise-shell and small heath butterflies.

The weather was not very favourable for mollusca, as there was no rain whatever till nearly the last day of our stay, and shells were for the most part somewhat difficult to find. I now give my list of shells, all of which have passed the scrutiny of my friends Messrs. J. W. Taylor and William Nelson, to whom I am indebted for assistance in determining some of the more critical specimens, as well as confirming my own determinations.

An examination of the subjoined list at once shows that the species of the montane or sub-alpine type are represented, usually in abundance, and that the fluviatile forms are almost entirely absent. I failed to detect any shells but Anodonta in the lake itself. The total number, twenty-seven only, of species and varieties presents but a meagre show, and my expectations of the capabilities of the district, based upon its geological and physical aspect, were distinctly disappointed, though there can be no doubt that further research at another season of the year, or under more auspicious meteorological conditions,

especially if undertaken by a more experienced collector, will add various species and varieties to the list. Such a result is still more likely if the streams and the woodlands (which I did not exhaustively search) are well examined. I do not anticipate, however, that Semerdale will prove a very prolific district, certainly by no means so productive as Mill Gill and Whitfield Gills (situated on the other side of the Yore) are. Its climatological conditions are against it. It is of a northerly aspect, with the encircling hill-ranges to the south, between it and the light and heat of the sun, and thus likely to be more cold and bleak than the valleys which are situated on the northern side of Wensleydale, facing the south.

Anodonta anatina, L. Very abundant in Lake Semerwater.

Limnæa truncatula, Müll. Common along road sides near Stallingbusk, and near the bridge at Bainbridge.

Ancylus fluviatilis var. *gibbosa*, Bourg. Found near Stallingbusk in 1877, by Mr. H. Crowther.

Arion ater, L., the black slug. Abundant about Counterside, Carr End, Marsett, Stallingbusk, &c. Ranges altitudinally as high as 1500 feet on Raydale Grainings.

A. hortensis, Fèr. Common on Bainbridge village-green, and near Stallingbusk, Marsett, and Counterside.

Limax agrestis, L., the field slug. This usually common pest was abundant everywhere.

Succinea putris, L. Common at the foot of the Lake; also found near High Blean, and a single dead specimen near the waterfall in Bardale.

Vitrina pellucida, Müll. Young specimens abundant under stones on Bainbridge village-green; a few also obtained near Stallingbusk and Marsett.

Zonites cellarius, Müll. One found at Carr End, near Marsett.

Z. alliarius, Müll. Not uncommon near Bardale Force, Marsett, Counterside, High Blean, and Stallingbusk.

Z. nitidulus, Drap. A few specimens found about Marsett, near the Knight's Close, and Bardale Falls, and in Bank Wood, Cragdale.

Z. radiatulus, Ald. Three or four specimens found under stones by the road sides near Stallingbusk.

Z. crystallinus, Müll. One specimen found in company with the last-named.

- Helix hortensis*, Müll. Occurs along Scar Top, near Bainbridge.
- H. arbustorum*, L. Common along the Scar Top; occurs also about Stallingbusk, Counterside, and in Bardale.
- H. arbustorum*, var. *flavescens*, Moquin-Tandon. With the type, not uncommon on Scar Top.
- H. rufescens*, Penn. Near Stallingbusk Church, in Bank Wood, Cragdalé, and at Carr End, near Marsett, abundant.
- H. hispida*, L. Very common. Scar Top, Bainbridge Village-green, round the Lake, about Counterside, Carr End, Stallingbusk and High Blean.
- H. sericea*, Müll. One near Semerdale House, and one at Knight Close Force, Marsett.
- H. rotundata*, Müll. Common everywhere.
- H. rupestris*, Stud. Common on limestone walls, about Bainbridge, Scar Top, Carr End, Stallingbusk, High Blean, Counterside, and in Bardale; also on the summit scars of Addleborough hill (1564 feet altitude.)
- Pupa umbilicata*, Drap. Common about Bainbridge, Counterside, Carr End, Marsett, Bardale waterfall, Stallingbusk, and High Blean, and on the summit Scars of Addleborough.
- Vertigo pygmæa*, Drap. A few specimens found near Carr End, in damp places.
- Balia perversa*, L. Several specimens at Carr End, and a few on Scar Top, near Bainbridge.
- Clausilia rugosa*, Drap. Not uncommon on Scar Top, about Stallingbusk, near Semerdale House, and one at Knight Close Force, near Marsett.
- Clausilia rugosa* var. *dubia*, Drap. Two specimens near the bridge over the Bain, at Bainbridge, one on Scar Top and one near Stallingbusk. Not common.
- Cochlicopa lubrica*, Müll. Common about Bainbridge, High Blean, Stallingbusk, Marsett, near Bardale Force, near Semerdale House, and at the foot of Semerwater Lake.

The results of my investigation of the mollusca of other parts of Wensleydale will be given in a supplementary paper, to appear in an early number of the *Naturalist*.

Leeds, Oct. 19th, 1882.

Short Notes and Queries.

LATE MIGRANTS NEAR HALIFAX. - Numbers of swallows and also martins have during the past week been constantly on the wing in the Ryburne Valley. I counted a score yesterday, and many are flying about to-day, October 17th.—F. G. S. RAWSON.

EARLY MIGRATIONS OF BIRDS.—On July 10th, whilst working in my garden, I heard the well-known cry of gulls, and on looking up, had the pleasure of seeing 25 black-headed gulls (*Larus ridibundus*); they were flying due south, and continued to pass over in twos and threes for nearly a month. July 27th, five curlews (*Numenius arquata*) passed over. Aug. 5th, on going out at ten o'clock at night, there was a flock of birds passing over which were very clamorous, but I could not make out their species. Sept. 24th, we have a very large flock of fieldfares (*Turdus pilaris*) in Mr. John Beaumont's and Mr. R. H. Tolson's parks, at Dalton. This is the earliest date I have of them. Sept. 27th, a large flock of swallows passed over, flying due south; they were all *Hirundo rustica*.—JAMES VARLEY, Huddersfield, Oct. 16th.

BOTTLE-NOSED DOLPHINS.—Bottle-nosed dolphins (*Delphinus tursio*) in the Humber and Ouse, have been very numerous this autumn. Three were shot several miles above Goole, and Mr. Jno. Harrison has handed me a rough sketch of one, with its dimensions. Our members have been very fortunate in finding *Volvox globator* this year. The members of the Y. N. U. who attended Snaith meeting, will probably remember obtaining a good supply there; had any of them been with Mr. Lord and me on the 7th inst., we could have shewn them a series of ponds or delvings reaching two miles, with *Volvox* in almost all of them. We also found it abundant in a pond at the edge of the moors a fortnight since; I was much surprised at this, as the place was simply a pond in a peat bog.—THOMAS BUNKER.

Cychnus rostratus IN SEMERDALE.—On the 17th August last, I found a specimen of this rather uncommon though widely distributed beetle amongst stones by the road side, at Counterside, a village near the foot of Lake Semerwater.—WM. DENISON ROEBUCK.

Acherontia Atropos AT HUDDERSFIELD.—I have received a very fine specimen of the death's head moth (*Acherontia Atropos*) from Mr. Lee, Somerset Road; it was taken at Brockholes, Sept. 28th last.—J. VARLEY.

ENTOMOLOGICAL NOTES.—BRADFORD.—The season 1882 is without doubt the worst we ever experienced. In early spring, *Phigalia pilosaria* was not nearly so common as usual, and this is the more remarkable when we take into consideration the great abundance of larvæ feeding in June, 1881. *Pieris napi*, which last year was very abundant, at Shipley Glen, has this season scarcely been seen; *Abraxas ulmata* seems almost to have disappeared from Hawksworth, where we usually saw it in thousands, but this season it turned up somewhat commonly at Shipley Glen, where, although we have visited the exact spot once, twice, and three times a week, for several years, we never saw it before. *Larentia salicata* has not been seen at Shipley Glen, and only one specimen observed in the

Bingley district; and a number of other species which are usually common, have, this season, rarely been observed. The most interesting capture which I made is one specimen of *P. stratiotalis*, which I took at Frizinghall, in July, and which Mr. Porritt informs me has only been recorded from three other Yorkshire localities. At the same place I took *H. nymphæalis* very abundantly, *S. cembralis* a few, and *P. trigonodactylus* flying over coltsfoot, all of which are new to our district record list.—J. W. CARTER, 14, Valley-st., Bradford, Sept. 10th.

ICHNEUMONS IN YORKSHIRE.—Several ichneumons secured during the year have been named for me by Mr. J. B. Bridgman, of Norwich, as follows:—*Ichneumon luctatorius*, L., Grassington, Aug. 7th, 1882. *I. nigritarius*, Gr., Edlington Wood, Aug. 5th, 1882. * *I. albicinctus*, Gr., Edlington Wood, Aug. 5th, 1882. *Perilissus flicornis*, (Gr.), variety? Lepton Great Wood, near Huddersfield, Sept. 23rd, 1882. * *P. vernalis*, (Gr.), Yorkshire, June, 1882, (locality not certain.) * *Tryphon signator*, Gr., Edlington Wood, Aug. 5th, 1882. Those marked * are new to the Yorkshire list.—GEO. T. PORRITT.

NEW YORKSHIRE MOSSES.—I have collected the following mosses which are not recorded for Yorkshire in the London catalogue of British mosses and hepatics:—*Gymnostomum tortile*, Schwg. Ingleborough, at 2000 feet, and Malham, above the Cove, at 1100 feet; *Sphagnum cuspidatum*, Ehrh., var. *falcatum*, Russ. Baildon Moor; *S. subsecundum*, Nees., var. *auriculatum*, Schpr., Adel; and *S. cymbifolium*, Ehrh., var. *congestum*, Schpr. Whernside, Baildon, &c.—W. WEST.

THE EFFECTS OF WEATHER ON INSECTS: BY MISS ORMEROD.—This lady, the well-known entomologist, has recently delivered a lecture on the above subject, at the Royal Agricultural College, to a large number of students, under the presidency of the Principal, the Rev. J. B. McClellan, which we think deserves to be widely known. We therefore make no apology for inserting a short abstract of her remarks, which, though perhaps in some respects not new to many entomologists, yet must interest all. The lecture was principally directed to the effects of rain, frost, heat, drought, &c., on insect life, and the methods by which these influences may be brought to bear practically in the course of common agricultural treatment in diminishing the amount of insects injurious to our crops. Miss Ormerod showed how, in addition to its direct influence on insect life, the effects of the weather may be traced for one, two, or more years in its promotion of the growth of special weeds, as, for instance, charlock, which may be the food-plant of some special crop pest, and also in its interference with the regularity of measures of cultivation by which plant and vermin are usually cleared out. Reasons were advanced why common farm insects were uninjured by even extreme cold, it being shown that they select some special locality under leaves or stones, or form a cell, or in some way supply themselves with shelter, and there they pass into a quiet, motionless state, the animal

functions decreasing in power with the increase of the cold. Still, even if totally frozen, many kinds of caterpillars are not injured so long as the freezing takes place in the shelters they have made for themselves. In the earth-cells, in which many kinds of caterpillars or grubs pass the winter, they are protected from drying winds and sudden changes of temperature, and these cells also appear to exclude the wet, so that the caterpillar lies clean and dry within, without risk of its breathing pores being choked by mud, which, though possibly not of importance to it while torpid, is a very serious matter when it wakes from its wintry sleep. It appears, in fact, that so long as they are in their own cells these common farm pests will survive a greater amount of cold than is likely to occur in these islands. If they are not in their own cells, circumstances will affect them very differently: and if, by ploughing, digging, or any other operation, the caterpillars and chrysalids can be thrown out of their cells or other wintry defences, and scattering them, mixing them with the soil and exposing them to drying winds, to alternate freezing and thawing, or to lying soddening in the rain or wet ground, when too torpid to move, that thus great numbers are got rid of. Thus, in the case of the maggots and pupæ of some kinds of the diptera (or two-winged flies) we may throw them on the surface, or turn them down so deeply in autumn cultivation, that any flies that may develop will have no power to work their way through the quantity of earth above them; and the best known remedy for the wheat midge is the method in which this plan is carried out in Canada and the United States of America. This is, when the "red maggot" is lying at the bottom of the stubble or a little below the surface in autumn, to skim off with the first turn-furrow of the plough about two inches of the surface-soil, with all the stubble, weeds, and vermin in it, and turn it to the bottom of the furrow; then raise another slice with the second turn-furrow, and throwing it over the first, bury it some inches deep. By this means the pest may be got rid of, if the surface can be left undisturbed until after the natural time of development for the wheat midge in the following season has passed; for even if these gnat-flies develop, their delicate powers are quite unsuited for piercing through the firm ground above them, and consequently they perish. It is, however, necessary that the ground should not be turned up again too soon, or the chrysalids or maggots in their cases may develop, and we shall have no benefit from their temporary burial. In the case of saw-flies, the cocoons may be thrown out in scores from under gooseberry bushes; in masses as large as a man's fist from under the pine-trees they have infested in autumn; and, in the case of beetle larvæ or chrysalids, we may get rid of some very injurious ones in this way; but the wireworm, having the instinct to bury itself when the weather is too cold for feeding, can only occasionally be dealt with in a torpid state; and the cockchafer-grubs, which are a great pest, also bury themselves safely too deep to be easily reached. In many cases the egg, whether laid singly or in clusters, is so placed as to be protected from rapid drying or sudden changes of temper-

ature. This locality is often either a little below the surface of the ground, as with one or more of the onion flies, the carrot fly, cabbage-root flies, and others, or amongst damp herbage, or on, or close to, the plants at the ground level, as with the daddy-longlegs or the click beetle (from whose eggs we are infested with the wireworm); and many others lay similarly.

(To be continued.)

Rainfall for September.

	Height of gauge above sea level.	Rain-fall.	No. of Days	TOTAL FALL TO DATE.		Date of heaviest Fall.	Amount of heaviest Fall.
				1882.	1881.		
HUDDERSFIELD (Dalton) ... (J. W. Robson)	Ft. 350	In. 1·64	17	24·68	* 23·63	30	0·26
HALIFAX...(F. G. S. Rawson)	365	1·86	11	35·94	32·34	...	...
LEEDS ... (Alfred Denny)...	183	1·135	17	19·440	†17·912	27	0·480
HORSFORTH ... (James Fox)	350	2·070	19	24·620	‡23·459	27	0·340
BARNSELY ... (T. Lister) ...	350	·71	15	22·01	18·52	27	0·72
INGBIRCHWORTH (do.)	853	3·18	16	30·97	28·30	19	0·72
WENTWORTH CASTLE (do.)...	520	2·90	15	23·40	21·56	26	0·59
GOOLE ... (J. HARRISON) ...	25	1·49	17	22·51	18·92	1	0·37
HULL (Derringham) (Wm. Lawton)	10	1·43	17	16·169	19·72	1	0·37

* Average to date for 16 years, 1866-81. † Average of 28 years, 1853-62 & 1865-82.
‡ Average of 13 years, 1870-82.

Reports of Societies.

BARNSELY NATURALISTS' SOCIETY.—Meeting Oct. 10th, Mr. T. Lister in the chair.—An interesting paper was read by Mr. Frankland on “Early Reminiscences of Birds and their Eggs, among the Cleveland Hills.” The botanical section have added to their long list several flowering plants, amongst them—Aug. 29, *Epilobium angustifolium*, *Sparganium simplex*, *Solanum nigrum*; Sept. 25, *Cerastium aquaticum*, *Sedum telephium*, *Nuphar lutea*; Sept. 7th, *Reseda luteola*; 27th, *Clematis vitalba*, *Antirrhinum Orontium*. Few insects have been observed, amongst them being *Nonagria fulva* and *Celena Haworthii*—the first new to the district. Amongst birds noted are, nightjar Aug. 21, whitethroat Sep. 5, landrail 19th, male gold crest and landrail 22nd; magpie, grey linnet, and twite numerous at Ingbirchworth; larks in song; swallows and martins in flocks at Stainborough Park; stragglng instances of swallows in Cockshaw-road, near Barnsley, 28th; martin Oct. 2nd; swallows in flock at Monkbretton Grange—the last seen by the chairman. Great spotted woodpeckers, jays, and kingfishers noted near Barnsley.—T. L.

BRADFORD NATURALISTS' SOCIETY.—Meeting Aug. 22nd, the president in the chair, who gave a number of interesting extracts from his entomological diary, dealing more particularly with species of lepidoptera peculiar to the Fens. Mr. B. Illingworth described rambles to Grange, Witherslack, and Kendal, and remarked upon the enormous number of wasps' nests observed at the latter place. Mrs. Broadley exhibited several marine objects, including razor-shell, &c. ; Mr. Carter, *Helix lapicida* from Burnsall ; Mr. Illingworth *E. Blandina* from Grange ; and Mr. Soppitt *C. catenulatus* from Heaton Woods.

MEETING Sept. 5th, the president in the chair.—Mr. Firth exhibited *O. filigrammaria* from Rombalds Moor (Wharfedale), and *L. olivata* from Shipley Glen : Mr. Carter *M. flammea* from Wicken Fen, received from Mr. Porritt ; *P. alpina* from Perthshire, 1881 ; *P. trigonodactylus* from Frizinghall ; *T. caudana* and *P. solandriana* from Rawdon ; Mr. Illingworth a large number of *V. Antiopa* from America ; Mr. Terry *P. phleas* from Rawdon, *M. arcuosa*, *M. rubiginata*, and a large number of commoner species from Shipley Glen, and a peculiarly marked specimen of *P. brassicae* from the South, which gave rise to an animated discussion. Mr. West showed specimens of the pearl mussel (*Unio margaritifera*) from Ireland ; Mr. Soppitt *Acme lineata*, *Balea perversa* and *Carychium minimum* from Ingleton, *Helix pulchella* from Otley, and the following plants : *Ceterach officinarum* from Poole, and *Filago germanica* from Baildon. A subscription list towards the " Darwin Memorial Fund " was commenced by the members.

MEETING Sept. 19th, Mr. Fawcett in the chair.—Mr. Scorch gave an interesting lecture on " Micro-Photography." Mr. Illingworth exhibited *O. filigrammaria* from Rombalds Moor (Airedale), *N. fulva* and *N. glareosa* from Shipley Glen, *L. Alexis* and *P. phleas* from Blackpool ; Messrs. Soppitt and Firth gave accounts of the recent meeting of the Y.N.U. at Wakefield, and Mr. Soppitt remarked that the district was extremely rich in fungi.

MEETING Oct. 3rd, Mr. Soppitt, v.p., in the chair.—The evening was devoted to conversation and the exhibition of specimens, of which a good number were laid on the table. Mr. Bennett showed beautiful fruiting specimens of *Hippophae rhamnoides* from Skegness ; Mr. Soppitt, on behalf of the Vicar of Arncliffe (the Rev. W. Boyd, M.A.), fine mounted specimens of *Polemonium caeruleum* and *Dryas octopetala*, from Arncliffe Clouders, the only Yorkshire habitat for the latter species ; Mr. Oxley, a large number of plants from Derbyshire and Cheshire, amongst which were a number of rare species collected by Mr. Searle, including *Colchicum autumnale*, *Festuca sylvatica*, *Hordeum sylvatica*, *Campanula latifolia*, *Vaccinium vitis-idaea* (in fl.) and *Ulex nanus*. Mr. West showed several species of local fungi, amongst which was a fine specimen of *Mærulius lachrymans* (dry rot fungus), from the cellar of Mr. Henry Ripley, of Bradford ; also a large number of foreign marine shells.—J. W. CARTER, Hon. Sec.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Monthly meeting, Sept. 25th, in the Free Library, the president (Mr. S. J. Capper) in the chair.—Mr. Benjamin Cooke, of Southport, read a paper on “Classification,” as applied to British insects. He recommended the adoption of a system of arrangement based on the character of the metamorphosis undergone in the earlier stages, as preferable to a system founded on the structure of the perfect insect only. Mr. Cooke also considered that in each order the carnivorous species should take precedence, on account of the greater amount of differentiation in the organs of the mouth. During the *conversazione* which followed the meeting, Mr. Cooke exhibited specimens of *Rhyssa pursuassoria*, from the New Forest, Hampshire; Mr. Walker, preserved larvæ of *Agrotis Ashworthii*; and Mr. J. Wall (under the microscope), specimens of the house-fly infested with parasites.

MANCHESTER CRYPTOGRAMIC SOCIETY.—Monthly meeting, Sept. 13th, Captain Cunliffe presiding.—Several of the members had recently made excursions to the Breadalbane mountains, and exhibited some of the rarities brought home from that district; Mr. Squire Ashton showed specimens of *Timmia*, *Ulota Ludwigi*, and *Hypnum Oakesii*; Captain Cunliffe, specimens of *Orthothecium rufescens*, *Dicranella squarrosa*, and *Stylostegium cæspiticium*. All the parties had found the beautiful *Hypnum crista-castrenses* fruiting more abundantly this year than had hitherto been seen, and Mr. Ashton had very kindly made up a few packets for distribution. Mr. Wm. Horsfall contributed freshly gathered specimens of *Cryphaea heteromalla* from Tenby. Mr. H. Boswell, of Oxford, sent specimens of a *Sphagnum* new to Britain, which he had discovered at Whitchurch, Salop. It had hitherto been found only in America, where it is known as *Sphagnum Torreyanum* (Sullv.) Mr. Boswell also sent specimens of *Sphagnum intermedium*, var. *pulchrum* (one of the prettiest of the bog mosses), from the same locality, and *Tortula princeps* from Blair Athol. The hon. sec. exhibited several species of frondose hepatics from Southport, the *Pallavicinia hibernica* being remarkable for its strongly pungent odour when dry.—THOS. ROGERS, Hon. Sec.

MEETING, October 11th, Capt. Cunliffe in the chair.—Mr. James Cash exhibited and distributed specimens of a moss which he had collected on Meal Tarmehan, during an excursion to the Highlands in company of the vice-president, in September last, and which he had now determined by microscopical examination to be the rare *Myurella apiculata*. Mr. Cash also exhibited a few interesting mosses he had gathered in Montgomery during the present month (October), *Scleropodium cæspitosum*, *Myrinia pulvinata*, and *Tortula latifolia* being amongst the number. The two latter species are new records for that district. Mr. W. H. Pearson, specimens of the new hepatics described by Dr. Spruce in his recent memoir on the *Cephalozia*, namely, *Cephalozia leucantha*, (Spruce) collected by Mr. Sim near Banchory, Scotland, and *C. æraria* (Pearson) from the mouth of an old copper mine near Tyn-y-groes, N. Wales; also the following:—*Jung. Hælliana*, Nees, a species new to Britain,

collected by Mr. G. Stabler at Mardale, Westmoreland ; the rare *Marsupella Stableri*, found on Cader Idris by Mr. G. A. Holt—this being new to Wales ; specimens of *Harpanthus scutatus*, from Tyn-y-groes, collected by Mr. C. J. Wild—a rare species only previously found in Wales at Beddgelert,—and *Anthelia Juratzkana* from Ben Lavigh, collected by Mr. Peter Ewing, this being the second station in Britain for this rare hepatic.—T. ROGERS, Hon. Sec.

SCARBOROUGH SCIENTIFIC SOCIETY.—The annual fungus foray took place on Saturday, September 30th. The day was fine, and the ramble much enjoyed by an enthusiastic party of mycologists. Fungi were in abundance, and some interesting specimens collected : *Ag. (Amanita) excelsus*, *Ag. (Mycena) rosellus*, and *Cortinarium russus*, by Mr. W. Robinson ; *Ag. (Omphalia) Postii*, new to Britain, and *Ag. (Amanita) Friesii*, by Mr. G. Masee. The exhibition was held in the Society's room, and being open to the public in the evening, was visited by considerable numbers. The common kinds were arranged according to their edible or poisonous properties.—G. M.

YORKSHIRE NATURALISTS' UNION.—Thirsk, Oct. 7th.—The sixth and closing meeting of 1882 was planned for the investigation of Pilmoor, a tract of waste land adjoining the main line of the North Eastern Railway. The meeting was fixed to be at Thirsk Junction, and parties were organised for Leckby Carr and Gormire Lake. Unfortunately for the success of the first meeting ever held so late as October, the weather was very unpropitious, rain falling throughout the day. The attendance was consequently the smallest ever known at a Union meeting, only ten members being present. The excursion was nevertheless a successful one, so far as the results were concerned. Three parties were arranged. One consisted of Messrs. Soppitt and Roebuck, accompanied by Mr. R. Thackway, of Brafferton, as guide. The route taken was over Pilmoor, through Brafferton Spring Wood, thence to Raskelf, and along the borders of Sessay Wood to Pilmoor Junction, and by rail to Thirsk Junction. Upwards of a hundred species of fungi were collected, and a few mollusca. The second party included Messrs. William Foggitt and Robert Lee, of Thirsk, and a gentleman from Darlington, who investigated the botany of Leckby Carr, attention being also paid to the birds. The third party drove to Gormire, and included Messrs. Percy Lund, B. M. Smith, Moss, and Hey, the Rev. F. Addison and the local secretary acting as leaders. The main object of this detachment was the geological examination of the escarpments of the Hambleton hills, and some attention was paid to the mollusca. The tea and meeting were held at Strickland's hotel, Thirsk Junction. The chair of the general meeting was occupied by Mr. H. T. Soppitt, of Bradford. The minutes of the Wakefield meeting were confirmed, and upon calling the roll it was found that the following seven societies were represented : Bradford (2), Ilkley, Leeds (3), and Ripon. The list of new subscribers included Prof. L. C. Miall, F.L.S., F.G.S.,

Leeds, Mr. John Rookledge, F.R.M.S., of Easingwold, Mr. H. Jowitt, of Bishop Thornton, and the Rev. Frederick Addison, of Thirsk. Mr. B. M. Smith, the secretary of the Ripon Naturalists' Club, proposed a vote of thanks to Mr. Wm. Gregson for his services as local secretary, and to Viscount Downe, Capt. Gallwey, and Messrs. B. T. Woodd and C. F. H. Bolckow, for permission to visit their respective estates. This was seconded and carried. The reports of sections were then given, beginning with the geological, for which Mr. Gregson reported that they had visited the glacial beds in the gravel pits adjoining Thirsk Junction, and found therein shap granite, encrinital limestone, several water-worn grypheæ, also *Cristellaria rotulata*, and *Astarte striato-sulcata*. The party then drove to the western escarpment of the Hambleton hills, where they investigated sections of the middle and lower oolites, and also some of the upper liassic strata. The middle oolites are represented in the face of the cliff by about 30 feet of Oxford clay, between 100 feet of calcareous grits above, and the same thickness of Kelloway rock below. They succeeded in finding several species of *Belemnites*, *Anmonites communis*, *A. Boulbiensis*, *Gryphea incurva*, *G. convoluta*, *Grevillia erosa*, *Pleuromya granata*, *P. contracta*, *Leda galathea*, *Rhynchonella plicatissima*, *Pecten substriatus*, &c. Mr. W. Eagle Clarke, secretary of the Vertebrate Section, reported that the only observations in ornithology had been those made at Leckby Carr by Mr. Robert Lee, who had seen thirteen common residents—the starling, rook, jackdaw, magpie, goldcrest, wood pigeon, meadow pipit, redbreast, yellow-hammer, common bunting, blue-tit, chaffinch, and lapping. Of other vertebrata had been observed, both at Leckby Carr and Pilmoor, the squirrel, weasel, water vole, toad, frog, and common or smooth newt. In the absence of the officers of the Conchological Section, Mr. Wm. Denison Roebuck stated that shells had been collected by each of the three parties out during the day, but that the total list was only a meagre one. Mr. Soppitt and himself, who had visited Pilmoor, Braferton Spring Wood, and the lanes north-west of Raskelf, had not been as successful as they expected, having only found 16 species and varieties, viz. :—*Planorbis complanatus*, *P. corneus*, *P. contortus*, *Limnea truncatula*, *Arion ater* and var. *rufus*, *A. hortensis*, *Limax agrestis* and Mr. Butterell's newly-described var. *niger*; *Vitrina pellucida*, *Zonites alliarius*, *Helix nemoralis*, *H. cantiana*, *H. hispida*, *Vertigo pygmæa*, and *Cochlicopa lubrica*. Mr. W. Foggitt obtained, at Leckby Carr, specimens of *Helix hortensis*, *H. cantiana*, and *H. hispida*. Mr. Percy Lund, of Ilkley, and some of the Ripon members, who had had the advantage of collecting upon calcareous soil—the slopes of the oolitic escarpments above Gormire Lake,—obtained *Zonites cellarius*, *Helix nemoralis*, *H. hortensis*, *H. arbustorum*, *H. cantiana*, *H. hispida*, *H. rotundata*, *H. lapicida*, *Bulimus obscurus*, *Clausilia rugosa*, and *C. laminata*. In the absence of the officers of the Entomological Section, there was no report given, but from statements made by various mem-

bers, it appeared that *Carabus violaceus* had been found at Pilmoor, and *Bombus leucorum* noted there and at Gormire, the individuals of the latter species being in both cases females in their hybernaculum, or winter resting-place. The Botanical Section was unrepresented by its officers, and Mr. Wm. Foggitt, of Thirsk, reported that, notwithstanding the lateness of the season and the very unfavourable weather, 235 phanerogams and a considerable number of cryptogams had been collected or seen; the former included *Berberis vulgaris*, *Drosera rotundifolia*, and *anglica*, *Silene anglica* and *noctiflora*, *Trifolium arvense*, *Comarum palustre*, *Pimpinella magna*, *Oenanthe phellandrium*, *Torilis nodosa*, *Sambucus ebulus*, *Scabiosa columbaria*, *Artemisia absinthium*, *Filago minima*, *Gnaphalium sylvaticum*, *Erigeron acris*, *Crepis paludosa*, *Vaccinium oxycoccus*, *Hieracium tridentatum*, *Origanum vulgare*, *Calamintha clinopodium*, *Acinos* and *menthifolia*, *Nepeta cataria*, *Lysimachia thyrsoiflora*, *Rhynchospora alba*, *Hordeum murinum*, all from Leckby Carr and neighbourhood. The interesting fungus *Geoglossum difforme* was exhibited from the sandstone quarry at Leckby. Twenty-five species of mosses were gathered, among which were the following:—*Sphagnum acutifolium*, var. *rubellum*, *S. intermedium*, *S. cuspidatum*, *S. subsecundum*, *S. rigidum*, *Campylopus pyriformis* (ft.), *Bryum atropurpureum*, *Aulacomnium palustre* (ft.), *A. androgynum*, *Tetraphis pellucida* (ft.), and *Brachythecium albicans*. Six species of hepatics were gathered, *Mylia anomala* being among them. Mr. Soppitt supplemented the remarks of Mr. Foggitt by an account of the day's investigation of fungi, which had been found very abundant. The district investigated was Pilmoor, Brafferton, Spring-wood, Sessay Wood, &c., and resulted in 92 specimens of fungi being collected; amongst these were *Collybia maculatus*, *C. tuberosus*, *Pholiota radicosus*, *P. squarrosus*, *Sphæronema subulatum*, *Russula nigricans*, *Cortinarius cærulescens*, *C. torus*, *Torrubia ophioglossoides*, *Lactarius vellereus*, *L. piperatus*, *Boletus luteus*, *B. scaber*, *B. elegans* (Leckby Carr), *Polyporus salicinus*, *Scleroderma verrucosum* (Leckby Carr), and *Puccinia clinopodii*. [A short distance above Sessay, I noticed *Phragmidium bulbosum* (at least what I took to be that species) exceedingly common, the pustules on some of the plants rather small and not so scattered, whilst on others, the pustules were very much larger and scattered all over the leaf. Upon examination, I found that the spores differed considerably, especially in the smaller pustules, the septa being more numerous, and the apiculus much longer than in the larger pustules. Both forms were sent to Mr. C. B. Plowright, who replied:—"The two phragmidia are distinct species, hitherto in this country confounded together as *P. bulbosum*. That with fewest septa is *P. violaceum*, Schultz.; that with most, *P. rubi*, Pers.—the old *bulbosum*."] Mycologists would do well to examine their *P. bulbosum*. Votes of thanks to Mr. Foggitt and the Rev. F. Addison, for acting as guides, and to the chairman, closed the proceedings.—W. D. R.

Original Articles.

ON THE CLASSIFICATION OF INSECTS.

BY BENJAMIN COOKE.

SOME of the ideas in this paper were produced at a meeting of the Northern Entomological Society, held on the 26th December, 1857. My views are now somewhat modified as to the details of an arrangement of the class *Insecta*, but I still adhere to the principle of classification which was advocated in that paper—a principle which was not new, but has been acted upon in the arrangement of more than one order of insects.

Mr. Dallas, in his “Elements of Entomology,” after stating his reasons for the adoption of the Cibarian system of classification, in his work says (p. 58)—“But, for my own part, I must confess that I think the adoption of the metamorphoses as the foundation of the arrangement of insects leads to a more philosophical result.” Coinciding with Mr. Dallas in this view, my object is to carry out this system, and to endeavour to show that the orders of insects follow one another in a more natural and regular course than in the system of classification which is founded on the structure of the mouth.

The principle of classification which will be here advocated is this: to begin with the highest development, and proceed in regular gradation to the lowest; care being taken in the details to associate together those which have a close affinity throughout the various stages of their existence. This principle seems to me to be applicable to all classes of animated beings. It is not new, as I stated before; and, whether accepted or not, it is manifest that unless *some* principle be adopted, classification will always be in confusion.

It is obvious that carnivorous animals which prey upon others belonging to the same order as themselves, will possess the highest development; their muscular powers in proportion to their size, their strength of bone and of jaws, and their agility, are all necessarily greater than those of animals which they have to subsist upon. The predaceous tribes, then, whenever such exist, should be placed at the head of each order: thus, in the mammals, the lion, the tiger, the leopard, &c.; in the birds, the eagles and falcons still claim the highest rank. There are exceptions to this rule in the case of insects which are only partly predaceous, and of inferior structure; these will have to be arranged along with the nearest allies.

In order to show the necessity for some guiding principle in the arrangement of insects, I give, in a tabular form, the systems proposed by those British authors who have published their views in a separate
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form, on the whole of the class *Insecta*, or rather the whole of the British insects; omitting the orders Dermaptera, Dictyoptera, Strepsiptera, Aphaniptera, Homaloptera, and Aptera, for reasons to be afterwards explained. The works from which the table is taken are—"Systematic Catalogue of British Insects," by Stephens, date 1829; "Guide to an Arrangement of British Insects," by Curtis, date 1829; "Introduction to the Modern Classification of Insects," the "Synopsis of the Genera of British Insects," at the end of the second volume, by Westwood, date 1840; "The Insect Hunters," by Newman, published about the end of 1857. This last work I did not see or know anything about until after my paper for the Northern Entomological Society was read. It is based on the Metamorphotic system, whilst the other authors have adopted the Cibarian.

STEPHENS.	CURTIS.	WESTWOOD.	NEWMAN.
1. Coleoptera	1. Coleoptera	1. Coleoptera	1. Lepidoptera
2. Orthoptera	2. Orthoptera	2. Orthoptera	2. Diptera
		3. Thysanoptera	3. Hymenoptera
3. Neuroptera	3. Hymenoptera	4. Neuroptera	4. Coleoptera
4. Trichoptera	4. Neuroptera	5. Trichoptera	5. Stegoptera
5. Hymenoptera	5. Trichoptera	6. Hymenoptera	
6. Lepidoptera	6. Lepidoptera	7. Lepidoptera	6. Neuroptera
7. Diptera	7. Homoptera	8. Homoptera	7. Orthoptera
8. Hemiptera	8. Hemiptera	9. Heteroptera	8. Hemiptera
9. Homoptera	9. Diptera	10. Diptera	

It will be seen that three of our authors commence with the order Coleoptera, and Westwood states his reason for so doing. He says: "This order comprises the extensive tribes of beetles, and, in respect to the size of some of these insects, or the number of individual species, must be regarded as occupying the foremost rank among insects." (*Introd.* i., p. 33.)

The omission of the orders before-mentioned has now to be explained. The Dermaptera, Leach, or Euplexoptera, Westw., containing the family Forficulidæ, also the Dictyoptera, or Blattidæ, will be included with the Orthoptera. The Strepsiptera, or Stylopidæ, are considered to belong to the Coleoptera. The Aphaniptera, or Pulicidæ, and the Homaloptera, containing the families Hippoboscidæ and Nycteribidæ, are both placed among the Diptera. There remains then the order Aptera to be disposed of. Curtis divides it into two orders, viz., Thysanura and Anoplura. Sir John Lubbock, in his

“ Monograph of the Collembola and Thysanura,” does not seem to regard them as belonging strictly to the class Insecta, though nearer to this class than they are to the Crustacea or Arachnida. According to Stephens the order Aptera consists of the two families Pediculidæ and Nirmidæ. Now it is possible that the Pediculidæ, or at least the greater portion of them, will have to be associated with the Hemiptera. Of the Nirmidæ, most of which are called bird-lice, I will not express an opinion, except that they ought not to form a distinct order of insects.

Restricting, then, the class Insecta as it has been done by Westwood and by Newman, and carrying out the metamorphic system of arrangement, the class will be separable first of all, into two divisions, which may be characterised thus :

DIVISION I.

Pupa unable to feed.

DIVISION II.

Pupa able to feed.

In the second division the pupa is as active and voracious as the larva, and in some cases more so. In the first division there is much difference in the power of motion possessed by the pupa, and this is most evident among the Diptera ; in a large proportion of this order the pupa is wholly incapable of any motion : whilst of those which live in the water up to the time of their assuming the perfect state, the pupæ of some families possess considerable power of motion.

I will now proceed to state my views as to the number of orders in the class Insecta, and as to their arrangement on the principle of commencing with the highest development. The following table exhibits six orders in the first division, and six orders in the second, viz :—

DIVISION I.

1. Coleoptera
2. Hymenoptera
3. Diptera
4. Lepidoptera
5. Trichoptera (caddis-flies)
6. Stegoptera (Newman in part
= Neuroptera planipennia

DIVISION II.

1. Neuroptera odonata (Dragon-flies only)
2. Neuroptera Hetera
3. Orthoptera
4. Hemiptera.
5. Homoptera
6. Thysanoptera (Haliday)

1. COLEOPTERA.—In the year 1861 Waterhouse published a “ Catalogue of British Coleoptera,” in three forms, one of which was intended for labelling cabinets—a most valuable boon to collectors and students of this order at that time. The arrangement was purely a tarsal one. After ten years, when the number of British species had considerably

increased, another catalogue was issued by Dr. Sharp, which I believe is now generally accepted by British coleopterists. It differs chiefly from the preceding in the removal of the Trichopterygidæ, Pselaphidæ, &c., from the Pseudotrimeræ, to positions of nearer alliance; also in the restoration of the Hydrophilidæ to a nearer connexion with the Dytiscidæ. The principle of the arrangement seems to my mind exactly the one which I have been advocating or supporting, and I consider Dr. Sharp's catalogue to be a model for the arrangement of all other orders of insects. If the principle is a good one as regards the Coleoptera, I cannot conceive any reason why it should not be carried out in the whole class.

The arrangement of the Coleoptera may be compared to the railway system: if a person wishes to travel from Chester to Southport, he takes the train to Birkenhead, and he there comes to a terminus; he crosses the river in a steam-boat, and then makes his way to Tithebarn-street station, in Liverpool, where he enters upon a distinct line of railway. So it is with the beetles; when we get through the Geodephaga and Hydradephaga, we come to a terminus, and then change to another line, as it were, going on with the Brachelytra.

2. HYMENOPTERA.—There may be a choice, in the commencement of this order, between the ants and the wasps; I prefer the latter, and if we begin the British species with *Vespa crabro*, we have a fine and a formidable insect to take the lead. To get into a hornet's nest is proverbial; to get into an ant's nest would be, comparatively, a weak expression.

3. DIPTERA.—In his investigations on the Hymenoptera, Westwood says (Introd., vol 2, p. 81):—"It seems to be admitted on all hands that the insects, which are the real analogues of the present order (Hymenoptera) exist in the dipterous order, almost every hymenopterous group having its representative in the latter."

In arranging this order on the same principle as the Coleoptera, there can scarcely be two opinions as to which family to begin with. Walker says of the Asilidæ ("Insecta Britannica—Diptera," vol. 1, p. 47)—"These flies are all carnivorous, and are the most powerful and generally the largest of the Diptera. They destroy Coleoptera and Hymenoptera, as well as insects of their own class."

4. LEPIDOPTERA.—Three out of the four British authors before mentioned commence the British species of this order with *Papilio Machaon*; and I believe this commencement is almost universal with British lepidopterists of the present day. Here, then, we have the

same principle in operation, which seems to have been the guiding one in the arrangement of the Coleoptera. The British butterflies are so few in number of species, that we have nothing to compare with the magnificent genus *Ornithoptera* of Java, Sumatra, and Borneo, which takes the lead in a general collection.

5. TRICHOPTERA.—This order is intended to contain the insects commonly known as caddis-flies only—in fact the species monographed by M'Lachlan under this title. He has recently revised, and I think improved, the arrangement of the British species, beginning with the genus *Neuronia* and ending with the minute species, that is to say the family *Hydroptilidæ*. It would be difficult, now to find any departure from the principle of classification advocated in this paper.

6. STEGoptERA.—Newman includes the caddis-flies along with the Neuroptera-Planipennia under the title proposed. If it be permitted to restrict the name to the latter insects as a separate order, the title is surely worth retaining in preference to Neuroptera-planipennia, which was proposed only as a division of the Linnæan order. The separation of these insects into a distinct order is not a proposal of mine; I only advocate its adoption. M'Lachlan has monographed the British species, but if we are to deal with them on the same principle as with the Trichoptera, the arrangement will want revising.

This order terminates the first division of the class Insecta, and I think there may be observed a regular gradation from a hard-bodied, strong, and well-defended class of insects, to a soft-bodied, weak, and defenceless one.

DIVISION II. Order 1.—NEUROPTERA ODONATA.—It will be observed that I propose to separate the Neuroptera of Linnæus into four distinct orders—two belonging to the first division of the Insecta, and two to the second, according to the nature of the metamorphosis. Fabricius proposed the Odonata for the dragon-flies, and I do not like to drop the title of Neuroptera, as it is done in the two orders in the first division: hence the combination. I believe, also, that Fabricius considered the Odonata to form a distinct order, therefore there is nothing new in the proposition which I make; it is only an attempt to restore that which has been allowed to drop. The reason for so doing is this: it has become very evident of late years that the sexual characters of insects, the genitalia and their armature including the anal appendages, are of high value in classification, and also as a test in the distinction of species. Now, the male genitalia of the dragon-flies differ from all other insects, so far as I am aware, in being situated, not at the tip of the abdomen, but at its base underneath.

This of itself one would think sufficient to separate them as a distinct order. An opportunity of witnessing the pairing of these insects may perhaps not often occur. I had once a most favourable one, and the species noticed was one of the larger kind. It was in a part of the New Forest, Hampshire, in September, 1856, and remembering what Westwood says on the subject (Introd., vol. 2, p. 38), I did not neglect this opportunity. Without going into particulars, I was perfectly satisfied of the truth of the statement alluded to, and that Burmeister's assertion to the contrary is without foundation. I may add that, after pairing, the male does not let go his hold of the other sex by the back of the neck, but assists her in the act of oviposition.

Besides the above distinction, the Odonata has no close relationship with any other tribe in the Neuroptera of Linnæus. Their eminently predaceous habits, their rapid and graceful flight, their very large eyes, their powerful jaws, their antennæ—in fact their whole organisation, places them at a great distance above the insects which will compose the next order.

2. NEUROPTERA-HETERA.—This order will contain the families Perlidæ, Ephemèridæ, and Psocidæ; the Termitidæ not being natives of Britain.

3. ORTHOPTERA.—The species of insects belonging to this order, and inhabiting Britain, are few. They are comprised in the following families:—Blattidæ, Forficulidæ, Achetidæ, Gryllidæ, and Locustidæ.

4. HEMIPTERA.—It will be seen that three of our British authors separate the Homoptera as an order distinct from the Hemiptera proper, and I think they have done wisely. The tendency in the present day is to multiply families and genera, many of the proposed families in the Hemiptera being represented by only one or two British species. And if entomologists agree with the authors alluded to, each of the two orders will contain far more British species than there are in each of the preceding.

There being no British species analogous to the Geodephaga among the Coleoptera, the order will commence with those which represent the Hydradephaga, namely, Notonectidæ, Hydrometridæ, &c.; and this has been done by both Curtis and Westwood. The tribe Reduvina contains predaceous insects, but of inferior construction, and are more nearly related to the Anthocorina.

5. HOMOPTERA.—The catalogue of these insects, published by the Entomological Society of London in 1876, does not include the Aphidæ and Coccidæ, and the arrangement is somewhat novel to British entomologists.

6. THYSANOPTERA.—This order, consisting of the single family Thripidæ (all very minute insects), was proposed by Haliday, and adopted by Westwood. I recognise it as a distinct order, in deference to the opinion of so eminent an entomologist as the proposer of the title, and the principal investigator of the group.

I must now conclude. The subject is so vast that it is not an easy matter to compress it into the limits of a paper without running the risk of being misunderstood. I have repeated very little of the paper published in the *Zoologist* in its original form. It has been my aim to avoid as much as possible the introduction of anything new in principle and in nomenclature. My sole object is to aid, if I can, in bringing the classification of insects into a more systematic form than it is at present. I have carried out the details, in the arrangement of my own collection, chiefly in the orders Hymenoptera, Diptera and Hemiptera; but these details will require a thorough revision, and this cannot be done properly without assistance.

Southport, Sept., 1882.

CONTRIBUTION TO A LIST OF THE HOMOPTERA OF LANCASHIRE AND CHESHIRE.

[THE NORTH OF LANCASTER EXCEPTED.]

BY BENJAMIN COOKE.

CIXIIDÆ.

- Cixius cunicularius*, F. Manchester, Hazelgrove, Marple.
C. nervosus, L. Manchester.
C. brachycranus, Scott. Marple, August, 1865.
C. pilosus, Oliv. Bollin Valley, near Bowdon.
C. stigmaticus, Germ. "The Brushes," near Stalybridge, June, 1863

DELPHACIDÆ.

- Liburnia pellucida*, F. Manchester, Rivington, Bowdon.
L. discolor, Boh. Hazelgrove, Marple.
L. neglecta, Flor. Manchester.

APHROPHORIDÆ.

- Aphrophora alni*, Fall. Hazelgrove.
Philaenus spumarius, L. Abundant.
P. lineatus, L. Bollin Valley.

MEMBRACIDÆ.

- Centrotus cornutus*, L. Warrington.

ACOCEPHALIDÆ.

- Strongylocephalus agrestis*, Fall. Manchester, Southport, Bowdon, Marple.

- Acocephalus rusticus*, F. Manchester, Southport, Bowdon, Hazelgrove.
A. bifasciatus, L. Rivington, Stalybridge.
A. albifrons, L. Southport, Hazelgrove.
A. flavostriatus, Don. Southport, Hazelgrove.

BYTHOSCOPIDÆ.

- Macropsis lanio*, L. Bowdon, Hazelgrove, Pettypool, Delamere.
Idiocerus adustus, Schaff. Manchester, Lytham.
I. populi, L. Manchester, Rivington, Southport.
Bythoscopus flavicollis, L. Manchester, Rivington, Greenfield, Hazelgrove
Pediopsis cereus, Germ. Southport.
P. nassatus, Germ. Manchester, Bowdon.
Agallia puncticeps, Germ. Hazelgrove.

TETTIGONIDÆ.

- Euacanthus interruptus*, L. Manchester, Bowdon, Hazelgrove.

TYPHLOCYBIDÆ.

- Alebra albostriella*, Fall. Hazelgrove.
Cybus smaragdulus, Fall. Manchester, Southport, Hazelgrove.
Chlorita viridula, Fall. Bowdon.
C. flavescens, F. Manchester, Bowdon.
Dicranoneura variata, Hardy. Southport.
Typhlocyba decempunctata, Fall. Pettypool.
T. quercus, F. Bowdon.
T. ulmi, L. Abundant.
T. geometrica, Schr. Manchester, Southport.
T. rosæ, L. Manchester, Bowdon, Hazelgrove.
T. blandula, Rossi. Bowdon, Hazelgrove.
Eupteryx tenellus, Fall. Bowdon, October, 1878.
E. urticæ, F. Manchester, Bowdon.
E. pictus, F. Manchester, Bowdon, Hazelgrove.
E. stachydearum, Hardy. Manchester, Aughton, Bowdon.
E. pulchellus, Fall. Manchester, Rivington. Hazelgrove.

JASSIDÆ.

- Cicadula sexnotata*, Fall. Manchester, Bowdon.
Thamnotettis torneella, Tett. Manchester, Hazelgrove.
T. quadrinotata, F. Bowdon, Hazelgrove.
Athysanus subfuscus, Fall. Manchester, Bowdon.
A. prasinus, Fall. Manchester, Bowdon, Hazelgrove.
Allygus mixtus, F. Manchester, Southport, Hazelgrove.

DELTOCEPHALIDÆ.

- Deltocephalus abdominalis*, F. Manchester.
D. sabulicola, Curt. Southport.
D. striatus, L. Bowdon, Hazelgrove.
D. socialis, Flor. Rivington, Pettypool.
D. ocellaris, Fall. Bowdon.
D. pulicaris, Fall. Bowdon.

PSYLLIDÆ.

- Psylla Forsteri, Flor. Manchester, Southport, Hazelgrove.
 P. alni, L. Manchester, Hazelgrove.
 P. salicicola, Forst. Bowdon.
 P. fumipennis, Forst. Bowdon.
 P. cratægicola, Forst., Manchester.
 P. mali, Forst. Bowdon.
 P. fraxinicola, Forst. Manchester, Rivington, Southport.
 Trioza urticæ, L. Bowdon, Hazelgrove.

Rainfall for October.

	Height of gauge above sea level.	Rain-fall.	No. of Days	TOTAL FALL TO DATE.		Date of heaviest Fall.	Amount of heaviest Fall.
				1882.	1881.		
HUDDERSFIELD (Dalton) ... (J. W. Robson)	Ft. 350	In. 3·69	23	28·37	* 27·19	24	0·70
HALIFAX... (F. G. S. Rawson)	365	4·50	19	40·44	37·40	..	...
LEEDS ... (Alfred Denny)...	183	3·640	30	23·080	†20·615	19	0·785
HORSFORTH ... (James Fox)	350	4·040	24	28·660	†27·170	24	0·710
BARNSELY ... (T. Lister) ...	350	4·77	24	26·78	21·56	24	1·15
INGBIRCHWORTH (do.)	853	4·94	27	35·91	34·61	24	1·00
WENTWORTH CASTLE (do.)...	520	4·41	21	27·81	25·83	24	1·18
GOOLE ... (J. HARRISON) ...	25	4·21	25	26·77	21·27	24	1·50
HULL (Derringham) (Wm. Lawton)	10	5·64	26	18·292	25·36	24	1·72

* Average to date for 16 years, 1866-81. † Average of 28 years, 1853-62 & 1865-82.
 ‡ Average of 13 years, 1870-82.

Short Notes and Queries.

BADGER, OTTER, AND POLECAT.—Can any zoologist give particulars, through the columns of the *Naturalist*, of the occurrence in Yorkshire of the three above-named animals for the last ten or twelve years? As these interesting quadrupeds are now rare, I have no doubt many naturalists would be glad to see a comprehensive account of recent occurrences.—GEO. ROBERTS, Lofthouse, Wakefield, Oct. 31st.

THE GOLDEN-EYE DUCK AND WHITE SPARROW AT ELLAND.—On the 5th Nov., two males and one female of the above duck, in nearly mature plumage, were shot on the garden pond, Marshall Hall, the residence of Mr. John Smithies. A few weeks ago a beautiful white sparrow was shot at Elland Hall. Evolution has no chance here; as soon as a variety appears, it is either shot or captured.—C. C. HANSON, Greetland.

FIELDFARES NEAR HUDDERSFIELD.—From a report at page 56 of last month's *Naturalist*, I perceive that fieldfares were observed near Hud-

dersfield on Sept. 24th. Can any other correspondent corroborate this observation? It is difficult to distinguish immigrant missel-thrushes from fieldfares when at a distance, especially if the respective notes of the birds are not heard. My earliest date for the appearance of the field-fare for the last twelve years is Oct. 12th.—GEO. ROBERTS.

SNOW-BUNTING.—Last winter I bought a snow-bunting of a bird-catcher for the purpose of making myself acquainted with its song and notes, and also for the purpose of noticing any changes of plumage. The bird had been caught some time during the previous winter near Leeds, and having been confined in a small cage, its tail was worn to a stump. Its plumage was a uniform rufous-brown and black above, and a dirty white beneath. I gave it a pretty large cage, and fed it with canary seed. About the middle of March last it began to sing. Its song is weak for the size of the bird; its notes, however, are mellow and full, and one peculiar note, generally uttered at night, is very loud and piercing. It sang only for a short time in spring, and always ceased singing if it saw anyone watching. For the first eight or nine months it kept continually jumping and dancing within the wires at the front of the cage, and at night never perched, but sat in a corner. About September it seemed to acquire a new dress without throwing off any of the old. It has now a full plumage, tail included, has lost its habit of dancing, and has begun to perch both in the daytime, and at night when roosting. The new plumage is similar to the old, except in being brighter, in having a red-brown crescent on the breast, and a few white feathers on the crown and round the eyes, and more conspicuous white feathers in the tail. Mudie says that the snow-bunting in a wild state never perches. I presume that the reason it did not perch at first was that it had been confined in a small cage without perches, and that it was without tail, consequently unable, or less able, to balance itself on a perch. The feet of this species are not grasping feet, but more fit for standing or running on the leaves of aquatic plants, like the feet of the skylark, which bird, judging from the prolongation of the toes, has doubtless originally been a marsh-bird. The claw on the heel of my caged bunting was (before being shortened) nearly three-quarters of an inch in length. The bill is yellow, tipped with black.—GEO. ROBERTS.

ENTOMOLOGICAL NOTES.—Through the kindness of Lord Walsingham, I have recently added to my collection a pair of *Steganoptycha rufimitrana*. His lordship bred a series, in June last, from larvæ found in Norfolk, on fir (*Abies cephalonica*); previously the species was only known, as British, by two Cambridge specimens, and one bred by Lord Walsingham last year. Other additions to my cabinet include *Platypteryx sicula*, from Bristol; a pair of *Dianthæcia Barrettii*, taken by the late Mr. R. W. Sinclair, at Howth; *Gymnancycla canella*, bred from pupæ sent me last year by the Rev. E. N. Bloomfield, of Guestling, near Hastings, to whom I am also indebted for a batch of larvæ, now feeding

on *Salsola Kali*; *Bactra furfurana*, taken this season near Dublin, by the Rev. G. C. B. Madden, of Armitage Bridge; several *Cedestis gysselinella*, taken this season at Dollar, N.B.; *Pterophorus Bertrami*, taken in Carmarthenshire, and *P. punctidactylus*, in Cardiganshire, both by Mr. Nelson M. Richardson.—GEO. T. PORRITT, September, 1882.

BINGLEY.—I quite confirm Mr. Carter's remarks about the past season being a bad one generally for macro-lepidoptera. The comparative scarcity of *N. mundana* and *P. pilosaria* was very noticeable. *A. meny-anthidis*, *N. Dahlii*, *H. glauca*, *C. ferrugata*, and *A. fumata* are the only insects, as far as I remember, that occurred in their normal numbers. *D. templi*, *A. inornata*, and an *Eupithecia*, perhaps *fraxinata*, one of each, are the only additions for this locality. *S. crategalis* was plentiful on Blackhills, and not uncommon on the southern slopes of Harden Moor. My brother was so fortunate as to secure *Tinea fulvimitrella* in Hawksworth Wood in June, thus adding another to the few already known British localities.—E. P. P. BUTTERFIELD, Wilsden, Bingley, Nov. 9th.—[Other Yorkshire localities for *Tinea fulvimitrella* are Bramham, Doncaster, Rotherham, Scarborough, and Sheffield.—G. T. P.]

Cychnus rostratus AT GRASSINGTON AND GILSTEAD.—I took a single specimen of this beetle at Grassington, on the 6th of last August. I pulled up a small patch of *Sedum acre* to bring home, and out rolled the beetle. I have also a specimen from Gilstead, in Airedale, taken by Mr. Firth, last spring, from under a stone.—J. W. CARTER, Bradford, Nov. 16th.

Cychnus rostratus AT HUDDERSFIELD.—It may interest Mr. Roebuck to know that last winter I took two specimens of this beetle in this district. They were hibernating under stones.—S. L. MOSLEY, Huddersfield, Nov. 15th.

Sirex gigas AT HUDDERSFIELD.—This autumn I had another *Sirex gigas* brought to me from Almondbury, by the same person and from the same place as the one last year.—G. C. B. MADDEN, Armitage Bridge Vicarage, Huddersfield, October.

Sphagnum Austini, Sull., IN S.W. SCOTLAND.—Mr. Jas. McAndrew has a note in the *Scottish Naturalist*, No. xlvi, p. 378, that he has found this moss and its var. *imbricatum* (of both of which he has kindly sent us specimens), in large hassocks, on Moss Raplock, on the farm of Clatteringshaws—the scene of one of Robert Bruce's victories. He also finds it, but not in plenty, in Barend Moss, Laurieston, near Castle Douglas, and in Auchencairn Moss, near Auchencairn. These are all in Kirkcudbrightshire, and are new to prov. 13 of Watson. Its distribution is now, therefore, 12, 13, 18 A.—C. P. H.

THE EFFECTS OF WEATHER ON INSECTS: BY MISS ORMEROD (*Concluded*).—The effect of weather as a means of destroying insect eggs, was next touched on, and it was laid down that the weather influence that seems

to be mainly depended upon as an agent for this purpose is *desiccation*,—that is, drying the egg by throwing it out from its natural locality to such influences of air and sunshine as may dry up the contained fluid, and thus prevent the embryo within from developing. It is possible to prevent attack by turning the eggs down to an ascertained depth, at which, although the tenant may hatch out, yet if the ground is in a natural state the insect cannot penetrate it. If the earth is cracked, of course the deep crevices admit air, and alter the state of the case, but it is plain that we can destroy great numbers of eggs by throwing them out, upwards or downwards, from their natural place of deposit, and also we may diminish the quantity of eggs laid above ground by decreasing the number of places proper for egg-laying. Clearing away neglected weeds will demolish many nurseries of coming attack, good liming will keep the click beetle from laying eggs to infest the meadow with wireworm, or a better plan is penning sheep on grass that it is particularly desirable to protect, thus not only preventing oviposition, but destroying the young grubs just beneath the ground from its being sodden with matter injurious to insect life. The use of chemical manure, such as super-phosphate, has been found to decrease the ravages of the cabbage-root maggot; while, as the onion-flies lay their eggs very frequently either just below the surface of the ground, or if possible at the base of the bulb, it has been found that if onion bulbs are earthed up from time to time the flies are thus obliged to lay their eggs at haphazard, on the leaves or ground, or at least not in such a position that the maggots, if they hatch at all, can make their way to their food, and this prevents very much of the attack, and agrees well with the plant-growth. Passing to deal with larvæ, the lecturer pointed out that in this country the conditions which are most favourable for the hatching of the larvæ of the greater part of our insects are moderate warmth, together with some degree of moisture, while heavy rain, and especially rain following a term of warm dry weather, is most destructive to larvæ exposed to it, as well by its immediate effect upon them as presenting them food caused thereby to be unsuitable to larval life. The turnip fly, or beet fly, or whichever it may be, was very injurious till the rain washed it off, or started the plant, or in some way put an end to its ravages; and it was pointed out that when we look at the injury caused by overplus of rain in some years and deficiency in others, and the benefits that might possibly be derived from a more extended plan of field cisterns, it is so plain that a better regulated distribution of water, both as an external application to clear off insect vermin and for absorption by the roots to press on the growth, would be thoroughly useful, that the point of how far it could be managed by steam power at a paying rate is well worth thinking of. Miss Ormerod concluded: The coolness and darkness of the night, or the bright sunshine, as distinguished from the cloudy light of many of our summer days, all have their effect on insect life, some of which we can utilise, and some of which, although we cannot alter them, will benefit us, if we notice them,

by preparing us for coming attack. The common cockchafer is quiet under the leafage in the heat of the day, and may then be shaken down and destroyed ; and, though we do not often suffer from injury caused by the grub of this beetle to the amount to which it ravages in Germany, yet the extent to which it has destroyed young pine plantations near Salisbury in the last two years shows that we need to keep it in check, lest it should rise to be as severe a pest as the grubs of various kinds of chafers are now proving in the Southern Island of New Zealand. The daddy-longlegs grubs come out at night to feed, or travel on the surface, and are then open to rolling or other measures of destruction ; some of our turnip and cabbage caterpillars are similarly open to attack at night, or in the dusk hours, and the great caterpillars of the death's-head moth, which sometimes do great harm to the leafage of the potato, are variable in their time of feeding, so that it is desirable for someone interested in the matter to ascertain the habits of the special caterpillars before setting destructive operations on foot. The click beetle, the parent of the wire-worm, may be swept up in great numbers in the evening from grass ; and, on the other hand, the turnip flea-beetle rejoices in the sunshine, and then flies far and spreads rapidly. It is points such as these that we need to know more of ; it is the province of the entomologist to give the name of the insect, and to know the precise history of its method and place of existence ; but it is the province of the agriculturalist to notice, in real practical and continuous observation, the various influences which act upon it, and, may I not add, when observed to make them known. It is a matter of great importance—it is nothing less than the daily bread of the nation, which, for want of attention, is being in many cases absolutely thrown to the insect-vermin, whilst the landholder is distressed for want of the crops which need not have been lost.

NOTICES OF BOOKS.—“Children's Flowers : the Friends of their Rambles and their Play.” London : Religious Tract Society, 1882.—We have received a copy of the above from the author, and though we are not quite sure that in some respects it comes within our scope, yet we cannot refrain from giving it a word or two of praise. It professes to be a book written for children, and for the purpose of interesting them, and giving them instruction about our common wayside flowers ; and for this purpose all must concede that it is an eminent success. We know children who can barely read, but who can understand what is read to them in simple language, who are quite captivated with it—who will gather all the flowers they meet with in their rambles through the fields, and eagerly demand of nurse or teacher to read to them what this book says about them. Each flower and plant is described in simple, untechnical language, that any child can understand, shows how, by dissecting them, they can compare the various components of the flowers and leaves of each plant with others, thus imparting both interest and instruction, and no doubt will sow the seeds of future and further enquiry into these

“beauties of nature.” A short moral lesson is also attached to each flower or plant, which, without being in any way partisan in character, may be studied with profit even by children of larger growth. We heartily commend the book to all who have young families, as a most useful and interesting birthday or christmas present, and one which will be thoroughly appreciated by any child of from 5 to 10 years of age, and possessed of ordinary intelligence. We should have been glad had the authoress—who is a native of our own town—been pleased to affix her name to the book ; but as she has not, although she is well known to us, we must preserve her *incognito*.

Reports of Societies.

BARNSELY NATURALISTS' SOCIETY.—Meeting Nov. 7th, Dr. Lancaster in the chair.—A paper of great interest to our coal district was given by Mr. H. B. Nash, entitled “How the Coal Measures were formed.” Observations of birds during the last few weeks : September 15th, willow warbler and chifchaff in song, last recorded ; Oct. 1, a great spotted woodpecker visited a garden at top of Church-street. It occurred on several days : not noted before in the town. It has again been recorded in the neighbouring parks and woods. Oct. 4th, a night-jar ; 5th, redwings and fieldfares observed ; 17th, a swallow noted ; 23rd, latest notice of house martins ; 29th, Ray's wagtail (a late stay) and the grey wagtail, a partial migrant from north-west Yorkshire in winter to our valley streams and warm mill-ponds ; 25th, sandpipers and water-rails by the Calder—the latter seldom seen with us ; woodcocks first noted ; 28th, yellow-hammer, hedge accentors, wrens, larks in song, the latter heard up to the present time (Nov. 18th) ; 29th, kestrel, gold-crest, grey wagtails, moorhens noted by Mr. J. Parkins between Wakefield and Barnsley ; 30th, a barn owl set up from a field by Mr. J. Dymond, of Burntwood, and chased by four rooks and other birds ; a pied blackbird noted several days in Locke Park, Barnsley : a skua gull, examined by Mr. G. Parkin and pronounced a young Richardson's skua, shot at Cudworth (not noted previously in our district) ; Nov. 17th, kestrel seen at Belk Farm, Worsborough ; 18th, one seen by me near Dodworth. Both were hovering over fields and copses, and were often seen further away from the town, and occasionally the sparrow-hawk.—THOS. LISTER.

BRADFORD NATURALISTS' SOCIETY.—Meeting Oct. 17th, the president in the chair.—The evening was devoted to the exhibition of microscopic objects. Messrs. Fawcett and Kershaw showed a large number of objects, including sheep-tic, parasite from pig, larva of *O. antiqua*, section of meteorite showing fluid cavity, &c. ; Mr. Oxley, stained sections of stems ; and Mr. West, *Draparnaldia plumosa*, &c., from

Clayton. Mr. Soppitt gave an account of the recent meeting of the Y.N.U. at Thirsk, and stated that he had collected about 90 species of fungi. He exhibited specimens of *Phragmidium violaceum* and *rubi*, collected at that meeting—two species hitherto in this country confounded as *P. bulbosum*, and pointed out the characteristics of each. He also showed *Tetraphis pellucida*, in fruit, collected on the same occasion. Mr. Illingworth showed *C. Edusa*, *A. Galathea*, *S. Ægeria*, &c.

MEETING Oct. 31st, the president in the chair.—The recorders of the botanical section (Messrs. Soppitt and West) reported on the work done by that section during the year 1882. They stated that the number of plants added to the list during the year was 110, viz :—phanerogams 11, fungi 55, mosses 16, hepatics 6, lichens 12, and algæ 10, making a total of 1,444 species actually observed by members of the society in the districts under investigation. Mr. Soppitt exhibited and described a number of micro-fungi.

MEETING Nov. 14th, the president in the chair.—Mr. Firth reported on the work done by the vertebrate-zoological section during the year. He stated that the additions to the list were few in number, and consisted of the whiskered bat (*Vespertilio mystacinus*) from Ben-Rhydding, little bittern (*Ardetta minuta*) from Frizinghall, the great-crested newt (*Triton cristatus*) from Baildon, and the common snake (*Tropidonotus natrix*) from Wilsden, making a total of 164 species recorded for the district, viz. mammalia 20 species, birds 136, reptiles 4, and amphibians 4. For the conchological section Mr. Soppitt gave an elaborate report and list of species of land and fresh-water mollusca, in which he enumerated 101 species and varieties, amongst which were *Sphaerium rivicola*, Shipley and Seven Arches; *Anodonta cygnea*, Bradford Moor and Saltaire; *Neritina fluviatilis* from Shipley, Bingley, &c.; *Pupa ringens* from Shipley Glen. Mr. West showed *Nitelia mucronata* from a pond near Bedford—the second British station.—J. W. C.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Monthly meeting, Oct. 30th, the president (Mr. S. J. Capper) in the chair.—Mr. C. H. H. Walker read a paper entitled “The Entomology of the Antediluvian World,” which he illustrated by coloured diagrams of its fauna and flora. He referred to the necessity of the study of paleontological entomology for a proper idea of the classification of recent insects; and with reference to discussions which have taken place at recent meetings of the society on the subject of connecting links between different orders of insects, he instanced the presence of insect remains (forming a group known as the Palæodictyoptera) in the carboniferous and permian series of strata, which are generally considered to be intermediate in structure between the Orthoptera and Neuroptera. To illustrate the paper, Mr. J. T. Moore sent specimens of fossil insects from the Ravenhead (St. Helen's) collection in the museum, and Mr. Walker exhibited a slab of slate containing fossil dragon-flies. Mr. Frazer, of Crosby, exhibited a

hermaphrodite specimen of the fox moth, *Bombyx rubi*.—J. W. ELLIS, Hon. Sec.

PORT ELIZABETH NATURALISTS' SOCIETY.—The meeting of this society, on October 19th, was one of unusual importance, the subject of discussion—viz., “Injurious Insects”—being of vital interest to agriculturalists and commercial men. Mr. Russell Hallack, president, occupied the chair. Mr. S. D. Bairstow, F.L.S., introduced the question, briefly alluding to the ravages of insect pests. Scientific research has failed hitherto in elucidating the causes which operate in producing the vast swarms of destructive insects at certain periods. Gregarious locusts, living peaceably together, by some curious and inexplicable communication of purpose, suddenly take wing and fly towards distant parts in countless myriads. Butterflies, beetles, flies, &c., of great rarity one season, appear in swarms during the succeeding. How may these facts be explained? By scientific and practical observation. The first is desirable, the latter *essential*. Thus, farmers and horticulturalists who are constantly working amongst their crops, are the proper persons to discover cause by recording effect. Much difficulty is encountered in this country through the utter absence of popular books or magazines. We have no gardener's chronicle, agriculturalist's guide, no text-books or useful monthlies, and few, if any, of our press publications devote columns to the furtherance of Natural History observations. The naturalists petition “outside aid.” They require notes and specimens, and will undertake for their part to accumulate observations and suggested remedies, forwarding all correspondence to a proper centre for purposes of determination. A most valuable and interesting letter was read by the secretary from Miss E. A. Ormerod, F.M.S., the well-known farmer's friend, and several pamphlets were distributed amongst the members. Mr. Bairstow also exhibited a pen-and-ink sketch illustrating the life-history of our common fig-moth, with comments thereon, as an example of personal observation.—[Communicated by S. D. BAIRSTOW, F.L.S., late of Huddersfield.]

RIPON NATURALISTS' CLUB.—A very pleasant evening, under Mr. E. A. Ebdell's presidency, was spent, and a number of exhibits were handed round for inspection, including—Mr. Lickley, prehistoric chisel of reindeer horn, found 1878 in Stammergate, 14 feet below the surface, three antique keys found near the Minster, blade of old dagger found near Quarry Moor, three coins and fossil from Whitby lias; Mr. T. Pratt, M.R.C.V.S., *Eozoon canadense* from Laurentian limestone, Montrose; Mr. D. W. Moss, several fossils from magnesian limestone of Wormald Green; Mr. G. Malthouse, cowslips, primroses, and violets in flower. Mr. J. Waite reported capture of the following moths this month:—*P. populi*, *E. tiliaria*, *H. pennaria*, *H. aurantiaria*, *H. defoliaria*, *O. fligrammaria*, *G. flavago*, *H. micacea*, *N. C-nigrum*, &c. The swallow was seen the third week in October, and the house martin the fourth week, at Borrage.

Original Articles.

CONCHOLOGICAL FIELD NOTES FROM WENSLEYDALE.

BY WILLIAM DENISON ROEBUCK.

IN continuation of the holiday notes contained in my paper on the conchology of Semerdale, I now give a list of the mollusca, which, during the same fortnight of August (1882), were collected by myself and friends in various parts of the main dale of Wensley.

The localities visited by us were principally about Askrigg, Aysgarth, Bolton, Wensley, Redmire, Middleham, and Jerveaulx, Bainbridge being the point of departure for all our excursions. Near Askrigg, our principal collecting grounds, which we visited several times, were those picturesquely wooded portions of the valley of the Sargill Beck (an affluent of the Yore, which joins it opposite the debouchure of the river Bain), known as Whitfield and Mill Gills, the former being situated about a mile further up the valley than the latter. These two Gills we found very productive of mollusca, both as regards species and individuals; their geological structure is favourable, and they present great diversity of surface, soil, and conditions. On other occasions we collected about Aysgarth Force and Bridge, and on both banks of the Yore at these places. We walked from Bainbridge to Aysgarth, collecting as we went, our road leading along what is called the 'Scar Top,'—which is the lowest of the escarpments of Addleborough Hill—and then passing through Cubeck, Thornton Rust, and Low Gill, to Palmer Flatts and Aysgarth Bridge. Leaving Aysgarth, our line of route was to the north, through fields, and past the Castle Banks to Bolton Castle, the ancient home of the Scropes; and on leaving the Castle we passed through the village of Castle Bolton to Redmire Station. Having, on more than one occasion, upwards of an hour to wait here for our train, our time was well and profitably spent in the investigation of a piece of waste land, situate at the point where the railway crosses the Apedale Beck, and about a hundred yards or so from the station. Another of our collecting expeditions had for its starting-point, Wensley Railway Station, from which we walked first south to the pretty and picturesque village, from which the whole dale derives its name (Wensley), and then to Middleham, taking the road which runs parallel with the river. Having duly inspected the Castle of Middleham (where we did not neglect to secure some molluscan souvenirs) we hired a conveyance and drove by way of East Witton

to Jerveaulx Abbey. Here the time at disposal, after examination of the ground-plan of the various buildings, did not permit of a search for shells, and we had to content ourselves with dead specimens which we found in a horse-trough among the ruins. Here, they were in tolerable numbers, both of species and individuals, giving some slight indication of what we might have expected to find living among the hoary ruins and well-kept gardens of the old Cistercian Monastery. The conveyance once more in requisition, we drove from Jerveaulx to Leyburn, and then walked along Leyburn Shawl and through Gillfair Wood to Scarth Nick, and down the Richmond Road to Redmire Station. Our other excursions—exclusive of those devoted to the examination of Semerdale—were pedestrian feats and mountaineering exploits, in the course of which we did not make conchological investigations, beyond duly noting such species as might casually and accidentally obtrude themselves upon our notice.

The observations on the weather, &c., made in the paper on Semerdale, apply in equal degree to the present one, and I will only add that as no rain whatever fell for nearly a fortnight, shells were day by day increasingly more difficult to detect. To put the case more pointedly, I will instance one or two visits to the waste ground near Redmire Station. One was immediately after our first arrival in the dale, and the other about a week later. Heavy rains had preceded the commencement of our holiday, falling, in fact, up to the very day before we started. So on our first visit to Redmire the waste land yielded abundantly. Then followed a week of bright, sunny, and dry weather, and our second visit was productive only of straggling individuals of *Helix rotundata*.

Messrs. Nelson and Taylor have done me the kindness to examine my shells, and give me the benefit of their opinions on the determination of the more critical ones; and I am much indebted to my friend, Mr. T. K. Skipwith, for co-operation and companionship during the collection of them; also to my other companions for the good-natured forbearance and cheerful resignation with which they endured the affliction of the company of a couple of “snail grubbers,”—as they feelingly styled us.

To render the present paper a complete record of what we, so far, know of the conchology of the upper portion of Wensleydale (from Jerveaulx upwards), I include in the list notes of the species and varieties which were collected in the dale, in 1877, by Messrs. Wm. Nelson and John W. Taylor, and Mr. Henry Crowther; at Hardraw

Scar, in 1879, by Mr. Robert Scharff; and at Aysgarth, in 1882, by Mr. J. A. Douglas; these observations (communicated to the Conchological Society) not having been before published. Their records are distinguished from my own by being enclosed in square brackets.

[*Sphærium corneum*, L. Was found in 1877, at Birk Rigg, three miles from Hawes—H. Crowther.]

Bythinia tentaculata, L. One dead specimen found in the horse-trough at Jerveaulx Abbey.

[*Planorbis carinatus*, Müll. Birk Rigg, 1877—H. Crowther.]

[*Physa hypnorum*, L. Birk Rigg, 1877—H. Crowther.]

Limnæa peregra, Müll. Common in a water-trough at Aysgarth Bridge; dead specimens were found in the horse-trough at Jerveaulx Abbey. [Birk Rigg, 1877—H. Crowther.]

L. truncatula, Müll. Very numerous in a shallow pool on a rock-shelf, ten feet above the level of the stream below Mill Gill Force. [Birk Rigg and Snaizeholme, 1877—H. Crowther.]

[*L. glabra*, Müll. Birk Rigg, 1877—H. Crowther.]

Ancylus fluviatilis, Müll. Very common with *Limnæa peregra* in the water-trough by the roadside at Aysgarth Bridge, and not uncommon in the Yore, above and below Aysgarth. [Near Ulshaw Bridge, 1877—W. Nelson.]

Arion ater, L. The Black Slug. Common in Whitfield Gill; noted also on the grassy slopes below Nappa Scar, Castle Bolton, and at Low Gill, near Aysgarth.

A. hortensis, Fèr. Noticed at Castle Bolton and in Gillfair Wood.

Limax agrestis, L. The Field Slug. Abundant on the waste ground near Redmire Station, and at Middleham Castle; at Whitfield and Mill Gills, and along the Scar Top, Bainbridge.

L. arborum, Bonch-chant. Two specimens found crawling on the eastern outer wall of Bolton Castle. [East Witton, 1877—W. Nelson.]

L. maximus, L. The Great Slug. One specimen seen at Whitfield Gill.

Succinea putris, L. The Amber Snail. Abundant on stems and leaves of butterbur, in damp situations in the remotest recesses of Mill Gill. [Birk Rigg, 1877—H. Crowther.]

Vitrina pellucida, Müll. The Glass Snail. A few immature specimens noted on Leyburn Shawl, and on the top of the Scar at Scarth Nick.

Zonites cellarius, Müll. The Cellar Snail. Common at Whitfield Gill; specimens also taken on Leyburn Shawl, at Aysgarth Force, and one in the ground floor of Bolton Castle.

Z. alliarius, Miller. The Garlic Snail. Common in Whitfield Gill; found also on Leyburn Shawl, at Leas House, near Askrigg, and near the summit of one of the towers of Bolton Castle. [Carperby, 1877—H. Crowther.]

Z. glaber, Stud. One specimen in the village of Castle Bolton.

Z. nitidulus, Drap. A few specimens at Mill Gill, in the court-yard of Middleham Castle, and at Leas House, near Askrigg.

Z. crystallinus, Müll. Common amongst decayed leaves at Whitfield Gill.

Z. fulvus, Müll. A few specimens found in moss and amongst decaying leaves at Whitfield Gill.

Helix aculeata, Müll. One specimen found by Mr. Skipwith on decayed leaves at Whitfield Gill.

[*H. aspersa*, Müll. One, an immature example, found at Jerveaulx Abbey in 1877—J. W. Taylor.]

H. nemoralis, L. One on the waste ground near the Redmire station; while on the summit of Nappa Scars, at an altitude of about 1600 feet, I found it very abundant in the interstices between the rocks. These latter specimens were all very fine and large, one of them being the largest I have ever seen.

[Aysgarth, 1872—J. A. Douglas.]

H. nemoralis, var. *Brissonia*, Moquin-Tandon. The specimen from Redmire mentioned above pertained to this colour-variation, being a five-banded example on a light-brown or reddish flesh ground colour.

H. nemoralis var. *libellula*, Risso. All the Nappa specimens were of this, the yellow bandless variety.

H. hortensis, Müll. All the specimens we obtained were either immature or dead. They occurred singly, near Wensley, on Leyburn Shawl, on the top of the Scar at Scarth Nick, at Aysgarth Force, and in an old limekiln at Aysgarth Bridge. [Jerveaulx Abbey, 1877—J. W. Taylor.]

H. hortensis var. *quinquevittata*, Moq. Tand. All my specimens (mentioned under *H. hortensis*) were of this, which is the typical form of the species, with five distinct black bands on a yellow ground.

H. arbustorum, L. Was very abundant on the rank vegetation in Whitfield and Mill Gills, and also occurred at Castle Banks and Castle Bolton. [Birk Rigg and Worton, 1877—H. Crowther; Hardraw Scar, 1879—R. Scharff; and Aysgarth, 1882—J. ^A Douglas.]

[*H. arbustorum* var. *flavescens*, Moq. Tand. Worton, 1877—H. Crowther.]

[*H. arbustorum* var. *alpestris*, Ziegl. Worton, 1877—H. Crowther.]

H. rufescens, Penn. Abundant in Whitfield and Mill Gills, at Castle Bolton, Aysgarth Force, near Wensley, and on the waste ground at Redmire; occurred also on the top of the Scarth Nick, and in the ground floor chambers of Bolton Castle; and dead specimens in the horse-trough at Jerveaulx Abbey. [Birk Rigg, and Askrigg, 1877—H. Crowther; East Witton, 1877—W. Nelson; and Hardraw Scar, 1879—R. Scharff.]

Helix hispida, L. Abundant at Mill Gill, Thornton Rust, Leyburn Shawl, Leas House, Aysgarth Force, and Aysgarth Bridge; occurred also at Worton Pasture, near Bainbridge, and near the summit of one of the towers of Bolton Castle; and dead ones in the trough at Jerveaulx. [Birk Rigg, 1877—H. Crowther.]

H. sericea, Drap. Occurred at Mill Gill and Whitfield Gill. [Birk Rigg, 1877—H. Crowther; and Hardraw Scar, 1879—R. Scharff.]

[*H. caperata*, Mont. Middleham, September, 1877—W. Nelson.]

H. ericetorum, Müll. A few specimens at the old limekiln, near Aysgarth Bridge. [Middleham, 1877—W. Nelson.]

H. rotundata, Müll. Was very common wherever we collected; at Whitfield and Mill Gills, at Leas House, at Thornton Rust, near Wensley, at Middleham Castle, near Redmire Station, on Leyburn Shawl, at Castle Bolton, and in the ground floors of Bolton Castle.

[Hardraw Scar, 1877—W. Nelson; Jerveaulx Abbey, 1877—J. W. Taylor; and Aysgarth, 1882—J. A. Douglas.]

H. rupestris, Stud. A montane or subalpine species, very abundant on all the limestone walls and "scars," as at Cubeck, Thornton Rust, Low Gyll, near Aysgarth, Wensley, Leyburn Shawl, top of Scarth Nick, and Castle Banks, near Bolton.

[Carperley, 1877—H. Crowther; Cotter Force, 1877—W. Nelson; Aysgarth, 1882—J. A. Douglas.]

[*H. pulchella*, Müll., var. *costata*, Müll. Aysgarth, 1877—W. Nelson.]

H. lapicida, L. Common on walls along the roadsides below Scarth Nick and at Castle Banks, near Bolton; occurred also at the limekiln at Aysgarth Bridge, and a dead shell on the top scar at Scarth Nick.

[Birk Rigg, 1877—H. Crowther; Jerveaulx Abbey, 1877—J. W. Taylor.]

Bulinus obscurus, Müll. Common at Aysgarth Force; a single specimen on the waste land near Redmire Station.

[Leyburn, 1877—H. Crowther.]

Pupa umbilicata, Drap. Common on Leyburn Shawl, at Middleham Castle, about Aysgarth Force, and at Leas House, near Askrigg; occurred also amongst moss collected in Whitfield Gill.

[Carperley, 1877—H. Crowther; Hardraw Scar 1877—W. Nelson.]

Pupa umbilicata, var. *albina*, Moquin-Tandon. Carperby, 1877—H. Crowther.]

Balia perversa, L. In September, 1877, Messrs. Nelson and Taylor found this species occurring in great profusion under the top stones of walls throughout Wensleydale, the shells turning up under almost every stone examined. In August, 1882, we certainly did not find it so numerous, nor at all generally distributed; but as the specimens we did get were those which the spiders had forcibly detained and probably killed, it may have been the dryness of the weather that prevented our finding living examples in as great abundance as my friends did five years ago. Mr. Skipwith and I found the spider-captured shells not uncommon on walls by the roadsides, east of Wensley, at Castle Banks, near Bolton, and on the boulder-walls of Gillfair Wood, but nowhere else.

[Carperby, 1877—H. Crowther; Cotter Force, 1877—W. Nelson.

Clausilia rugosa, Drap. Common about Wensley, at Aysgarth Force, at Whitfield and Mill Gills, on the waste land at Redmire, and at Castle Banks, near Bolton; we also found it at Gillfair Wood, Thornton Rust, Leyburn Shawl, and Jerveaulx Abbey.

[Birk Rigg and Carperby, 1877—H. Crowther; East Witton, 1877—W. Nelson.]

C. dubia, Drap. Besides those we found in Semerdale, we only found one specimen in Wensleydale; this was by the road-side, east of Wensley.

[Cotter Force, 1877—W. Nelson; Jerveaulx Abbey, 1877—J. W. Taylor; Fencote, Wensleydale—W.N.]

C. laminata, Mont. Two specimens found at Aysgarth Force.

Cochlicopa tridens, Pult., var. *Nouletiana*, Dup. Whitfield and Mill Gills, one example at each place.

C. lubrica, Müll. Not unfrequent on Leyburn Shawl, at Castle Bolton, Aysgarth Force, Low Gill near Aysgarth, and at Redmire.

[Hawes, 1877—H. Crowther.]

Carychium minimum, Müll. Common amongst moss, and on decaying leaves in moist places at Whitfield Gill.

The list thus includes the names of 48 species and named varieties of mollusca, to which should be added, *Anodonta anatina*, L., *Ancylus fluviatilis*, Müll., var. *gibbosa*, Bourg., *Zonites radiatulus*, Ald., and *Vertigo pygmæa*, Drap., forms which were enumerated in my paper on Semerdale, as having occurred in that little valley, and which have not as yet been reported from other parts of Wensleydale. These additions bring up the total of the Wensleydale molluscan fauna, so far as is at present known, to 52 species and varieties, of which 10 only are aquatic forms.

Leeds, Oct. 31, 1882.

AN ATTEMPT TO CLASSIFY THE BRITISH LEPIDOPTERA,
SO AS TO FORM A CONNECTION
WITH THE TRICHOPTERA AT ONE END, AND THE
HYMENOPTERA AT THE OTHER.

BY S. L. MOSLEY.

MR. Benjamin Cooke says that one order of insects has nothing whatever to do with another order, and that each should be arranged independently of the other. I scarcely think that this is the view entertained by naturalists generally, and for myself, I have always thought that the most natural arrangement is that by which one unbroken continuity is obtained, one uninterrupted progression from species to species, genus to genus, family to family, and order to order. If one order or one genus has no connection with another, what is the use of quibbling over the "natural position" of such and such a genus—say *Acentropus*? The progress from one order to another should be as imperceptible as possible, and each should, at both ends, merge gradually into the next-of-kin.

I will, therefore, attempt to arrange the lepidoptera according to the above plan, though perhaps without much effect, for collectors are so accustomed to arrange their collection with *Papilio Machaon* at the head, that any other plan would be discarded as unnatural—not being like their cabinet drawers. The type of any genus, family, or order, should not be at the head, but in the centre, and shade off above and below into the next division, as expressed in my last paper.

In the first place, let us consider the two divisions I have placed next to the lepidoptera.

TRICHOPTERA.—These insects are, undoubtedly, very nearly allied to the lepidoptera, so near, indeed, that the late Ed. Newman, at one

time, considered they formed part of the lepidoptera, and at present it is by no means clear that some genera like *Acentropus* and *Psyche*, which are placed in the lepidoptera, do not properly belong to the trichoptera. It is, therefore, very clear that this order, or sub-order, should be placed in close proximity to the lepidoptera.

HYMENOPTERA.—Another family of insects which possesses several, perhaps I might say many, points of resemblance to the lepidoptera, is tenthredinidæ or saw-flies; these, especially in their larva state, in their appearance, manner of feeding, formation of cocoons, &c., are so near to the lepidoptera as to be easily mistaken for them. These insects should also occupy a position close to the lepidoptera, and the only natural way seems to be to place the trichoptera at one end, and the tenthredinidæ at the other, with the lepidoptera between, the former connecting them with the neuroptera, and the latter with the hymenoptera.

The arrangement which I propose should be begun with the genus *Acentropus*, as being the nearest allied to the trichoptera, if, indeed, it really be not one of that sub-order. Then should follow the genus *Hydrocampa*, and the rest of the Pyrales, followed by the Deltoides, Crambites, Tortricina, and Tineina. Then should come the Geometrina, beginning with “the pugs.” After the Geometrina the Noctuæ, beginning with the Noctua-Geometriformes, and ending with the Noctua-bombyciformes, the reverse of which is at present employed.

The step out of the Noctuæ is through the genus *Acronycta* into the Bombyces, in which I should place all, or nearly all, of those Nocturni now generally placed after *M. arundinis*, the pseudo-bombyces, and perhaps one or two of those included under Noctuæ. These I would arrange in a similar manner to that of our present lists, with the hairy larvæ at the end, finishing up with the bristly *S. carpini*. From this we go to the butterflies, beginning with those that have spiny larvæ, the Nymphalidæ, arranging them on a similar plan to that adopted in Newman’s work on these insects. From the butterflies (skippers) we pass to the Sphingidæ, beginning with the clear-wings (*Sesia*), and thus merging into the first division of the next order.

I throw out these few ideas, not that they will be likely to be adopted by many, but more with the view of causing others to express their opinions upon the plan proposed. It seems to me that each collector has devoted himself to one order, arranged that according to his own idea, without any reference to any other order. We want to study the relationships of the various groups more, and this cannot be done when collectors and students devote themselves to one group or

perhaps a section of a group; and although this is very desirable for the thorough working of groups, yet, we want more general workers—more entomologists who go in for the “whole hog.”

Beaumont Park,
Huddersfield.

NATURAL HISTORY NOTES FROM SOUTH AFRICA.

BY S. D. BAIRSTOW, F.L.S.

WHEN Fate decrees that friends must part, then Fortune steps in and provides the consolatory links of pen, ink, and paper. Since we do not possess, as yet, an Anglo-African *phone* through which we may transmit our thoughts, I am compelled to write them down, and reserve the speech for a future and happy occasion. Over six thousand miles of sea divide us, but my mind often travels back to scenes of yore, and I do not forget those happy rambles amongst hills and vales, heaths and forests, when friends, flushed in the excitement of search priority, drink to repletion from Nature's runnel, and sink all caste prejudices and social feuds with an earnestness matured by congenial fellowship. I yearn to feel the grip and honest wag of so-and-so's hand; to hear “Halloo! Bairstow, how are you?” escape from somebody's lips; to sit 'twixt two notorious GRUBBERS at a long table in a local Natural History “pub.” rehearsing the day's delightful captures, and discussing sliced ham or under-done beef. Ah! we value what we lose, do we not? I have sufficient conceit, however, to believe there are a few old friends who will not regret hearing my “silent voice” once more; and though this letter, strictly speaking, cannot be included in the huge category of Yorkshire Field-Club exploits, you may be enabled to pick up a few fragments and pass them round your festive board.

To prelude science, permit me to remark, “the name of Naturalist is a passport into antipodean regions.” Thus I introduce myself to an old colonist. Dame Nature is broached. We are at home in a second. “Come and take supper with me,” said the gentleman. We suppered, and have since continued the best of friends. This beats Freemasonry, and when two men fill their pipes from the same pouch, you may declare an amicable settlement.

Verbosity avast! What shall I write about? You know my weaknesses—lepidoptera and ichneumons; and, if partiality directed, I might be induced to confine observations to one or both of these

most interesting studies. But in so short a period—eighteen months—I really feel incapable of doing justice to the favorites, so I must endeavour to draw an outline of first impressions of Nature's handiwork in this country, or a portion thereof. I describe no circle round which to travel. I sketch no plan or system of operations, but simply and in a desultory manner, devoid of method, dot down ideas as they crop up. As regards the topography of the Colony, my first impressions were decidedly unfavourable. Eh! live in this sandy wilderness of infertility? Perish the thought! Truly it was a sore disappointment to a Briton accustomed to hawthorn hedges, ploughed land, and hayfields.

Rounding the corner of Cape Recife, we see a magnificent bay. Far, far ahead the noble Winterhock upheaves its mighty arms, and all the mountain dependents congregate around, until they seem at last to merge into obscurity. Leftwards stretches the Algoa coast, on which Port Elizabeth is situated. A visitor would imagine that civilization, or its enemy, had tumbled a bagfull of houses on the top of a rock; some of these remained where they fell, others more ponderous dispersed themselves downwards, whilst the heaviest of all rolled to the bottom. A practical inhabitant, unbiassed by fancy, opposes such a fallacious theory. The main street, running parallel to the beach, is admirably constructed, and the grand buildings erected are ornaments of skill and worthy enterprise. Nature scantily provided for her sister Artifice shifting sand, incorrigible rock, and poverty-stricken soil (!). These were her gifts, coupled to which an overpowering sea, backed up frequently by heavy S E winds, thundered its giant strength against the paltry barriers raised by human labour. Colonists encountered three ugly verbs: create—destroy—alter. They struggled gallantly, and complete success crowned their efforts: skill conquering force, a fine and healthy town is the result. Thus, you will perceive it is not always wise to judge a locality from a vessel's deck.

Similarly was I deceived in the flora and fauna. I stupidly sought for wild rose and blackberry,* doek and nettle, but found mimosa bushes, prickly pears, proteas, stunted herbage, &c., filled the vacuum. If food plant differed, insect life was there, and burdened pill-boxes soon revealed the fact that

One insect chooses

What another refuses,

or, more clearly expressed—

* The blackberry occurs here, but is probably a visitor.

It dares not *object*,
When it cannot *reject*.

I shall not readily forget my first ramble on African soil. The country, flora, fauna, atmosphere—all, all was novel to me; and the grandeur of the scene, beneath a blue and cloudless sky, dispelled sensations of solitude which swayed a heart of sadness. Hist! what is that? Something tall and stately, refined and graceful—a brother naturalist. Boldly striding with the assurance and ease of conscious superiority a secretary-bird parades the arid veldt.† My companion is also in search of specimens, but amongst the order *Ophidia* perchance. Believing that a stranger is poaching on preserved ground, he rushes (foolish, frantic bird!) far beyond my reach, proving himself by such an unwarrantable act no naturalist at all. A true snake-feeder, he is well-named both in vulgar parlance secretary, and scientifically *Serpentarius reptilivora*, and is, I think, our largest bird, succeeded by the bearded vulture. Of a pale pluish plumage, thighs and abdomen black and brown, tail feathers black, more or less interspersed with grey, and tips white, the secretary is, of a truth, a really noble fellow, and admirably deserves the distinction of Government protection. I have seen him quite a hundred times hunting in barren spots and sandy places, but only once has the privilege of viewing an attack been accorded me. Writers speak of the bird's "pouncing spring," and "the first blow which paralyses prey," and very likely action is suited to the character of his victim. On the occasion of which I speak, he seemed to flutter his wings about after the style of an enraged ostrich, then daintily approaching and meditatively, as if mocking the reptile's antagonism, he battered his wretched dinner with a sharp and fierce wing-stroke, and retreated, repeating the dose once more, and swallowed his little enemy at one gulp. I must here avow a little disappointment also, whilst in the company of my feathered friends. Beautiful and diversified are they, beyond a doubt, but apparently deficient in sweet vocality. They do not melodise their love-whispers, and sing to us as poets say they do at home. Sky-lark and throstle! I miss your cheery notes; Christmas robin, I miss your scarlet vest and welcome piping of wintry welcome. Yes! and, dear old sparrow, I miss your once-despised "chirrup! chirrup!" and modest yet genteel attire. Why should I shrink from speaking truth in order to maintain the *prestige* of Old England's vocabulary? The cat is out of the bag! I miss the very droppings which my native sparrow rain-spout lodgers playfully cast down upon the front-door

† Pronounced by Africanders "felt."

steps and parlour windows. The birds, I reiterate, are lovely, but—if you will excuse paradox—they have not British voices. The flowers, too, are gorgeously grand, but they mostly lack the delicious meadow-scent or fragrant freshness which Britons love. Following a line of thought adopted through past days of youthful folly, I naturally concluded that *existences apparently essential in one part of the globe may be represented by substitutes in another part*. Whether the economy of life corresponds I am in no position here to discuss, but merely ask—Does any South African bird resemble our British sky-lark, thrush, or robin? And here I quote the authority of Mr. Russell Hallack, whose name is not unknown at home, and whose kind assistance to all enquirers is proverbial. I am proud to introduce him to my Yorkshire friends, for as an original thinker and accurate observer he has few rivals, and possesses a pair of the hardiest legs in existence, forty-mile constitutionals acting upon him as sips to the tippler, viz.—thirst for more.

The nearest approach to the sky-lark is *Megalophonis apiatus*. Rising some twenty or thirty feet into the air, it makes a sharp cracking sound with its wings, and utters a long shrill piercing “phew,” then descends suddenly to the ground. Commencing early in the morning before sunrise, *Apiatus* continues these curious antics until dusk. To replace the song-thrush we have *Petrocincla rupestris*, or rock thrush, which makes a house beneath stones or favourable rocks, and deposits its eggs in a nest composed of fine roots and hair, quite different from the clay-plastered nest of an English thrush, and utters a sharp note much weaker in effect than that of the latter. The Cape robin, *Bessmonius phænicina*, frequents town residences and gardens, and does not much resemble our pert old redbreast, though exhibiting a similar wing-droop and tail movement, and uttering a note akin to that of its English cousin. The Cape canary, *Fringilla Capensis*, is sure to please new residents in the Colony; also our common fink, *Hyphantorius Capensis*. This polygamous old gentleman in a consequential manner pays us a very fussy visit as an inspector of garden premises. If he discovers a favourable tree for household purposes, he starts business as an architect and builder, issues information to his various wives, provides nests, and, presto! a second Salt Lake City is founded. Mr. Hallack’s garden was inspected in this manner, and upon the site selected a cock finch runs up no fewer than seven nests for his spouses. Five hens have taken possession, feathered their nests, and several are blessed with eggs, or infant finks.

(To be continued.)

Rainfall for November.

	Height of gauge above sea level.	Rain-fall.	No. of Days	TOTAL FALL TO DATE.		Date of heaviest Fall.	Amount of heaviest Fall.
				1882.	1881.		
HUDDERSFIELD (Dalton) ... (J. W. Robson)	Ft. 350	In. 4·74	25	33·11	* 30·09	5	0·92
HALIFAX... (F. G. S. Rawson)	365	8·11	20	48·55	43·78	...	...
LEEDS ... (Alfred Denny)...	183	2·98	30	26·06	†22·78	3	0·39
HORSFORTH ... (James Fox)	350	4·00	26	32·66	‡30·02	8	0·47
BARNSELY ... (T. Lister) ...	350	3·46	25	30·24	23·78	19	0·56
INGBIRCHWORTH (do.)	853	8·65	25	44·56	49·90	19	1·75
WENTWORTH CASTLE (do.)...	520	4·01	24	31·82	28·56	3	0·61
GOOLE ... (J. HARRISON) ...	25	2·68	23	29·45	23·31	3	0·40
HULL (Derringham) (Wm. Lawton)	10	2·43	23	20·433	27·79	3	0·35

* Average to date for 16 years, 1866-81. † Average of 28 years, 1853-62 & 1865-82.
‡ Average of 13 years, 1870-82.

Short Notes and Queries.

INSECT CAPTURES IN SCOTLAND.—I send list of some of my rarer captures in 1882. Coleoptera :—*Anthophagus testaceus*, *Acidota crenata*, *Telephorus Darwinianus*. Trichoptera :—*Asynarchus cœnosus*, *Rhyacophila obliterated*. Lepidoptera :—*Scotosia undulata*, (I believe not recorded as a Scotch insect), *Cedestis gysselinella*, not uncommon.—ALFRED BEAUMONT, Low Valleyfield, Culross, N. B., Dec. 1st.—[*S. undulata* is included in Dr. F. B. White's "Lepidoptera of Scotland." See *Scottish Naturalist*, Vol. iv., p. 221.—G. T. P.]

AN UNDETERMINED YORKSHIRE INSECT.—In looking over the volume of the *Naturalist* for 1852, I found an extract from Ray, which may be of interest to Yorkshire entomologists. It is contained in a letter from Mr. J. C. Dale, asking the name of a fly which is very troublesome on the tops of hills in different parts of England. The passage is as follows :—I give the *description* of the insect in English, leaving its *designation* in the original Latin—*Musca Apiformis montana, corpore brevior, thorace nigro abdomine annulis nigris et rubris alternis vario*. This fly is somewhat shorter than the honey-bee with dark thorax, the abdomen marked with alternate rings of black and red. The wings are grey, marked with a black transverse line near the tips. I have found it on the high mountains of Hincelhaugh (Ingleborough), near Settle, a small town in the County of Yorkshire. It was very importunate and troublesome about the mountain top. This insect has no sting, but a pair of forceps at the tail, like those which are in the jaws of a caterpillar. It would be very interesting to determine what fly is thus described, and any one living

near Settle might probably be able to solve the difficulty. Mr. Dale suggests it is a *Tabanus* or *Asilus*, or less likely *Æstrus* or *Sericomyia*. Is any British insect known which will in all respects answer this description? It was evidently an insoluble problem to the naturalists of the last generation, and Mr. Haliday suggested to Mr. Dale that he should go over to Ingleborough and try to take the insect. As Mr. Dale resided in Dorsetshire, this would have been a long journey. I trust, however, some Yorkshire naturalist may take the hint.—E. N. BLOOMFIELD, Guestling Rectory, near Hastings, Dec. 15th, 1882.

HABITS OF *Psylliodes hyoscyami*.—Some years ago, whilst on a visit to a friend, I was capturing this beetle for several days. I found it most readily on the young plants of *Hyoscyamus niger*; its presence is betrayed by the habit of eating small round holes in the leaves. Like its congeners it gives a jump when alarmed, and if found will be lying on its back, exhibiting only, the deep black underside, and looking as much as anything like a small bit of coal on the soil. But it is not worth while for the collector to hunt after one which has thus given him the slip; he has only to remove to a short distance and the beetle will soon return to the plant. I could not learn anything about the larva; the proprietor of the grounds assured me that the holes were made by the perfect insect; they are similar to those made by *Orchestes fagi* in the leaves of the beech, but proportionally larger.—BENJ. COOKE, 63, Windsor-road, Southport, Nov. 6th, 1882.

ENTOMOLOGICAL NOTES.—Whilst collecting with Mr. S. L. Mosley in the rough field adjoining Lepton Great Wood, near here, on the 12th of June last, we found many of the flowers of *Ranunculus bulbosus* closed up with silken threads, and tenanted each by a single Tortrix larva; but although the flowers seemed all to be closed up in pretty much the same way, there were evidently two species of larvæ of very distinct form and pattern. In July they produced *Sciaphila pascuana* (*pasivana*) and *Sphaleroptera ictericana* freely and in about equal numbers, and one well-marked specimen of *Sciaphila octomaculana*. The two former species seem to be previously unrecorded for the county. Towards the end of October I found a lot of old wool which had lain in the warehouse (in the centre of the town) for some months, swarming with Tineæ, and comprised of six species. The most numerous was *Tinea biseliella*; then *Æcophora pseudo-spretella*, then *Tinea tapetzella*, *T. pallescentella*, *T. pellionella*, and *Endrosis fenestrella*. Of these the *pseudo-spretella* were all dead, but the others living; and, indeed, on looking at the wool again at the end of November, *biseliella* seemed to be almost as plentiful as ever. On finding so many moths, I felt sure the parasites could not be far off, and had scarcely sooner looked for, than found a dozen or more ichneumons amongst them, mostly dead, but two lively enough. These, Mr. Bridgman has written me, are *Hemiteles bicolorinus* (which is new to the county list) and a *Braconid* he did not know. Some Trichoptera I captured in

Eddington Wood on August 5th last, Mr. M'Lachlan has named *Glyphotaelius pellucidus*, *Limnophilus sparsus*, and *L. vittatus*; and a neuropteran from Huddersfield on Sept. 16th, *Hemerobius subnebulosus*.—GEO. T. PORRITT.

Reports of Societies.

BARNSELY NATURALISTS' SOCIETY.—Meeting Dec. 21st, Mr. T. Lister in the chair.—The president (Dr. Lancaster) read a paper—"Notes on the Skeletons of Birds," with illustrations, including skull and beak of the eagle, pigeon, showing wing-bones, and how adapted for flight; crop of capercaillie filled with particles of heather and moorland plants. He explained the organisation of birds as adapted to their manner of procuring their food, and their choice of situation, and general habits.

MEETING, Dec. 5th, Mr. T. Lister presiding.—Mr. J. Broadhead read a paper on "The Wood Ant." The latest date for the house martin is Oct. 30th. Eleven wild geese flew from E to S W, Nov. 22nd. A goldcrest was observed in Ackworth School garden, also several of the thrush family, supposed to be redwings.—T. L.

BRADFORD NATURALISTS' SOCIETY.—Meeting Nov. 28th, the president (Mr. Jagger) in the chair.—The recorder of the entomological section, Mr. J. W. Carter, reported on the work done during the year 1882. He gave the first list of the coleoptera of the district, which comprised about 90 species, chiefly collected in Airedale during the past year, and stated that a good number of species had been added to the list of lepidoptera, which was accounted for by the fact that the micros had received a greater share of attention than in the past.

ANNUAL MEETING, Dec. 5th, v.p. Mr. Soppitt in the chair, who exhibited specimens of *Hirneola auricula-Judaea* from Cottingley, *Planorbis nitidus* from Shipley—new to the district,—and the following, on behalf of Messrs. E. P. P. and J. A. Butterfield, of Wilsden:—*Helix caperata* from Cottingley, and a specimen of the snow-bunting, recently obtained near Wilsden. The annual reports as read by the secretary showed the society to be in a healthy and prosperous condition. The election of officers for the ensuing year resulted as follows:—president, Mr. J. W. Carter; corresponding secretary, Mr. Oxley, &c.

ANNUAL SOIREE, Dec. 12th, the president, Mr. J. W. Carter, in the chair.—Addresses, readings, recitations, &c., were given by several members and friends. The usual votes of thanks concluded a very pleasant evening.—H. L. O.

HUDDERSFIELD NATURALISTS' SOCIETY.—Annual meeting, Dec. 11th, Mr. C. P. Hobkirk, F.L.S., in the chair.—The report showed considerable progress made by the society during the past year. New rooms had been acquired; the library had undergone re-arrangement; and many old books had been disposed of, and new ones purchased. A rule had also

been passed admitting ladies at about half the usual fee, and several had already joined. The School Board had granted permission for the society to use any of their schools for ramble meetings, free of expense ; and the Corporation had promised to devote a portion of the new Beaumont Park for the purpose of a Botanic Garden. The balance-sheet showed over £12 in hand. A "district" was also defined, and a map ordered to be printed and inserted in every member's book. The officers for the next year were elected as follows :—President, C. P. Hobkirk, F.L.S. ; corresponding sec., S. L. Mosley ; librarian, G. H. Crowther, &c.—S. L. M.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting, Nov. 27th, the president, Mr. S. J. Capper, in the chair.—Mr. T. Von Sobbe read an essay from a work on the North American Noctuidæ, entitled "A Colony of Butterflies," in which the writer referred to the "white mountain butterfly" (*Eneis semidea*) which inhabits the Washington Mountain, New England, at an altitude of never lower than 5,600 feet. Mr. A. Short read a paper on "Connecting Links," in which he endeavoured to disprove the possibility of the occurrence of links connecting the different orders of the animal kingdom. The paper gave rise to considerable discussion. The hon. sec., Dr. John W. Ellis, read a continuation of his "Coleoptera of the Liverpool District," (Part III.), enumerating, besides additional localities for many species recorded in Parts I. and II., 15 species of Geodephaga and Hydradephaga, now for the first time recorded from the district ; after which he mentioned the localities of 43 species of Palpicornia occurring in this neighbourhood. During the conversazione Mr. E. R. Billington exhibited several locusts from the West Indies ; Mr. Wilding and Dr. Ellis, specimens of the rare beetle *Anthicus bimaculatus*, captured at Crosby.

MANCHESTER CRYPTOGRAMIC SOCIETY.—Meeting, Nov. 20th, Captain Cunliffe in the chair.—The last part of the "New Moss Flora" by Dr. Braithwaite, was presented to the society by the author. A number of freshly-gathered mosses were placed upon the table, having been sent from Orme's Head by Mr. W. Jones, of Llandudno ; some interesting species were distributed amongst the members. The hon. sec. exhibited specimens of *Hypnum virescens* (Boulay), which had been gathered on the Pyrenees, and also at Goodall, Malham, by John Nowell, in the year 1849, but were named as a variety of *H. commutatum* at that time. Dr. J. B. Wood sent specimens of *Myurella apiculata* and *Lescuriæa striata* in fruit ; these were Continental specimens from his very complete herbarium of British and Continental mosses. Mr. Foster exhibited a specimen of *Phegopteris vulgaris*, showing a very remarkable variation from the typical form, the pinnæ of the fronds being cut up into long narrow lobes after the style of *Polypodium vulgare*, var. *cornubiense*. If the variety proves to be constant, it will make a nice addition to varieties of British ferns in cultivation. He found this last August, in Patterdale.—THOS. ROGERS.

Original Articles.

SCARCITY OF WINTER BIRDS.

BY GEO. ROBERTS.

SINCE the end of September, the scarcity of birds in this, the Loft-house district, has been remarkable. No flocks of redwings, fieldfares or bramblings appeared at the usual time. Few bullfinches have been seen, and tree-sparrows are much less frequent than they were last winter. Fieldfares have been observed in this district in gradually decreasing numbers for nine or ten years, and redwings have been noticed in less numbers for six years.

About the end of last October, the only birds seen by the writer during a walk of two miles along a brook-side, were, in addition to house sparrows, one robin, one chaffinch, and one blue titmouse. The scarcity does not arise from lack of food: haws, and various other winter fruits were, and still are, tolerably plentiful; and the weather, save about one week when deep snow covered the ground, has been mild and favourable.

It has long been surmised that birds from northern districts move southward at the beginning of winter, and that the deserted districts are partially filled up by birds from more northern regions: in other words, there has always been a general tendency among what are called resident birds to emigrate southward before or during winter. The question arises—may the four or five severe winters that we have had lately, have encouraged and developed that inherent tendency to migrate southward, or may they have induced some entirely new migration? Immense numbers of our small birds have perished during the arctic winters that we experienced previous to 1881–2; if such winters had continued, and no migration or shifting of quarters had taken place, nearly all of our small birds would have been exterminated. When we find that birds perish from cold and hunger when a southward flight of five or six hours would place them in a more genial and bountiful region, a want of fore-knowledge and instinct seems to be displayed, so that it is not unreasonable to suppose that the series of severe winters might have quickened the migrative impulse, and caused them to withdraw from northern latitudes in greater numbers, and, as just hinted, new or more lengthy preservative migrations may have originated. All migrations must have had a beginning, and they are subject, like everything else, to modification. When once a bird, or a flock of birds, have been driven to take a longer flight, or to deviate from the usual course, we may infer that

the journey each day will not be forgotten, and that the impulse to take the same route especially if the journey has been favourable and preservative, will not be lost when the same seasonal circumstances come round again.

The following birds are migratory in Scandinavia :—rook, starling, redbreast, song thrush, pied wagtail, meadow pipit, hedge sparrow, black-headed bunting, skylark, wood-lark, brown linnet, chaffinch, hawfinch, ring-dove, and stock-dove ; that is to say, they leave in autumn for Central or Southern Europe, and it is not improbable that many of our birds may leave us and join them in their winter quarters. It is true that *accessions* of birds are regularly observed in autumn in Britain, but as a rule these birds will only form the outer fringe of the migrative tide that is passing along the Continent ; and on their arrival here they do not stay long in one place, unless there happens to be an abundance of food in their path, but keep shifting, and eventually are lost to observation. It is rational to conceive that terrestrial birds will keep as much to the land as possible on the Continent, and not risk themselves across the North Sea. When they appear in extraordinary numbers on our coasts, the occurrence doubtless arises from their being driven from their course by storms, rather than from any inclination or eagerness to visit us, because our northern shores in winter are nearly as forbidding and inhospitable as those the birds are deserting.

It would be interesting to learn if the scarcity of winter birds is general over Britain, or if accessions have been observed in the south of England. If the scarcity is merely local, the idea of an over-sea migration can scarcely maintain its ground, and we may consider it more likely due to insular, partial movements.

Lofthouse, Wakefield, Jan. 5th, 1883.

A PHYSIOLOGICAL ARRANGEMENT OF THE BRITISH LEPIDOPTERA.*

BY A. H. SWINTON.

THE Linnæan system of arrangement being enunciated as a linear projection of a Darwinian tree of descent, it becomes evident the clearer we can trace the gradation of the organic structures in any group of life-forms, the more perfectly we shall be able to marshal their columns and draw them up into a single front. Nor is it necessary

* Read at a recent Meeting of the Entomological Society of London.

to our intent that we should be acquainted with all the scions of the group in question, past and present, any more than it is essential to an artist that every leaf and twig appear in a painting; for, when links are missing, the shadowy tree of life is not one whit less perfectly indicated by coupling aright those that come under our immediate observation. The simpler the material, the bolder the drawing.

In the *Naturalist* for Oct., 1881 (p. 45) I observed that it has been a long standing practice with authors of works on British butterflies to treat the five groups represented in this country in the following order:—Papilionidæ, Nymphalidæ, Erycinidæ, Lycænidæ, and Hesperidæ; but that since the first family, according to Dr. Scudder and others, has close affinity with the last, the method is only plausible on the principle of extremes meeting, the better arrangement every way being Nymphalidæ, Erycinidæ, Lycænidæ, Papilionidæ and Hesperidæ. I also added that if physiological reasons could ever be got to prevail over the fancy for having the butterflies first, I would likewise suggest a further arrangement of the five groups of lepidoptera, showing the development of a structure at the base of the abdomen attributed with the faculty of hearing, that highest of insect senses, thus: Noctuina, Bombycina, Geometrina, Butterflies, and Sphingina.

Since writing this, a new light has broken upon the subject, and it has become evident to me that the Darwinian tree may be co-ordinated with two lines; namely, that discovered by Linnæus, in which the mere connexion of the organism being taken into consideration, the branches are thus projected vertically as the shadows fall, and that of more late origin that has taken its rise in the study of structural development, where the branches are projected horizontally, and the degree of perfection of the species is also estimated. The horizontal line of Linnæus thus *shows* the connexion or the scions in families and genera, the vertical line of the Darwinian school *indicates* the evolution of races as far as progression is implicated; and we must believe there has been, on the whole, such progressive development of lepidoptera, although there is not extant sufficient geological evidence to quarrel about. But whether true in causation as in actuality, that arrangement of the groups of the lepidoptera which I have suggested, may be taken as a good outline of the new structural and physiological method which I have previously advocated in my "Insect Variety"; while that worked out with so much pains by Edward Newman, will furnish a good example of the Linnæan or horizontal co-ordination.

I will now show how his latest systematic co-ordination may be projected vertically, and with what result. Instead of the arrangement

Diurni, Nocturni, Geometræ, Drepanulæ, Pseudo-Bombyces, Noctuæ, and Deltoides, as adopted by that author, ranking the insect from physiological data we should have the following order:—Noctuæ, Pseudo Bombyces, Drepanulæ, Deltoides, Geometræ, Bombyces (or the Nocturni of Newman's arrangement from the genus *Procris* to the genus *Saturnia*), Diurni and Sphingina (or the remaining portion of the Nocturni of Newman).

It is evident we have in this way greater harmony as regards structure, and that certain insects of lower organic perfection than the rest are more thrown together, instead of being isolated as heretofore among those more highly organised, as always must result from a horizontal projection. The Deltoides where certain of the males are fan-footed, ally themselves with the falcate-winged Drepanulæ; the Noctuæ, in the fan-footed *Catocalæ* bridge over the passage to the fan-footed Geometræ; the tailed Geometræ of the genus *Urapteryx* form a passage to the genera of the Bombyces, *Saturnia*, and *Endromis*; while both Geometers and Bombyces alike exhibit transition to the butterflies. The Diurni, or butterflies, again, pass into the Sphingina and their allies, where we find assorted such rudimentary forms as the genera *Hepialus* and *Psychidæ*, that form a natural passage to the case-bearing micro-lepidoptera. Another link, according to Mr. A. G. Butter, is found in the clear-winged *Ægeriidæ* (*Trans. Ent. Soc.*, 1878, p. 121), and these lowly forms, by way of the aquatic genera of the *Pyralides*, *Acentropus*, and *Hydrocampa*, form a transition to the trichopterous forms of the Neuroptera.

If anyone is desirous of further following up this essay towards a fresh arrangement of the British Lepidoptera, I should suggest the procuring of an exchange list such as is sold by Mr. Cooke, of Museum-street. If he then will number the groups from the Noctuæ backwards as suggested, and draw a line dividing the first two columns of the Nocturni from the last four, the matter will flash upon him at once. Perhaps he may gain thereby some new light regarding the mysterious tree of life.

July 26th, 1882.

THE GOOSEBERRY CATERPILLAR, OR LARVA OF
NEMATUS RIBESII.

BY MISS ORMEROD, F.M.S.

[ABSTRACT OF PAPER IN *JOUR. ROY. COLL. AGRIC. CIRENCESTER.*]

THE Gooseberry Sawfly is perhaps one of the commonest of our garden pests, and by means of its caterpillars regularly year by year causes damage from, we might say, one end of the kingdom to the other. It

is at the same time a thoroughly good example of how, by a knowledge of the habits of a so-called pest, also a little thought on the reasons for good or bad action of the remedies, an injurious attack may be kept down with very little trouble and hardly any expense. In this case infinite trouble is yearly taken in pinching the grubs, shaking, dusting, syringing, trampling, and all kinds of *remedial* means, too often with very little effect, except in the case of Hellebore powder, which if properly done and with good powder, appears to get rid of the attack very surely, but at the same time has the disadvantage that if applied near the time when the berries are to be of service for table use (unless great care is taken in clearing them of the powder), the eaters are in danger of severe—possibly fatal—illness. A far simpler course is to clear away the coming brood in the larva state from beneath the bushes. If we start the attack—say of 1882—from its very beginning it stands thus:—In the autumn of 1881 the caterpillars of the last brood when full fed went down from the bushes into the ground, perhaps only two inches deep, but if the soil was light, possibly to a depth of six or eight inches. Here they made themselves each a cocoon, or outer casing of a kind of secretion, which formed a bluntly oval brown case, about half-an-inch long, in which each grub or larva passed the winter still in its larval state. When spring came, and the gooseberry and currant bushes were coming into leaf, then the grub changed to the chrysalis, and the chrysalis shortly developed, and from it came the perfect gooseberry sawfly, to lay its eggs and thus start a brood of caterpillars on the young leafage just ready for them to feed on. Here we see at once how to forestall attack, and practically the point is worked forward in some of the gooseberry growing districts near Isleworth. If the soil is removed from beneath the gooseberry bushes after the fall of the leaf, with this soil we remove the grubs, and are just in that proportion freer from attack next year. But some degree of care is necessary, and want of this at times leaves the larvæ as much in possession (for all practical purposes) as if nothing had been done. The earth and contained grubs ought to be so disposed of by burning, throwing where it will be trampled on, or other means, that these grubs will be destroyed, or they will develop as if nothing had been done, and if left near the bushes, the sawflies will (as in previous generations) as soon as developed just walk or fly to the new leafage and start the new course of injury. A good example of this was given in a case where, last autumn, the earth was disturbed and removed in due course from beneath the bushes of a gooseberry ground near Isleworth, but it was *not taken away*. Month after month it lay in lines

between the rows of the gooseberry bushes, and (presumably) there, *under* it, the larvæ passed the winter unhurt, and all ready for spring action, for now, on the 6th of July, the bushes in many cases are badly stripped, and the caterpillar of the summer brood may be seen, with its bluish green skin spotted with black, and in its characteristic position, that is, fastened by its caudal proleg to the surface of the leaf, and by the others to the gnawed edge on which it is feeding. When once these grubs are in possession, remedies are troublesome to apply, and, in districts where gooseberry growing is one of the gardening trades, co-operation is necessary to destroy the "pest" totally. However, there are a very large proportion of cases in which, by examining the soil to see how deep the grub cases lie, and then clearing them away and destroying them, much good would be done.

NATURAL HISTORY NOTES FROM SOUTH AFRICA.

(Continued.)

BY S. D. BAIRSTOW, F.L.S.

I MUST now continue my first walk on African soil, and spare divergent pleasures. When an acquaintance returns from foreign parts, we naturally ask, "What did you see?" but on the face of it this is a stupid question. What does he not see? Out of a world of novelties I choose the most striking—those which, once seen, are ever remembered—first impressions, pleasant reminiscences—*Olim meminisse juvabit*. Tortoises abounded on the flats, and I counted over fifty dead carcasses, bleached and decaying. Millipedes (*Julus?*) were in countless thousands—living, dead, and dying; indeed the Myriapoda represent a grand study, though hitherto apparently neglected, for I cannot find a published work on South African species. Turning over a stone on the slope of Cradock's Kloof, I was delighted to come across a small family of scorpions. At first the fighting fiends, or inveterate poisoners,* were torpid and motionless, but a gentle tap on the anal weapon of self-defence provoked some annoyance. They fenced and guarded in a wonderful manner, and bold as brass; they were also sneakish as puff-adders, never losing sight of a chance to make a bolt, and elude further vigilance and warfare. I speedily discovered that in order to bottle my formidable antagonists I must extemporise a rude instrument of capture, *a la* forceps. Experience has since taught me there are few "police bracelets" to beat ancient

* The poison is emitted through a small orifice situated *over* spur of tail, and connected to the main supply.

sugar-tongs or wooden clothes-clips. It is a fact worthy of passing remark that kloofs and mountains maintain the highest vegetative development upon their southern slopes. I have observed also that scorpions prefer a southern position, and are somewhat gregarious in disposition.

Rivers bisecting or subdividing localities, separating human habitations into states and sections, spread out their tributary arms for the dispersion of animal tribes and species, each diminutive territory evincing a distinct generic or specific faunal and floral localisation at once striking and significant. On this slope occurs one species of *Arachnid*; on that, another quite dissimilar. I submit no theory of universality, nor do I desire to place undue stress thereupon; nevertheless, a collecting-box comparatively regulated and stored will reveal, in a couple of hoards from different positions, a wonderful contradiction of natural existences. I remember New Brighton, Cheshire, as the happy hunting ground for *N. zonaria*, and Penmaenmawr for *A. contiguaria*. Of course food-plant may partly solve the problem of eccentricity in both insects; and whilst the Cheshire sandhills provide peculiar advantages in respect of position, &c., for *zonaria*, it is quite probable that much patient search will eke out a new locality for *contiguaria*, endowed by Nature with equal requirements for this insect's welfare. But here, a paltry stream cutting up level ground where food-plants on either side apparently correspond, separates families and separates species. Here is a tiny brook; on either hand a declivity. *Zeritis Alphæus**—(I humbly scrape to thee, O Prince of *Lycænidæ*!)—patronises a southern ground, and rarely, though a magnificent flyer, intrudes upon the opposite domain.

Away with fancy freaks and theory! Buzz! Buzz! Bzzz! Is it a bee? Buzz! or a wasp? Buzz! It is a beetle. Buzz, Buzz, Bzzz! Please remark, the final consummation of Buzzes changes form. What a trifle to write about, I hear you say. No, sir, not a trifle. The final buzz has led me to many a grand *Buprestis*. Netting is useless amongst Mimosa bushes, whose thorn-spikes have demoralised into shreds the well-cut breeches of more than one astute Coleopterist. My maxim is "Wait, watch, listen." When the last hermaphrodite Buzz, indicating curiosity satisfied, is pronounced, then I go for that beetle. A tap on the bush, and whack tumbles the old grumbler into my helmet. It is impossible to conceive a more beautiful insect than *Hirsuta* of the South. The head, thorax and elytra are sprinkled with gamboge—yellow tufts of powdery hair; and over the base of

* An extremely local butterfly.

antennæ and hind legs are two tufts of bright scarlet, with a row of seven tufts of the same colour running along the *Elytra costæ*, gradually diminishing in size from base to apex. I have described this insect* in a rough manner, not paying attention so much to scientific and synoptical nomination as the subject warrants. My desire is merely to give you "a reflective idea" of the wondrous beauty of this noble Coleopteron, and spare you the disgust of any pedantic assumption. To select one type of loveliness amongst the *Buprestidæ* in preference to others is a difficult task; and to my mind, many of the smallest and most slighted species are superior to their big relations in every respect save clumsiness. In Hirsuta's company I found a splendid Longicorn—*Zoographus oculator* and *Cantharis*—*Mylabris oculata*; also a large number of Longhorns, commonly termed "Spanish Flies".† These are readily discovered, as they diffuse a strong, and not unpleasant ‡ odour of lasting power. An Africander youngster who accosted me one day, gave them the name of "Smellers;" and he was not far wrong. They always appear to be friendly, however, and to pedestrian Naturalists, who now and again sniff Kaffir location breezes, the selection of the least of two evils produces "peace, good-will" towards "Smellers." As I journey along, the inevitable *Cetonia*, yclept *Pachnoda marginata* buzzes about on all sides. This insect, whose bump of destructiveness is so extraordinarily developed, is a perfect pest to horticulturists, exhibiting, as it does, a ruining propensity for dahlias, and those of the most perfect kind in particular. I strongly suspect *Marginata* is opposed to Blue Ribbon Army principles. Mr. Wilson, the affable botanist and chief gardener of St. George's Park, in this town, ordered a certain tree to be cut down. From the stump issued, as I believe, sap of an alcoholic kind. The top of this stump in circumference would be about twelve to eighteen inches, and thereon liquored, in a most reprehensible manner, over a dozen fat *Marginatas*, evidently acting on the maxim "First come, soonest served." The sight swelled my bosom with indignation, and inwardly I heaved a sigh of compassion; and though I do not aspire to teetotalism, a "kinder sort'er hope busted up" that before long Sir Wilfrid Lawson would visit the Eastern province. From the aforesaid incident and addendum which follows, experimental philosophers might sketch a moral lesson, for *Marginata* is one of the very few beetles § which deteriorates in spirits.

* *Julodis hirsuta*.—Prof. Westwood (authority).

† A weak Provincialism.

‡ Opinions differ on this point.

§ I mean deceased beetles of course.

The sober brown colour of its elytra is displaced by a shade of Isabella.

After capturing a few *Marginatas* at pleasure, I come across another fine Longhorn, a species of *Ceroplesis*. This genus is well represented here, but as the various species are so closely allied, and differences minute, I refrain from inserting doubtful names. A pretty little *Cicindela Capensis* (?), evidently out of its latitude, because unaccompanied by friends, rushes in a semi-flighty manner across the sandy path. The "pop" of a drawn cork, and one slight seething hiss, announces—Verdict: "Death by drowning;" and my Tiger Beetle succumbs to fumes of liquid gin. I have labelled this insect "Doubtful," for a simple reason that, as I presume there are two species occurring simultaneously together, and very much alike, I have not yet persuaded myself—which is which?

Capturing two specimens of the huge *Mantuora* (possibly *Maxillosa*), a fine *Anthia thoracica*, recognised by all Coleopterists, *Anthia 10-guttata*, and several dung-rollers, I re-commence the stone-turning process. As an old minister used to remark when desirous of emphasizing a grand point, and bringing it home to his audience, "put your finger on" the stone-turning process. It merits a moment's digression. Our fathers have taught us that *Rolling stones gather no moss*. Slightly altered to the tune of Entomology, this proverb stands thus: Rolling of stones discloses lots of beetles. The idea is axiomatic. Are you acquainted with some aspiring student, or would-be author, who, anxious to write a book on Natural History, pining for criticism and everlasting fame, yet lacketh the one thing needful—a subject? Let him take the cue from my advice, and christen his book "Stone-turning," with an inaugural and fashionable couplet, something after this style:

A stone o'er hurled
Reveals a world!

If insects could speak to us in some known language; if each departed grub had left us the legacy of its history; if the swaddling clothes of chrysalids, discarded in imagin(e)ary flights; If.....

I must dissemble. Labyrinthine realms of Fancy's "ifs," will lead me into endless misery unless the sequel is broached. I say, then, that as there are "books in running brooks," so there is a world beneath a pebble. Kneeling upon the ground, pipe in my mouth* straining every nerve, I succeed in topsy-turveying a big stone, and rush forward to investigate—what? The stock of an old curiosity

* Tobacco is conducive to discovery.

shop ; emblems of a thousand histories ; tragedies, fictions and farces ; curious specimens of animated matter ; carcasses of deceased beings ; germs of future lives ; and perfected atoms. What a sentimental medley ! snails, slugs, beetles, bugs, millipedes and caterpillars, ants, spiders, scorpions, and orthopterous creatures in all stages of existence.

But at present I am "Bairstow on Beetles," not "Bairstow on the World." There are nearly a dozen species of Coleoptera revealed to view, one of which I recognise as *Anthia*. It is of a dusky colour, with metallic bronze-like lustre on the elytra, utterly devoid of spots or markings, but an *Anthia* nevertheless, a stridulous *Anthia*, and a gregarious *Anthia*. The moment an intruder was announced, this family squeaked vengeance in loud and unmeasured terms ; indeed half-a-dozen young mice could scarcely excel in the vituperative department. That such a faculty with this insect, is provided as an intelligible medium of communication, or warning of danger, I have not the slightest hesitation in asserting, and feel assured that expressive and sympathetic utterances are produced from apprehension of consequences, a remarkable discernment of possible calamity affecting the entire community. When I handle one of them it immediately vociferates against such encroachment upon the liberty of a natural subject, *but the cry is not continued*, and extra violence or oppressive digitation does not compel emotion.

(To be continued.,

Rainfall for December.

	Height of gauge above sea level.	Rain- fall.	No. of Days	TOTAL FALL TO DATE.		Date of heaviest Fall.	Amount of heaviest Fall.
				1882.	1881.		
HUDDERSFIELD (Dalton) ... (J. W. Robson)	Ft. 350	In. 4·22	21	37·24	* 33·55	6	1·37
HALIFAX... (F. G. S. Rawson)	365	6·70	21	55·25	49·28	..	...
LEEDS ... (Alfred Denny)...	183	2·98	27	29·04	†24·85	26	0·49
HORSFORTH ... (James Fox)	350	3·89	24	36·55	‡32·80	6	0·72
BARNSELY ... (T. Lister) ...	350	5·15	24	35·39	26·25	6	1·63
INGBIRCHWORTH (do.)	853	5·95	25	50·51	45·13	6	1·70
WENTWORTH CASTLE (do.)...	520	5·59	23	37·41	31·74	6	1·79
GOOLE ... (J. HARRISON) ...	25	4·99	20	34·44	25·29	6	1·63
HULL (Derringham) (Wm. Lawton)	10	5·49	19	33·28	§25·96	6	1·91

* Average to date for 16 years, 1866-81. † Average of 28 years, 1853-62 & 1865-82.

‡ Average of 13 years, 1870-82.

§ The annual average for 30 years, 1850-79, is 22·347 on 151·15 days.

RAINFALL :

RESULTS OF 25 YEARS' OBSERVATIONS ON THE BEVERLEY ROAD, HULL.

YEARLY FALL.					
Year.	Fall in Inches.	*Days.		Inches.	Days.
1858	22·42	135	Average	26·42	182
1859	21·12	170	Wettest Year—1872.....	36·51	221
1860	31·74	205	Year with largest number		
1861	19·97	163	of Days—1877	29·33	222
1862	23·69	174	Driest Year—1864	18·27	152
1863	24·63	155	Year with least number of		
1864	18·27	152	Days—1858	22·42	135
1865	23 80	170			
1866	29·20	202			
1867	24·10	184			
1868	26·54	163			
1869	28·29	189			
1870	25·81	172			
1871	25·69	170			
1872	36·51	221			
1873	22·09	180			
1874	20·19	176			
1875	28·87	178			
1876	30·77	191			
1877	29·33	222			
1878	27·86	212			
1879	25·92	189			
1880	31·94	172			
1881	27·61	194			
1882	33·91	205			

AVERAGE YEARLY FALL IN EACH FIVE YEARS.		
Years.	Inches.	Days.
1858 to 1862.....	23·79	169
1863 to 1867.....	24·00	173
1868 to 1872.....	28·57	183
1873 to 1877.....	26·25	189
1878 to 1882.....	29·44	194

* Days—by “Days” is meant the number of days in which any rain was measured, without any reference to quantity. A Fall of One Inch of Rain is equal to 100 Tons per Acre.

Number of Days in which 1 inch or more fell in the 25 Years.	AVERAGE RAINFALL FOR THE 20 YEARS 1860 TO 1879.	
January	2	At Hull 26·16
February	0	At London 26·46
March	1	„ Leeds 24·08
April.....	3	„ Sheffield..... 31·97
May	2	„ Malton 27·95
June	2	„ Manchester 34·66
July	2	„ Bolton 46·38
August	8	„ Lincoln 22·28
September	12	„ Hunstanton 21·41
October.....	7	
November	6	
December.....	4	
	49	
Fall of Rain at the Stye Head of Borrowdale, in 1872, amounted to 243·98 inches.		
HAROLD SMITH, F.M.S.		
Fulford House, Hull, January, 1883.		
Heaviest Fall in one day 2·00 on August 21, 1858.		

The total Rainfall for the Six Months—October, 1857, to March, 1858, was only 3·58.

The average Fall for each 5 years shows a steady increase in number of days on which Rain was measured, and a similar increase in quantity, with the exception of the fourth period, the average of which was reduced by the two dry years 1873 and 1874 ; the last period shewing an average annual excess of 3 inches over the year's average fall for the 25 years.

Wettest Half-year was the second half of 1880, with fall of 22·27.

Short Notes and Queries.

BADGERS IN YORKSHIRE.—In compliance with Mr. George Roberts' request for a list of the occurrences of the above animals in Yorkshire, I report for this district as follows :—One Sunday morning in 1832, Mr. John Taylor, of Stainland, went into Hardplatts Wood, accompanied by his famous dog "Jack." They encountered a fine full-grown badger, and immediately commenced the struggle for existence. Mr. Taylor was not slow to perceive that the badger was going to be the fittest, but, providing himself with a heavy cudgel, after a tough fight he secured the survival for his four-footed companion. Less than three years ago, a fine badger was caught in Turner Wood, Rishworth ; it is in the possession of Mr. Wheelwright, of Ripponden, on whose estate it was captured. It was thought to be an escape.—C. C. HANSON.

ENTOMOLOGICAL NOTES.—A short time ago Mr. A. E. Atmore sent me a series of *Tortrix Lafauriana*, a species he had added to the British list from specimens taken at King's Lynn in 1880, and which species had been announced as new to science in France so recently as 1876. During the past season Mr. Atmore reared it rather freely from larvæ found feeding between united leaves and tops of *Myrica gale*. When in London last month, Mr. W. H. Tugwell very kindly gave me a fine series of each of *Nola centonalis*, *Ennomos autumnaria (alniaria)* and *Nyctegretes achatinella*—all from Deal recently. I am also indebted to Mrs. Frazer for a nice set of *Crambus furcatellus*, captured by herself in the Highlands of Scotland during the past summer ; and lately I have ascertained that some tortrices I netted in Wicken Fen last Whitsuntide, and which had been put on one side since then, include *Phoxopteryx paludana*, *P. biarcuana*, and *P. siculana*.—G. T. PORRITT.

ENTOMOLOGICAL NOTES FROM YORK.—The past unfavourable season has not furnished you with many good lists of captures from collectors throughout the county ; and I think it cannot be questioned but that there has been a decided dearth amongst all orders of insect life, from what causes it is difficult to say, unless the three or four preceding bad seasons have been effectual in destroying, in some stage or other, insect life. In this neighbourhood, the Diurni have been particularly noticeable by their absence, as I only remember seeing one *A. cardamines*, one *A. Atalanta*, a few *V. urticae*, no *P. Phleas*, and no *L. Alexis*, although *P. brassicae* and

Napi were fairly common. The same may be said of the Sphingidæ and Bombycidæ—one *S. ocellatus* larva, one or two *D. vinula*, and one *bifida*, no larvæ of *B. quercus*, *D. furcula*, or *E. lanestris*. The Geometræ were subject to the same conditions. I did not give the Noctuæ trial all the season with sugar, so I cannot speak so certainly of them, but I believe they were affected in like manner. However, I have met with a few which I had not previously taken in this locality. *Dianthæcia cucubali*: I reared a number of this from larvæ found on *Lychnis flos-cuculi*. They are very hardy larvæ, not requiring near so much attention as *Eupithecia dodoneata*. Early in April I was glad to see in my room a specimen of this pug, the larva of which I had beaten from oak the previous season. I have also the pleasure to add to my list *Chrysoclista bimaculella*. This rare and pretty little insect fell to my beating-stick in this neighbourhood; I hope I shall be able to find more of it another season. *Tinea fulvimitrella*, another rare species, turned up in this locality; also *Gelechia luculella*. A very good example of *Lavema ochraceella* turned up in fair numbers. It has the open habit of sitting on the upper side of the leaves of *Epilobium hirsutum* quietly until boxed, though it requires a sharp eye to detect its presence. The Terebrant portion of the Hymenoptera have been more plentiful, especially in the early part of the year. I found amongst them the following:—*Ichneumon varipes*, three examples taken at Holgate; *Dicelotus parvulus*, one taken at Acomb Wood; *Phæogenes stimulator* and *P. fulvitaris*, found by beating, Acomb Wood; *Cryptus erythropus*, *C. parvulus*, and *C. dubius*, these three species bred from *Emphytus cinctus*. *C. dubius* (Tusch) is new to Britain. *Phygadeuon vagabundus*, found at Holgate; *P. oviventris*, bred from *E. cinctus*; *Hemiteles areator*, found at Holgate; *H. formosus*, *H. fragilis*, bred from *E. cinctus*; *Campoplex erythrogaster*, beaten out of oak, Acomb Wood; *Mesoleius caligatus*, *M. rufolatræ*, and *M. napans*, found by beating; *M. dubius* and *M. aulicus*, bred from *E. cinctus*; *Bassus planus* and *B. pictus* found by beating, Holgate; *Limneria virginalis* and *L. erucator*, captured in Acomb Wood; *Perilissus* sp., found in wood; *Nematopodius ater* (Brischke), two examples bred from *E. cinctus*, two others captured at large; *Trematopygas discolor*, found at Holgate (Mr. Bridgman: "I believe it is this species"); *Lissonota variabilis*, captured at Holgate; *Polyblastus rivalis*, var., found in wood; *Eclytus ornatus*, var., one example by beating. A few of these have been recorded before for this locality, but, having bred these, I record their hosts. The same remarks that have been applied to the order Lepidoptera apply to the aculeate portion of the Hymenoptera—hardly any to be seen. Of course there are exceptions in all the orders, and there are one or two here—*Bombus lucorum* and *B. muscorum*, the former of these abundant all the season, the latter very common in the autumn. There is also one apparently new to the county, *Andrena Trimmerana*. I took two examples of this in this neighbourhood flying in hedge bottoms; also *Andrena* sp. which remains unnamed. *Sirex juvencus*.—On Sept. 11th, whilst I was passing along one of the paths in the

York Nurseries, I picked off the ground a very fine female example of this species. It had evidently not been there long, as it was in very fresh condition. There is no record of this siricid from the York neighbourhood since 1875; this is therefore the more remarkable, since the last notice of it was a notice of it taken flying on the top of York Minster (see Transactions of the Yorkshire Naturalists' Union, Parts I. & II.) *Odynerus pictus*.—I discovered two or three colonies of this insect during the past summer making their earthen cells on some hard glass lights. They formed them on the glass, and, curiously enough, I was able to see the larvæ in the interior as they progressed from the egg to maturity. The cells were filled by the parents with sawfly larvæ, and fastened up. Here is a wonderful instance of forethought or sagacity: the parent knows exactly what size to build the cell so as to contain sufficient food for its larva.—T. WILSON, Holgate, York, Jan. 16th, 1883.

OBITUARY.—JAS. VARLEY.—Another representative of the old school of working naturalists passed away on Sunday, Jan. 7th, in the person of James Varley. Born May 3rd, 1817, at Primrose Hill, Huddersfield, he lived for sixty-four years within a comparatively short distance of the same spot. His taste for Natural History was evidently early developed, for he was, I believe, one of the founders of the Huddersfield Naturalists' Society, which is now perhaps the oldest provincial society of the kind in the United Kingdom; and thirty years ago his name appears to have been a household word with the naturalists of the West Riding, whilst he was also well known as a successful collector by the leading lepidopterists of the country. My own almost earliest lessons in the science were received from him, and I well remember the fear and trembling with which, as a small schoolboy, I used to take my specimens to him to name, and the joy and excitement I felt when, on one of my earliest visits, he presented me with my first half-dozen larvæ of *Saturnia carpini*. In the year 1864 he somewhat excited the entomological world by rearing from a very large quantity of larvæ a good series of the deep black-bordered variety of *Abraxas grossulariata*, which, although repeatedly bred in Yorkshire since, up to that time appears to have been quite unknown. The form at present very properly bears his name—variety *Varleyata*. Besides entomology, he took equal interest in ornithology, and of both lepidoptera and birds he formed extensive and rich collections. His health failing, and becoming reduced in circumstances, he sold the former, several years ago, to Mr. Bennett, of Bradford, but his fine collection of birds was, I think, still in his possession at the time of his death. Of late years he has been unable to do as active work in his favourite pursuits as formerly, but his numerous notes and his papers in this journal will be evidence to our readers of the keen interest he still took in all matters pertaining to them. He was twice president of the Huddersfield Naturalists' Society—the last time during the year 1880. Mr. S. L. Mosley, Beaumont Park, near Huddersfield, intends writing a sketch of Mr. Varley's life, and will

be glad of any anecdotes or other suitable information from any of his correspondents and friends.—G. T. P.

Reports of Societies.

BARNSELY NATURALISTS' SOCIETY.—Meeting Dec. 19th, Dr. Lancaster in the chair.—A very interesting paper was read by Mr. R. Creighton, on the Trochilidæ, or “Humming Birds,” many choice specimens of skins of these minute and brilliant birds being exhibited by him, and their range from the southern to the northern parts of the American continent described.

ANNUAL MEETING, Jan. 19th.—Mr. T. Lister was elected president, and Mr. W. E. Brady hon. sec. But little progress was reported in entomology and botany. In ornithology some particulars were given of the effect on birds before and after the snow-storm of Dec. 6th, and the intense frost of the 12th. Birds were rendered tame by the cold and starvation, and some were found dead. Starlings, bullfinches, blue tits, blackbirds, and even jays, came about houses and garden-sheds in the town and villages. The Rev. J. Johnson writes of a flock of golden plovers near the Vicarage, Denby. After the melting of the snow, daws, rooks, meadow pipits, grey and pied wagtails, and redpolls stirred about in the fields in quest of food. A few have cheered us with their song—as missel thrush Dec. 3rd; thrush Jan. 3rd; blackbird, 4th.—T. L.

BEVERLEY FIELD NATURALISTS' AND SCIENTIFIC SOCIETY.—Meeting 11th January. A resolution was passed to make application to the Gilchrist Trustees for their series of lectures to be held in Beverley during the next winter session. Mr. H. M. Ellis presented a number of coal-measure fossils to the society, and Mr. Swailes, on behalf of Mr. C. Dixon, exhibited a fine specimen of the waxwing, shot recently in Pig-hill-lane. Mr. R. Cherry showed the following lepidoptera:—*Tephrosia crepuscularia*, *Agriopis aprilina*, *Amphidasis betularia* and its black variety, *Cherocampa elpenor*, and *Gramnesia trilinea*. Mr. F. Boyes reported that a specimen of the hooper, or whistling swan (*Cygnus ferus*) had been shot near Beverley on the 22nd ult., and also that a bittern and several goosanders (*Mergus merganser*) had been seen in the neighbourhood. After the specimens had been duly examined, a highly interesting and instructive lecture on the “Transit of Venus” was given by Mr. J. A. Ridgway, F.R.S., who illustrated his remarks with diagrams and models showing the means employed to measure the distance of the sun and planets from the earth.

BRADFORD NATURALISTS' SOCIETY.—Meeting Jan. 9th, the president, Mr. J. W. Carter, in the chair.—Mr. Saville exhibited a specimen of *Trichomanes radicans*; Mr. West, a number of mosses from Malham and Gordale. The president gave his inaugural address on “The Orders of Insects,” and briefly reviewed the different systems of classification that have from time to time been propounded, and explained the different

orders according to the Cibarian system, in a very lucid and interesting manner. The lecture was fully illustrated with examples of each, and also by diagrams.—H. L. OXLEY.

MANCHESTER CRYPTOGAMIC SOCIETY.—Annual Meeting, the president, Dr. Carrington, in the chair.—The hon. secretary read the annual report, which briefly enumerated the various discoveries made by the members during the last year, and the new localities recorded for the rarer species. It was remarked that the exhibitions and distribution of the rarer species of cryptogams had been a pleasing feature in the society's proceedings. The thanks of the society were accorded to Mr. Chas. Bailey for a copy of his recent paper on the "Structure of the Characeæ," to Dr. Braithwaite for a copy of the last published part of his "British Moss Flora," and to the Royal Microscopical Society for their journals, reports, and proceedings. Dr. Carrington was re-elected president, Capt. P. G. Cunliffe and Mr. W. H. Pearson were elected vice-presidents, and Mr. F. Rogers hon. secretary. After the election of various other officers of the society, the hon. sec. made some observations on specimens of *Pottia cavifolia* which had been sent from Llandudno, and he exhibited specimens of its variety *canina* from the Continent, which Dr. Wood thought might possibly be found in Britain, if attention were paid to the genus. The interesting Continental moss *Pharomitrium subsessile* was exhibited; the specimen had been gathered by Prof. Schimper in Styria, and was interesting on account of its representing a well marked out division of the genus *Pottia*. It is, however, not yet known as a British moss. Mr. Atkinson exhibited specimens of *Pezziza aurantia*, which he had seen growing in large beds near Bowness in September last. The partially dried specimens smelled faintly, like dried rose petals.

MEETING, January, 1883, Capt. Cunliffe, F.R.M.S., in the chair.—Mr. J. Cash exhibited a fruiting specimen of *Leucobryum glaucum*, var. *minus*, gathered near Lyndhurst, New Forest. Mr. Geo. Stabler sent a specimen of *Schistostega osmundacea* which had been gathered on Dec. 30th, 1882, in the caves of Bis Parlis, Penrith, Cumberland, by Mr. Martindale, the moss not having been hitherto recorded for this province. Mr. W. H. Pearson brought before the notice of the society the discovery of a new British hepatic, *Cephalozia Jackii* (Limpricht), which Dr. Spruce had detected in specimens of *Junq. byssacea*, collected by Mr. W. Wilson in Cheshire, near Warrington, April, 1841. The species does not appear in the recently published memoir on *Cephalozia* by Dr. Spruce. Captain Cunliffe exhibited a fine series of recently collected mosses, *Didymodon cylindricus* and *Campylostelium saxicola*, being abundantly in fruit. Dr. J. B. Wood sent fruiting specimens of *Eurhynchium circinnatum*, collected in Italy by the Marquis Bottini, and a new European moss (*Hypnum Bottinii* (Breidler) discovered by the Marquis Bottini in Etruria, May, 1881. M. Robert du Buysson, Brout-Vernet, France, was elected a corresponding member of the society.

Original Articles.

COLEOPTERA OF THE LIVERPOOL DISTRICT.

PART III.

BY JOHN W. ELLIS, L.R.C.P., L.R.C.S., ED.,

HON. SEC. LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.

Read before the Lancashire and Cheshire Entomological Society,
November 27th, 1882.

IN continuation of my previous papers on the Coleoptera of the Liverpool District, I purpose this evening bringing before your notice the additions which have been made during the past year, to the species and localities of Adephaga, which are contained in Parts I. and II.; and then enumerating the species of the small group Palpicornes or Philhydrida, which I know to have occurred in our district, leaving the extensive group of Brachelytra to the consideration of another paper, wholly to be devoted to that group.

The long continuance of wet weather during the past year, has been very unfavourable for beetle collecting; but through the observations and work of Messrs. Kinder, May, Smedley, and Wilding, in addition to the attention I have myself given to them during the year, I am able to add in addition to new localities for many species of Geodephaga and Hydradephaga, no fewer than seven species of the former, and eight of the latter, to our local list. In addition to the information derived from the above-named gentlemen, I have to acknowledge an interesting communication on Parts I. and II. from Mr. Joseph Chappell, of Manchester, one of our honorary members.

The species of Adephaga, now recorded for the first time, are as follows:—*Notiophilus 4-punctatus*, Dj.; *Dromius nigriventris*, Th.; *Pterostichus diligens*, Sturm.; *Harpalus serripes*, Sch.; *Bradycellus distinctus*, Dj.; *Bembidium nigricorne*, Gyll.; *B. flammulatum*, Clair.; *Haliphus flavicollis*, Sturm.; *H. fluviatilis*, Aubé.; *Hydroporus picipes*, F.; *H. nigrita*, F.; *H. angustatus*, Sturm.; *Colymbetes exoletus*, Forst.; *Agabus paludosus*, F.; and *Gyrinus distinctus*, Aubé.

GEODEPHAGA.

NOTIOPHILUS.

N. 4-punctatus, Dj. Mr. Wilding has taken two specimens of this questionable species at Derby, one of which is *biguttatus* on one side and *4-punctatus* on the other, bearing out Mr. Crotch's view that these are only varieties of the same species. (See a paper by the Rev. W. W. Fowler, in the Ent. Monthly Magazine for Nov., 1882, on Additions, &c., to the Coleoptera.)

N. substriatus, Wat. Under seaweed below Leasowe embankment, in April. (J. Chappell.)

ELAPHRUS.

E. cupreus, Duft. Mr. Smedley and myself took this species abundantly in March, among rejectamenta on the banks of one of the "lakes" on the sandhills at Wallasey.

DYSCHIRIUS.

D. impunctipennis, Daws. Wallasey sandhills. (J. Chappell, *in litt.*)

D. globosus, Hbst, was exceedingly abundant with *cupreus* in March, and on the Hightown shore in May last.

DROMIUS.

D. nigricentris, Th. (*fasciatus*, Dj.) I discovered this species on Bidston Hill, under heath (among the dead leaves), in February last; Mr. Smedley took it in similar situations at Thurstaston, in March.

ANCHOMENUS.

A. viduus, Pz. Several specimens at Moreton. (J.H.S.*)

A. fuliginosus, Pz. A few specimens in a quarry near Ince Blundell, in May last. (J.W.E.)

A. puellus, Dj. Mr. R. Wilding was fortunate enough to capture a specimen of this species at West Derby, a few weeks since.

PTEROSTICHUS.

P. diligens, Sturm (*strenuus*, Daws). Thurstaston, (J.H.S., A.H. May); Hightown shore, in May. (J.W.E.)

AMARA.

A. acuminata, Pk. A single specimen on the railway bank at West Derby. (R. Wilding.)

HARPALUS.

H. serripes, Sch. A single specimen on the Wallasey Sandhills, in March last. (J.W.E.)

BRADYCELLUS.

B. distinctus, Dj. Mr. Smedley took this species commonly among rushes, at the edge of a pit near Liscard, in May last. I took a single specimen at Bromborough, about the same time.

CILLENUS

C. lateralis, Sam, was very abundant on the clayey mud at the mouth of the river Alt, in May.

BEMBIDIUM.

B. biguttatum, F. Common at Hightown, May.

B. nigricorne, Gyll. Mr. May has added this species to our list, he having taken several specimens on Bidston Marsh last December.

* The initials J.H.S., F.K., and J.W.E. refer to Messrs. J. H. Smedley, F. Kinder, and myself, respectively.

- B. bipunctatum*, L., was common with *biguttatum*, at Hightown among rejectamenta.
- B. Stephensi*, Crotch. In addition to the locality already recorded for this species, Mr. Wilding has taken it several times around West Derby, and Mr. Smedley took one recently near Spital.
- B. concinnum*, Steph. Very abundant at Hightown in May, on the banks of the Alt.
- B. flammulatum*, Clair. Mr. Smedley took two specimens, and I myself one, of this beautiful species under rejectamenta, on the shore at Hightown, in May last.

HYDRADEPHAGA.

Mr. Kinder has taken the following species, in a pit in the neighbourhood of Westminster Road, Kirkdale.

The following have occurred in considerable numbers :—

<i>Haliphus obliquus</i> , F.	<i>Hydroporus reticulatus</i> , F.
„ <i>confinis</i> , Steph.	„ <i>pictus</i> , F.
„ <i>fulvus</i> , F.	„ <i>septentrionalis</i> , Gyll.
„ <i>flavicollis</i> , Stu.	„ <i>lineatus</i> , F.

The following have occurred in fewer numbers :—

<i>Haliphus fluviatilis</i> , Aubé.	Moderately common.
<i>Hydroporus picipes</i> , F.	Three specimens.
„ <i>assimilis</i> , Pk.	Four specimens.
„ <i>memnonius</i> , Nic.	} Moderately common.
„ <i>nigrita</i> , F.	
„ <i>angustatus</i> , Stu.	

In addition to the above I have to record :—

- Haliphus fulvus*, F. A single specimen on the Hightown shore. (J.W.E.)
- Hydroporus nigrita*, F. Common in a pit on the Sandhills near Hall-road Station.
- Noterus sparsus*, Marsh. Common in a pit near Wallasey, April. (J.W.E.)
- Colymbetes exoletus*, Forst. I picked up a dead specimen of this species, which is new to the district, on the bank of the Alt, near Hightown, in May last.
- Agabus paludosus*, F. Mr. Kinder has a specimen of this handsome species, taken by himself in the district, he believes at Crosby.
- Gyrinus distinctus*, Aubé. Mr. Chappell informs me he has taken this species in pools at Leasowe, in April.

PALPICORNIA.

Of this small group of beetles, which has had little attention paid to it, I am able to enumerate about 43 species as having occurred in our district. Of the genus *Helophorus* alone I have to record 10 out of the 12 species given as British in Dr. Sharp's last catalogue; and of the puzzling genus *Cercyon* I give a list of 14 out of the 18 British species.

HYDROBIUS.

H. fuscipes, L. Abundant in pits. A smaller variety with paler legs occurs on the Sandhills.

PHILHYDRUS.

P. testaceus, F. Common in pits, Westminster Road. (F.K.)

P. melanocephalus, Ol. A single specimen from the same locality. (F.K.)

ENOCHRUS.

E. bicolor, Pk. A single specimen with the above. (F.K.)

ANACENA.

A. limbata, F. Common in pits.

A. variabilis, Sharp. Not so common as the preceding.

LACCOBIUS.

L. minutus, L. In the Fender, Bidston Marsh. (A. H. May.)

L. nigriceps, Th. I have a single specimen, taken on the Wallasey sandhills, in April, 1876.

BEROSUS.

B. affinis, Brullé. I used to take this species frequently in claypits behind Wavertree Park; Mr. Kinder takes it sparingly about Westminster-road.

LIMNOBIUS.

L. truncatellus, Th. Crosby, September. (F. Archer's diary.)

HELOPHORUS.

H. rugosus, Ol. On the shore at Crosby. (F. K.)

H. nubilus, F. Bidston Marsh, in November, 1862. (Mr. Archer's diary.)

H. intermedius, Muls. Crosby, September. do.

H. aquaticus, L. Abundant in pits.

H. mulsanti, Rye. One specimen from the Hightown shore, May, 1882. (J. W. E.)

H. griseus, Hbst. Common.

H. granularis, L. Common, especially near the sandhills.

H. œneipennis, Th. Altcar rifle ground. (F. Archer's diary.)

H. arvernicus, Muls. I have a single specimen, taken along with *granularis*. (J. W. E.)

H. dorsalis, Marsh. Altcar rifle ground. (Mr. Archer's diary.)

HYDROCHUS.

H. angustatus, Germ. Mr. Kinder takes this species commonly in pits near Westminster-road.

OCTHEBIUS.

O. bicolor, Germ. Two specimens from the Fender, Bidston Marsh. (J. W. E.)

O. rufimarginatus, Steph. Several specimens among rejectamenta on the banks of the Fender, in October last. (J. W. E.)

CYCLONOTUM.

C. orbiculare, F. Abundant at the edge of a pit at Liscard, last April. (J. W. E.)

SPHERIDIUM.

S. scarabæoides, L. Common in dung.

S. bipustulatum, F. With the above, but less common.

S. marginatum, F. Taken with the above. (F. K.)

CERCYON.

C. obsoletus, Gyll. Common in dung on the sandhills.

C. hæmorrhous, Gyll. A single specimen, loc. ? (J. W. E.)

C. aquaticus, Muls. Moderately common about Kirkdale.

C. flavipes, F. The most abundant of the genus with us. (F. K.)

C. lateralis, Marsh. A few specimens on the sandhills (J. W. E.) Moderately common about Kirkdale. (F. K.)

C. littoralis, Gyll. Common under rejectamenta on the shore.

C. depressus, Steph. One specimen from Aigburth, and one specimen from Hightown. (J. W. E.)

C. unipunctatus, L. Common in dung.

C. quisquilius, L. Common.

C. melanocephalus, L. Abundant.

C. terminatus, Marsh. One specimen, Wallasey (J. W. E.) Common at Litherland (F. K.)

C. pygmaeus, Ill. Two specimens from Hightown (J. W. E.)

C. lugubris, Pk. One specimen from Hightown (J. W. E.)

C. analis, Pk. Common.

MEGASTERNUM.

M. boletophagum, Marsh. Common in dung.

CRYPTOPLEURUM.

C. atomarium, F. Common about Litherland (F. K.) Two specimens from Eastham (J. W. E.)

In conclusion, I would call attention to the valuable results which may be achieved by systematically working one locality; as an instance of which, [the number of species (many not hitherto recorded

from the district) taken by Mr. F. Kinder in the fields near Westminster-road, only a short distance from the city boundary, and a locality which we would probably think as unproductive of good species of insects as any locality could well be.

A WORKING MAN BOTANIST.

[A correspondent sends us the following notice, and although our friend Mr. Whitehead is still living, and we trust will live for many years to continue his useful work, we make no apology for publishing it.—ED. NAT.]

“Mr. John Whitehead, of Ashton, has been a diligent student of botany for upwards of thirty years, but during the greater portion of that time he has devoted himself more especially to the study of mosses. As a boy his scanty pocket money was expended in the purchase of botanical works, and his spare time after work hours was then, and is now, given to botanical rambles and researches. In the first year that he began the study of mosses, in 1859, he was fortunate enough to make two important discoveries, viz., *Dicranella Schreberi*, var. *elata*, Schimper, found in Stirrup Wood, Charlesworth, and *Atrichum crispum*, Staley Brushes, which was said by the late Professor Schimper, of Strasburg, to be a very interesting addition to the flora of Europe. The late Mr. John Nowell had known this moss for some time, but failed to get it determined. The following may also be mentioned:—*Heterocladium heteropterum*, found near Bolton (1863), in company with his friend, Mr. R. Scholefield, the first and only locality in England where this moss has been seen with fruit; *Hedwigia ciliata*, var. *striata*, Wilson, near Grasmere (1867), the first locality in England, and only found hitherto in two places in the world; *Buxbaumia aphylla*, Tintwistle (1867), an addition to the Manchester flora, and hitherto known only in two localities in England; *Rhynchostegium depressum*, Marple (1867), the third station in Britain; *Seligeria tristicha*, near Castleton, Derbyshire (1868), the first locality in Britain; *Plagiothecium Borrerianum*, Arthog (1876), hitherto called by some of the principal writers on mosses, *Hypnum elegans*; but by cultivating this plant, under favourable conditions, for three months, Mr. Whitehead was able to show that it had been incorrectly named by all authorities except Dr. Spruce in 1846, when the moss was new to science; *Seligeria acutifolia*, Arncliffe, Yorkshire (1868), new to Britain; *Bryum rufum*, near Litton, Yorkshire (1879), new to science; *Carex ornithopoda* (a sedge),

new to Britain, found in Miller's Dale (1874), by Mr. H. Newton, and first named by Mr. Whitehead; *Jungermannia Nevicensis* (a liverwort), Ben Nevis (1876), new to science.

Among Mr. Whitehead's numerous correspondents are Dr. Spruce, the late Mr. William Wilson, author of the "Bryologia Britannica," Professor Babington, Sir Joseph Hooker, Professor Balfour, Mr. H. C. Watson, and Professor Schimper, of Strasburg. In his Synopsis of European mosses, Schimper refers to Mr. Whitehead as "sharp-eyed," and they were introduced to each other when the Professor visited this country in 1865. Dr. Braithwaite published in 1877 a work on Sphagnums (bog mosses) with dried specimens, those for the counties of Lancashire, Cheshire, and Derbyshire being collected and prepared by Mr. Whitehead; and he is contributing to the same gentleman's superbly illustrated "British Moss Flora," now in course of publication. He is also providing specimens for a new edition of Wilson's "Bryologia Britannica," which is being brought out by the Rev. J. Fergusson, of Brechin. In addition he is preparing a moss flora for North Derbyshire, and another for a circuit of ten miles round Ashton.

Mr. Whitehead was one of the founders and first president of the Manchester Cryptogamic Society, is now the president of the Ashton Linnæan Society, and the United Field Naturalists, and the Ashton Biological Societies number him among their vice-presidents. He possesses a small but valuable library of scientific works, his herbarium is probably unequalled for variety and completeness, and he is a not infrequent contributor to our botanical journals. It will be seen that Mr. Whitehead has done good work in the cause of science, of which he is an enthusiastic lover, and his chief characteristics are untiring energy, modesty, and a willingness to impart his knowledge to others."

NATURAL HISTORY NOTES FROM SOUTH AFRICA.

(Continued.)

BY S. D. BAIRSTOW, F.L.S.

AGAIN, we might excusably imagine that when daylight was exposed on the raising of a stone, beetles would immediately, without premeditation, rush away in all directions. My own experience points to an opposite result. They wait for the word of command, when one signal trumpet annihilates the colony. Insects *may* give expression to their affections by means of audible (or inaudible to human ears) specific

calls, and who has proved that they are inaccessible to feelings of friendly interest or Good Samaritanship? Darwin has exposed marvels of biological research. He elevates the poor earth-worm to a platform of usefulness. Lubbock, unconsciously perhaps but nevertheless powerfully, proclaims the sovereignty of fragile ants, and the more we learn, not the less do we exhibit our insufficiency of wisdom. Study the domestic economy and life-history of our insects as we will, the time is yet far distant for the revelation of structural, susceptible and expressible utility. In this respect effect is fact, but cause, theory. Adverting to the stone turning once more, I have always understood that species of the genera *Chrysomela* and *Cassida* were Phytophagous insects. There is a lovely *Chrysomela* not uncommonly taken here *under* stones, quite dormant, and where one occurs I generally find companions. The regular hunting ground for this insect is some distance from the food-plant. *Cassida atrata* (a noble fellow) I have never captured in any other situation. I should like to hear if any of my home friends can enlighten me as to the reason. When once we recognise the food-plant of a *Cassida*, we are tolerably sure wherever it is growing to find thereupon our desired acquaintance. In this respect the genus is exceptional. Thus, *C. Tigrina* (Olivier) feeds on a species of *Solanum*. I have seen the plant in a dozen localities widely separate, and no matter whether it is commonly distributed or isolated the beautiful and auriferous-spotted *Tigrina* in larval stage with excrementitious tail, or the perfect insect is almost a certain accompaniment. I have well nigh exhausted my premier list of beetles, always excepting the dozens of species whose names are unknown to me. Professor Westwood, that most urbane friend of the antipodean Coleopterist, is rendering every assistance in the naming process, and I may have to speak further on subsequent finds at some future date. My companion in nearly every love-labour is Mr. Sloman Rous, a most zealous and painstaking naturalist of the 18 carat stamp. He has the finest private collection of beetles in South Africa, and duly considering vast and insuperable difficulties of identification, I am bound to acknowledge that few men approach him in point of general knowledge on the entire group. As we are constantly together, comparing notes and hunting Entomons, I am tolerably safe to pilfer (?) his opinion in many things, unconsciously stating it as original. He will pardon the *loan*.

In the arrangement of his cabinet he is a stickler for two subsidiary articles. The first, corrosive sublimate, as a preservative against *Acari* and beetle pests, requires no comment; but the second is so

palpably "good" that I recommend it strongly to cabinet-makers and collectors. Instead of cork for lining cases, he adopts the pith of the American aloe. This is cut into long strips of the required thickness, and being lighter and more impressible than cork, is, I think, infinitely superior. I noticed also that the names of specimens were neatly written on cardboard of different shades, thus : Dark-red...class ; rose colour...genus ; pink...species. No wonder that relations of pinned and defunct beetles are happy when the latter are immortalised in gems of calligraphy inscribed on artistic and appropriate tablets.

As a back-form student in botany, I naturally remark the prickly appearance of the majority of African bushes. As an ardent sportsman I naturally *feel* the quality and power of the prickles. These attain to all sizes from one line to one foot long, assuming the most grotesque shapes imaginable.

A good old lady who resides peaceably in the sanctity of an un-sanctified canteen (celebrated for miles around as a fishing-tackle depository) owns a small museum of local prodigies. Let us take a seat at her supper table. We don't require a bill of fare after the fashion of "Three in Norway." Stout and oysters, nothing more, (I hear you exclaim, "Quite enough too!"). As edible molluscs rapidly slip away from view, Mother B. entertains her guests, while exhibiting treasured curios one by one in a most affable manner. Here are four fine specimens of Paper Nautilus, taken on the adjacent beach ; also a couple of huge Tritons, and hosts of smaller shells. "This," she remarks—perceiving our attention fixed upon a black billiard ball, only more so,—“was cut out of the paunch of an ox, and is composed of hair soldered together by constant licking and salivary manipulation.* And now,” says she, “I think I shall puzzle you. Can you name these for me?” “Buckhorns!” stammers a neighbour. I, remembering the old truism, “where ignorance is bliss,” &c., assume a violent cough and say nothing. We “give the riddle up,” and the old lady inwardly chuckles and outwardly heaves, as she answers, “a pair of Mimosa Thorns.” A better substitute for buck-horns I have never seen, and placed over the door of a gentle man's hall these spikes could perplex a sportsman of keen discernment. I have jotted down a few examples of shape, which will convey a vague idea of the numerous enemies and demoniacal obstacles a collector's pants or gauze net contends with in a South African bush. The originals were all gathered from one small bush. Some of the

* The largest specimen I have ever seen.

withered and sapless thorns are appropriated by small ants. Splitting one down the centre, I am tolerably safe to find the hollowed space inhabited, but am not equally certain as to where the place or places of ingress and egress are bored.

(To be continued.)

Short Notes and Queries.

Sericomyia borealis.—I would call the attention of your readers to this very conspicuous and interesting fly, of whose life-history so very little is known. It is one of the largest and handsomest of the hover flies *Syrphidæ*; the antennæ are plumose, and the body marked with bands alternately yellow and piceous. It seems for the most part to frequent the hilly districts of England and Scotland, being more especially fond of the hill tops. It is chiefly remarkable for its curious habit of making a harmonious piping sound while sitting on the stones apparently at rest; the sound has been mistaken for singing at a distance. It is also said to cause some annoyance to visitors to the hill-tops by flying towards them in a threatening manner, but this requires corroboration. It will be observed that Mr. J. C. Dale suggests that this may be the insect referred to by Ray as having been met with near Settle, and proving very annoying (*Nat.*, Jan., 1883, p. 93). To anyone interested in the subject I would suggest a reference to the notices in the *Ent. Month. Mag.*, Dec., 1881, p. 159, and Jan., 1883, p. 188, and the very interesting letters of Mr. Swinton and Mr. Hellins in the same publication, Jan., 1882, p. 189. I should be very glad to hear of fresh observations on these and other points in the life-history of this insect. *Sericomyia borealis* is a stout-bodied fly about the size of the large *Valucella*, which are parasites on the humble bee, and so curiously mimic them.—E. N. BLOMFIELD, Guestling Rectory, Feb. 17th, 1883.

A WORLD IN MINIATURE.—Through the kindness of Mr. Loran, smack owner, of Hull, I had forwarded to me, a few days ago, a "specimen" from the North Sea; it consists of a female edible crab, *Cancer pagurus*, unfortunately deceased in transit, and measuring about 8in. across the carapace. On the back were eleven oysters, *Ostrea edulis*, the largest about 3in. by 2in., twenty or thirty *Anomia ephippium* and its variety *aculeata*, several *Saccicava rugosa*, and three or four Ascidians. On the upper valves of the oysters were numerous Serpulæ, *S. triquetra*, annelides forming sand tubes, patches of polyzoa and egg capsules of one of the whelks. In the interstices of the shells were four medium-sized and several minute specimens of the plumose anemone, *A. dianthus*, the largest of which was furnished with two distinct mouths. The large claws were furnished with a forest of Sertularian and Tubularian zoophytes, and the pedipalps were infested with what appeared to be a

specimens of sponge. On breaking the mass up into suitable pieces for my aquarium, I also found three small crabs of another species, not yet determined. I have handed over the refuse sand, &c., to a friendly microscopist for examination. Unfortunately many of the animals had died from exposure to the air; had it been otherwise, the whole would have formed a splendid object for a large tank.—J. D. BUTTERELL, 2, St. John Street, Beverley, Feb. 11th, 1883.

BADGER IN CLEVELAND.—A fine male badger was caught a few days ago near the river Lees, by Mr. Thomas Braithwaite of Red Hall Farm, near Yarm. The weight of it is about 25lbs.—W. GREGSON, Baldersby, Thirsk, January 29th, 1883.

SCARCITY OF WINTER BIRDS.—Referring to the letter in the January No. of the *Naturalist* upon the scarcity of birds, both residents and winter visitors, at the present time, I can fully confirm the writer's remarks respecting many species. We have very few fieldfares or redwings this winter. I myself have seen none, but hear of one or two small flocks having been noticed by other persons. The absence of woodcocks has been a great disappointment to the majority of sportsmen. Covers from which some of these birds have been invariably killed in former years, have been entirely blank this winter, and I have only heard of one or two having been shot in the neighbourhood in the month of October. The first bird observed was shot on the 16th of that month. Not a single short-eared owl has been recorded, though a few generally accompany the woodcocks here. Hooded crows are of much more frequent occurrence than formerly—in fact they are becoming abundant in this locality. Since Christmas 25th, when I first saw one, very few days have passed without my hearing their harsh croak. The first flock of siskins appeared on the 28th of October, and these birds, as well as gold-crests, were abundant from that date until about Christmas, when they left us. Some large flocks of snow buntings made their appearance about Nov. 25th, on the higher cultivated land a few miles from here. Snipe and jack-snipe have not been nearly so numerous as in previous winters. The first jack-snipe seen was shot on the 11th December. During the last week or two a few magpies have come down to us from the hillside plantations, which does not often occur. The peewits have never left us, although they usually do so; and, about the commencement of this year, a large flock of golden plovers, consisting of several hundreds, paid us a visit for a few days. Starlings, song-thrushes, blackbirds, and wrens suffered severely during the three consecutive hard winters of 1878-79-80, but the two latter are again increasing—much more so than the two former. Song-thrushes have been entirely absent this winter, but a few made their appearance about the middle inst. Bullfinches have been unusually plentiful; skylarks have been scarce, but began to re-appear the first week of this month (February). Titlarks were fairly numerous in December, but they have

now left us for their favourite locality—the moors. Considering that we have had no prolonged severe weather, the average number of wild fowl has visited us, among them being a flock of eight wild swans, and a single specimen of the red-breasted Merganser. On the 3rd of January a great grey shrike was shot here, being the second bird of this species which has been killed in this neighbourhood within the last few years. Another specimen was seen during the last week in January. Unless we have an exceptionally severe winter the wood-pigeons quit this immediate locality for districts where large woods give them shelter close to an abundance of food, such as turnips. This is the case now, but farmers within a few miles say they have far too many of these birds. I think the stockdoves accompany the wood-pigeons in these local movements, both birds re-appearing here on the return of spring. We have about the same number of tree sparrows as in former years, and I may say the same of chaffinches, greenfinches (one of our commonest species), yellowhammers, tits, hedge-sparrows, and robins. I observed a pied wagtail on the 4th instant, the first I have seen for many weeks. To sum up, we do not appear to have anything like the scarcity of birds here, which prevails near Lofthouse, and the diminution in numbers chiefly applies to our winter visitors.—THOS. CARTER, Burton House, Masham, Feb. 12th, 1883.

ADDITIONS TO THE WENSLEYDALE SHELL LIST.—Since the publication of my notes on the shells of Wensleydale, I have been favoured, by friends, with additional information. Another of my boxes has turned up, containing specimens picked out of moss brought home from Whitfield Gill, near Askrigg. The species are *Planorbis albus* and *P. parvus* (*glaber*, Jeff.), neither of which has hitherto been recorded for the dale. For the detection of these forms I am indebted to Messrs. Wm. Nelson and Jno. W. Taylor. It is from them also that I derive information of another addition, *Pisidium amnicum*, a bivalve, which they found at Cover Bridge, in 1877. This brings up the tale of fresh-water forms to thirteen, and the whole Wensleydale list to fifty-five. My friends have also furnished me with notes of additional localities for other species. They found *Helix sericea* and *H. pulchella* near Wensley, and Mr. H. Pollard tells me that he has taken various species near Hawes, including *Helix hortensis*, *Bulimus obscurus*, *Pupa umbilicata*, *Clausilia rugosa*, and *C. dubia*, as well as others which I have already recorded for that place on other authority. — WM. DENISON ROEBUCK, Leeds, Feb. 14th, 1883.

ERRATA.—We regret that several errors occurred in Mr. T. Wilson's paper, on page 109 of our last (February) number. Line 9 from top of page 109, should read "larvæ, not requiring so much attention as some others. *Eupithecia doneata*, early in April." Line 16 from top should read "*luculella*, a very good example. *Laverna ochraceella* turned up in fair numbers." Line 25 from top, "Tusch" should read "Tasch." Line 29 from top, "*rufolatrix*" should read "*rufolabris*," and "*nupans*"

should read "*napeus*" Line 4 from top of page 110, "1875" should read "1835."

OBITUARY.—BENJAMIN COOKE.—It is with the deepest regret I record the death of my late friend Mr. Benjamin Cooke, of Southport, who died suddenly on the 3rd inst. He was born on the 16th September, 1816, and was the son of Mr. Isaac Cooke, founder of the well-known firm of Isaac Cooke & Sons. cotton brokers, Liverpool. From earliest childhood he and his brother, Mr. Nicholas Cooke, were remarkable for their intense love of insects, astonishing their friends by covering the walls of their nursery with moths, butterflies, &c., spread out so as to show their beauties to the best advantage. This natural taste very greatly developed at the Friends' School, York, where great attention was, and is still, paid to the cultivation of a love of Natural History in the scholars. Mr. Cooke was not content with studying one order of insects only, but was wonderfully acquainted with insect life generally—indeed, unless it was Diptera, I do not know to which order he paid the greatest attention. His knowledge of species was truly astonishing, as numerous friends can testify who have sought his assistance in naming their specimens. You will miss, I am sure, a valued correspondent, as the papers from his pen you have from time to time published have added much to the interest of your useful periodical.—S. J. CAPPER, Huyton Park, Liverpool, Feb. 18th, 1883.

Rainfall for January.

	Height of gauge above sea level.	Rain-fall.	No. of Days	TOTAL FALL TO DATE.		Date of heaviest Fall.	Amount of heaviest Fall.
				1883.	1882.		
HUDDERSFIELD (Dalton) ... (J. W. Robson)	Ft. 350	In. ...	...	...	...	...	...
HALIFAX... (F. G. S. Rawson)	365	8·40	21	8·40	6·05	28	2·11
LEEDS ... (Alfred Denny)...	183	3·74	22	3·74	†1·79	28	0·745
HORSFORTH ... (James Fox)	350	3·98	24	3·98	‡2·36	28	0·58
PATELEY BRIDGE... (E. Warburton, M.R.C.S., L.S.A.)	436	4·31	13	4·31	0·26	29	1·89
BARNSELY ... (T. Lister) ...	350	3·37	18	3·37	2·46	28	0·71
INGBIRCHWORTH (do.)	853	6·55	23	6·55	4·19	28	1·54
WENTWORTH CASTLE (do.)...	520	4·69	19	4·69	2·90	28	0·97
GOOLE ... (J. HARRISON) ...	25	2·12	21	2·12	1·65	24	0·45
HULL (Derringham) (Wm. Lawton)	10	1·92	19	1·554	§1·92	24	0·56

* Average to date for 16 years, 1866-81. † Average of 29 years, 1853-62 & 1865-83.
‡ Average of 14 years, 1870-83.

§ The annual average for 30 years, 1850-79, is 22·347 on 151·15 days.

Reports of Societies.

BARNESLEY NATURALISTS' SOCIETY.—Meeting Feb. 13th.—The report of the Conversazione and Exhibition, Jan. 25th, was favourable, there was a small balance to the credit of the Institute. There is little to report as to insects and flowers. *Mercurialis perennis* flowered first week in January; *Tussilago farfara*, February 1st. Mr. H. Garland, of Woodhall, reports that he has a fine specimen of the Bohemian wax-worm, obtained near that place, Dec. 20th; this, and the Richardson's skink, obtained at Cudworth, Oct. 27th; the snow-buntings, Dec. 26th; and the Slavonic grebe, reported by Mr. M. G. Parkin; are the rarest occasional winter visitants to this neighbourhood the present season. Song-thrushes are decreasing, and need more protecting. The songs of birds are increasing daily—skylarks, early in January; chaffinch, Feb. 10th; yellow-hammer, Feb. 16th. The traces in the snow of an otter were observed at Woodhall, early in January.—THOS. LISTER.

BRADFORD NATURALISTS' SOCIETY.—Meeting Jan. 23rd, the president in the chair.—Mr. Firth reported taking *H. leucophearia*, at Saltaire, and also exhibited a beautiful series of *H. defoliaria*, from Shipley Glen. The president—a drawer from his cabinet, containing, amongst others, *S. ocellatus*, *S. convolvuli*, and *D. Galii*. Mr. Soppitt named some fern sent from Timsbury, Somerset.

MEETING, Feb. 6th, the president in the chair.—Mr. Soppitt exhibited three specimens of Geaster, from Norfolk. The president exhibited specimens of the whole of British butterflies belonging to the order Papilionidæ, and described their characteristics, and geographical distribution. Mr. West—a large number of British and American plants, to illustrate the Nat. Ord. Ericacæ.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting, Jan. 27th, the president (Mr. S. J. Capper) in the chair. The officers elected for the current session were Mr. S. J. Capper, president; Mr. Robert Brown, vice-president; and Dr. J. W. Ellis, honorary secretary. The president then gave a short address, in which, after thanking the members for his re-election, he referred to the entomological work during the past season. The past year had been a most prosperous one, 15 new members having been elected. He believed this was a greater number than in any previous year. Seven members had left through removal from Liverpool and other causes, and the society now numbers 67 against 59 members at the beginning of the year. At the eleven meetings which had been held 13 papers had been read, most of which had evinced a considerable amount of care, thought, and talent in their preparation. The secretary read the annual report for 1882, and the financial statement showed a good balance in the bank. Mr. E. R. Billington read a paper entitled "Fourteen Days in Trinidad," in which he detailed his experiences, entomological and otherwise, in that charming West Indian island, describing very vividly, and occasionally with much humour, its

fauna and flora, its scenery, and the character and mode of life of its inhabitants. A short discussion terminated the proceedings.

LEEDS NATURALISTS' CLUB AND SCIENTIFIC ASSOCIATION. — 500th meeting, Feb. 13th.—This was celebrated by a tea and social gathering of members, with Messrs. Hobkirk and Porritt present as visitors, at Powolny's Rooms, the evening being devoted to a conversazione, at which numerous interesting objects were shown. The proceedings after tea commenced by the president, Mr. Thomas Fairley, F.R.S.E., giving a brief *resumé* of the Club's history. Its double title shows its twofold origin, the Naturalists' Club and the Scientific Association coalescing (in 1872) by a process of mutual gravitation, after modest beginnings and independent co-existence. The subsequent history was that of a gradual unfolding, and steady and continued progress. The naturalists have usually predominated, but this is simply because they have been more numerous and more active than the students of other sciences; and as the society's scope includes the whole range of physical science, it only remains for the students of any particular branch to emulate the zeal and energy of the naturalists, to secure for their subject its due preponderance. Speeches were afterwards made by Mr. Jas. Brodie (the "parent" of the Naturalists' Club proper), Mr. Thomas Hick, B.A., B.Sc., Mr. B. Holgate, F.G.S. (ex-presidents), Mr. Wm. Eagle Clarke, and Mr. C. P. Hobkirk, F.L.S. The meeting then became an informal and most enjoyable *conversazione*. The president showed various calculating instruments, Mr. F. W. Branson, F.C.S., an incandescent lamp for microphotography and Mr. B. A. Burrell, F.C.S., a case of silver ores. Mr. Clarke showed, for Mr. Edwd. Bidwell of London, a beautiful series of instantaneous photographs of bird-life at the Bass Rock and Farne Islands. Mr. H. B. Hewetson brought water-colour drawings of birds of his own execution, and Mr. Grassham a splendid German book of birds. An old work, "Natural History" (1645) was shown by Mr. J. T. Beer, and models of the internal eye and ear by Mr. Geo. Hainsworth. An album of photographs and autographs of Yorkshire naturalists, to which various members contributed, was on view. Mr. Edwd. Atkinson, F.L.S., showed dried specimens of *Linnaea borealis*, and a collection of the turf-mosses was sent by Mr. W. West. A box of rare lepidoptera was shown by Mr. G. T. Porritt, F.L.S., and Mr. W. Barwell Turner, F.R.M.S., had numerous objects, including original drawings from the microscope and a copy of Piaget's "Les Pediculines," with photographic plates. Microscopic objects were shown by him, by Mr. Fairley, Mr. Emsley and Mr. J. W. Dixon. The meeting was altogether a decided success, and will probably form the precedent for an annual gathering of similar character.—W. D. R.

PORT ELIZABETH NATURALISTS' SOCIETY. — Annual meeting. — The financial and secretary's reports were adopted, and the following officers selected for the ensuing session:—president, R. Hallack, re-elected; vice-president, S. Rous, re-elected; hon. secretary and treasurer, S. D.

Bairstow, F.L.S., re-elected. The report showed good progress, and was very satisfactory. Entomology seems to be the favourite science, botany ranking second. The following notes of a ramble on New Year's Day (midsummer in South Africa), sent by our friend the founder of the society, Mr. S. D. Bairstow, will, we venture to think, be read with interest:—"We have it on good authority that the weather on New Year's Day, even from a naturalist's point of view, was all propitious, leaving nothing to be desired. Arriving at Sandfontein, our friends, after visiting the lovely miniature of a waterfall on Mr. Conrey's farm, employed a coloured guide, who led the way across country to the Uitenhage springs. Here they pitched their imaginary tents, and whilst one or two dignified officers of the society, viz., Messrs. —(hush!) "did a snooze," the beetle-men prowled about in search of spoil. A magnificent longicorn yclept *Zoographus oculator* innocently ruminating on a sweet-scented mimosa blossom, awoke to find himself in Mr. Bairstow's odiously odorous prison bottle. Another specimen, similarly situated, soon sniffed the benzine breeze dispensed by Mr. Amphlett. The emerald beauty, *Cetonia aurata*, narrowly escaped with its life, but Mr. Rous made sad havoc amongst the family of a certain white butterfly (*Pieris gidica*), and Mr. Read boxed bugs (Hemiptera) *ad infinitum*. Three species of *Reduvius* were taken on the *Ornithogalum*. Escort John now receives his dismissal, and with it a good sample of golden leaf and cut cavendish, and inwardly hopes "we may meet again." Although recent rains have considerably improved the appearance of bushy regions, the naturalists failed to discern any floral novelties, and, according to Mr. Hallack, who is conversant with our district botany, the best find of the day was frail and fickle *Gethyllis spiralis*. A pretty specimen of our curious tree-frog and several interesting larvæ were taken *en route*, and the naturalists arrived at Uitenhage just in time to be too late for the train. Nothing daunted, they visited the farm of Mrs. Stewart, near the railway station, in the homestead of which they were hospitably entertained, and in the grounds of which some local Coleoptera were captured. The naturalists returned to Port Elizabeth by the 7.45 p.m. train, not a bit the worse—tanned hides and aching bones always excepted—for spending New Year's Day with Dame Nature and her relatives.

RIPON SCIENTIFIC ASSOCIATION.—First annual meeting, Feb. 13th.—Mr. T. C. Heslington presided. The secretary, Mr. B. M. Smith, read the report, which stated that the club, which was commenced in February last, had now 120 members, their object being to establish a museum and publish a record of the fauna and flora of the district, from Harrogate on the south to Richmond on the north. The Marquis of Ripon was elected president, and Mr. B. M. Smith secretary. It was resolved to accept the tenancy of a house in Park-street, at a rental of £23 per annum, for a museum, Mr. G. Waite being accepted as a resident curator. Several new members were elected.

Original Articles.

ON THE PRESENT STATE OF OUR KNOWLEDGE OF THE GEOGRAPHY OF BRITISH PLANTS.

BY J. GILBERT BAKER, F.R.S., &c.

THE ANNUAL ADDRESS OF THE PRESIDENT TO THE MEMBERS OF THE YORKSHIRE
NATURALISTS' UNION, AT SELBY, ON MARCH 3RD, 1883.

WHEN Professor Williamson and Mr. Denison Roebuck first spoke to me at the York Meeting of the British Association about undertaking to fill for a year the presidential chair of your Union, I felt at first very unwilling to accept the responsibility. Greatly interested as I have always been in what concerns the Natural History of my native county, when I lived in Yorkshire my time was so much taken up by business engagements, that in order to collect the material for my book on "North Yorkshire," I was forced to almost entirely neglect the two other Ridings, and I left the county for London too soon after it was finished to be able to find time for visiting those interesting tracts in the West and East Ridings that I should have been so glad to have had an opportunity of exploring; and I also felt that, since I have lived at Kew, my attention has been so much occupied with other kinds of botany, that in anything relating to home-work, I had not only not progressed with the times, but that I had forgotten a great deal of what I knew familiarly twenty years ago. As however, I failed to convince your representatives that these excuses were good ones, I accepted their invitation, and beg now to thank you heartily for the compliment which it implies. When the time came round that I had to select a subject for this present address, I thought I could best utilize the occasion by asking you to consider for a while what is the present state of our knowledge of the geography of British plants, with a view that, in thinking the matter over, our attention might be specially drawn to considering what are the grooves in which further research may be profitably pushed forward. At the outset you will, I think, all be prepared to admit readily the proposition that in Natural History, in an eminent degree, the general rule holds good that the value of our work, whether as individuals or societies, will depend very greatly upon its being carried out upon a methodical plan. The facts of Natural History are so infinitely numerous, that if a naturalist does not go about his work methodically, he may toil hard and long, and yet have very little of any value to show, as the result

of all his labour. So long as the facts remain as mere isolated facts, they can only interest and be remembered by a limited number of specialists; but when our facts can be made to illustrate general laws, their value rises to a higher level, and in Natural History in general, and botanical geography in particular, the value of our results will depend very greatly upon our attempting to realise for ourselves beforehand, as clearly and fully as we can, what it is we want to get to know, and then setting to work systematically to collect and arrange the facts that elucidate the subject we have selected.

What I am going to say will all have exclusive reference to our indigenous British plants of the more complicated types of structure, flowering plants, and vascular Cryptogamia, of which the number of specific types is estimated by different authorities at a figure varying from 1,200 to 1,500. But I should like to pause for just one moment to point out to those amongst you who are not botanists, that our British flowering plants and ferns have been studied so long and by so many different observers, and under such favourable circumstances, that we probably know as much about them, from different points of view, as about any set of organised beings whatever; and that for this reason they furnish a field of research specially adapted to support general conclusions.

There is a special fitness in taking stock of the position which we occupy in our knowledge of British botanical geography just now, as we are in the position of an army that has lost its leader. My late friend, Hewett Cottrell Watson, who died eighteen months ago, made the study of the distribution of British plants the labour of his life, and worked at it through fifty years with unremitting patience and diligence. When he first turned his attention to the matter—when he was a student at the University of Edinburgh, attending the classes of Professor Graham, about 1830—botanical geography had no footing as a separate field of study. The only idea which botanists had then in registering plant-stations was to guide collectors to the places where they could gather the rarities. His first work was an octavo volume of 300 pages, entitled “*Outlines of the Distribution of British Plants belonging to the division Vasculares,*” printed in Edinburgh in 1832, when he was 28 years old, for private distribution. Under the title of “*Remarks on the distribution of British plants, chiefly in connection with latitude, elevation, and climate,*” he published what is substantially a new edition of the same work in London, through Longman’s, in 1835. In the same year he published the first volume of the “*New Botanist’s Guide,*” and the second

followed two years later. This is planned upon the lines of the old "Botanist's Guide" of Turner and Dillwyn, and enumerates the special localities of the rare plants of England and Scotland, taking them county by county. In 1843 he issued the first part of a much more elaborate work on the plan of the Outlines. This was only carried out through the series of natural orders, following the Candollean sequence, as far as the Papaveraceæ, when the plan being found to be too cumbrous, the work was discontinued. The first volume of his "*magnum opus*"—*Cybele Britannica*—appeared in 1847, and it was followed by vol. ii. in 1849, vol. iii. in 1852, and vol. iv. in 1859. It was his own original idea to apply the term *Cybele* to a systematic treatise on the geographical distribution of the plants of any particular tract of country, applying it as parallel to the term *Flora*, which has been used for a long time for a systematic description of the orders, genera, and species of any given tract. It is in the *Cybele* that we have his plans for registering the details of plant distribution brought out and used in their full development. To each individual species he applies four different measuring-scales, each adapted to measure its distribution from a different point of view. To record its range of station he uses a series of adjectival terms, such as agrestal, paludal, glareal, sylvestral, &c. To register the horizontal distribution of the species he divides Britain into eighteen provinces, founded, as far as possible, on river drainage, so as not to infringe upon county boundaries. Yorkshire is the only county that can claim a province to itself. What he calls the "Peninsular province" includes the three counties of Cornwall, Devonshire, and Somerset, and so on through the series. He traces the distribution of the species through these eighteen provinces by giving for each a line of figures indicating the provinces in which that particular species has been ascertained to grow. For further detail, suitable to be used in local work, these provinces were afterwards subdivided into 38 sub-provinces and 112 vice-counties. The vertical range of the species he registers by means of two regions of climate and altitudes, each divided into three zones. The Agrarian region includes all that portion of Britain in which it is possible, so far as climate goes, to grow corn and potatoes. Of course it includes the whole area of the island at sea level from north to south; it includes also the hills up to 600 yards of elevation in the north of England, and up to 400 yards in the Scotch Highlands. All above this is mountain, rock and heather, with a temperature like that of the low levels in Arctic latitudes. Then he deals with each species from a historical point of view, classifying them into natives, colonists,

denizens, and aliens, according as they are aboriginal inhabitants of the country, or appear to have been introduced through man's agency, acting either indirectly or directly. And, finally, he separates out the species into their types of distribution—British, English, Atlantic; Germanic, Scotch, Highland or Intermediate, according to whether they are dispersed through the whole of the island, or preponderate in some part of it. In a "Supplement of the Cybele" that came out in 1860, the horizontal range of the species is traced through the 38 sub-provinces. In the three volumes of the "Compendium" (1868-70) the species are again traced out through the provinces. Of course the earlier works raised up a number of helpers, who gladly aided him to make the later ones more complete. In the "Compendium," in addition, the dispersion of each species beyond the bounds of Britain is traced out; and finally, in "Topographical Botany," 2 vols., 1873-74, the horizontal distribution of the species through the 112 vice-counties is traced out. Of this work only a limited number of copies was printed for private distribution. At the time of his death, Mr. Watson was engaged in the preparation of a second edition of it; this Mr. Quaritch has undertaken to publish, and my friend Mr. Newbould and I have been engaged for the last year in seeing it through the press, and we expect it will be ready about midsummer.

What, then, still remains to be done? I make answer that, in the first place, we expect from every local or county Natural History society that if such information be not already placed on record, they should set to work to collect and publish a full account of the horizontal and vertical range of the plants of the area they deal with, explaining the circumstances under which each grows, what is its rarity or commonness, and all particulars as to how it adapts itself to the different soils and geological strata that occur in the district. We have in Watson's "Topographical Botany," a separate catalogue for each of the five vice-counties of Yorkshire, but three out of the five still need dealing with in the way I have just indicated. The information in botany, which, primarily and particularly, we ask from you as a county society, is a full account of the distribution of species through the West and East ridings. For the West-Riding the general sketch contained in the "West Yorkshire" of Dr. Arnold Lees and Mr. Davis is excellent as far as it goes, and there is also the small Flora of Miall and Carrington, but much more than this is still needed; and for the East-Riding there is nothing to turn to except the list in "Topographical Botany," and the scattered records in Baines's "Flora of Yorkshire" and its supplement. Looking beyond the bounds of Yorkshire, through the rest of

the north of England, we have no such records for the very interesting counties of Westmoreland, Cumberland, and Lancashire. I attempted long ago to collect notes about the Lake district, and if no one else enters the field, shall feel inclined to publish them, incomplete as they are; and whilst speaking of this matter, I cannot leave it without expressing a hope that some day we may see in print, the full material which Mr. Warren has gathered together for Cheshire, which would be specially acceptable, because we have no recent flora for any western county.

Broadly speaking, the external conditions which affect the dispersion of species may be classified under three heads. By these I mean, first, how a species is influenced by climate; secondly, how it is influenced by soil; and thirdly, how its dispersion at the present time is affected by its past history, and the changes that have taken place in the conformation of sea and land in past times. A fourth influence, to estimate which at its full value is one of the great lessons we have learnt from Mr. Darwin, is brought about by the large extent to which plants depend on insects for their fertilisation. This has been fully dealt with of late years by many investigators. Speaking of the other three factors, I should say that, for Britain as a whole, the vertical and horizontal range of each species has been so fully registered that the climatic range of the British plants is fully worked out, but that under the two other heads there are several fields of work that want further following out.

In tracing out the pedigree of species, a great deal still remains to be done in gathering together, sifting, and testing the evidence derived from palæontology. As an example of a valuable recent contribution to our knowledge in this department, I may cite the memoir on the Ferns of the British Eocene Strata, recently published in the Transactions of the Palæontographical Society, by Mr. Starkie Gardiner and Baron von Ettingshausen. It would appear already in the eocene period, that the present sub-orders, and many of the present genera of ferns, were already differentiated, and there is no evidence of the existence then of any type of subordinal value that is not in existence now. There are at the present time eight distinct sub-orders of Filices, each distinguished by a characteristic type of sporangium. Out of the forty-three British ferns which exist at the present day, thirty-seven species belong to Polypodiaceæ, three to Hymenophyllaceæ, two to Ophioglossaceæ, and one to Osmundaceæ. Four sub-orders, Gleicheniaceæ, Cyatheaceæ, Marattiaceæ, and Schizæaceæ, are at the present day not represented in Britain, nor, in fact, anywhere in Europe. In the

eocene fern-flora, three sub-orders out of the eight are absent, Cyathaceæ, Hymenophyllaceæ, and Ophioglossaceæ. In Polypodiaceæ there are ten species, all apparently belonging to genera now known, *Adiantum*, *Pteris*, *Woodwardia*, *Polypodium*, and *Acrostichum*. There seems every reason to believe that the eocene *Acrostichum* is identical with *Acrostichum aureum*, one of the the commonest tropical marsh-ferns of the present day, both in the old and new world. Gleicheniaceæ is represented in the British eocenes by a single unmistakable species. At the present day there are eighty species of this sub-order, widely spread in the tropical and south temperate zones, and two of them extending into temperate Asia. Of the sub-order Osmundaceæ, there are two species in the eocene beds, one of them apparently identical with *O. regalis*, and the other with *O. javanica*, a species confined at the present time to tropical and temperate Asia. Of Schizæaceæ there are two species of two genera, and of Marattiaceæ one species in the British eocene beds. Not long ago I asked one of our most experienced paleontologists to tell me, in general terms, what point of knowledge had been reached in the investigation of these early tertiary beds, and he estimated the number of their generic types, now known, at five hundred, of which four hundred are still in existence; and of species, at two thousand, of which, perhaps, fifty are still in existence. I suppose no competent authority would estimate the lapse of time between the close of the miocene period and the present day at less than five hundred thousand years. The most curious point about these rich tertiary floras is that there seems, broadly speaking, to be no geographical differentiation in them. In Greenland or Austria, or in our own island, at Bournemouth, or in the London basin, they appear to contain substantially the same types. It is likely that in the next twenty years we shall reap a rich harvest from paleontological work.

Upon the general question of evolution, an important light is thrown by studying the flora of Britain in comparison with that of Continental Europe. The most important general character of the British flora is its utter want of any distinctive individuality. Leaving out of count a few doubtful Hieracia, Willows, Rubi and Roses, I can give only two good instances of British plants that do not occur in Continental Europe. One of these, *Potamogeton lanceolatus*, is known in Cambridgeshire, Anglesea, and the north of Ireland; the other, *Eriocaulon septangulare*, is found in Skye and Galway; and, across the Atlantic, it is widely spread in North America. It is now generally believed that Britain was last separated from the Continent towards the close of the glacial period. I do not think any competent authority would

consider that it was an extravagant suggestion that Britain may have been an island for a hundred thousand years.* If, then, out of 1400 species which it produces, not one is distinct, this is a very significant fact.

Perhaps the most important of all the generalizations established by Mr. Watson's labours was his separating out the plants of Britain according to their types of distribution. He worked out the fact that out of the 1425 British plants 532 are spread through the length and breadth of the island; that a little over 600 are either confined to England or become quite rare when the Scotch border is crossed, and soon cease in a northern direction; that out of these, 70 show a preference for the western and 127 for the eastern side of the island; and that the boreal element is represented by 200 species, which are concentrated in the Scotch Highlands, and occur southward only amongst the mountains. And here again, the seas that separate Britain from the Continent seem to be of very small account. The 500 species universal in Britain are mostly spread over the whole area of the Continent; the 200 boreal species are plants of Scandinavia, which often extend southwards to the Alps of Central Europe. The 600 characteristically English species are plants of the great Central European plain; and the moisture-loving types, restricted with us to Ireland and the south-west of England, creep up from Portugal and the Asturias, and the country round Bordeaux, just as if no broad channel of waters intervened. The memoir † in which, long ago, Prof. Edward Forbes tried to work out what these types of distribution imply, is well known. I will not pursue the subject further now, than to point out the striking testimony which this whole series of facts furnishes to the long-continued stability of the present condition of things, as regards our specific types.

(*To be continued.*)

Short Notes and Queries.

OTTERS IN HALIFAX PARISH.—About 70 years ago Squire Pinder shot an otter from Elland Bridge, as it was fishing on the damstones, in the grey of the morning. About 40 years since, James Hobson and others caught one in the Calder, in a large fishing-net; another was caught at

* See Wallace's "Island Life," p. 318.

† Memoirs of Geological Survey, vol. i., p. 336. See also the shorter paper in the Annals and Magazine of Natural History, vol. xvi., p. 126.

Brighthouse since then. Over 60 years since, James Turner and John Nutton, of Greetland, were rat-hunting on the Calder under North Dean Wood. Their dog went up a drain from which there was a small stream flowing. They soon heard a fierce combat going on, the water became muddy and stained with blood, and out bolted a bitch otter and two cubs. The mother escaped, but the cubs were caught and kept alive for a short time. In September, 1873, some men were strolling on the banks of a small stream at Cotton Stones, Ripponden. They had two dogs—a lurcher and a terrier—the former weighing 50lbs, and the latter 22lbs. The dogs were set behind the remnants of an old burr-wall, and whilst they were digging in at each end, an otter made its way out at the top, between the wall and the bank, and made for the stream, which was so shallow that it could not dive. The fight then commenced. The strength and tenacity of the otter were remarkable; it could have both dogs down at once. It soon had them both covered with blood, got from them and ran up a drain, from which they dug it out. It again made for the stream, the dogs and men after it; and whilst the dogs worried, the men struck it across the back with a rail-pole, which rebounded as if they were striking at a tight-blown football. One man, who held it by the tail so that its hind feet could not touch the ground, said if it had been tailless they could not have captured it; but holding its feet from the ground placed it at a disadvantage with regard to its wrestling powers. The otter weighed $17\frac{1}{2}$ lbs, and measured 4ft. 6in. from tip to tip. The skin was not perforated by the dogs' teeth. On Aug. 19th, 1876, a large otter was caught in a box-trap on the Calder. It had been seen to go up a drain near Messrs. Clay's dyehouse at Sowerby Bridge. In the winter of 1881 an otter was seen by the night-watchman at North Dean station, which, on being followed, ran into the Calder. It was traced on the snow and on the mud by the river-side, but not caught.—C. C. HANSON.

BIRD-NOTES FROM NEWTON KYME, NEAR TADCASTER.—The Rev. J. W. Chaloner, rector of Newton Kyme, writing on the 2nd or 3rd of March, says that the week before last he saw nine goosanders together at that place, which is very unusual. The week of his writing he noted a pair of black-spotted woodpeckers. He has now in his yard a fine specimen of a wild duck having assumed the plumage of a mallard.

NOTICES OF BOOKS, &c.—*Hepaticæ Britannicæ Exsiccatae*.—Fasc. III. of this useful set of specimens has just been issued by Messrs. B. Carrington, M.D., and W. H. Pearson, and contains some very rare and interesting specimens, amongst them being *Cephalozia araria*, *C. Francisci*, *Nardia (Marsupella) Stableri*, *Lepidozia Pearsoni*, *Petalophyllum Ralfsii*, &c., &c.—in all 65 species and varieties. Subscriptions may be sent to Mr. W. H. Pearson, 6, Seedley Park Road, Pendleton, Manchester.

Rainfall for February.

	Height of gauge above sea level.	Rain-fall.	No. of Days	TOTAL FALL TO DATE.		Date of heaviest Fall.	Amount of heaviest Fall.
				1883.	1882.		
HUDDERSFIELD (Dalton) ... (J. W. Robson)	Ft. 350	In. 2.11	17	7.40	*5.40	1	0.32
HALIFAX...(F. G. S. Rawson)	365	3.38	20	11.78	9.47	10	0.46
LEEDS ... (Alfred Denny)...	183	1.99	18	5.74	†3.18	17	0.32
HORSFORTH ... (James Fox)	350	1.90	17	5.88	‡4.82	17	0.32
PATELEY BRIDGE...(E. Warburton, M.R.C.S., L.S.A.)	436	4.45	19	8.76	||4.29	...	
BARNSELY ... (T. Lister) ...	350	2.33	14	5.70	4.18	1	0.42
INGBIRCHWORTH (do.)	853	3.95	17	10.50	7.16	1	0.73
WENTWORTH CASTLE (do.)...	520	2.64	15	7.33	2.90	1	0.47
GOOLE ... (J. HARRISON) ...	25	2.24	15	4.36	3.69	11	0.45
HULL (Derringham) (Wm. Lawton)	10	2.44	15	4.36	§2.88	10	0.59

* Average to date for 17 years, 1866-82. † Average of 29 years, 1853-62 & 1865-83.
‡ Average of 14 years, 1870-83.

§ The total average for 32 years, 1850-82.

|| For year 1880.

Reports of Societies.

BARNSELY NATURALISTS' SOCIETY.—Meeting Feb. 27, Mr. T. Lister, president, in the chair.—An interesting paper was read by Mr. T. Rose, entitled "A Holiday in Holland, Belgium, and North France," with graphic descriptions of the places visited, interspersed with notes on Natural History.

MEETING, March 15th, Mr. Lister presiding.—A valuable paper on "Carbon," with experiments, was given by Mr. G. M. W. Hutchin. Mr. G. H. Teasdale reported that an owl had been heard in Silkstone Hall Wood, before the last severe frost. A pied blackbird was seen near Dodworth station on March 8th. A flock of the common snipe flew to north-west on the 5th; the lapwings had returned to their old haunts Feb. 25th; many pied wagtails and yellow-hammers noted on the 11th. These last birds sang on the 16th Feb., and chaffinches on the 9th. The missel and song-thrush, and the above-named songsters, have frequently been heard during the present frost. Thrushes are still scarce here, but more numerous near Hemsforth.—T. L.

BEVERLEY FIELD NATURALISTS' AND SCIENTIFIC SOCIETY.—21st meeting, held February 22nd, the President (Mr. J. A. Ridgway) in the chair. After the routine business had been disposed of, the Rev. W. Smith read an interesting paper on the "Cellular tissues of Plants," illustrating his remarks by a number of carefully prepared micro-slides and dissections of living specimens. Amongst the exhibits were 47 species of *Graminae*, 16 *Carices*, and a very fine horn of the red deer, dug up in Swinemoor, Beverley, brought by Mr. Boyes; a pair of waxwings, *Ampelis garrulus*, shot in Beverley Westwood, by Mr. Cheny; micro-slides showing plant-culture, by the Rev. W. Smith, and living specimens of diatoms, marine algæ, and crustacea belonging to the *Pycnogonidae*, by Mr. Butterell.

Meeting, March 8th. The President (Mr. J. A. Ridgway) occupied the chair. The Rev. E. J. Barry presented to the Society two store cases for insects. A number of carefully prepared micro-slides of animal parasites, chiefly from birds, were shown by Mr. John Watson, and Mr. Butterell exhibited specimens of two zoophytes, *Plumularia falcata* and *Sertularia operculata*.

MALTON NATURALISTS' SOCIETY.—Annual general meeting; Mr. G. W. Slater in the chair. Mr. T. Lister, the secretary, read the annual report, and Mr. W. Hodgson, the treasurer, the financial report. Mr. M. B. Slater was then called on to report on the work of the botanical section during the year. He chiefly referred to what had been done at the meeting of the Naturalists' Union at Selby, quoting from the report of that meeting, and the president's address. He also mentioned some of the best plants obtained during the year. One of the rarest and most interesting, sent by Mr. Barugh, of Octon Grange, was *Bupleurum rotundifolium*. An important thing sent by Mr. Boynton, of Ulrome, was a moss found on an embedded log, supposed to be the remains of an ancient lake dwelling, *Antitrichia curtipeudula*. Mr. Chadwick next gave an account of what had been done by the geological section, Mr. A. H. Taylor reported for the conchological section, and Mr. A. W. Walker for the ornithological. The election of officers was then proceeded with; the Hon. H. W. Fitzwilliam, M.P., was re-elected president, and Mr. T. Lister secretary. At the next meeting of the Society on April 16th, Mr. T. Lister, the secretary, will read a paper on British Grasses.

MANCHESTER CRYPTOGAMIC SOCIETY.—Monthly meeting; Dr. B. Carrington, F.R.S.E., in the chair. Mr. W. H. Pearson exhibited a specimen copy of the Fasc. III. Hepaticæ Britannicæ Exsiccatae, containing many new and rare species, amongst which were noticed *Mersupella Stableri*, *Cephalozia Francisci*, *C. æraria*, *C. Turneri*, *Bazzania trilobata*, *Lepidozia Pearsoni*. Dr. J. B. Wood sent specimens of *Buxbaumia indusiata*, and *B. aphylla*, both species having been gathered by himself in the same locality during his visit to the Vosges, August, 1872; the *B. indusiata* growing on rotten wood, and the *B. aphylla*, on the ground. He also sent specimens of *Dichelyma capillaceum* in fruit from Norway and N. America. Mr. George Stabler and Dr. R. Spruce were elected honorary members of the Society.—T. ROGERS, Hon. Sec.

MEETING, March 9th, Captain P. G. Cunliffe, F.R.M.S., in the chair.—Mr. James Cash exhibited specimens of *Cinclidium stygium* from Malham Tarn, and read an interesting paper on its history as a British moss;* Mr. Wm. Forster, a remarkably handsome and robust variety of *Polystichum angulare*: it belonged to the multilobum type of variation, and was strongly set with bulbils along the rachis of the frond.—THOS. ROGERS, Hon. Sec.

ST. THOMAS'S FIELD NATURALISTS' SOCIETY, YORK.—Monthly meeting Feb. 22nd, in St. Thomas's Schools, Lowther-street. Mr. S. Walker occupied the chair. Mr. Guy showed specimens of *Euclidia glyphica*, *Euclidia ni*, *Mania typica*, *Plusia chrysitis*, *Hadena pisi*, *Dianthæcia capsicola*, *Calocampa exoleta*, and *P. monacha*. Mr. Wilkinson sent for exhibition the following lepidoptera:—*Catacola sponsa*, *C. promissa*, *Polia chi*, *Agriopis aprilina*, *Epunda nigra*, *Euplexia lucipara*, *Hadena protea*, *H. peregrina*, *H. thalassina*, and *Oloantha solidaginis*. Mr. R. B. Cook exhibited the following British land shells:—*Helix virgata*, from Bristol and Kent, with the variety *alba*, from Bristol, and the variety *submaritima*, from Weston-super-Mare; also *H. caperata*, with a rare unnamed variety, and the variety *ornata*, all from Bristol. Mr. Barker showed the following nocturni:—*Smerinthus ocellatus*, *S. populi*, *Sphinx ligustri*, *Chærocampa*

* Will be published in our next issue.

elpenor; also a fine example of *Acherontia Atropos* and its chrysalis; he also submitted living specimens of *Limnea palustris*, and other fresh water shells, from Strensall Common. The chairman exhibited a case of geom-træ, containing, amongst others, a fine series of the annexed, showing in many instances great deviation of colour:—*Urapteryx sambucata*, *Ennomos erosaria*, *E. angularia*, *Epione apiciaria*, *Eurymene dolabraria*, and *Selenia lunaria*. Mr. C. D. Wolstenholme then gave an interesting paper on "The Snipe" (*Scolopax gallinago*), describing its structure and habits, with special reference to the remarkable humming sound produced by the male bird during breeding time, supposed to be caused by the position of the wings in the falling flight of the bird. The paper was illustrated with a series of eggs of the snipe, together with a specimen of the bird. He also exhibited an egg of the griffon vulture (*Vultur fulvus*) taken in Spain. A conversation on the various exhibits concluded the meeting.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Monthly meeting, February 26th, the President (Mr. S. J. Capper) occupying the chair. The President, in the course of a short address, referred to the death of an old member of the society, the late Mr. Benjamin Cooke, of Southport, and he gave a short *resumé* of his life as an entomologist. The honorary secretary (Dr. Ellis) read a paper, entitled "Passive means of defence in Insects," in which he briefly noted a number of cases of protective resemblance in various orders of insects, and afterwards alluded to cases of so-called "mimicry" in lepidoptera. During the conversazione, Mr. Robert Brown exhibited a specimen of *Nyssia zonaria* which had remained nearly 20 months in the pupa state, and Mr. J. Wall exhibited scales of lepidoptera under the microscope.

YORKSHIRE NATURALISTS' UNION.—21ST Annual Meeting, Selby, March 3rd, 1883.—This year the Union was received by the Selby Naturalists' Society at a microscopic soirée and conversazione, in the Public Rooms, and their enthusiasm and kindly hospitality to fellow-members from other districts left nothing to be desired. The annual meeting for transaction of business was held at 3 p.m., under the genial chairmanship of the Rev. William Fowler, M.A., of Liversedge. There was a moderately large attendance, numbering about 70 or 80, the following 23 societies (out of 35) being represented:—Barnsley, Beverley, Bradford, Dewsbury, Doncaster, Elland-cum-Greetland, Goole, Halifax, Heckmondwike, Huddersfield (2), Ilkley, Leeds (3), Liversedge, Malton, Scarborough, Selby, Wakefield, and York (2). On the suggestion of the chairman the minutes of the previous annual meeting, being somewhat long, were taken as read. The Shipley Field Naturalists' Club was then admitted into the Union on the motion of Mr. H. S. Ward, seconded by Mr. J. W. Davis, F.S.A., &c., of Halifax. Thanks were then voted to the new subscribers (Mr. Hugh Richardson, Ackworth, and Mr. W. Officer, Hull), and to the donors of gifts to the library (including 24 volumes of British Association reports and a set of the Ashmolean Society's publications.) The following annual report was then read by Mr. W. Eagle Clarke, one of the secretaries:—"The Council, in presenting their Twenty-first Annual Report, congratulate

the members upon the Union having now attained its majority—in itself a strong evidence of vitality—and while considering that it is at present in a sound and healthy condition, more especially as regards its membership, feel that they would be failing in their duty were they not to express their opinion that the attendance at the meetings calls for the serious attention of the members. THE FIELD MEETINGS during the year—for each of which the usual arrangements were made and circulars issued—were six in number. The places visited were—Beverley on Whit Monday, May 29th ; Snaith on Saturday, June 17th ; Scarborough on Saturday, July 15th ; Grassington on Monday, Aug. 7th ; Wakefield on Saturday, Sept. 6th ; Thirsk for Pilmoor on Saturday, Oct. 7th. There have been—probably to a greater extent than in most years—remarkable fluctuations both in the attendance at, and the success of, the meetings ; and while there cannot but be gratification with the manner in which the anticipations of the promoters of some of the excursions were realised, it is matter for regret that at others the attendance was discouraging, particularly as it involved heavy pecuniary loss to the Union in respect of the guarantees entered into for the tea. The smallness of the attendance was not attributable to any inaccessibility of the place of meeting, for the three places with which most disappointment was felt were convenient of access to large centres of population. The weather accounted for two of these failures, as the Thirsk meeting was utterly marred by rain, and the Scarboro' one partially so. The smallness of the attendance at Wakefield is more inexplicable, considering the very central position of that town. On the other hand, the Grassington meeting, fixed for one of the most remote and inaccessible of places, was remarkably successful, both as to attendance and as to the character of the work done ; and the Council feel that this circumstance demonstrates that the members appreciate to the full the importance of arranging for the investigation of localities whose natural history is but little known. RAILWAY ARRANGEMENTS.—During the past year the railway companies have granted us increased facilities. The North Eastern Railway Co. have, in connection with each of our meetings, allowed our members to obtain return tickets at reduced fares to the place of meeting, on production of the stamped card of membership at the booking-office. The privilege has been conceded by all the other companies in Yorkshire for the present meeting, with the additional convenience of its being made available on through tickets. It is hoped that members will avail themselves largely of these concessions, and so insure the success of our future meetings.—THE SOCIETIES in union at the commencement of the year were 31 in number. Out of these, the Huddersfield Scientific Club has virtually ceased to exist. On the other hand five newly established societies, all of them vigorous and flourishing, have been admitted. These are—Beverley Field Nat. Soc., 43 members ; Ilkley Scientific Club, 53 ; Ripon Nat. Club and S. A., 98 ; Scarboro' Scientific Society, 60 ; and York St. Thomas's F.N.S., 47 : total, 301 members. The statistics furnished by the different societies show that

the 35 societies possess in the aggregate 2100 members, which, with the 300 subscribers, shews a total individual membership of about 2400 members—an increase of 322 during the year. PUBLICATIONS.—Part V. of the Transactions is now in the printer's hands, and will be issued as soon as possible, to be followed by the other parts in arrear. Various causes have combined to retard the punctual issue of the Transactions, but arrangements have been made with the view of overcoming these hindrances. Various papers of value have been received during the year for publication in the Transactions. Mr. Porritt's Catalogue of the Lepidoptera of Yorkshire—a work which our lepidopterists have much needed for some time—has been completed, and is now in the hands of the printer. The Report on the Fungus Foray of 1881, with the full list of species then collected, has been completed by Mr. Masee, and papers have been received from the Rev. H. H. Slater and others. It will be well here to point out again how inadequate the present income of the Union is, and your Council would suggest that a systematic effort to increase it should be made. Calculation shows that if the Union possessed 500 regular subscribers at 5s. (not an extravagant number to expect), it would permit of the issue of about 200 pages of printed matter each year, and so enable the publication committee to cope with the large amount of valuable manuscript now awaiting publication. The balance available for this purpose on the amount of the present average income will only admit of about 60 pages per year. It should not be forgotten that the expenses of the meetings and the general management have first to be defrayed out of the income, and that the surplus only—or excess of income over expenditure—is available for the publications. The expenses just mentioned are not, however, liable to increase proportionally with the increase of the income, and they may be considered as practically a stationary amount. Consequently it will be seen that the whole of any increase in the Union's income is available for the publications.—THE LIBRARY, which consists of books and pamphlets acquired by donation or by exchange, has benefitted during the year by some acceptable additions. Besides the exchanges, several members—amongst whom Mr. G. T. Porritt and Mr. C. P. Hobkirk, who have each given a large number of donations, may be cited—have contributed in this way. Mrs. Windsor has presented a copy of the 'Flora Cravoniensis,' and the British Association 24 volumes of their reports. Several numbers of the Mineralogical Society's Magazine, one of which is a geological map of Sutherland, have been received from that society; while from the Tyne-side Naturalists' Field-Club have been received a complete set of seven vols. of the valuable Natural History Transactions of Northumberland and Durham. INCOME.—The number of subscribers has remained stationary at about 300, the withdrawals having nearly balanced the additions to the list. When the arrears of transactions have been overcome, it may be expected that the number of subscribers will again increase. PROPOSED MAP.—On this head there is nothing to report, the

map committee not having met during the year.—In conclusion, your Council trust that the coming year may be one of prosperity, and that their successors will, at the close be able to make a more satisfactory report than the present one.”—THE BALANCE-SHEET, which showed a balance in hand, was also read. There was some discussion as to the heavy cost of some of the meetings, in course of which the secretaries explained that about £4 was the minimum cost at which an excursion could be worked, involving as it did the issue of 2,500 or more copies of a closely-printed circular, and its postage to members, besides incidental expenses. In the case of meetings costing more than this, it was caused by the failure of guarantees which had been given to tea-providers. The report and balance-sheet were then adopted, on the motion of Mr. Thomas Hick, B.A., B.Sc., seconded by Mr. C. D. Wolstenholme, of York. The excursion programme for 1883, as recommended by the Council, was then arranged as follows :—Doncaster for Sandal Beat, Whit-Monday, May 14 ; Filey for Flamborough, Monday, June 11 ; Strensall Common, Saturday, July 14 ; Washburn Valley, Bank Holiday Monday, Aug. 6 ; and Malham, Saturday, Sept. 1 ; being an excursion for each of the Parliamentary divisions of the county. The sixth excursion (the fungus foray), on which a sub-committee had been appointed to consider and report, was left over for the decision of the Council, to whom the sub-committee was directed to report. The invitation from the Barnsley Naturalists' Society, for the following annual meeting to be held in their town, was accepted for the first Tuesday in March, 1884. The election of officers was next proceeded with. Mr. John Gilbert Baker, F.R.S, of Kew, was unanimously re-elected president, on the motion of Mr. Hick, seconded by Mr. John Emmett, of Boston Spa. Mr. Wm. Denison Roebuck and Mr. Wm. Eagle Clarke, F.L.S., both of Leeds, were unanimously re-elected joint honorary secretaries, on the proposition of Mr. Washington Teasdale, F.R.M.S., of Leeds, seconded by Mr. J. J. Stead, of Heckmondwike. Auditors were also chosen, Messrs. B. Holgate, F.C.S., and W. B. Russell, L.L.B., both of Leeds, being re-elected. A letter from Mr. John W. Taylor, of Leeds, was read, wherein he offered, with the view of stimulating original investigation in Yorkshire conchology, two prizes—value one guinea and half-a-guinea—for the best collections (accompanied by remarks) of *Helix arbustorum*, special attention being paid to variation and distribution ; adding that original notes of any kind, whether upon embryology, anatomy, habits, food, or relationship to soil and climate, would add to the merit of the collection, and that neatness of arrangement of the specimens or literary finish in the accompanying notes (however desirable in themselves) were to be regarded as quite of subsidiary importance. Mr. Taylor's offer was accepted with thanks, a hope being expressed that the competitors retain their collections, on the motion of Mr. J. W. Davis, seconded by Mr. W. D. Roebuck. The draft of a new prospectus, embodying the constitution and practice of the Union as set forth in numerous resolu-

tions scattered up and down the minute books, with such changes as experience gained during six years showed to be advisable, was then read by Mr. Clarke. The adoption of the recommendation of the Council that it be authorized was then moved by the Rev. W. Fowler, and seconded by Mr. Roebuck. Mr. Fowler pointed out that a prospectus or circular, setting forth the Union's objects, aims, and methods of procedure, was very much needed, and expressed an opinion that it would lead to a considerable increase in the membership. Mr. Roebuck explained that the principal changes proposed in the existing practice were the raising of the minimum subscription to 5s., and the establishment of an executive, or working committee of ten members, in addition to the president and secretaries. He defended the raising of the subscription, on the ground that the experiment of fixing it at 2s. 6d. had failed, the members of the affiliated societies generally not having taken advantage of so low a minimum to anything like the extent that might reasonably have been expected. It was explained, too, that existing subscribers of less than 5s. who kept up their payments without interruption, and were unable or unwilling to pay more, should retain their privileges at the old rate. The discussion that took place had reference to the tenure of the presidency, the prospectus being altered in this respect to suit the views of the majority of the members present, and the prospectus was unanimously adopted as amended. Thanks were voted to the president; to the secretaries and other officers; and to the Selby Society for their reception of the Union that day. It was now 4-30 p.m., and the meeting was adjourned until 6. In the meantime the sections held their annual meetings, which resulted in the election of the following officers:—The Vertebrate Section elected Mr. J. Cordeaux, M.B.O.U., of Great Cotes, president, and re-elected Mr. W. Eagle Clarke, F.L.S., of Leeds, secretary; the Conchological Section chose the Rev. W. C. Hey, M.A., of York, as president, and re-elected Mr. J. D. Butterell, of Beverley, as secretary; the Entomological Section re-elected both their officers, Mr. Geo. T. Porritt, F.L.S., of Huddersfield being president, and Mr. E. B. Wigglesworth, of Wakefield secretary; this section also passed a resolution inviting Mr. S. L. Mosley to act as recorder in economic entomology, with the view of drawing the attention of members to this important subject; the Botanical Section re-elected their president, Mr. Thomas Hick, B.A., B.Sc., of Harrogate, and their cryptogamic secretary, Mr. Geo. Masee, of Scarborough, choosing for their phanerogamic secretary Mr. P. F. Lee, of Dewsbury; while the Geological Section elected Mr. J. W. Davis, F.L.S., F.G.S., of Halifax, as their president, and re-elected their two secretaries, Mr. J. E. Wilson of Bradford, and the Rev. E. M. Cole, M.A., of Wetwang. A good meat tea was then partaken of at the Londesbro Arms Hotel, after which at 6 p.m. the meeting was resumed punctually at the Public Rooms. The chair was now occupied by Mr. Mark Scott, president of the Selby Naturalists' Society, who introduced Mr. J. G. Baker, F.R.S., to a numerous audience. Mr. Baker having

delivered the presidential address [printed at p. 129 of this volume] a vote of thanks to him was moved by the Rev. Wm. Jessop, of Shipley, seconded by Mr. C. P. Hobkirk, F.L.S., of Huddersfield, and unanimously adopted. Mr. Baker replied, and proposed a similar vote to the chairman, which was seconded by Mr. Thos. Hick, and carried. This concluded the business of the Union, and the remainder of the evening was given up to the examination of the numerous objects of interest which the Selby people had provided for the soirée. Microscopes and objects were shown by Messrs. B. Holgate, F.C.S. (coal-plants), Percy Lund (rock-sections), Jno. Harrison (Naidina, showing peristaltic action, &c.), E. B. Wigglesworth (spiders), R. J. Farmer, J. E. Wilson (better bed coal-slides and rock-sections), Rev. F. Hunter (polarised objects), Thomas Bunker, J. Bennett (vinegar eels), R. Smith (trichinous human muscle, &c.), Miss May Kerdall (vorticellæ), W. Standerling, G. D. Todd (*Bacillus tuberculosis*, or consumption germs), W. N. Cheesman (monads and bacteria), Vincent Taylor, B.A. (a growing seed—*Collomia coccinia*), and others. Of other exhibits, Mr. H. T. Soppitt showed micro-fungi from the United States, and Mr. W. West had sent a series of *Sphagna*, showing the variability of the species. Mr. Joseph Pulleyn had cases of stuffed birds, and Mr. Richard Kendall some cases of butterflies. Insects, &c., were on view for Mr. David Smith. Round the walls were shown an exquisite series of magnified sketches from Nature of infusoria and diatoms, drawn in white upon black cardboard by Mr. J. M. Kirk, of Doncaster; he also shewed animal life in water by means of the electric light and paraboloid. Mr. M. B. Slater exhibited type specimens of the British mosses and hepatics, and Sir Charles Strickland some characteristic liassic, oolitic, and cretaceous fossils. Geological specimens were also shown by Mr. H. Liversedge, jun., F.G.S., and mounted specimens of British and exotic ferns by Mr. Peter Kendall. Mr. W. Denison Roebuck showed to enquiring conchologists living examples of *Limax gagates* from Hampshire, and Dr. J. Mitchell Wilson had bacteria in water, with illustrations of a new method of water analysis. Of other objects, Mr. Washington Teasdale showed an interesting series of photographs, printed by the platinotype process, and Mr. Thomas Bunker a number of Natural History specimens imported with foreign dyewoods into Goole; Mr. T. Ullathorne, a series of measured drawings of Selby Abbey Church. During the evening Mr. R. J. Farmer performed some electrical experiments and exhibited an electrical railway, pump, &c., and Mr. C. H. Bothamley, F.C.S., gave an address on Artificial Indigo (illustrated with experiments), while from time to time music and singing, under the direction of Mr. Wm. Rawling, added to the enjoyment of the visitors. The ladies of Selby must not be forgotten, who provided light refreshments, and were most assiduous and kind in their attentions to the visitors. Altogether, the meetings were summed up by the members as among the most pleasant and social gatherings in which the Union has ever participated.—W. D. R., W. E. C.

Original Articles.

ON THE PRESENT STATE OF OUR KNOWLEDGE OF THE GEOGRAPHY OF BRITISH PLANTS.

(Concluded.)

BY J. GILBERT BAKER, F.R.S., &C.

[THE ANNUAL ADDRESS OF THE PRESIDENT TO THE MEMBERS OF THE YORKSHIRE
NATURALISTS' UNION, AT SELBY, ON MARCH 3RD, 1883.]

ANOTHER important set of facts bearing upon the pedigree of our indigenous plants, is furnished by their distribution beyond the bounds of the island. Some of the common plants of the north temperate zone have an extremely wide dispersion. Let us take a few of our best known ferns as instances. *Osmunda regalis* is spread in the old world from Sweden to Japan, and reappears in the Himalayas, the Alps, and the mountains of the Indian peninsula. In Africa it is found in the Barbary States, Abyssinia, Cape Colony, Angola, and Sierra Leone; and in America it is spread from Canada and the Red River as far south as Rio Janeiro. *Cystopteris fragilis* is found everywhere in Europe and Asia, from Iceland eastward to Kamschatka, and from the Arctic Circle southward to the Himalayas, where it reaches an altitude of 15,000 feet. It reappears in the mountains of Abyssinia, Fernando Po, Bourbon and Cape Colony, in Tasmania, New Zealand, and the Sandwich Islands, and in America is found in the temperate regions both on the north and south of the equator, and in many places in the tropical zone amongst the Andes. *Aspidium aculeatum*, *Nephrodium filix-mas*, and *Pteris aquilina* are spread equally widely. Of the 1425 British species only about 300 are restricted to Europe, whilst 450 reach America, 250 the Himalayas, and nearly 100 the southern hemisphere. We always take for granted that a species has spread from a single centre, and if this be the case, what an enormous amount of time we must allow for this wide diffusion of types to have taken place, and what an amount of change in the configuration of sea and land must have taken place since they first started upon their travels!

Another important field for investigation is the light thrown upon the pedigree of species by the study of our more variable specific types. I can see no solution that will in any way account for a wide mass of facts except the Darwinian one—that between slight individual modifications, varieties, and sub-species and species, no clear line of demarcation can be drawn. Every fresh year teaches us that, even amongst organisms which have been studied as closely as our British flowering plants, specific types that have been supposed to be stable and uniform

are in reality plastic and variable. For instance, within the last year or two Mr. Nicholson has shown us that no clear line of demarcation can be drawn between *Papaver Rhœas* and *Papaver dubium*, and Mr. Arthur Bennett is fast reducing *Potamogeton* to the condition of *Salix* and *Hieraceum*. Within the bounds of Britain we possess about two hundred of what Sir J. D. Hooker and Dr. Boswell call "sub-species"—types of a kind that the majority of descriptive botanists place upon a par with species, but which are not limited quite so definitely. In addition to these 1400 specific types, we acknowledge 300 or 400 named varieties—types between which and their species no clear line of demarcation can be drawn, but yet which are considered to be thought worthy of a distinctive name. It would be a very interesting subject for inquiry what this proportion that exists in our flora, of six species of full rank to every one sub-species, and every two varieties, implies. For my own part, if I were asked to explain it, I could only say that I was completely unable to do so. Although I do not think that any further work in this direction is at all likely to modify the conclusion that has already been indicated, there is a wide field here for collecting and correlating facts, many of them of a kind that can be investigated suitably by a local country botanist with limited leisure. For instance, it would be quite within the scope of anyone with a small garden, to raise from seed for a few years some of the numerous varieties of *Viola tricolor*, and its sub-species *arvensis*, *lutea*, and *Curtisii*, and keep a record of what happened; or to bring half-a-dozen of the native *Epilobium* and *Rumex* into his garden, and make experiments in hybridizing them. Work of this kind can be done far better in a quiet little garden in the country than in a large establishment like Cambridge or Kew. There is no one now that I know of who has any large number of these "critical" British plants under cultivation, like Mr. Watson used to have twenty years ago in his small garden at Thames Ditton.

In accounting for the variation of our more variable specific types, I do not think that the Darwinian principle of the propagation by natural selection of characters that aid the organism in the struggle for existence will carry us very far. In *Rubus*, for instance, in which of all our indigenous generic types we get the widest range of variation between remote extremes without any clear line of demarcation, one can scarcely believe that any varietal or sub-specific type (a few hybrids like *R. pseudo-idæus*, and manifest degradations like *R. Leesii*, excepted) possesses any character or capacity that, in the struggle for life, will give it an advantage over any other. The two facts in *Rubus*

that have most attracted my attention in this connection are these : the first, that in Yorkshire some of the types which though plentiful are sharply limited as regards individuality, in the neighbourhood of London, though not more plentiful, slide off into others through gradual intermediate stages. I have found that this holds good for *R. discolor*, *leucostachys*, and *diversifolius*. The other fact is, that in the interior of the Lake country, round the shores of Windermere, Derwentwater, Ulleswater, and Coniston, the common types of the surrounding country, especially *cœsius*, *corylifolius*, and *discolor*, do not penetrate.

Turning next to the influence of soil, I found that in the North Riding 40 species out of 872 natives, or one species out of every 22, were manifestly influenced in their distribution by a predilection for limestone rock, and that in the same area 40 species were restricted to the neighbourhood of the sea. In this last case, no doubt chemical reasons are the determinant element, but there are two points about the matter worthy of further inquiry. Many of these characteristically maritime species grow inland occasionally, like *Armeria maritima* amongst the Wensleydale lead mines, and *Plantago maritima* on the Teesdale sugar limestone. In some cases, as *Cochlearia officinalis*, we have two well-marked varieties—one on the shore, and the other amongst the mountains ; and we find that many of these types, characteristically maritime when wild, grow easily without any special treatment in inland gardens. As instances I may cite cabbage, seakale, and celery. We want some one who is both chemist and botanist to investigate the circumstances under which these maritime plants grow away from the sea, and explain to us what it implies.

As regards the minute circumstances connected with soil that affect species-distribution, gardeners could teach botanists a great deal, if they would keep their eyes open, in the routine of their daily work. The most valuable recent contribution to our knowledge in this direction is Kerner's "Cultur der Alpenpflanzen" published at Innsbruck in 1864, of which an excellent abstract in English appeared in the number of Mr. Robinson's periodical called "The Garden," for Dec. 10th, 1881. Kerner's observations refer to the plants of the Alps of Central Europe, and in the first place he classifies the species into three groups, according to the amount of humus, or vegetable matter, which they need. In the first group, those that can grow in a soil, poor in humus, he places the alpine Crucifers, Crassulaceæ, Alsines, Silenes, and most of the Compositæ. In the second group, composed of species that grow well on soil composed of vegetable humus and

inorganic detritus mixed in equal proportions, he places the *Potentillas*, *Primulas*, *Gentians*, *Orchids*, *Leguminosæ*, *Umbelliferæ*, *Cyperaceæ*, and grasses. In the third group, which need a soil rich in humus, he places the *Junci*, *Luzulas*, *Heaths*, *Vaccinia*, *Ferns*, and *Lycopodia*. In a second list he classifies the species in three groups, according to whether they succeed best in soil containing lime, or whether lime harms them, or whether they are indifferent to it. Among the lime-lovers he places *Campanula pusilla*, *Cypripedium Calceolus*, *Draba aizoides*, *Dryas octopetala*, *Primula auricula*, *Scabiosa lucida*, *Rubus saxatilis*, and *Phyteuma orbiculare*; amongst the lime-haters he classifies *Allosorus crispus*, *Asplenium septentrionale*, the *Droseras*, *Linnæa borealis*, *Lycopodium alpinum* and *Selago*, *Viola lutea*, *Salix herbacea*, *Trientalis europæa*, and *Scirpus cæspitosus*; amongst the species indifferent to lime he places *Aspidium Lonchitis*, *Gentiana verna*, *Lychnis alpina*, *Saxifraga aizoides* and *stellaris*. And, finally, he again classifies all the species under three groups, according as to whether they grow best in a sandy or a clayey soil, and are indifferent in this respect. So that we get a full classification of all the species noted, made from three different points of view, which is eminently suggestive in its bearing upon their dispersion as wild plants.

We have in the North of England five hill-masses of different and well-marked lithological constitution—the porphyritic Cheviots; the slate hills of the Lake country; our great hill-mass of North-East Yorkshire, made up of lias and oolite; and the great backbone ridge of the Pennine chain, underlaid by limestone grits and shales of carboniferous age. Several years ago I made a calculation* that out of the 201 boreal plants of Britain we had 102 in the North of England, and that out of these, in the Cheviot range there were 38, in North-East Yorkshire 33, amongst the slate hills (which have a damper climate and rise to a higher level than the other three ranges) 79 species, and amongst the Pennine chain in the North Riding, 76. I should like to see this contrast between the four hill-masses worked in detail, not for the montane species alone, but also for the plants of the British type, and for those of the English type that reach up amongst the mountains. How is it, then, in Teesdale there is such a nest of mountain plants concentrated within a limited area at a comparatively low level? Out of the 100 montane plants of the North of England, ten species are almost or quite restricted to an area of a few square miles in the superagrarian zone in Upper Teesdale—a few

* On the distribution of the montane plants of the North of England, in Trimen's "Journal of Botany," Sept., 1871.

square miles which it so chances fall within the bounds of three counties, Yorkshire, Durham, and Westmoreland.

Another point that I should wish to commend especially to the study of the botanists of the north of England, is the distribution of the species of what Watson calls the Intermediate type of distribution. These are about 40 in number, and are concentrated, so far as Britain is concerned, amongst the hills of the north of England. But then they are all, I believe, plants that reappear in Central Europe, and with us they form an outlying colony, widely dissevered from their central area. I believe it would be found, if their general distribution was worked out, that they are species of a comparatively boreal tendency, so far as climate is concerned, and that they have a special affinity for limestone, and that the want of limestone has kept them from spreading northwards into Scotland.

But it is quite time that I should come to a conclusion. In one sense it has been a great pleasure to me to come down to Yorkshire again, after nearly twenty years of absence, and take the chair at the annual meeting of a society that represents more than two thousand of the inhabitants of my native county, banded together for the promotion of Natural Science ; but it has also made me remember how many of those with whom I worked and rambled a generation ago have passed away from amongst us. Since I left Yorkshire how many of the botanists that were then old or middle-aged have gone to join the great majority—Henry Baines, John Nowell, Willam Mudd, James Ward, James Backhouse, John Tatham, Silvanus Thompson, Gerard Smith, Abraham Stansfield, William Bean, John Windsor ; and now we have lost our leader, Hewett Watson, the father of British botanical geography, who, although he left the county at a very early age, was also a Yorkshireman.

Like clouds that rake the mountain summit,
Like waves that own no curbing hand,
How fast has brother followed brother
From sunshine to the sunless land.

Within this last quarter of a century Darwin has pulled up the old tree of Natural History by the roots, and planted it in fresh soil. A new generation has arisen, and in this present paper I have done my best so to direct their steps that they may walk as worthy successors of those whose places in our ranks now know them no more.

ON *CINCLIDIUM STYGIUM*, SWARTZ.

BY JAS. CASH.

THIS moss, which is of arctic or sub-arctic type, occurs in this country only in three recorded localities, namely—at Malham, in the West-Riding of Yorkshire; in the Breadalbane district of Perthshire—on Ben Lawers; and (according to Schimper's Synopsis) at a place called Tuddenham Bog, in Suffolk.* Its natural home is Northern Europe, where, particularly in Sweden and Norway, it is said to be abundant. It is also found in the Arctic regions, being included, with many other British species, in the list of mosses collected by Dr. Lyall during one of the expeditions sent out to search for Sir John Franklin. Its association with such mosses as *Splachnum Wormskioldii* and *Mnium hymenophylloides* leads us to hope that these and kindred species, as yet unknown to us, may also some day be found in Britain.

Moreover, when we find, in a list of forty-eight arctic mosses, no fewer than forty-two which have been recorded as British, the fact seems to indicate a very close correspondence between our own moss flora and that of regions much further north.

The history of *Cinclidium stygium* as a British moss is not a little interesting to Lancashire muscologists, especially those who are old enough to remember its fortunate discoverer, John Nowell. In speaking of Nowell as its discoverer, I merely give utterance to the current belief, though, as we shall presently see, Nowell did not, at the time of the discovery, do more than share the credit with certain muscological acquaintances, namely—John Hanworth of Lobb Mill, and William Greenwood of Lumb Butts. The discovery was made in the summer of 1836. When the moss was picked up on the bog near Malham Tarn, none of the three could identify it. They were, however, acute enough to see that it was a rare thing, and convinced themselves by subsequent investigation—apparently before communicating the moss to any of the experts then living—that it was new to the British flora. I cannot say whether they sent specimens for identification to anyone besides Mr. Wm. Wilson, who at that time (seventeen years before the publication of his "Bryologia Britannica") was known throughout England as the best authority on British mosses; but the presumption is that they did not, if we are to judge

* Since this was written I have ascertained that the moss was found on Ben Ledi, in 1864, by the late Mr. McKinlay (this being the first Scottish locality), and that a year or two later it was discovered near Balquhiddy, by Mr. John Shaw.

by a letter they sent to him dated Sept. 12th, 1836. That letter bore at the foot the joint signatures of Hanworth, Greenwood, and Nowell—and they appear in the order here given—a circumstance which seems to show that no one claimed priority over the rest. It was the first letter, apparently, which had reached Mr. Wilson from the Todmorden muscologists, and I have no doubt that *Cinclidium stygium* was the interesting medium of introduction between Nowell and Wilson, forming the commencement of a lifelong acquaintance, and of extensive correspondence on matters muscological.

The writers intimated to Mr. Wilson the discovery, “in the vicinity of Malham, Craven, June 13th and 14th”—“on a very wet bog near Malham Tarn, a species of moss which,” they said, “appears to us not to be described in volume 2nd, part 1, of Hooker’s ‘Brit. Flora.’” The letter at this point bears a memorandum in Mr. Wilson’s writing giving the name of the moss, *Cinclidium stygium*. The writers enclosed specimens of the moss for Mr. Wilson’s acceptance, with remarks on its general appearance. “It has,” they said, “much the appearance of *Bryum punctatum*. It was growing along with *Hypnum scorpioides* and *Bryum dealbatum*. We will thank you to give us your opinion of it, as we think none more competent than you, who have displayed so much zeal in collecting and investigating the various species of the British musci.”

Mr. Wilson lost no time in communicating the fact of *Cinclidium* having been added to the list of British mosses, to his friend Dr. W. J. Hooker, then Professor of Botany in the University of Glasgow. To the author of the “Muscologia” it was a highly interesting discovery, for in the second edition of that work, published in 1827, he had included this very moss in the list of Continental species of which, up to that time, Great Britain could not boast the possession.* Acknowledging Mr. Wilson’s communication in a letter dated Nov. 28, 1836, he says:—“I am delighted to find that *Cinclidium stygium* has been found in Britain, and hope, from what you say, in fruit.” In a subsequent letter to Mr. Wilson, he wrote:—“I shall be glad to obtain specimens of *Cinclidium stygium*, and to announce its exact habitat.” And again, Jan. 25th. 1837, not having got the desired specimens, he wrote: “My dear Sir—I begin to be anxious to hear from you again, especially upon the subject of *Cinclidium stygium*, of which I am very desirous, as I scarcely need tell you to possess British specimens. Will you intercede on my behalf with the

* It is curious to find *Dicranum Schraderi*, *Mnium turgidum* (*Aulacomnium turgidum*), and *Bryum squarrosum* (*Paludella sq.*) in the same list.

discoverer, and enable me to obtain specimens? for I do not yet know the name of the lucky individual who detected it." After this, Mr. Wilson sent specimens to Dr. Hooker through a friend in Liverpool, as, under the postal system then prevailing, it was impossible to send them direct.

Dr. Hooker wrote, on the 15th February, 1837, to Mr. Wilson a letter, in which occurs the following passage:—"Thank you for having sent to Liverpool for me the *Cinclidium*. Surely the persons who discovered it must be men of some knowledge, and acuteness too; and if so, they deserve to be encouraged."

It is quite certain that the Todmorden worthies received from Mr. Wilson the encouragement of which the Glasgow Professor considered them so deserving. After receiving his acknowledgment of the specimens first sent, they dispatched to him "a number of specimens for general distribution," and in the letter which accompanied them they said:—"Our situation in life (being that of labourers) will not admit of us going so far at *any* time, the distance being nearly forty miles from Todmorden."

At the time of which we write, Hanworth, Greenwood, and Nowell seemed to be pursuing their botanical labours jointly, and it is curious to see letter after letter with their three signatures at foot. There is one dated May 28th, 1837, which though it refers to certain mosses besides that which is the subject of this note, I will take the liberty of quoting in full:—

"Lobb Mill, May 28th, 1837.

"Dear Sir—We received your valuable communication of the 19th November, together with an abundant and interesting supply of rare mosses, such as we have long wished to see, and for which we beg you will accept our most sincere thanks.

"Our reason for troubling you again so early is, that you desired directions to the spot where we found our *Cinclidium*, which will be best found (if you start from Malham) by going directly to the place where the water discharges itself from the Tarn; then turn to your right in the direction towards Gordale. The distance, we think, where it grows is not above a quarter of a mile from the bye-wash, in a hollow place on the moor, on which grow *Carex teretiuscula* and *Menyanthes trifoliata*, which we think will not fail to attract your attention.

"We thank you very kindly for your remarks on *Hypnum flagellare*, which is far from being uncommon with us, growing in nearly all the ravines or Clough holes, but the fruit is always rare. *Leucodon* we have not yet found near Todmorden. *Encalypta streptocarpa* we found on an old wall near Bolton Bridge, Wharfedale, April, 1835. *Hypnum rugulosum* we found in Gordale Scar, near Malham.

“ We take the liberty to enclose a few specimens which we are not just satisfied about. No. 1 is what we had named *Grimmia ovata* at the time we made our list. We found it only in small quantities, and the fruit was very young. We have found it in a better state since. We think it does not agree with your specimens of *G. ovata* ; perhaps it is the *G. Doniana*. [Mr. Wilson makes a note that it is this latter species.] We hope you will forgive us disappointing your expectations. No. 2 is that which we had named *Pterogonium gracile*, but we find that it does not agree with your specimens of that plant. We have never seen it in fruit, but we think the leaves—at least some of them—are two-nerved at the base. [Mr. Wilson’s note is that this moss is *Hyp. catenulatum* ; some of the leaves were two-nerved.] No. 3 we have thought was *Trichostomum microcarpum*, [Mr. Wilson writes “ Not so ”] but the capsules appear rather cylindrical in shape. No. 5 we have thought was *Didymodon flexifolium* [which Mr. Wilson confirms], but we have not seen it in fruit. No. 6 is what we have called *Didymodon rigidulum*—[perhaps an aquatic variety—W.], but you will see that the capsules are cylindrical. No. 8 we think may be *Hyp. albicans*—[“ Probably ”], but we have not seen it in fruit. No. 9 is what we have named *Hyp. murale*—[*H. confertum*], but we think that the leaves are serrated.

“ Perhaps you will think that we are taking too much liberty in presenting these specimens in their present condition, but we trust that you will excuse us, as we have no other person to apply to for information on this subject ; and should we ever be able to render you any service in procuring for you any plants in our vicinity, we shall ever feel happy to do so.

“ We remain, yours truly,

“ JOHN HANWORTH.

“ WILLIAM GREENWOOD.

“ JOHN NOWELL.”

In a P.S. the writers ask for exact directions to *Weissia trichodes* (*Brachyodus trichodes*), near Littleborough.

I do not know what became of Hanworth and Greenwood, but Nowell continued to correspond with Wilson, and in a letter dated October, 1838, he wrote :—“ I have the pleasure to inform you that this summer I have had a botanical ramble to Malham and Ingleborough. I found *Cinclidium stygium* in considerable plenty in the station on Malham Moor ; but unfortunately the finest of the fruit had been eaten off by something, so that I did not get very many specimens in fruit ; but I got a good supply in a barren state. I find the *Hyp. rugulosum* in two or three places in the neighbourhood of Malham, but not in plenty. I found *Weissia pusilla* (*Seligeria pusilla*) on shady rocks in Gordale, and also on Ingleborough, but very sparingly. The following I found in Ingleborough :—*Tetraplodon muioites* (very rare),

Encalypta rhabdocarpa (abundant), *Distichium capillaceum* (in fr.), *Bartramia gracilis* (rare), *Leskea moniliformis* (barren), *Bryum Zierii* (fr. very rare), *Mnium serratum* (rare), *Amblyodon dealbatus*. This I also found in wet places, near Settle, but very sparingly." In a P.S. he adds—"I have found *Weissia trichodes* in several places in the neighbourhood of Todmorden, but not common; I have also found *Grimmia saxicola* (*Campylostelium*) in Ramsden Clough, near Todmorden. The place where *Cinclidium stygium* grows on Malham Moor is not above 500 yards from the outlet of the Tarn, in the direction towards Gordale."

Such is the early history of this interesting moss, in Britain. It still grows in the bog at Malham, and, from the accounts given of its condition and abundance by our friend Mr. Cunliffe, who gathered it so lately as in 1880, it is likely to grace this its first English habitat for many a long year to come.

Cinclidium stygium.—I see, in the April No. of the *Naturalist*, that you will print next month a paper on the history of *Cinclidium stygium*. I think it probable I may be able to give some additional information. I was with Mr. E. Skipper, editor of the "Suffolk Flora," when he discovered the moss growing in a small bog at Tuddenham, near Bury St. Edmund's, Suffolk. It was in November, 1860, that we met with it, but from its habitat supposed it a *Mnium*. Mr. Skipper, however, sent a piece to Mr. John Nowell, of Todmorden, who at once replied it was *Cinclidium stygium*. In that month, and in the November of 1862, Mr. S. found it beautifully in fruit and in good condition, though earlier in the year (September) the fruit was quite immature. I know he sent specimens to a good many botanists—among others, to Mr. Wilson. It was thus, probably, that Dr. Schimper was aware of this locality.—E. N. BLOOMFIELD, Guestling Rectory, near Hastings, April 14th.

Short Notes and Queries.

ARRIVAL OF MIGRANTS IN RYBURN VALLEY.—Willow wren April 2nd, swallow, 13th; martin, 17th; sand-martin, 17th; Ray's wagtail 17th; Sandpiper, April 19th.—F. G. S. RAWSON.

ECONOMIC ENTOMOLOGY.—Having been elected by the Y.N.U. as the recorder of Economic Entomology for the county, I appeal to the members, and to all naturalists who are not members but resident in the county, to help forward this desirable work, by forwarding me notes or specimens, or both, of any kind of insect ravages which may come under their notice. With the help of the members of the Union this might be

made one of the most important items in the Union's work, but without such help I shall be able to do very little. I particularly solicit communications on all insects found to be injurious to field or garden crops, such as daddy-longlegs, turnip flea, beetle, aphides, wireworms, larvæ of various kinds, &c. ; also notes of any remedies which have been found serviceable—either artificial, as chemical dressings, or natural, as the counter-action of other insects, insectivorous birds, &c. Such notes, however small, will be of great service in drawing up a report at the end of the year, which probably will be sent free to all who help forward the work by rendering assistance. I would also ask that readers of the *Naturalist* should call the attention of horticultural and agricultural societies to the fact of such appointment. It will be my duty to forward advice upon the best known and most simple remedies to persons seeking that advice, but such communications must always be accompanied by specimens of the insects, and of the injuries done by them, and any notes or information relating to the same. Miss E. A. Ormerod, F.M.S., has kindly offered to assist me upon the more difficult points. Besides the information asked for above, I should also be glad of such as relates to any kind of insect ravages, either to stored grain, grocery stores, clothing, or any which directly or indirectly affect the interests of man.—S. L. MOSLEY, Beaumont Park, Huddersfield.

FOUMART (*Mustela putorius*) IN YORKSHIRE.—Eight years since, a fougart was seen running across a field at Three Nuns, Kirklees, and shortly after, one was caught in Strangsty Wood, Elland, by Roland Brook, probably the same animal. Seven years ago B. Sykes, contractor, Rishworth, trapped a fine specimen, but has not heard of any in that locality since. The keeper over Clowes Moor informs me that in the winter of 1861-2 he and his father trapped three fougarts ; and fourteen years since in December, he traced one in the snow across Cudworth pastures, which join up to Clowes Moor, and following the trail, he came up with a shepherd and his dog just giving the *coup de grace* to a fine dog or male fougart. The next (and last) instance occurred five years ago, when he trapped one on the moors shot over by Messrs. Whitehead, of the Royal George Mills, Greenfield. During the winter last past, the keepers have captured four stoats or ermines, one a beautiful variety, marked with red stripes. In 1854 two local men caught a pine or beech marten (*Martes foina*), at Romfolly, near Hebden Bridge ; it measured 2ft. 6in. from tip to tip, and had a splendid fur. It was kept in a cage at a public-house, and was exhibited to visitors.—C. C. HANSON.

ADDITIONAL WENSLEYDALE SHELL-NOTES.—I have now to record that, as Mr. J. W. Taylor informs me, the specimens of *Helix rufescens* which Mr. Robert Scharff collected at Hardraw Scar appertain to the variety *rubens*—a variety which has, as yet, not been recorded for Britain in a formal manner. Mr. H. Pollard gives me Hawes as an additional locality for *H. rupestris* ; and Mr. James Ingleby lately sent me

specimens of *Limnæa peregra* from Coverdale, which he found in damp grass in swampy places near the river.—WM. DENISON ROEBUCK, Leeds.

Leptoscyphus interruptus (Nees).—This very rare hepatic has lately been found in Cheedale, Derbyshire, by Mr. G. A. Holt, of Manchester. In Dr. Carrington's "British Hepaticæ," no mention is made of any locality in Derbyshire for this species; it is, however, given in the London Catalogue of British Mosses and Hepatics" for province 8, which includes Derbyshire. Can any reader say if this species has previously been found in Derbyshire, and where? or is Mr. Holt's discovery new to the county?—W. H. P. Since sending the above, with reference to *Leptoscyphus interruptus* (Nees), I find that it is recorded in "Synopsis Hepaticarum," (1844). "In Anglia (Matlock, Derbyshire), leg., W. Wilson."—W. H. P.

Rhizomorpha subcorticalis IN YORKSHIRE.—Mr. C. C. Hanson, of West Vale, has sent us a curious specimen of fungoid vegetation to be named. He writes us that he found it "on stripping the bark off a dead maple tree; it was between the bark and the wood, but adhering to the wood, on which it left a beautiful imprint, and was many yards in length." Being unable to name it ourselves, we sent it to Mr. J. G. Baker, F.R.S., of Kew Herbarium, who determines it to be the celebrated *Rhizomorpha subcorticalis* (see Berkeley's Outlines, p. 42), and that it is an abnormal condition of the mycelium of various species of fungi of the genera *Polyporus* and *Xylaria*, vegetating under the bark. In Sir J. E. Smith's Eng. Flora, by Sir W. J. Hooker, vol. v. pt. 2, p. 235, it is referred to *Xylaria* (*Sphaeria*) *Hypoxyylon*, where it is further remarked—"though, as Fries observes, every production so named is not to be referred to this species. Withering long ago perceived the connection. The editor of the last edition is, however, most probably wrong in referring it to *Rh. imperialis*. I perfectly agree with that most judicious author, M. Fries, as to the desirableness of excluding from the list of fungi all such doubtful productions. Nothing, however, can be more interesting, and, as regards the physiology of these plants, more instructive, than the correct reference of such abortive forms to the perfect species."—We should be glad to learn whether any other observer has come across any specimens of this curious production, and under what circumstances.—C. P. H.

NOTICES OF BOOKS.—"On Cephalozia (a genus of Hepaticæ): its Sub-genera and some Allied Genera: By Richard Spruce, Malton.—Printed for the Author, 1882."—This, the latest work of a distinguished naturalist and explorer, will be studied intently by all who are interested in the Hepaticæ, for in it are given some of the results of many years of careful observation in different parts of the world: whether in the woods, dales and heaths of his native county; or in the South of Ireland botanizing with the late Dr. Taylor; or rambling in the Pyrenees with his friend Dr. Southby; or alone in the wilds of South America; supplemented by years of quiet microscopical study, only interrupted by painful

illness, till of him may appropriately be said

“Old experience *hath* attained
To something like prophetic strain.”

And so, in addition to other important work, we have this unpretentious book with its brown paper back—“dear, as books go now,” as someone remarks, but which we conjecture will soon be difficult to be purchased, as only a limited number of copies have been printed. In it we find, as far as we can judge, food for future years, for no superficial study can grasp the large questions which are raised by the author, and a conscientious student must feel that before he can accept or reject the author's conclusions, he must have a wide and clear knowledge of the plants in question. Here are shown that characters used by other systematists are unreliable, and systems so based are shaken or overthrown by the author's genera reduced in rank, species reduced into varieties, &c., &c. Fortunately the author is not one of those iconoclasts who pull down a system and have nothing to set up in its place, for we find here outlines of a natural arrangement, supported by scientific illustrations, and indications and suggestions of affinities—some perhaps bold, as, for instance, when sketching the affinities of several genera he states that we shall probably find with every tribe a genus having pouched fruit—which, if not found hitherto, has either escaped our notice, or, being weaker than other plants, has succumbed to them in the struggle for place, or has not yet been evolved. It would be difficult to indicate, in the short space at our disposal, the affinities pointed out and the systems suggested, with an account of the characters upon which the author bases his conclusions; suffice to mention that the mode of insertion of the branches on the stem, the origin and structure of the angles of the perianth, the structure of the walls of the capsule, and the number of the sexual organs, are the author's leading characters; and in this memoir is the method proposed by him well demonstrated. Several new genera are proposed by him: one to contain the *Jung. albescens* of Hooker, another the two new species of Dr. Carrington, *Jung. myriocarpa* and *Jung. Nevicensis*. The species peculiar to our flora are all fully elucidated and described, and as they are amongst the most perplexing of any in the tribe *Jungermaniaceæ*, all British hepaticologists are under obligation to the author for making these the special object of his study. Several new additions to our flora are made: *Cephalozia heterostipa*, Carr., et Spruce, which may be lying hidden in many herbaria as an alpine form of *Jung. inflata*, Huds., with which it has some points in common, but is distinguished by its postical branches, some flagelliform, the presence of stipules, and different perianth; *Cephalozia leucantha*, S., found by J. Sim on rotten wood near Banchory, Scotland—a species previously found by Continental botanists in similar localities, but confounded by them with *Cephalozia catenulata* (Huben.) from which it is quite distinct, being of a paler color, leaves of a different shape, &c. *Cephalozia aeraria*, Pears., found about the mouths of old copper mines in Wales is a small species distinguished

from *Cephalozia divaricata* by its inflorescence being on lateral branches, its uncinat leaves, and other characters. A species which had erroneously been looked upon as a form of *Cephalozia connivens* (Dicks.), is named by the author *Cephalozia multiflora*, and from the full description given, there will be no difficulty in determining the *Cephalozia multiflora* of Spruce, whatever there may be of the *Cephalozia multiflora* of other authors. Several species only previously announced as British, are fully described by the author, and their stations given. The book can be obtained from Mr. J. W. Slater, Malton, or Mr. Wesley, Essex-st., Strand, London, 6/-

Rainfall for March.

	Height of gauge above sea level.	Rain-fall.	No. of Days	TOTAL FALL TO DATE.		Date of heaviest Fall.	Amount of heaviest Fall.
				1883.	1882.		
HUDDERSFIELD (Dalton) ... (J. W. Robson)	Ft. 350	In. 1·20	14	8·60	*7·86	7	0·30
HALIFAX... (F. G. S. Rawson)	365	1·50	17	13·20	14·04	19	0·35
LEEDS ... (Alfred Denny)...	183	0·52	18	6·26	†4·84	19	0·26
HORSFORTH ... (James Fox)	350	1·31	14	7·19	‡7·14	19	0·40
PATELEY BRIDGE... (E. Warburton, M.R.C.S., L.S.A.)	436	1·62	13	10·38	§9·01	19	0·37
BARNSELY ... (T. Lister) ...	350	1·39	15	7·09	5·82	19	0·42
INGBIRCHWORTH (do.)	853	1·36	21	11·86	10·38	19	0·42
WENTWORTH CASTLE (do.)...	520	1·59	13	8·92	6·55	7	0·42
GOOLE ... (J. HARRISON) ...	25.	1·29	15	5·65	5·32	19	0·30
HULL (Derringham) (Wm. Lawton)	10§	...	...	...	...	...	...

* Average to date for 17 years, 1866-82. † Average of 29 years, 1853-62 & 1865-83.

‡ Average of 14 years, 1870-83.

§ No Returns.

|| For 4 years, 1880-83.

OBITUARY.—MR. ROGER EARNSHAW.—We have to record the death of one of our most eminent local botanists, at the age of 53. Mr. Earnshaw had been a member of the Ovenden Naturalists' Society since its commencement, and was well known as a botanist far beyond the limits of his own district. During the existence of the West-Riding Consolidated Naturalists' Society he was frequently sent to represent his society at their meetings, and was several times called upon to assist in naming the specimens collected during the day's ramble, this being considered not only an honour, but as a rather severe test of his knowledge of botany. He was one of those humble workers in science who seem to be fast dying out—men who loved to spend their time and money in the pure desire for knowledge, and who, according to the high

authority of Prof. Williamson, F.R.S., "form the life-blood of science," for without them no scientific association can flourish. He was, when well, full of energy and enthusiasm, of a gentle and peaceful disposition, ever ready to help young beginners in the study of botany, and to render all the aid he could to the science he loved so well. A kind father, a faithful husband, and a tried friend, he has gone to his rest without leaving an enemy behind him, and amid the tears and true sorrow of numerous relatives and friends.—J. OGDEN.

Reports of Societies.

BARNSELY NATURALISTS' SOCIETY.—A summary has been given of the remarkable occurrences of the winter season. The most curious or rare have been partly recorded, as Richardson's squa, Oct. 27th; waxwing, Dec. 20, by Mr. H. Garland, who obtained another the year before at same place, Bolton-on-Dearne; and the Slavonian grebe, Jan., 1829. Several gulls, flocks of wild geese and ducks in the Dearne valley, when inundated by the snow floods about Feb. 25th. Thrush, with eggs, noted at Swithen March 4th, this rich songster again becoming more plentiful there than at Hemsworth, and was heard also at Brighthouse April 18th. Blackbirds more numerous at Barnsley, increasing slowly after the winter of 1880-81. The secretary read letters from magistrates and police officers that his application for enforcing the Birds' Protection Act would be attended to. Starlings, meadow-pipits, pied wagtails, partially migrating in the late frosts, are returning in numbers. The grey wagtail has not yet gone to its breeding haunts, the north-west Yorkshire hills. Golden-crested wrens, kingfishers, a few herons, a carrion crow, many jays and magpies, reported in different parts. Several reports received of swallows and other migrants—one swallow as early as April 2nd, another 3rd and 5th; cuckoo 10th and 13th; willow warbler and chiffchaff April 8; tree pipit, 11th. Martins seen by Mr. G. J. Dymond on the 17th at Darfield and Parkgate; redstart and lesser whitethroat near Silkstone. Wheat-ear, usually the first visitant—average date March 26th—seen at Woolley Edge by Dr. White, Apr. 4th; a fine stoat taken by Mr. R. Creighton at Hemsworth, Feb. 26th. A toad was seen by Mr. J. Dewhirst, of Wombwell, in his greenhouse, to cast his black skin and eat it—the new skin being of a whitish tint—Feb. 16th.

BRADFORD NATURALISTS' SOCIETY.—Meeting Mar. 20th, the president in the chair.—Dr. W. H. Evans gave a paper on "Land and Fresh-water Shells," minutely describing their characteristics, mode and tenacity of life, habitat, &c. The lecture was illustrated by a large number of shells, some of them very rare. Mr. Eastwood exhibited, on behalf of Mr. Rudd, a specimen of *S. convolvuli*, taken at Great Horton eight years ago.

MEETING April 3rd, the president in the chair.—Accounts of rambles were given by several members. Mr. Oxley exhibited *Ranunculus*

Lenormandi, in bloom, from Rombalds Moor ; Mr. Soppitt, a species of fungus, *Dedalea unicolor*, and Mr. Bennett, bred specimens of *S. carpini*.

MEETING April 17th, the president in the chair.—Mr. F. Bamford gave a very interesting paper on “Coal and its Distribution.” Mr. Bennett exhibited *Planorbis spirorbis* from Althorpe, Lincoln ; Mr. Illingworth, a number of insects from America ; and Mr. West, mosses and lichens from Ingleton.—H. L. O.

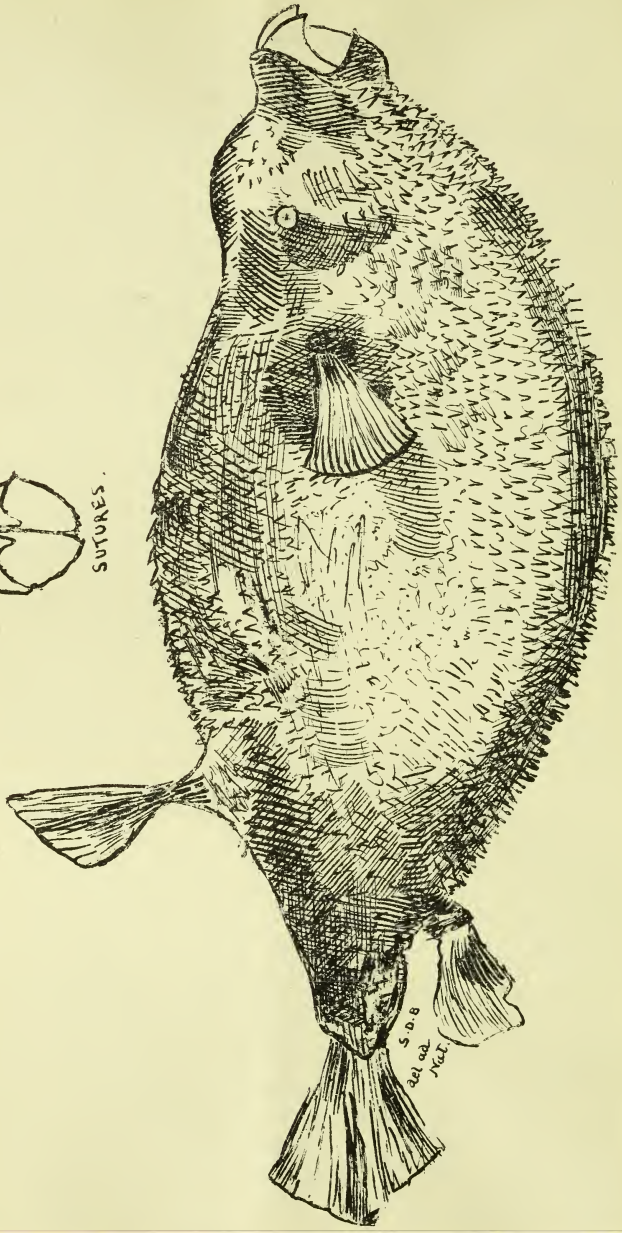
BEVERLEY FIELD NATURALISTS' AND SCIENTIFIC SOCIETY.—Fortnightly meeting, Apr. 5th. Mr. R. Stuart exhibited a nicely mounted case of waxwings, *Ampelis garrulus*, which were shot last December in Lincolnshire, also a pair of water rails, *Rallus aquaticus*, shot on the river Hull. Eggs of the following species were shown by Mr. J. B. Hood, viz. :—Great black-backed gull, *Larus marinus* ; lesser black-backed gull, *L. fuscus* ; herring gull, *L. argentatus* ; common gull, *L. canus*, taken in Scotland ; black-headed gull, *Chroicocephalus ridibundus*, taken at Scotter Moor, Lincolnshire ; and the kittiwake gull, *Rissa tridactyla*, from the cliffs at Flamborough. The president, on behalf of Mr. Key, showed a fine series of butterflies from Singapore, the large size and beauty of the specimens attracting much attention. A collection of British butterflies, chiefly taken in the neighbourhood of Beverley, was brought by Mr. R. Cherry ; Mr. J. J. Marshall exhibited a large specimen of the fresh-water mussel, from Skelton, near York ; and Mr. Butterell a large and brilliantly coloured example of the sea mouse, *Aphrodite aculeata*, sent for exhibition by Mr. Dinsdale, smack-owner, of Hull. It was reported by Mr. Swailes that the first summer migrant, a wheatear, *Saxicola oenanthe*, was observed in Westwood on the 1st April.

MANCHESTER CRYPTOGAMIC SOCIETY.—Monthly meeting, April, Capt. Cunliffe in the chair.—The hon. sec. read notes communicated from Mr. J. Martindale, of Kendal, on *Gonionema compactum*, Nyl. Mr. J. M. Barnes, of Milnthorpe, was elected an honorary member of the society. A communication was read by Captain Cunliffe from Mr. Robert de Buysson, of Brouet-Vernet, France, who had sent specimens of *Grimmia arvernica*, Phil., for the use of the society. The species has recently been discovered as new to Europe, and is fully described in the “Revue Bryologique” for 1882. Mr. W. H. Pearson exhibited the following rare hepatics :—*Jamesoniella Carringtoni*, Balf., found on Ben Lavigh by Messrs. Wild and Holt ; *Leptoscyphus interrupta*, Nees, found in Cheedale ; and *Cephalozia fluitans*, Nees, on Carrington Moss, by Mr. Holt. Mr. Pearson also exhibited *Cephalozia Turneri*, found by himself at Dolgelly (new to Wales). *Hypnum nitens*, from a swamp in Western Manitoba, gathered in March last, was exhibited by the secretary. Mr. J. Cash read a most interesting paper on Mr. Wm. Wilson's first visit to Scotland, 1827, and his first visit to Ireland, 1829-30. It was replete with notes made at that time on the discoveries and rare gatherings of cryptogams and flowering plants, and included some interesting correspondence with Hooker, Arnott, Borrer, Harvey, &c.—THOS. ROGERS, Hon. Sec.

FRONT VIEW OF



SUTURES.



S. D. B.
del. ad.
J. G. T.

Original Articles.

CADDIS-FLY HUNTING IN 1882.

BY A. H. SWINTON.

My friend Mr. King has just written to say he quite envies us southerners in our fine localities for Trichoptera. As chance has it, I have just been reading in the "Bulletino della Società Entomologica Italiana" an interesting account of the pursuit of a *Helicopsyche* in a watercourse at Atrani, of which the males are as black as the prince of Morocco, while the females are garbed in the russet-grey of Nancy; and whose larvæ, previous to transformation, have been noticed to seal their cases with an operculum, and to anchor them to stones with threads of silk. I am quite captivated by the manners of the *Helicopsyche*, and feel rejuvenescent as a Nimrod.

Well, here we are, at the end of June, among the crimson willow herbs and the yellow water-lilies of the river Wey. Beside the lock stand some vine-mantled cottages, and a little wicket takes you on to the rustic wooden bridge that spans the eddies. Listen to the pleasant gush of the water, and the melodious chirp of the young throstle from its cage suspended on the wall: how the bull-frogs of Atrani would have fired a volley of *Brekake, kake, koax, koax, koax*, in soft response and gratitude. Look how invitingly the roses and currants trail their lustrous branches in the darker water. "The very place!" you exclaim, "for *Helicopsyche*." The forest flies rest idly on the rushes, and desecrate not the sweet sounds and shadows of the afternoon with their buzz. Now is your chance for a sweep among the rank grass and rosy flowers: the net has hitched on a thorn, and all the boys are down upon you—"Caught a jack, sir?" The Trichoptera flicker like moths in a barrel of bran, and you wish the boys and spaniel anywhere. Next, some workmen have been rolling in the marsh hay, and here is the proprietor arrived to give you a history of their misdeeds. Now then for the longhorns. Nothing but the yellow *Leptocerus senilis* and the black *Leptocerus aterrimus*. My thoughts revert to the Trichoptera of Atrani, and something whispers to me, perchance there was a time when *senilis* and *aterrimus* were one in matrimony.

Summer is gone, and the scene changes to Glasgow. I am seated with my friend, recapitulating my heroic deeds. As he calls the roll of the slain, I hear *Molanna angustata*, *Leptocerus cinereus*, *Tinodes Waencri*, *Hydropsyche angustipennis*, *Neureclipsis bimaculata*, *Cyrnus trimaculatus*, *Sisyra terminalis*—all from Guildford. Then comes a conventional rarity, *Setodes notata*, only hitherto taken at Weybridge

and at York, on the meanders of the Ouse probably. There is likewise an unseasonable occurrence in the fourth month, provided the Roman numeral be not transposed, of an autumnal sort, *Anabolia nervosa*.

Being in possession of the titles of our books, let us turn to the biography within; for, without a knowledge of the latter, entomology is likely to expire in the mephitic air of the heirloom of verbiage. Now, evidently the rarity is either an importation into this country, a relic of a state of things that is dying out, or its distribution is imperfectly made out; and the untimely occurrence in the dearth of miracles may point to two annual appearances on the Wey. Then as to love or strife. Here is a sly and portly *Phryganea grandis*, female I believe, who when poked from a slimy crevice of my rustic bridge, was as filthily redolent of excrement as any lace wing. Being naturally not too particular, I applied a pocket lens at the time, and brought into view certain clear drops that were exuding from a scent-pore beneath the fourth segment of the abdomen. Another autumnal Trichopteron I netted flying near a rivulet in the island of Bute, possessed a piquant zest for honey; its name, I learn, is *Anabolia nervosa*. What sentiments can insects associate with aromas to us so opposite!

Before taking my leave, I while away a little time looking over my friend's collection. I learn that *Encœcylla pusilla* has an apterous female that waddles over the rushes—(and where will you find a tribe of insects in which this trace of domesticity is wanting?)—and likewise that we have an insular dwarf which attains to great dimensions in parts of the Continent, and in Switzerland becomes mottled. The first of these peculiarities, in *Asynachus canosus*, is by no means startling, since the size of a species merely depends on the amount of food consumed in the immature or larval form; and this will depend on the climate, annual sunshine, or nature of the food, as may be easily made a matter of proof or observation.

Binfield House, Guildford.

LOCAL BIRDS OF THE WILSDEN DISTRICT.

BY E. P. P. BUTTERFIELD.

THE following list (with a few notes) of some of the scarcer or more local birds which breed annually, or which have bred within recent years in this district, may be considered of sufficient general interest to justify their publication. Such a list, even if but a short one, will better serve as a basis to the ornithologist from which to draw a just notion of its avian peculiarities, than a long list of accidental visitors.

It is now generally agreed among ornithologists that, to have a proper conception of the avifauna of a country, such stragglers must be dismissed from consideration as of doubtful value or but little interest. The following observations embody the result of many years' experience, and although all error may not be eliminated, I trust that the moral element which should aim at making them accurate has not been wanting.

Tawny owl (*Strix aluco*).—A pair or two breed annually in Bingley Wood, or about St. Ives, the seat of W. Ferrand, Esq. I saw a brood at dusk one summer's eve, I think in 1881, alight in a sycamore tree beneath which I was standing. They had apparently just left the nest which had been built, I conjectured, in the crevice of a huge rock hard by.

Pied flycatcher (*Muscicapa atricapilla*).—A pair commenced building their nest in a beech tree in Bingley Wood, in May, 1881 (see *Naturalist*, vol. v., p. 171), but from some cause or other they discontinued operations—a result I very much deplored. It is an exceedingly local bird, and I cannot state on what occult principle it selects its breeding quarters, but doubtless it is connected with its food supply.

Dipper (*Cinclus aquaticus*). Breeds not uncommonly every year. My brother and I found a nest last spring near Bingley, which was built in a hole in some masonry constructed to divert a portion of the water of the beck, for the purpose of supplying motive power to drive a waterwheel belonging to a mill. Beside the nest my brother found a little fish, which we both thought had been brought for the young by their parents, but had been accidentally dropped; and on my brother giving it to one of the young, it was bolted with evident relish, which is, I think, a presumptive proof of its ichthyological proclivities, although a great deal has been said and written to the contrary.

Ring ouzel (*Turdus torquatus*).—Breeds abundantly in Harden Clough, and occasionally on Black-hill.

Sedge warbler (*Sylvia phragmitis*).—Although this is regarded as a common and generally-distributed bird, it is somewhat scarcer in this neighbourhood. It has been, however, commoner these last three than the preceding ten years.

Blackcap (*Sylvia atricapilla*).—Not so common, and more local than its congener, the garden warbler. Its song differs from the latter species in being shriller, and performed in a more hurried manner, besides lacking compass and melody.

Wood wren (*Sylvia sylvicola*).—Common in Bingley Wood and Goit Stock Valley, but seems partial to some parts of the wood, and to prefer woods of old growth to young plantations.

Goldcrest (*Regulus cristatus*).—A common bird in winter, though I have not succeeded in finding its nest in this locality up to present time, but it perhaps breeds occasionally, for I saw a brood in Cottingley Moor plantation in 1881, which I felt sure had been bred there. It however breeds plentifully about Drebley, in Upper Wharfedale, especially in fir trees of considerable age; and I cannot assign any particular reason why it should not breed here more commonly.

Cole tit (*Parus ater*).—Plentiful in winter, but it only occasionally remains to breed.

Marsh tit (*Parus palustris*).—Not quite so common in winter as the last-named, but a few more remain to breed, although it is by no means common in the breeding season.

Long-tailed tit (*Parus caudatus*).—Breeds occasionally. I found a nest a few years since, built in a holly hedge. It was an exquisite piece of workmanship, and greatly excited my admiration. I have known of but two nests, neither of which had two holes, as Mr. Selby asserts—one for ingress and the other for egress.

Grey wagtail (*Motacilla boarula*).—A pair or two breed annually in the Goit Stock Valley, particularly near the waterfall, where the “dun umbrage o’er the fallen stream romantic hangs.” Here it is at home, consorting with the dipper.

Ray’s wagtail.—This is one of the species that seems to have a *penchant* for certain localities in which to breed—returning year after year, as I have known it, to nest about a particular slope of a meadow field, or more often in clayey fallow or cornfields, especially where coltsfoot grows, under the leaves of which I have frequently found its nest.

Hawfinch (*Fringilla coccothraustes*).—A pair bred in the neighbourhood of Bingley in the year 1878.

Lesser redpoll.—Breeds plentifully about Manywells and Cottingley Moor plantation.

Twite (*Fringilla montium*).—Common on the high moors in the district, particularly about Denholme, where it breeds in great numbers. It occasionally breeds near the village.

Bullfinch (*Loxia pyrrhula*).—One of Mr. Ferrand’s gamekeepers tells me a pair breed about St. Ives nearly every year. It used to

breed about here more commonly. A few come to feed on elderberries every autumn on Blackhills.

Spotted woodpecker (*Picus major*).—A pair has bred in Bingley wood for two or three years successively. I believe it leaves this locality in autumn, returning in February.

Creeper (*Certhia familiaris*).—Common in winter, but very rarely remains to breed. It is an interesting sight, and one which never palls upon my sense from its frequent repetition, to see it busily engaged, running up the trunks of trees, in search of food. It is almost invariably in company with titmice in winter.

Kingfisher (*Alcedo ispida*).—It is not so common in summer as it formerly was. I found a nest containing young in the Goit Stock Valley a few years ago, but have not found one since.

Nightjar (*Caprimulgus europæus*).—Breeds on Blackhills every year. I once found two young nightjars in Cottingley Moor plantation, and it was quite obvious they had been hatched in the place where I found them, although there was not a trace of a nest, not even a slight depression in the ground, and judging from the relative sizes of the young birds, one of them must have been hatched fully a week before the other.

Stock dove (*Columba *Ænas**).—Several pairs breed about Mr. Ferrand's estate every year. My brother and I found a nest in March, 1881, at the old ruins in Bingley Wood, which we at first mistook for the nest of a ring dove. During the same summer we got very near a pair, without at all disturbing them, in Bingley Wood.

Common sandpiper (*Totanus hypoleucos*).—About the Manywells reservoir, a pair, and sometimes two, may be seen every summer. I shall never forget my first flushing an old bird from its nest. It rollicked and tumbled about in front of me, pretended to be incapable of flying, and screamed so piteously that it was with some difficulty I restrained myself from giving it a chase, although I knew it was all a "pious fraud." Usually it is strictly terrestrial in its habits, yet one which I saw in the Goit Stock Valley, a few years since, could perch on trees with great facility, and should exigency require, it will betake itself to water and swim with apparent ease, as I once witnessed one which had been disabled with a gun-shot wound, plunge into the river Wharfe to elude its pursuers, and swim to a point beyond the middle, when, upon seeing my brother and I on the opposite bank, it turned round and swam again to the left bank, where it remained concealed amongst the tangled mass of roots.

Common snipe (*Scolopax gallinayo*).—Breeds not uncommonly about marshy places in the immediate neighbourhood, but more frequently about our moorlands bogs.

In referring to the foregoing list, it will be seen at a glance from what we know of the habits of the birds contained therein, that the district to which the notes apply is of an elevated or sub-alpine character.

NATURAL HISTORY NOTES FROM SOUTH AFRICA.

(Continued.)

BY S. D. BAIRSTOW, F.L.S.

I AM dwelling somewhat lengthily upon the Mimosas, for they took a strong hold of my "first impressions." Their blossoms* are powerfully alluring to vast swarms of insects, and a sunny day amongst them is as a night, wind due west, spent amongst the sallow catkins, haunts of revelling Noctuas at home. I give an example. At Fort Beaufort, the other day, from one solitary tree I bottled four specimens comprising three species of Longhorn beetles, three species Buprestis, two Chrysomelas, and eight Cetonias (amongst the latter a few *Aulica*), all different species. Besides these there were hosts of butterflies, chiefly *Lycæna*, and other inebriates. This bush flourished on the town-side of the river Kat. I crossed the bridge, and tramping miles of country with limited success, returned to find the scene of early happiness bright and glittering in Entomon splendours, and encircled by a million winged fairies whose musical instruments agreeing in difference, appeared to produce one humming note.

The Batrachians are a curious group of creatures here, but it was upon the Mimosa I saw for the first time my trusty little friend the tree-frog *Hyperolius (Rappia) Horslockii*, which Mr. Trimen informs me occurs in many parts of South Africa, and also in Madagascar. You may be acquainted with the European *Arborea*; you may know that the tree-frog exhibits a dual capacity for adherence: first, the toes terminate in distended, rounded, flattened fashion, and are naturally endowed with a remarkable viscosity, as I shall prove; second, the abdomen is blessed in "means to a similar end," being capable of glandular depression or expansion. The hind-legs are very long, and trustworthy as propellers or jumpers. I brought home the specimen referred to, and placed it on my table, intending to "spirit" him away

* They give forth a delicious fragrance. Sugaring does not pay during the period of bloom.

speedily, when lo ! and behold ! the torpid imp of insignificance, with ne'er a hint or caution,

But, with mien of 'scaping thief, he jump'd right on my cabinet door,
Squatted on a glazed window that beautifies my cabinet door,
Jump'd, and squat, and nothing more.

—in other words, he leaped at one bound from my table-top on to the glass of my cabinet door—a distance of four good yards. I was much amused to see how “pat” he deposited himself, not screwing and twisting about to ensure comfort, like a dog. Several ladies who were *in* the room at this moment also leaped *out* of the room.

In my first ramble I was gratified in securing a fine specimen of one of the Neuroptera, with long linear hind-wings over twice the length of its body. One might be excused for mistaking it for a Dipteron with prolonged poisers. Another insect was a stranger to me—one of the peculiar antennæ-clubbed Neuroptera, belonging, I think, to the genus *Ascalaphus*. It is a most voracious creature.

Another fly*—a dark, murderous blood-sucking rascal of about an inch long—was common, humming about, sounding death-knells to victims. He is a terrible fellow, and will attack a lovely *Anthocaris* with as little compunction as a brother of his own order. I have often watched him pretending to snooze at rest on a rock, then pouncing,† running, or flying in a direct way upon an innocent fly. A large species of *Ophion* frequents low bushes. *Iphiolax* (and doubtless *Vipio*) is represented by many and beautifully variegated species. I should imagine Vollenhoven's surmise that these genera may be accounted exotic was perfectly accurate. They include various interesting Ichneumous. Chrysidids I do not consider numerous, and saw-flies require much patient hard work. Glancing momentarily into the world of Hymenoptera, consolidating a grand majority of Ichneumons within a restricted area, those having dusky wings of indefinite visible neuration and interlacing, predominate. The same perhaps may be said of the bees, wasps, &c. There are black wing-forms, blotchy black, apically black, but the transparent forms bring up the rear. Unless, therefore, large series of specimens are compared, we cannot readily determine them. All the more difficult are they to recognise on the wing.

The following list of butterflies completes my first day's observations :—*Pieris Hellica*,‡ *P. gidica*, *P. charina*, *Anthocaris achine*, *Colias electra*,‡ *Danais chrysippus*, *Pyrameis cartui*, *Erebia sabacus* (n. sp.),

* Dipteron—most likely one of the *Asilidæ*.

† The legs are admirably provided with bristles for “gripping.”

‡ These were the commonest butterflies.

Chrysoplanus lara, *Zeritis chrysaor*, *Z. perion*, *Z. thyra*, *Pyrgus elina*, and several other species I failed to identify. I am quite astray amongst the Mantidæ. They are quite foreign to me, but the yellow forms appear to mimic the plants which they frequent, even as do the yellow spiders and others. Of the Cicadæ and Arachnidæ I shall speak later on.

My premier and sweeping impression of faunal characteristics was one pertaining to philosophy or sentiment. It was this: "How grand are the provisions which Nature ordains for such frail creatures as insects!" I might adapt the same inference with reference to the higher animals. She uses her blessings with admirable discretion, and those who study "utility" have a giant task alone to discover the organs of defence and aggression, and the means whereby the sexes are attracted. The task grows big indeed when we peer into the maze of Nature's creative purposes, and method of dovetailing *this* to *that*.

Altogether, I wrote down my first ramble "profitable," and of course I include the fine-feeling romances in this verdict.

Now a word or two about an able article which appeared in the *Entomologist*, some couple of years ago, on the Rhopalocera of Natal. It was both gratifying and disappointing. It is pleasing to know that we have such an earnest and painstaking naturalist in our midst, hailing more especially from Africa's garden. I should feel less disappointed had that article first passed the scrutiny of our meritorious curator, Mr. Roland Trimen, of wide reputation as author and gentleman. He it was who sifted the *debris* of a scattered literature and constructed a firm basis of reference, being assisted ably by the *crème de la crème* of our Colonial entomologists, and rendering, on all occasions, Cæsar's due *unto* Cæsar. Personally, I should no more think of registering a new take unless it were submitted to Mr. Trimen than should I think of penning these words minus my fingers. Had not the article referred to commenced with the following paragraph, it would never have been touched upon by me: "... .. *but the list (Trimen's) is evidently incomplete, since I have taken several new species myself.*" I ask, what guarantee has the writer that *his* new species *are* new? I ask, is there such a thing as completion or perfection to discovery? For my own part, during a short space of time, what with home and colonial aid, a long list of new species is speedily metamorphosed, doubt precedes certainty, commonness perhaps rarity; and, indeed, an intimate contact with our unpretending yet well-informed colonists, who do not always publish their knowledge to the world, has

gone far in proclaiming my own impoverishment. As Miss E. A. Ormerod very tersely puts it (and especially is this desirable in our Colonies), “the chief thing seems to me, to have a *centre* that cares for the surroundings.” Mr. Trimen, therefore, I regard as the centre of butterfly lore, not self-constituted, but acknowledged as the leading spirit by all. Considering general beauty, specific variation, diversity of form, and structural attractiveness of our insects, taken in order of merits, or merits of order, my first impressions give precedence respectively as follows:—

Coleoptera.

Hymenoptera—Diptera.

Orthoptera.

Lepidoptera.

Hemiptera.

Arachnida.

Neuroptera.

A general survey—casual or concise—from visitor or native, results in confirming the appointment of Coleoptera to the first place of honour. Aggregating all the species which occur in the eastern districts alone, from Cape Agulhas to Durban, it might be possible to under-compute the whole at a quarter of a million. I do not doubt a collector working regularly year by year, would add daily to his list of species. Is it not, therefore, singular and lamentable that home entomologists—whose advantages are so pronounced—spend their time almost exclusively in the treatment and study of threadbare subjects, whilst thousands of foreign species remain unworked, unknown, and when willing hands of willing entomologists droop from sheer destitution, in absence of material aid, and mutual intercourse. Specialists do certainly serve their day and generation, but generalists must take the lead. In a country like South Africa, conforming to an order or a genus means snatching at gold when diamonds surround—another term for heartache. Heaping up collections is a secondary affair. Walking out of darkness into light precedes.

I may not bid adieu to the dear old Coleos until I have mentioned an early impression relating to protective instinct, or protective provisions. Beetles exist capable of ejecting an acidulous secretion as an obstacle to, or a means of, ejection from depredatory enemies. *Anthia 10-guttata* belongs to these blockaders, and directs its formic acid battery with tolerable success, forcible enough to cover long distances. Occasionally when my foot has been deposited gently upon an enraged captive, the liquid has actually reached my eyes, causing

a severe smarting sensation of pain, and smelling palpably of nitric acid. I could have testified to its identity. It produces likewise a similar yellowish effect. Dr. Palmer, of Fort Beaufort, assures me that venomous reptiles, and various other vertebrates, discharge formic acid. A friend sent to me a singular fish, one of the *Plectognathi*—a species of *Tetraodon** (Plate vi.), first cousin to *Diodon*, referred to by Darwin in his “Beagle Experiences.” The specimen was quite fresh, and recently captured. I had it preserved, and the taxidermist told me that his venturesome cat, intruding too imprudently within museum precincts, bit off forbidden flesh, and biting—died—a poisoned thief. Formic acid again, no doubt! The spines of *Tetraodon*, I believe, affected my flesh, and this fact suggested the following query to my mind, viz. :—When *Tetraodon* is inflated, floating helplessly on or near the surface of the sea, does it discharge poisonous matter at will for self-protection? “It fills with air a thin and extensive membranous sac, which adheres to the peritoneum the whole length of abdomen. When thus inflated it rolls over and floats belly upwards, without any power of directing its course.” When the tiger claw (!) jaws of this peculiar fish are brought to market, they may realise a fancy price.

You will remark Hymenoptera and Diptera in my list are classed co-equally, but I omit Formicidæ from the former. The ants constitute a world unto themselves. An interesting species of *Odynerus* has often arrested my attention. It makes a nest in the stalk of some *Ornithogalum*, and continues a recess for concealing or burying carcasses of larval-slaughtered Diptera. Another species I took, some time ago, alive in a mud cocoon of some lepidopterous insects. There was no hole of egress. One remarkable wasp—a rarity—deserves special treatment. Its body is covered with a soft greyish flavescent pile, sparingly distributed, black antennæ thickly pectinated, longer than thorax, thorax and scutellum deeply rufous, metathorax distinct, shapely and tuberos. Abdomen: base of seg. 1 having narrow greyish fulvous band, discontinued beneath. Middle of seg. 3 with corresponding band, broader, extending around abdomen, narrowing on under side. Legs pilose, apical tibial spines conspicuous and fulvous. Wings: smoky black, of varying depth, glossy and semi-transparent, with dark-blue tinge, obscuring towards disc, and forming a distinct dirty band. Fore wings having a decided grey streak, bisecting radial areola to nerve and continued almost at right angles to

* Trimen.

edge of disc, at top of proediscoral areola and irregular triangular spot of grey. First humeral clearly defined, pale smoky. Hind wings smoky, deeper than in fore, converging from radial to anal margin. Probrachial areola pale smoky, very distinct, long $\frac{1}{2}$ in.

(To be continued.)

Rainfall for April.

	Height of gauge above sea level.	Rain-fall.	No. of Days	TOTAL FALL TO DATE.		Date of heaviest Fall.	Amount of heaviest Fall.
				1883.	1882.		
HUDDERSFIELD (Dalton) ... (J. W. Robson)	Ft. 350	In. 3·04	10	11·64	*10·05	28	0·98
HALIFAX... (F. G. S. Rawson)	365	2·96	11	16·16	19·84	28	0·88
LEEDS ... (Alfred Denny)...	183	2·85	13	9·11	†6·69	28	0·99
HORSFORTH ... (James Fox)	350	3·46	11	10·65	†9·77	28	1·05
PATELEY BRIDGE... (E. Warburton, M.R.C.S., L.S.A.)	436	3·23	10	13·61	§9·98	28	1·06
BARNSELY ... (T. Lister) ...	350	3·29	10	10·48	9·35	28	1·13
INGBIRCHWORTH (do.)	853	3·34	10	15·20	14·41	28	0·90
WENTWORTH CASTLE (do.)...	520	3·29	10	12·21	10·52	28	1·00
GOOLE ... (J. HARRISON) ...	25	2·15	10	7·80	8·68	29	0·50
HULL (Derringham) (Wm. Lawton)	10	1·60	14	7·01	5·75	19	0·39

* Average to date for 17 years, 1866-82. † Average of 29 years, 1853-62 & 1865-83.
‡ Average of 14 years, 1870-83. § For 4 years, 1880-83.

Short Notes and Queries.

NATURAL HISTORY NOTES FROM WHARFEDAILE. — The following observations were made in Wharfedale during a three days' walk, on May 14th, 15th, and 16th, from Ilkley to Grassington and back, taking both sides of the river. BIRDS.—Pied flycatcher: three pairs at Bolton Abbey, one pair at Grassington Bridge, one pair at Grass Wood—all in song. Goldcrest: one pair in the Lythe, near Grassington, and one pair in Grass Wood, in song. Bullfinch: one pair at Grass Wood. Swift: numerous at Ilkley on the 14th. Grasshopper warbler: one heard at Nessfield. Sandmartin: nests at Ilkley, Burnsall, and other places up the river. Lesser whitethroat: one heard at Appletreewick. Nightjar: one seen at Grass Wood. Blackcap and garden warbler: in Bolton Woods only. Corncrake and chiffchaff not heard. SHELLS.—*Vitrina pellucida*, *Zonites cellarius*, *Z. allianus* (Ilkley), *Z. nitidulus*, *Z. cristallinus* (Burnsall), *Helix arbustorum*, (type and *flavescens*), *H. nemoralis*

(type, major, and minor), one, three, four, and five-banded—all at Grassington. *H. hortensis*, five-banded, Grassington; *H. lapicida*, very common at Grassington on the walls; ditto, minor (?); *H. rufescens* common—one contortion with spire much raised; ditto *alba*, Grassington, on walls; *H. hispida* common; *H. sericea* and *H. aculeata*, Ilkley; *H. rotundata* common everywhere; *H. rupestris* on walls at Grassington; *Bulimus obscurus*, Ilkley; *Pupa* (?) Grassington; *Balea perversa*, Grassington Bridge, on walls; *Clausilia laminata*, Ilkley; *C. nigricans* common; ditto *dubia*, Grassington; *Zua lubrica*, var. *lubricoides*, Ilkley; *Succinea putris*, the Lythe at Grassington; *Limnæa peregrina*, Grassington; *Ancylus fluviatilis*, ditch at Burnsall; *Cyclostoma elegans*, on a bank between Grassington and Burnsall, a few yards from the river (dead shells); *Helix cantiana* and *H. aspersa*, common shells on the sandstone—seem to be absent or rare. MAMMALS.—One shrew *Sorex araneus*, caught near Bolton; one bat, not identified, caught at Hebden; hedgehog at Grass Wood. PLANTS.—*Lathræa squamaria* in flower at Bolton; oxlip (*Primula elatior*) in flower at Barden.—GEORGE ROBERTS, Lofthouse, May 18th, 1883.

Reports of Societies.

BARNSELY NATURALISTS' SOCIETY.—May 8th, Mr. T. Lister, president, in the chair. In the Botanical and Entomological Sections not much of importance was added to former reports. The list of spring migrants nearly completed by the following dates:—Whinchat, reported near Wakefield, April 2nd; Ray's wagtail, 11th; redstart, 18th; nightjar, 16th; sand martin (in flocks), 22nd; sedge warbler, 28th; grass-hopper warbler, 30th; sandpiper, 28th (partial migrant); stone-chat, 18th (partial migrant); land-rail, May 1st (killed by telegraph wire); lesser whitethroat, first heard May 7th. Several scaup ducks, a few wild geese, coots, kingfishers, observed about the pools and streams.—THOMAS LISTER.

BEVERLEY FIELD NATURALISTS' AND SCIENTIFIC SOCIETY.—The above Society have held a most successful conversazione and exhibition in the Norwood Rooms during the week ending 21st April, and we regret that space will not permit of a lengthened account of it. The exhibits were included under the following heads:—natural history, art and archæology, scientific apparatus, geology and microscopes. Several interesting lectures were delivered during the week, including—on the Boulder Clay, by Rev. E. M. Cole; on Coal Gas, by Mr. E. Bryan; on the Chalk, by Rev. E. M. Cole, and on the Wold-dwellers, by Dr. Stephenson.

FORTNIGHTLY MEETING, 3rd May, the president, Mr. J. A. Ridgway, F.R.A.S., in the chair. The following presentations to the Society were announced, and thanks voted to the donors:—Three pamphlets, on “the White Chalk of Yorkshire,” on “the Red Chalk,” and “the Origin and Formation of the Wold Dales,” by the Rev. R.

Maule Cole, M.A.,—by the author. A case of sea birds, specially representing those breeding in the cliffs at Flambro', by Mr R. Stuart, and a fine specimen of coral from America, by Mr. R. Whitton. Mr. Swailes, secretary of the Vertebrate section, reported the arrival of the under-mentioned migrants :—Wheatear, April 1st, willow-wren, April 6th, chiff-chaff and yellow wagtail, April 7th, swallow, April 12th, tree pipit, April 18th, cuckoo, April 24th, lesser whitethroat, April 25th, whinchat, April 27th, sedgewarbler, April 29th, sandmartin, April 30th, landrail and whitethroat, May 2nd. The specimens exhibited included a robin's nest, found near Skidby, and built in an old American meat tin, shown by Mr. R. Ridgway, and a number of crabs brought by Mr. Butterell, amongst which were *Portumnus holsatus*, *Portumnus latipes*, *Hyas coarctatus*, *Corystes cassivelaunus*, *Cancer pagurus*, *Carcinus moenas*, and a species of *Ebalia*.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting March 19th, the president (Mr. S. J. Capper) in the chair.—The attendance included several lady visitors. The Rev. S. Fletcher Williams read a paper on "Louis Agassiz," in which he gave a biographical sketch of the life, work, and character of that great naturalist. He alluded particularly to his attitude of antagonism to Mr. Darwin, Agassiz throughout maintaining a belief in specific creation. During the conversazione which followed the lecture, there were exhibited, through the kindness of Mr. T. J. Moore, the curator of the Derby Museum, one large and three small photographs of Louis Agassiz. Mr. E. Dukinfield Jones exhibited four species of *Attacus* and a drawer of *Hesperidæ*, collected during his residence at St. Paul's, Brazil; and Mr. J. R. L. Dixon displayed a fine specimen of the death's-head moth (*Acherontia Atropos*), captured at Eastham.

MEETING, April 30th, the president in the chair.—The hon. sec. (Dr. J. W. Ellis) was appointed Recorder of Economic Entomology for the counties of Lancashire and Cheshire. After the reading of a number of communications, Mr. E. D. Fish read a paper entitled "Notes on the Study of Entomology," in which he recommended the study of the mature insect, its habits, its uses, and not only endeavouring to obtain a knowledge of what injury it or its larva is capable of causing, but also of what benefit it is. He considered utilitarian entomology, in this sense, the most valuable of all branches of the science. He specially deprecated the passing over of minute insects as being of little consequence, believing that the smallest objects in animated nature often possess greater power for good or evil than larger ones. During the conversazione Mr. Wall exhibited Hydræ, ova of water snails undergoing development, &c., under the microscope.—J. W. ELLIS, Hon. Sec.

YORKSHIRE NATURALISTS' UNION.—DONCASTER, May 14th.—The Yorkshire naturalists opened the season of 1883 on Whit Monday (Easter falling very early) at Doncaster, the object being to investigate the

productive entomological localities of Green Farm Wood and Sandal Beat, for which permission had been most kindly granted by Capt. Brown, Mr. Winter Cockill, and Mr. Councillor Brundell. Parties left Doncaster station at 9.15 and 10.15 a.m. for those places, under the charge of Messrs. George Tindall and M. H. Stiles. Other parties left at the same hours, under the guidance of Mr. J. M. Kirk and Dr. J. Mitchell Wilson, for Potteric Carrs ; and bodies of members explored other localities in an independent manner, one taking the Gravel Drain and other dykes towards the borders of Lincolnshire, and others the old level of Hatfield Chase. All these parties, as will be noticed, were designed for the exploration of the districts lying east and north-east of the town. For the geologists, however, these districts offered no special points of interest, and a party was organized under the leadership of Mr. T. H. Easterfield, for Balbey, Warmsworth and Conisborough. All parties met at tea at 4-30 p.m., at the Angel Hotel, and afterwards the business of the sectional and general meetings was transacted at the Guildhall. At the general meeting Mr. J. W. Davis, F.S.A., F.L.S., &c., one of the vice-presidents, was voted into the chair. The minutes of the Thirsk meeting, last year, were read by Mr. Wigglesworth (who, in the absence of Mr. Clarke, assisted Mr. Roebuck in discharging the duties of the secretariate), and confirmed. The roll of the 38 societies in the Union being called over, it was found that the following 20 were represented :—Barnsley, Bradford (3), Dewsbury, Doncaster, Driffield, Elland-cum-Greetland, Goole, Halifax, Huddersfield (2), Hull, Leeds (3), Ovenden, Sheffield, Wakefield, and York St. Thomas. Of individual members the attendance was about 60 or 70. Two new societies—the Bradford Microscopical Society, 61 members, and Rotherham Naturalists' Society, 63 members—and three new members—Mr. R. W. Kendall of Selby, Mr. P. W. Dawson of Hull, and Mr. H. S. Ward of Bradford,—were elected. A vote of thanks was then proposed by Mr. C. P. Hobkirk, F.L.S., of Huddersfield, and seconded by Mr. Thomas Lister of Barnsley, and unanimously adopted, to Capt. Brown, Mr. Winter Cockill, Mr. Coun. Brundell, Mr. Senior, Mr. Gibson, Mr. Dearden, and Messrs. Crawshaw and Son, for permission to visit their respective estates or works, and to the Doncaster Microscopical Society and its members for their co-operation and assistance. The reports of the sections were then taken. Mr. Thomas Lister of Barnsley, who had presided over the Vertebrate Section, with Mr. Thomas Bunker of Goole acting for the secretary (in the absence of both the sectional officers) stated that 17 summer migrants and 28 resident birds had been noted, and also four mammals, no reptiles, three amphibians, and four fishes. The migrant birds were—the white-throat, sedge warbler, swift (numerous), swallow, martin, landrail, whinchat, willow warbler, wood warbler, blackcap warbler, tree pipit (numerous), chiffchaff, cuckoo (abundant), yellow or Ray's wagtail, nightingale, and spotted flycatcher (seen by Mr. Bunker on the borders of Hatfield Chase). The residents were the skylark, meadow pipit,

chaffinch (numerous, and nesting), starling, wren, jay, marsh tit, grey tit, blue tit, hedge accentor, rook, lapwing, linnet, sparrow, yellow-hammer, bunting, black-headed bunting, redshank, curlew, partridge, pheasant, robin (nest and six eggs), greenfinch, song thrush, missel thrush, black-bird, greater spotted woodpecker (one given to Mr. Bunker which had been taken out of a jay-trap in one of the woods), and black-headed gull. The other animals were the rabbit, squirrel, mole and hedgehog, frog, smooth newt and great-crested newt, eel, loach, pike, and stickleback. The Rev. W. C. Hey, M.A., of York, president of the Conchological Section, reported that land mollusca had been very meagrely represented, and that the fresh-water mollusca had been collected partly in Potteric Carrs, and partly in the river Torne and the Gravel Drain. Thirty-four species had been noted—21 freshwater and 13 land-shells, viz. :—*Pisidium pusillum*, *Bythinia tentaculata*, *B. Leachii*, *Valvata piscinalis*, *Planorbis albus* (Gravel Drain only), *P. vortex*, *P. spirorbis*, *P. carinatus*, *P. complanatus*, *P. corneus*, *P. contortus*, *Physa fontinalis*, *P. hypnorum*, *Limnæa peregra* (also its varieties *ovata*, *acuminata*, and *oblonga*, the two latter near Blaxton Grange), *L. auricularia* (river Torne), *L. stagnalis*, *L. palustris*, *Arion hortensis*, *Limax agrestis*, *Succinea putris* (Potteric Carrs), *S. elegans* (Blaxton Grange), *Vitrina pellucida*, *Zonites alliarinus*, *Z. crystallinus* (Cantley) *Z. fulvus* (Cantley), *Helix hispida*, *H. nemoralis*, *Vertigo pusilla*, *V. edentula* (the last two in Cantley Park) and *Zua lubrico*. For the Entomological Section both its officers reported. The president, Mr. G. T. Porritt, F.L.S., reported, upon the lepidoptera, that but few species had been observed, owing doubtless to the recent long-continued east winds. Larvæ of *Geometra papilionaria* and *Cheimatobia boreata* were beaten from the birches in Green Farm Wood, whilst searching for larvæ of *Phycis betulella*; this latter species is usually common in the wood at this time, but probably had not yet begun feeding this late spring. Mr. Porritt's remarks were supplemented by Mr. Geo. Tindall, of Doncaster, who had acted as leader during the day. Mr. E. B. Wrigglesworth, of Wakefield, and the Rev. W. C. Hey, M.A., of York, reported the following coleoptera as having been taken, among many other species :—*Sylpha rugosa*, *S. thoracica*, and *S. atrata*, *Necrophorus ruspata* and *N. numata*, *Apion violaceum*, *A. miniatum*, *Cionus blattaricæ*, *Pterostichus vulgaris*, *Timarchia levigata*, and five species of *Coccinellide*—all in the Sandal Beat and Green Farm Woods; and the following from Potteric Carrs :—*Dytiscus marginalis*, *C. fuscus*, *Ilybius ater*, *Agabus Sturmii* and *A. bipustulatus*, *Hydroporus lepidus*, *H. dorsalis*, *H. reticulatus*, *H. pictus*, *H. angustatus*, *Haliphus ruficollis*, *Hydrobius fuscipes*, *Aphodius prodromus*, *Anchomenus prasinus*, *Pterostichus madidus* and *P. vulgaris*, *Phædon tumidulus*, &c., &c. Hymenoptera and hemiptera were also plentiful, but the latter mostly in immature stages. For the Botanical Section, Mr. P. F. Lee, of Dewsbury, secretary, reported upon the flowering plants, and Mr. Wm. West, of Bradford, upon the cryptogams. About 30 species of mosses were collected, among

which were *Pogonatum nanum*, *Phascum subulatum*, *Orthotrichum diaphanum*, and *Barbula Hornschuchiana*. Hepaticæ were not abundant, only six species being collected, the best being some fine examples of *Marchantia polymorpha* from Hatfield Chase. Lichens were conspicuously absent, even *Parmelia physodes* was scarce. Fungi were not much sought after, and only about 15 species were noticed, including *Morchella esculenta*, *Peziza venosa*, *Æcidium viola*, *Æ. menthæ*, and *Æ. ranunculacearum*, also the hetero-plant, described in the *Naturalist* last month as *Rhizomorpha subcorticalis*. Many algæ were collected, but few have been examined as yet; *Spirogyra crassa* was amongst them. For the Geological Section, Mr. J. W. Davis, its president, asked Mr. T. H. Easterfield, of Doncaster—who had been cicerone during the day—to report: he thereupon stated that the party under his charge had started from Doncaster for Messrs. Gibson and Dearden's brick-works, at Balby, inspecting the red sandstone quarry on the opposite side of the road. The brickworks are in a thick bed of glacial tile and clay, said to be 60 feet in thickness, resting on red sandstone. The base is not exposed, but about 30 to 35 feet are worked. It has the usual tough character, and contains a large number of ice-scratched stones, mostly from the coal measures; one or two being found, however, which appear to have travelled a long distance. About four or five feet from the present base of the works, and about 20 or 25 feet from the surface of the ground there is an apparent division into an upper and lower glacial deposit; the division of the two being marked by the smoothness of the surface of the lower bed, as though it had been ground off and polished by the succeeding glacier. Above part of the quarry or pit, a reddish tile has been worked, which contains large masses of gypsum, but comparatively few other stones. Indiscriminately dispersed amongst the clays are beds of sand, lenticular in form and small in size. Having examined the glacial beds at Balby, the party visited the railway cutting, for the line between Doncaster and Conisborough, and noticed the upper magnesian, or Brotherton limestone at the eastern end of the cutting, succeeded by the middle marls and the lower limestones, well shown at Levitt Hagg. Thence along the picturesque banks of the river Don to Conisborough, where the sections exposed at the fire-brick works and beneath Conisborough Castle exhibited the junction of the coal measures and the permian limestone series. Mr. C. P. Hobkirk, F.L.S., of Huddersfield, then exhibited a fine specimen of the so-called *Rhizomorpha subcorticalis* (an abnormal state of the mycelium of a fungus—*Polyporus*) which he had detached from a dead birch in Green Farm Wood, and made some remarks upon it. He then called upon Dr. Burman to move, and Dr. J. Mitchell to second, the adoption of a vote of thanks to the chairman. This was agreed to, and the proceedings came to an end.—It should be stated that Mr. Winter Cockill very hospitably entertained the party visiting his district to luncheon, at about 2 p.m.—W. D. R.

Original Articles.

A LIST OF THE FERNS OF THE NEIGHBOURHOOD OF YORK.

BY ROBERT MILLER CHRISTY.

It is hardly to be expected that I should be able to add much that is new to the already large amount of available information as to the Botany of Yorkshire. The subject has been so ably treated by Mr. Baines in his "Flora of Yorkshire," and by Mr. J. G. Baker in his "North Yorkshire," that comparatively little remains to be done; but, having collected for several years in the district immediately surrounding the city of York, I hope to be able to give a few interesting new facts and observations on the ferns of that neighbourhood. In the following list I have followed the nomenclature and arrangement employed in the London Catalogue (7th ed.), and have included most of those species which are often spoken of as "fern-allies." The district which I have considered to be the neighbourhood of York may be briefly described as a circular tract having the city as its centre and a radius of ten or fifteen miles, although it will be seen that this boundary line is a purely arbitrary and non-natural one. It includes the whole of Mr. Baker's Drainage District, No. vi. (Nidd and Wharfe), part of No. iii. (Derwent), most of No. i. (Ouse and Foss), as well as certain portions of the E. and W. Ridings lying immediately to the south of the Ainsty of York. Nevertheless the majority of the species enumerated may be found within six or seven miles, at most, of the city. For remarks on the geological peculiarities of the district I may refer the reader to a very pertinent note by my friend Mr. J. Edmund Clark, attached to my paper on "The Land and Fresh-water Shells of the neighbourhood of York" (*Zoologist*, 1881, p. 175). My own observations have provided me with most of the facts given herein, but I have to thank the late Mr. Sylvanus Thompson, Mr. James Backhouse, Mr. J. E. Clark, Mr. B. B. Le Tall, and other friends, for advice and assistance. The list has also profited by the exertions of the botanists belonging to the York Friends' School Natural History Society in Bootham, whose results for thirty or forty years past are recorded in the MS. pages of the "Bootham Observer."

Our chief localities for ferns are the city walls and the extensive pine-woods to the north of the city, about Stockton and Sandburn, but especially those magnificent tracts of virgin moor and bog which are to be found in the vicinity, such as Strensall, Towthorp, and Riccall Commons, Tillmire, Knavesmire, Clifton Ings, Bishophthorpe

Ings, and Askham Bogs—the latter being perhaps the best of all. During the latter part of the year 1877 I occupied myself with a thorough exploration of the fern-flora of the city walls. Commencing at Lendal Bridge I went completely round the city, except for that part lying between Lord Mayor's Walk and Bootham Bar, which is not open to the public.

Altogether, I am able to enumerate the very fair total of thirty-four species, growing within the district. Of these, one—*Nephrodium cristatum*, is new to Yorkshire, if not to the North of England, and three—*Asplenium Trichomanes*, *A. Adiantum-nigrum*, and *Scolopendrium vulgare*—are, I believe, new to the neighbourhood of York.

Pteris aquilina.—Less common than in some parts of England, but certainly far from rare. It is cut down by the earliest frosts of winter—often by the beginning of September. Among its localities are Strensall, Askham, Hobmoor, Acomb, Naburn, Stockton, York, &c. At Strensall it has been measured 11ft. 6in. high. In September, 1877, I was searching that part of the city walls situated just over the Old Station, when I came upon two diminutive ferns which I was totally unable to distinguish, but Mr. Backhouse afterwards informed me that they belonged to the present species. The shape of the fronds was somewhat triangular, the longest did not exceed $1\frac{1}{2}$ inches in length, and they grew in tufts unlike bracken, when growing in the ground. I afterwards found in several other spots on the walls on the west and south-west sides of the city, about half-a-dozen other plants showing more clearly the species, the fronds being adult, though none exceeded three inches. A bifid variety occurs at Linton-upon-Ouse and elsewhere.

Lomaria spicant.—South of the city I have not met with this, but on the north it often grows fine and abundant, as at Langwith Woods, Strensall, and, in smaller quantities, at Stockton, Castle Howard, and Dunnington. The fertile fronds stand erect, often reaching the height of 2ft., but the barren ones seldom reach that height, are procumbent, and often remain green throughout the winter. Both Mr. Backhouse and myself have on rare occasions met with fronds of this fern near York which appeared to be intermediate between the barren and fertile, the latter being most apparent in the lower pinnæ while the upper ones bore some fructification. Both sorts of frond are not uncommonly bifid or trifid. I got eight such fronds off one plant at Castle Howard, and a quantity from the roadside near Wiggington. A barren variety with the fronds three inches broad, the pinnæ also broad and curved upwards, with their lower edges somewhat deeply serrated,

was found at Castle Howard in September, 1877, and I have found it inclining towards this variety at Hagg Farm Wood.

Asplenium ruta-muraria.—A common enough fern to those who search for it in our district. In my examination of the city walls I found it in abundance. It grows finely on an old wall by the Earl of Yarborough's, on some old walls at Copmanthorpe, on St. Olave's Church and the surrounding walls, on old walls near Lendal Bridge, finely but not abundantly on the old wall forming the back of the Castle, also at Kexby, Sutton-on-Derwent, Acomb, and Skipwith, but finest of anywhere that I have seen it round York, though scarce, on the old boundary wall of St. Mary's Abbey, which now forms the backs of the houses on the left hand side of Marygate going down. That which grows on the city walls principally does so on the south and south-west sides of the city. At the following places it abounds, while it occurs more sparingly at many other spots:—On the inner side over the Old Station, between the Station and Micklegate Bar, and between there and the corner. Whether it be a general rule or not I cannot say, but I have observed, almost wherever I have found this plant in the York district, that it seems to have a great objection to growing on an *unprotected north wall*. The only places where I have seen it growing with an unprotected and direct northerly facing are, a single plant overlooking Cherry Hill, another close to the Iron Works, and several overlooking Lord Mayor's Walk—all on the outside of the city walls. It used to be said that it would only grow in the mortar of a *stone* wall, but I have seen it many times on brick. The seedling frond is kidney-shaped. There being no natural rocks *in situ* in the immediate vicinity of York, I should imagine that the spores have probably been brought with the stones from other districts.

Asplenium Trichomanes.—Castle Howard (H. Ibbotson), Kexby. I found seven or eight small plants growing on the city walls between Micklegate Bar and Victoria Bar, but they have, I believe, all disappeared now. Mr. Backhouse suggests that the spores would very likely have been introduced with the stone.

Asplenium Adiantum-nigrum.—Castle Howard (H. Ibbotson). One plant was found near York many years ago (S. Thompson). The rarity of this species surprises me.

Athyrium filix-fœmina.—A very variable species. The midrib is often pink. The fronds frequently attain a huge size; at Askham I have measured one 3ft. 8in. long, in Overton Wood 4ft., and at Castle Howard I found one in a marshy spot under bushes measuring even

4ft. 6in. Among its localities are Strensall, Langwith, Stockton, Skelton, Overton, Askham, Castle Howard, &c., &c. The following varieties have been identified with more or less certainty: *incisa*, Acomb Wood (B. B. L. T.); *obtusum* and *odontomanes*, Langwith; *rhaeticum*, Strensall Common.

Scolopendrium vulgare.—Very rare, near Acomb and Bishopthorpe; very small on an old wall near Lendal Bridge. On the 30th of September, 1875, we found a number of seedlings growing under the mill-arch at Naburn, where the spores had doubtless been floated, as the plants were below the level of the highest water. Mr. H. T. Mennell (Observer, vol. ii., p. 138) found it at Heslington, and other Bootham collectors at Hobmoor in 1852 (Observer). I found a small plant which had the edges of its leaves notched, on the city walls by the Victoria Bar. These are all in Mr. Baker's Drainage District No. 1, from which there were previously no records; its distribution, therefore, is now general in North Yorkshire.

Cystopteris fragilis.—Sutton-on-the-Forest (H. Ibbotson). Mr. Baker also gives it as occurring in his district, No. vi.

Aspidium aculeatum.—Though common to all Mr. Baker's drainage districts it is rare near York. Its localities are—near Strensall, Lane beyond Clifton, by the north road near Skelton, Colton Hagg, Wig-hill, Askham Richard, Healaugh, and on the 30th of March, 1877, I discovered a quantity on the edge of Overton Wood. I believe the var. *lobatum* occurs among the rest in the last named spot, also at Askham Richard (B. B. L. T.), Strensall, Colton Hagg, and Wighill.

Aspidium angulare.—Occurs in all Mr. Baker's districts except No. i, but very rare near York. Castle Howard (H. Ibbotson.)

Nephrodium filix-mas.—A very variable and very abundant species. Knavesmire Wood, Langwith, Askham, Strensall, Castle Howard, Overton, and most other places. Not unfrequently it grows on walls, in which position it takes a very diminutive form, the fronds being seldom over four inches long. I have found it so on a railway arch near Skelton Wood, on the back of the Castle, and in more than one spot on the walls. Young fronds seem to be coming up all the year round. On June 2nd, 1877, I found in Langwith Woods a frond which had a very curious appearance, from having been checked by frost. Many of the lower pinnae were very diminutive, and brown, being scarcely an inch long, while those above were perfect, having grown since the lower ones were cut. The following named varieties have been more or less correctly identified:—*palaeacea*, Acomb Wood, Askham, &c.; *producta*, Acomb Wood; *deforme*, lane near Stockton;

multifidum (with many bifid pinnæ), Langwith, Stockton; *incisa*, Acomb Wood; *elongata*, ? locality.

Nephrodium cristatum.—Rare. Askham bog. I, with my friend Mr. J. W. West, first discovered it there on September 29th, 1875, and I have seen it nearly every year since. I believe this rare fern had never before been found in Yorkshire. I decline altogether to state even on what part of the bog the plants grow, knowing what has been the result when, on previous occasions, the precise localities of rare ferns have been described. The plants are but few in number, and I believe that there are less than a score on the whole bog, which covers many acres. Some of these plants are very fine ones, bearing many fronds which push their way up through dead grass and herbage. The situation in which they all grow is an exceedingly wet one, covered with high bushes. All the plants that I know of grow within half-a-mile of one another. On discovering the first root we took about a dozen fronds from it, only the largest of which, 2ft. 6in. long, bore fructification. Visiting it again on the 26th of August following, I found it had increased in size, and that the longest frond was now 33½in. from tip to bottom. It, with two others, was slightly bifid at the apex. I again saw this plant on August 11th, 1877, when it had still further increased in size. On the 7th of October following, I discovered another smaller root, with one or two seedlings near it. I have been unable to discover any other plants than these, but by diligent search, Mr. Backhouse succeeded in finding about a dozen more roots growing in three patches all near one another. The pinnæ of this species are set on half across the midrib and face almost upwards.

Nephrodium spinulosum.—More abundant than I have ever seen it elsewhere. Mr. Baker says “frequent in the low country woods, especially in the carrs of the central vale.” Among its localities are Strensall, Stockton, Overton, Skelton, Askham, Langwith, Buttercrambe, &c. I have found it 35in. high in Askham Far Wood, where it grows in great abundance near this end. It varies considerably, and the fronds do not seem nearly so susceptible to frost as those of some other species. I believe the following varieties have been identified:—the var. *uliginosa* at Stockton Woods and Askham bogs; the var. *chanteriae* on Strensall Common (B.B.L.T.); and the var. *glandulosa* at Stockton. The bifid variety has occurred at Langwith (B.B.L.T) and elsewhere.

Nephrodium dilatatum.—A large, fine, and common fern growing at Acomb Wood, Clifton, Langwith, Naburn, Strensall, Dunnington,

Kuavesmire, Overton, Skelton, Sandburn, and Buttercrambe Woods, &c. It is generally a wood-loving species, but I have sometimes seen it on open commons or banks, as at Wiggington and Haxby (roadsides), Tillmire and Strensall. At the first-named place I have found a strange plant bearing fronds apparently intermediate between this species and the last, having the general appearance of the former but the scales of the latter, though less darkly striped down the centre than usual. At Castle Howard I have seen quantities of this fern nibbled into small pieces by rabbits. The young fronds rise in the end of April, and are densely covered with scales of a rich brown colour. The bifid variety has occurred not uncommonly at Wiggington, Langwith, and Nova Scotia Plantation, and the var. *dumetorum* at Langwith (B.B.L.T.)

Nephrodium Thelypteris.—Mr. Baker says, “rare in swampy woods in the low country. Plentiful in Askham Bogs and Terrington Carr, and on Buttercrambe Moor. It formerly grew in Holly Hill Bogs, near Castle Howard.” Abundant in several parts of Askham Bog, especially in the Far Wood, where I have found it 4ft. 3in. high, while 2ft. is about the average, and so slender a fern is it that it could not even attain this height unless supported by grass or bushes. In spite, however, of the great abundance of this fern, fronds bearing fructification are so extremely rare that, until the last year or two, I could only hear of a single stunted specimen. On September 27th, 1876, I found a plant bearing half-a-dozen very fine fronds, each 3ft. in length, and all fructified. This plant was on a rather dry part and removed from all others. I understand that about September, 1879, some fertile fronds were found on the Bog, and that in Heslington Fields—once a locality for this fern—such fronds were not at all rare. The probable reason for rarity of fertile fronds seems to be that this species having a creeping rhizome and plenty of room to spread, selects this simpler means of increasing, and does not waste its resources in producing spores, as it probably would if its roots were confined. I have seen plants growing on a rockery that produced spores plentifully (vide “Natural History Journal,” vol. ii., pp. 89 and 152). A bifid variety is not rare.

Nephrodium Oreopteris.—Rather common, Strensall, and Wheldrake Commons, Langwith, Stockton, Sandburn, and Buttercrambe Woods. It is an early fern to die down. On a bank at Strensall, I once got a plant bearing one frond with several tips, and another with the mid-rib bifid near the root; one tip and several pinnae were also bifid.

Polypodium vulgare.—Far rarer than in most districts. It grows at Escrick and several places in the Stockton, Strensall, and Wiggington direction. At Castle Howard it grows on trees as in the south of England. A bifid variety is pretty common. Probably no British fern is so given to be bifid, both in the midrib and pinnae, as this. The var. *auritum* occurs near Turker's Wood (B.B.L.T.), and abundantly where the railway crosses the Haxby and Stockton Lane. It has a small projecting lobe just above each pinnæ.

Polypodium Phegopteris.—Mr. Baker says, "in the central vale on Buttercrambe Moor." It is said that this species grew twenty years ago in the Long Lane, at Langwith, but has not been seen since, and it is therefore very interesting to learn ("Natural History Journal," vol. vi., p. 181), that last September one plant of beech fern was, for the first time, found at Askham Bog by Geo. Robley and Saml. Lee, of the York Industrial School. The fronds it bore were seven inches long, and were fully identified by Mr. Clark.

Polypodium Dryopteris.—Castle Howard (H. Ibbotson).

Osmunda regalis.—Mr. Baker says, "swampy woods in the low country, rare." Langwith Woods and Askham Bogs are our only localities. At the former place it used to be common, but now—probably because the roots are taken away—it is quite rare there, and I have only seen three or four plants; but, about two years since, my brother saw a great number of seedlings springing up in one spot. At Askham Bog it still abounds in the Big Wood, and there are a few plants in other parts. Seedlings differ considerably from the mature fronds, which I have seen growing near 8ft. high at Askham. The young fronds come up early in May, and I have noticed that where two or three come up together there is often a quantity of a soft gummy substance present. The fronds are cut by the earliest frosts of winter. The fructification appears about the middle of September, but on October 6th I once saw a frond bearing it still green, and on the 1st of September, 1877, I found an apparently seeding frond bearing green fructification. The whole plant often grows to such a size that I believe some would nearly fill a cart. The pinnæ are sometimes bifurcated.

Ophioglossum vulgatum.—Common; Hobmoor, Clifton Ings, Bishopthorpe, and Monk Stray. Also fine and plentiful in meadows near Stockton Wood.

Betrychium lunaria.—Mr. Baker says, "area general; frequent in grassy places and on heaths." In our district it is rare, and I have

never found it. Castle Howard (H. Ibbotson), Linton-upon-Ouse (F. T. Le Tall), Knavesmire (Mr. Backhouse in Newman's Ferns). In 1863 the Bootham collectors found it at Heslington.

Lycopodium clavatum.—Mr. Baker says—"Frequent upon heaths. ascending from Stockton Forest and Strensall Common."

Lycopodium inundatum.—Mr. Baker says—"In many places among the swampy heaths of the low country; Pilmoor, Stockton Forest, Strensall Common, Welburn Moor, Terrington Carr."

Lycopodium Selago.—Strensall (Flora of Yorks.) Mr. Baker says—"Ascending from the vale heaths to the peak of Micklefell."

Selaginella selaginoides.—Mr. Baker says—"In the Central Valley on Stockton Forest and Strensall Common, and in the Howardian Tract on Welburn Moor and Terrington Carr."

Pilularia globulifera.—Ponds near the station at Strensall, pond between Bootham and Gate Helmsley (T. A. Smith), Stockton Forest, near Copsie's Wood, pond near the rabbit warren on Tillmire. This and the previous four species must be scarce on Strensall Common; I have been over it many times, but never seen one of them.

Isoetes lacustris.—Castle Howard lake (Flora of Yorkshire), according to H. Ibbotson.

Equisetum arvense.—Very abundant. Early frosts cut it.

Equisetum maximum.—Castle Howard, &c, but not near York.

Equisetum sylvaticum.—Castle Howard (Flora of Yorks.). Mr. Baker says of North Yorkshire, "area general."

Equisetum palustre.—Very common. Bishopthorpe, Hobmoor, Askham, Strensall, &c. The fertile spikes occur from June to October. The var. *nudum* is common, and the var. *polystachion* is said to have been found by Bootham collectors in 1847.

Equisetum limosum.—Hobmoor, Askham, Bishopthorpe, &c., &c.; var. *fluviatile* equally common, Hobmoor, &c.

Equisetum hyemale.—Mr. Baker gives "in the Central Valley at Raskelf, Hazel Bush, near Strensall, and between Topcliffe and Thorpfield." By the Malton-road beyond the Market Weighton Railway (Flora of Yorks.). I believe the collectors from Bootham have never found this.

Chignal St. James,
Near Chelmsford.

Short Notes and Queries.

A NEW BRITISH MOSS.—Specimens of a *Bryum*, lately gathered in the river Usk, Breconshire, by the Rev. Augustin Ley, have been sent me for examination, and after a good deal of puzzling, prove to belong to *B. gemmiparum* of De Notaris—a species hitherto recorded only for the extreme south of Europe, and therefore an unexpected and very interesting addition to our list of mosses. It appears to rejoice in the sandy deposit lining the sides of mountain streams, and to form considerable tufts or patches somewhat like dwarf states of *B. Schleicheri*, or *latifolium*, but from which species it differs in the muticous leaves with narrow areolation. Indeed the shape of the leaves is more as in *B. alpinum*, and especially *B. Muhlenbeckii*, but they are more loosely imbricated, more spreading when dry, and the tufts of a pale green or greyish-green colour, not purplish or glossy. It is not unlikely that this species may be found, if looked for, by the sides of some of the streams of North or West Yorkshire.—H. BOSWELL, Oxford, 14th June, 1883.

Cinclidium stygium, SWARTZ.—Apropos of Mr. Cash's note on this moss it is reported to me on good authority that it has been gathered above High Force, in Teesdale; if correct, this will be another Yorkshire locality. I have not yet seen specimens from there. In the same note, a few other mosses are mentioned; *Hyp. rugulosum*, in two or three places in the neighbourhood of Malham, but not in plenty. This moss is very abundant indeed in the old bed of the river above the Cove, in many places; so is *Zygodon Nowellii*, which Nowell found later on. It also occurs plentifully in Gordale, along with *Cylindrothecium concinnum*. In passing I may mention that a few mimics (to a tyro), of the latter species occur also along with it; rock forms of *Hyp. purum*, *H. Schreberi*, and *H. cuspidatum*. *Seligeria pusilla* is plentiful on both the Clapham and Ingleton ascents of Inglebro'; it also occurs on rocks close to Malham village. *Mnium serratum* is also abundant on the Ingleton ascent of Inglebro', but is nearly always mixed with *M. stellare*.—W. WEST.

Morchella semilibera AT DONCASTER.—Referring to the report in the *Naturalist*, of the Y. N. U. meeting at Doncaster on Whit-Monday, I note that mention is made of *Morchella esculenta* in the list of Fungi. My specimens were the only ones exhibited in that section, and I have since ascertained that they were a decided rarity, viz:—*Morchella semilibera*, good characteristic specimens. This is confirmed by Mr. W. G. Smith, of London, and I believe that they have not previously been reported in the district which the Y. N. U. embraces.—A. CLARK.

SHELLS, ADDITIONAL TO BEVERLEY LIST.—Since publishing a list of the land and fresh-water shells of Beverley and neighbourhood in the *Journal of Conchology* for April, 1882, I have been able to make the following additions:—*Unio pictorum*, Lever canal and river Hull; *Unio tumidus*, river Hull; *Limax agrestis* var. *nigra*, in gardens at Beverley:

Testacella haliotidea, in garden at Beverley. My attention was first called to this species by Mr. F. Boyes, of Beverley, and specimens have since been kindly procured for me by Mr. Geo. Swailes, from his garden, where he informs me it has been taken from time to time during the last four or five years. I am not aware that this species has been previously recorded for the East Riding. *Zonites purus* var. *Margaritacea*, Westwood, Beverley.—J. DARKER BUTTERELL, Beverley.

THE NIGHTJAR.—I am interested in Mr. Butterfield's remarks as to the relative sizes of his young nightjars, as I have several times seen their nests, if "nests" they may be called, and I believe in every case one young one was bigger than the other. It would be curious if this is always so. I do not find it stated in any account of the nightjar, but it is well known to be the case with the barn owl, though that certainly is a very different bird. Dr. E. A. Brehm and other ornithologists say that the nightjar only breeds once a year, but I have seen eggs and young ones so very late, that I have not the slightest doubt it frequently breeds twice. I enclose a sketch of a nightjar, which had young, feigning to be wounded, drawn from the bird as it sat on the bough of a Scotch fir.—J. H. GURNEY, Northrepps, Norwich.—[We regret we are unable to reproduce Mr. Gurney's interesting sketch.—Eds. *Nat.*]

NOTES ON NESTS AND EGGS.—During the past spring the following nests and eggs have come under my notice in the neighbourhood of Loft-house :—Yellow hammer, nest with three white eggs. Meadow pipit 1.—Nest with six eggs. Four were mottled finely with light brown, with a slight zone of darker brown at the larger end ; size, 10 lines by 7. The other two were blotched with two shades of light brown, the blotches aggregated, but not zoned at the larger end ; size, 9 lines by 7. In the "Rural Notes," for 1881, I described a nest of the corn-crake which contained two types of eggs. The facts seem to indicate that two females may occasionally lay in one nest. A few years since, a farmer here found a nest containing twelve hen's eggs and ten partridge's eggs, on which the partridge was sitting. Meadow pipit 2.—Nest with four eggs of a uniform dark brown colour, the brown darker, but uniform at the larger end ; size, 11 lines by 8 : much like the egg of the nightingale. Greenfinch.—Nest with four eggs of different sizes. Beginning with the largest, the dimensions were : 10 by $6\frac{1}{2}$, 8 by $5\frac{1}{2}$, $6\frac{1}{2}$ by 5, and 6 by 5 lines. The smallest egg was the size of that of the goldcrest. All the eggs were of the ordinary colour. Chaffinch.—Nest with two eggs ; dimensions, 7 by $5\frac{1}{2}$ lines. Nest 2 in. wide, and $1\frac{1}{2}$ in. deep, composed externally of fine grass stems, moss and spiders' webs, and lined with black and white hair. Projecting obliquely about an inch above the top of the inside of the nest was a firmly fixed white feather ; this decorative feather was the only one visible in the nest, but the rim was further garnished by several small bits of white paper, spread and glued neatly amongst the moss. The nest and eggs were remarkably small.—GEO. ROBERTS, Loft-house.

CURIOUS FREAK OF A DUCKLING.—A curious thing happened yesterday. A duck built its nest near the stonework on the island, about 10ft. above the water. I saw eight young ducklings in the nest, called my keeper, who took them away with three eggs (young not out), leaving a rotten egg in the nest. One of my servants in the forenoon, working near the place of the nest, saw the duck take the rotten egg in her beak and carry it across the lake to the large willow tree, where it seemed to be burying or messing it about.—E. HAILSTONE, Walton Hall, 28th May, 1883.

MONOGRAPH OF BRITISH MOLLUSCA.—It is proposed to accumulate materials for a new and comprehensive Monograph of the Land and Fresh-water Mollusca of the British Fauna, and it is desired to enlist the assistance of all persons interested in the detailed and exhaustive study of the species and varieties of British Mollusca. Communications of all kinds, letters, specimens, books, &c., should for the present be forwarded to Mr. J. W. Taylor, Office of the Journal of Conchology, Leeds.

Rainfall for May.

	Height of gauge above sea level.	Rain-fall.	No. of Days	TOTAL FALL TO DATE.		Date of heaviest Fall.	Amount of heaviest Fall.
				1883.	1882.		
HUDDERSFIELD (Dalton) ... (J. W. Robson)	Ft. 350	In. 0·90	13	12·54	*12·11	7	0·22
HALIFAX... (F. G. S. Rawson)	365	1·09	17	17·25	21·77	12	0·26
LEEDS ... (Alfred Denny)...	183	0·91	13	10·02	†8·35	25	0·17
HORSFORTH ... (James Fox)	350	1·20	13	11·85	‡11·79	9	0·30
PATELEY BRIDGE... (E. Warburton, M.R.C.S. L.S.A.)	436	1·37	10	14·98	§12·07	7	0·45
BARNSELY ... (T. Lister) ...	350	1·18	15	11·66	10·44	7	0·27
INGBIRCHWORTH (do.)	853	1·58	17	16·78	16·01	25	0·25
WENTWORTH CASTLE (do.)...	520	1·25	15	13·46	11·83	7	0·24
GOOLE ... (J. HARRISON) ...	25	1·86	12	9·66	10·61	10	0·44
HULL (Derringham) (Wm. Lawton)	10	1·70	13	7·23	8·71	8	0·41

* Average to date for 17 years, 1866-82. † Average of 29 years, 1853-62 & 1865-83.

‡ Average of 14 years, 1870-83. § For 4 years, 1880-83.

Reports of Societies.

BARNSELY NATURALISTS' SOCIETY.—Meeting, June 19th, the president, Mr. T. Lister, in the chair. Messrs. Batley and Hemingfield gave a list of flowering plants taken in recent local excursions. Few insects were reported. *Hadena glauca* has been taken. Mr. Lister gave a list of a few

birds not included in last report. On April 20th, the wryneck is reported by Mr. Hailstone, at Walton Hall. This migrant has been seldom noted in this district. May 9th, the swift; 6th, black-cap warbler; 14th, garden warbler, wood warbler, nightingale, spotted flycatcher. Mr. R. Parkin wrote, last week in May, that a nightingale was nearer to Barnsley than recorded of late years. On May 11th, Mr. Creighton wrote reporting the wax-wing in a garden at Hemsworth, and the black redstart in front of Hemsworth Hall; the black-headed gull, sparrow hawks, kestrels, and jays. The lesser tern was found dead in a field near Penistone. The ringed dotterel and curlew have occurred on the pools near the moors this spring. The sandpipers are breeding there, and in the Dearne valley.—T. LISTER.

BEVERLEY FIELD NATURALISTS' AND SCIENTIFIC SOCIETY.—The ordinary meeting, 18th May, the president, Mr. J. A. Ridgway, in the chair.—After some discussion it was decided to hold field meetings every Wednesday evening, for the exploration of the immediate neighbourhood of the town, in addition to the ordinary meetings of the society, and a number of afternoon excursions are also to be organised. A letter was read from Thos. Bainton, Esq., of Arram Hall, reporting the arrival of the pied flycatcher on May 7th, and a number of interesting botanical specimens were shown by Mr. J. J. Marshall, amongst which were *Hottonia palustris*, *Geum rivale*, *Luzula campestris*, *Valeriana dioica*, *Ranunculus auricomus*, *Bunium flexuosum*, and others. Mr. Butterell exhibited a series of *Unio pictorum*, and *U. tumidus* from the river Hull, the edible snail *Helix pomatia*, and also specimens of the snail-slug *Testucella haliotidea* found in Beverley, and probably the first time it has been recorded for Yorkshire.

Huddersfield Naturalists' Society.—Meeting June 18th, Mr. C. P. Hobkirk, F.L.S., in the chair.—The chairman exhibited a new British moss, *Bryum gemmiparum*, discovered in Breconshire by Rev. Augustin Ley, and hitherto found only in the extreme south of Europe. A large collection of local grasses was exhibited by Mr. A. Clarke, who had adopted a new system of naming. It consisted in having the London Catalogue No., the natural order, the Linnæan class, and the name, neatly written upon a card and laid upon the table along with the specimen. This system was considered by all present to be a great improvement upon the old one of simply calling out the names. Mr. Mosley exhibited a series of *Meliphora alveariella*, a species very destructive to the combs of the honey bee. He also showed samples of injured comb, with cocoons of the moth. Mr. Simeon Kaye read a paper on "The Medical Properties of Plants."—S. L. M.

MANCHESTER CRYPTOGRAMIC SOCIETY.—Mr. W. H. Pearson in the chair.—Mr. W. Stanley exhibited specimens of *Cephalozia fruitans* from Staleybrushes, being a new locality for this hepatic, and *Disclium nudum* from the neighbourhood of Mottram. Mr. Pearson exhibited and

distributed specimens of the rarely fruiting *Saccogyna viticulosa*, which he had recently collected at Festiniog, in fruit. He also exhibited specimens of *Asplenium septentrionale* and *Glyphomitrium Daviesii*, which he and Mr. Stabler had collected a few days previously at Llanberis. The hon. secretary exhibited a few recently gathered lichens from Sweden, and specimens of three beautiful ferns, belonging to the genus *Cheilanthus*, which had been sent from the mountains of the Pacific coast, California, viz. : *Cheilanthus Californica*, *C. Fendleri*, and *C. Clevelandii*.—THOMAS ROGERS, Hon. Sec.

OVENDEN NATURALISTS' SOCIETY.—The monthly meeting, May 26th, Mr. J. Spencer, president, in the chair.—The following botanical specimens were named by Mr. C. Sheard, viz. :—*Equisetum sylvaticum*, *Myrrhis odorata*, *Vicia Lathyroides*, *Doronicum Pardalianches*, *Pedicularis palustris*, *Polygonum Bistorta*, &c. Mr. Thomas Cockroft, who has so often enriched our local geology by the discovery of rare and interesting specimens, has again been successful in finding a specimen of a new fossil plant which is of great interest, not only to local geologists, but also to all those engaged in the study of fossil botany. He exhibited a fine specimen of this small fossil plant, which he had obtained from the Stannary quarry, belonging to the Halifax Corporation. It has a slender tapering stem, which is furnished with four very slender branches arranged alternately. The chairman observed that in its form and mode of branching, it offered a striking contrast to the great majority of fossil plants. He is acquainted with only one fossil plant which could furnish such a "cast," namely, *Astromyelon*. Scores of specimens of this pretty fossil plant have been found in our Halifax coal-nodes, but this is only the second instance (and the finest specimen) recorded of the occurrence of *Astromyelon* in an ordinary fossil condition. The fact of it having been found in the mill-stone-grit rock is also interesting, as the only other rock, with the exception of our local "balls," from which it has been recorded is the Ringby flag rock. Recent discoveries in our Halifax nodules have shown us the interesting fact that the *Astromyelon* was an aquatic plant, but like most of the other coal plants, it attained a much larger size than any of its modern representatives.—J. OGDEN, Sec

YORKSHIRE NATURALISTS' UNION.—FILEY, June 11th.—The second meeting for 1883 was held at Filey, with the view of investigating the section of the Yorkshire coast-line which includes the bold prominences of Filey Brigg and Speeton Cliffs, and the intervening concave sweep of Filey Bay. There was a large muster of members from all parts of Yorkshire, and the excursion was a decided success. The weather was bright and sunny, in accordance with the usual experience of the Union, nothing occurring to the personal discomfort of the members. Only two parties were arranged, both starting from Speeton railway station. The geological party was in charge of the Rev. E. Maule Cole, M.A., while the ornithologists had the benefit of the experienced leadership of Mr.

Jno. Cordeaux, and the genial companionship of the Vicar of Filey (Rev. A. N. Cooper). The latter party visited the famed cliffs of Speeton, Buckton, and Bempton, and were rewarded by the view of the breeding-haunts of the sea-fowl. These were sitting in thousands on the ledges of the cliffs, the guillemots and razorbills being the commonest. The operations of the cliff-climbers were also witnessed, and one of the ornithologists was bold enough to trust himself down the cliff, bringing up with him an egg of his own gathering. Returning from the cliffs, the party made their way to Filey along the shore, overtaking the geological party on their way home. These two parties monopolized most of the excursionists, but there were nevertheless a few who remained about Filey to explore the cliffs in the immediate vicinity, and to investigate the animal and vegetable life which the conveniently-timed low tide revealed on Filey Brigg. Tea, which was somewhat late, having been served, and the sections having sifted their findings, the general meeting was opened (half-an-hour later than intended) at 5-30 p.m., at the Crescent Hotel. Mr. John Cordeaux, M.B.O.U., of Great Cotes, president of the Vertebrate Section, was voted to the chair. The minutes having been taken as read, the roll was called, when it was found that fourteen societies were represented, viz :—Beverley, Bradford Naturalists, Driffield, Halifax, Hull, Ikley, Leeds (3), Malton, Scarborough, Shipley, and York (2). The number of members present was about fifty or sixty. The following new members were elected :—Mr. J. W. Dunning, M.A., F.L.S., president of the Entomological Society of London ; Rev. John John Gott, D.D., vicar of Leeds ; Mr. Basil T. Woodd, J.P., Conyngham Hall, Knaresbro' ; Sir R. Payne Gallwey, Bart., Thirkleby Park ; Mr. John Hopkinson, F.L.S., Watford, Herts ; Mr. Thomas Hick, B.A., B.Sc., Harrogate ; Mr. William Aldam, J.P., D.L., Frickley Hall, near Doncsster ; Mr. W. C. Scott, of Leeds ; Mr. Donald McLean, of Lofthouse-in-Cleveland ; Mr. R. D. Darbishire, B.A., F.G.S., of Manchester ; Rev. J. C. Atkinson, B.A., of Danby-in-Cleveland ; Mr. R. Morton Middleton, jun., F.L.S., of Castle Eden, co. Durham ; Dr. Haworth, of Filey ; Mr. J. W. Pallister, of Leeds ; Mr. Leonard Gaunt, of Farsley ; and Mr. W. H. Stott, of Doncaster. It was explained that these were the first fruits of the issue of the new prospectus, and the members were invited to assist the executive in adding largely to the membership of the Union. Thanks were then voted, on the proposition of Mr. Thomas Hick and the Rev. W. C. Hey, to the gentlemen who had acted during the day as leaders of parties. The reports of sections were then called for, beginning with the Conchological Section. The Rev. W. C. Hey, M.A. of York, president of the section, reported. For the Entomological Section there was no report, the members having deserted their own science on account of the attractions of the sea-fowl on the cliffs. Mr. Thomas Hick, B.A., B.Sc., president of the Botanical Section, reported that no special work on Phanerogamic Botany had been done, but about 32 species were collected or seen by members of

the different parties. Among these were a few common coast forms, such as *Glaux maritima*, *Plantago Coronopus*, and *Plantago maritima*. *Geranium sanguineum* was brought in by the Speeton party, and was regarded as a somewhat notable plant for the locality. Mr. Turner gave his list of Algæ as follows:—*Halidrys siliquosa*, var. β minor, *Fucus vesiculosus*, ditto var. β *Balticus*, *F. ceramoides*, *F. serratus*, *Hymanthalea lorea*, *Desmarestia aculeata*, *Sporochnus pedunculatus*, *Laminaria digitata*, *Chorda filum*, *Zonaria parvula*? *Clordaria flagelliformis*, *Mesogloia virescens*, *Leathesia tuberculiformis*, *Cladostephus spongiosus*, *Sphacelaria filicina*, *S. fusca*? *S. plumosa*? *Ectocarpus littoralis*, *Polysiphonia urceolata*, *P. fibrata*, *P. fastigiata*, *P. byssoides*, *Dasya coccinea*, *Laurencia pinnatifida*, *L. obtusa*? *Chylocladia articulata*, *Corallina officinalis*, *Melobesia lichenoides*, *Delesseria alata*, *Plocanium coccineum*, *Hypnea purpurascens*, *Chondrus crispus*, *Iridocœa edulis*, *Ptiloba sericea*, *Ceramium rubrum*, *C. acanthotum*, *C. gracillimum*, *Callithamnion roseum*, *Cladophora rupestris*, *C. arcta*, *Conferva ærea*, *Enteromorpha intestinalis*, *E. compressa*, *Ulva lactuca*, *U. linza*. Appendix: * *Laminaria saccharina*, *Chylocladia parvula*, *Jania rubens*, *Delesseria sanguinea*, *Nitophyllum laceratum*, *Rhodymenia palmata*, *Callithamnion Daviesii*, *Bryopsis plumosa*, *Ulva latissima*. Mr. M. B. Slater, who searched for mosses and hepatics, stated that of the former he had found *Hypnum cuspidatum* (in fruit), *H. purum*, *H. molluscum*, *H. filicinum*, *H. commutatum*, *Trichostomum mutabile*, *Bruch* (in fruit), *Tortula Hornschuchiana* (in fruit, old); and of the latter he had obtained *Jungermannia turbinata*, *Lophocolea bidentata*, and *Pellia epiphylla*. Mr. Slater remarked that the district is not rich, and the season too dry, for these plants. Autumn or early spring would have yielded a better result in mosses, and as hepatics require shade, and like to grow in damp woods, it is not to be expected that the bare sea-cliffs would furnish a home for them. Of Fungi, reported upon by Mr. H. T. Soppitt, between 30 and 40 specimens were collected during the day, amongst which were *Æcidium calthæ*, *Puccinia calthæ*, *P. galiorum*, *P. pulverulenta*, *Phragmidium obtusum*, *Æcidium valerianacearum*, *Æ. epilobii*, *Æ. urticæ*, *Comatricha Friesiana*, *Peziza Curreiana*, and *Uromyces Poæ*. Mr. J. W. Davis, F.S.A., Halifax, president of the Geological Section, on being called upon to report, turned the duty over to the secretary of the section, Rev. E. Maule Cole, M.A., of Wetwang, who thereupon stated that the party under his charge made for Speeton Gap, where they descended, and walking for some distance along the undercliff, eventually reached the shore. The tide being low, they then pushed on for some distance under the Buckton cliffs, examining the grey chalk with pink-coloured bands in situ. Overhead thousands of sea-birds were perched on the crevices and ledges of the perpendicular cliffs. On the shore, large rolled masses of white chalk

* These were found at Filey by me, in July, 1877.—W. B. T.

exhibited on their surface the peculiar suture-like appearance due to the presence of minute films of fullers' earth deposited on the irregular surface of the chalk when forming. Attention was called by the conductor to the needle-shaped structure which accompanied the sutures, and specimens were taken by Mr. G. R. Vine, for analysis. A magnificent potstone of flint, or paramondra, was found on the shore, measuring 4ft. in diameter, with a height exposed of 2ft. 6in. On returning to the true red chalk, or Hunstanton limestone, near Speeton Gap, the following fossils were obtained :—Some fish teeth, spines of *Cidaris*, *Belemnites minimus*, *Terebratula semiglobosa*, *T. biplicata*, and *Inoceramus Coquandianus*. A palatal tooth of *Ptychodus*, from the white chalk, was also picked up. The Speeton Clays were next examined—they have been carefully worked and classified by Prof. Judd. They are a marine formation, equivalent to the freshwater Wealden beds of the south, and are divided into upper, middle, and lower, each from 150 to 200 feet thick. At the base of the upper is a persistent line of cement stones. At the base of the middle, a line of nodules, containing shrimps. At the base of the lower is a coprolite bed. The characteristic fossils for the three divisions are :—Upper, *Belemnites semicaniculatus* ; middle, *B. jaculum*, *Pecten cinctus*, and *Ancyloceras* ; lower, *Ammonites Speetonensis*, *A. Noricus*, *A. Astierianus*, *Belemnites lateralis*, and *Exogyra sinuata*. The Coprolites represent beds of a Portlandian age. The upper clay is the equivalent of the Atherfield Clay of the Isle of Wight. The middle clay is represented in Lincolnshire by the Tealby beds, and an iron sandstone in Penisthorpe Dale, on the outer edge of the Wolds, near Kirby Underdale, in Yorkshire. The Speeton Clay is overlaid by Boulder Clays—but under the lowest Boulder Clay, lying on the Speeton Laver Clay, is a preglacial shell-bed, of Estuarine formation, containing *Cardium edule* and *Mytilus edulis* ; also *Scrobicularia piperata* and *Tellina balthica*. The bed has been described in the *Geol. Mag.* (April, 1881) by Mr. G. Lamplugh. The contorted beds of Kimmeridge Clay in the cliffs and on the shore were next examined. After tea some of the party visited the Brigg and examined the Middle (Filey Brigg) calcareous grit and the "ball-bed" of the lower Calc. grit. In addition to those mentioned above the following fossils were found during the day :—In the Upper Speeton Clay—*Crioceras Duvallii*, *Vermicularia Sowerbii*, *Arca*, *Nucula obtusa*, *Isocardia angulata*, *Rostellaria Parkinsoni*, and fossil wood ; in the Middle Speeton Clay—*Myeria ornata*, *Pleurotomaria*, *Amm. rotula*, *A. marginatus*, *A. nucleus*, ; in the Lower Speeton Clay—*Astarte laticosta*, *Thetis Sowerbii*, *Thracia Phillipsii*, and *Rhynchonella* ; in the Kimmeridge Clay—*Amm. bplex*, &c. At the Sectional meeting Messrs. Davis, Cole, Mortimer, Lamplugh, Chadwick, Vine, &c., were present. For the Vertebrate Section the chairman reported. A vote of thanks to Mr. Cordeaux for presiding, proposed by Mr. W. Barwell Turner, F.C.S., of Leeds, closed the proceedings.—W. D. R.

“ NEC TEMERE—NEC TIMIDE.”

THE
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Union,

AND

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LOUIS AGASSIZ.

BY REV. S. FLETCHER WILLIAMS.

Read before the Lancashire and Cheshire Entomological Society,
March 19th, 1883.

OF the names of illustrious men who have promoted the cause of science in the present generation, none is higher than that of Agassiz. While I am conscious of my inability to do justice to the labours and character of this noble student and interpreter of the works of nature, I wish to pay at least some feeble tribute to his memory. Louis John Rudolph Agassiz was largely and richly endowed. His mind was fashioned on a colossal scale. His temperament was lively and enterprising, his reasoning faculties keen and comprehensive, his nature deeply impressible to all excellent influences, and his physical constitution of such a frame as to endure the most laborious efforts and activities. Scientifically his merits were of the class that commands lasting popularity. He was an originator of new ideas; and that on a subject second only to astronomy in grandeur and interest, namely, the physical history of our globe, or geology.

Agassiz was born in the town of Mottier, between the lakes of Neufchatel and Morat, in the Swiss Canton of Friburg, on May 28th, 1807. His ancestors were of French origin, and were among those Protestants whom the revocation of the Edict of Nantes compelled to leave France. His father was the Protestant pastor of the parish. At the age of thirteen he entered the gymnasium of Biel, where he gave sufficient evidence of his ability to attract the notice of his teachers. After he had been at Biel nearly four years, he was removed to the Academy of Lausanne, as a reward for his proficiency in science. But his already developed enthusiasm for science was distasteful to his father, who destined him for a commercial life, and who was impatient at his devotion to frogs, snakes, and fishes. The last, especially, were objects of the boy's attention. His vacations he spent in making journeys on foot through Europe, examining the different species of fresh-water fishes.

He came to London, with letters of introduction to Sir Roderick Murchison.

"You have been studying nature," said the great man, bluntly. "What have you learned?"

The lad was timid, not sure at that moment that he had learned anything. "I think," he said at last, "I know a little about fishes."

“ Very well. There will be a meeting of the Royal Society to-night. I will take you with me there.”

All the great scientific *savants* of England belonged to this society. That evening, towards its close, Sir Roderick rose and said :

“ I have a young friend here from Switzerland, who thinks he knows something about fishes ; how much, I have a fancy to try. There is, under this cloth, a perfect skeleton of a fish which existed long before man.” He then gave the precise locality in which it had been found, with one or two other facts concerning it. The species to which the specimen belonged was, of course, extinct.

“ Can you sketch for me on the blackboard your idea of this fish ? ” said Sir Roderick.

Agassiz took up the chalk, hesitated a moment, and then sketched rapidly a skeleton fish. Sir Roderick held up the specimen. The portrait was correct in every bone and line. The grave old doctors burst into loud applause.

“ Sir,” Agassiz said, on telling the story, “ that was the proudest moment of my life—no, the happiest ; for I knew, now, my father would consent that I should give my life to science.”

Agassiz's faith in his father was a little premature, as we shall see. On the completion of his studies at Lausanne natural history had gained so great an ascendancy over him that he chose the profession of medicine, as offering the best opportunities for prosecuting his favourite pursuits. He studied medicine at Zurich, Heidelberg, and Munich. At Heidelberg he devoted himself especially to the science of Comparative Anatomy, under the direction of the celebrated Professor Tiedemann, and his proficiency in this department subsequently stood him in good stead. Here, too, he was noted not only for his glow and ardour in study, but also for the rare talent of managing, with equal dexterity, the rapier and the scalpel. He remained at Munich four years, and took the degree of M.D. there in 1829.

Before this Agassiz had begun lecturing to his fellow students, and had written several important papers on Zoology. His already extensive knowledge of natural history soon attracted the notice of scientific men. So great was his reputation that in the year 1826, Martius, the eminent Bavarian naturalist, entrusted to him the editing of an account of no less than 116 species of fish, which he and his travelling companion Spix had collected in Brazil. Agassiz was led by his study of this work to form a new classification of fishes, in accordance with the formation of their scales, to which he sub-

sequently adhered. Though this work gained for him great credit, his father still disliked his exclusive devotion to science, and his dislike took the very practical but uncomfortable and impoverishing form of refusing to continue Agassiz's allowance. His enthusiasm won the heart of a bookseller, who enabled him to convert fishes to other purposes than those of study. Another friend also provided him with a purse, by the aid of which he visited Paris, where he gained the friendship of Cuvier and Humboldt,¹ with the former of whom he remained until Cuvier's death, in 1832.

On his return to Switzerland he was appointed Professor of Natural History in the University of Neufchatel—a position which he filled until his departure for the United States. In 1833 he published, with the generous aid of Humboldt, a great work, *Researches on Fossil Fishes*, in five volumes, with an atlas of about 400 hundred folio plates, and comprising descriptions and figures of nearly a thousand species of fossil fishes.² This work gained for him the respect of the whole scientific world, and, at the age of thirty-four, Agassiz was a member of nearly every

¹ Writing from Berlin, on 9th May, 1858, to Mr. George Ticknor, of Boston, Humboldt refers to Vols. I. and II. of Agassiz's *Natural History of the United States*, published in 1857:—"The great and beautiful work of Agassiz (the first two volumes) reached me only a few days since. It will produce a great effect by the breadth of its general views, and by the extreme sagacity of its special embryological observations." Humboldt speaks also of Agassiz as "this illustrious life, who is no less a man of a constant and beautiful nature." Ticknor's *Life, Letters, and Journals*, Vol. II., p. 338.

I may add that Vol. I. of this *Natural History of the United States* consists (1) of an elaborate Essay on Classification, and (2) of the application of the principles of Classification to the American turtles. Vol. II. treats of the development of the turtle's egg, from its first appearance to the time of hatching. The exceeding minuteness of the history may be inferred from the fact that it occupies one hundred and seventy quarto pages of compressed details of the successive changes in each part of the young creature's frame, from the moment of the first hint towards its formation. It teaches a lesson of thoroughness and patience which it would be well for all students to ponder. The development of one egg, studied with such care, and described with such accuracy, as to require one hundred and seventy quarto pages for the description! Nor is the work that of simple observation and record. It displays an immense amount of patient, instructive reasoning.

² Agassiz found it necessary to adopt a different system from that generally in use among zoologists, as, in many instances, the organs upon which the latter relied for the characters of their groups were absent or unrecognisable in the remains of fishes of former ages. Under these circumstances he derived the leading characters for his general classification of fishes from the form and structure of the scales, or dermal appendages, these organs being generally well preserved in fossil specimens; and this has undoubtedly been of great service in the study of fossil Ichthyology. It cannot be doubted, however, that, as is always the case where the structure of a single system of organs is adopted as the basis of classification, the arrangement of fishes proposed by Agassiz is evidently artificial, and often violates the natural affinities of the animals, removing closely allied species to a distance from each other, and bringing others into close juxtaposition which have nothing in common but the general form of their scales. For this reason the system has only been partially adopted by succeeding naturalists, although it is admitted on all hands to have been of great service in facilitating the study of fossil fishes. Perhaps the most important zoological point in the work of Agassiz is the establishment of the Ganoidea as a distinct order.

scientific society of Europe. His next work was his *Description of Echinoderms*, followed, in 1839, by his grand treatise on the *Fresh-water Fish of Europe*.

But the book by which he attained his highest honours, and won his best and widest European fame, was his treatise entitled *Studies of Glaciers*, the result of many years of observation. His theory, promulgated in 1837, formed a singular advance upon previous geographical discoveries. It is needless to recall to your recollection the fact that Werner and Hutton were then the grand oracles on this subject. Werner referred to water nearly all the changes undergone by the face of the globe. Hutton held that fire had been the prime agent. So eminent did their respective names become in connection with these two theories, that the one was familiarly called by geologists the Wernerian system, and the other the Huttonian. Strong parties of advocates and supporters arose on both sides. But the majority of scientific people could not coincide wholly with either party. The action of both water and fire on the surface of the earth was too plain to be disputed, and to regard either as the sole agent could not be generally admitted. So that, in the course of time, the principal questions came to be, "Which of the powers had done most? And in what ways had they acted?" It was perfectly plain that the deeper stratifications had resulted from both agencies, aqueous and igneous (or volcanic); but which of them had had the largest share in arranging the outer and existing crust of the earth, in forming its mountains, its vales, and all the varied appearances which it presents, was a point really open to discussion. On this head men of science still continued to doubt and dispute. By his close and searching observations on the icy masses called glaciers, as they are to be found in Switzerland and other Alpine countries, Professor Agassiz threw a flood of light on this important subject. In fact, he began a new era in geology, for it was he who first pointed out the signs of the Glacial Period. He proved, beyond question, that, in arranging the visible parts of the earth as they stand, water had been an agent in a form before scarcely thought of, and to an extent before not apprehended. He proved that, in the shape of mighty rivers of ice, it had modified the terrestrial surface most materially in places where the climate no longer permits of such action. Thus the glacier or ice theory came to involve many curious points, relating as well to the temperature of the earth as to its actual superficial structure in early ages. It accounted, also, for matters which science had before looked on hopelessly, as, for example, on the existence of boulders, or large water-worn stones, in positions far above

the reach, now-a-days, of the agencies to which they must have been at one time and long subjected.

Although we all know what glaciers are, I will mention, for the sake of clearness and completeness, that the name is given to those masses of ice which are found, in all elevated latitudes, clothing the mountain tops, and clogging up the higher valleys. At the present day such phenomena as glaciers are, of course, to be observed only in those situations called alpine, or peculiarly hilly; though a single mount of great height, like Mount Etna, presents so far the glaciers with their usual peculiarities. However, it is not only where they now exist that their action is discoverable. They have left their marks over almost the whole globe, or at least over all the northern countries of Europe—warm, mild, or chilly; and so they have led to the certainty that immense changes have occurred in respect to the temperature of such parts of the earth. By the presence of blocks of stone in quarters to which they are by nature strangers, and where they lie alone to excite wonder, as also, by the existence of shells where shells never could have been found without some such means of transportation, and by the presence of the remains of plants foreign to the soil, the action of glaciers is proved in climes where they have been long, long unknown. Nor must it be imagined that these transportations have gone on merely on a small scale, or but from one to another hill-side. On the contrary, for example, the granite cliff of Criffel, a large hill in Kirkcudbrightshire, has been found strewn on the English shores of the Solway, and shifted masses of Norwegian stone have been discovered on the eastern coasts of Britain. The alteration of temperature, and other circumstances, must thus have been vast, as far as the lands in question were concerned; and the glacial theory assumes a degree of importance of no ordinary kind in the eyes of all to whom the history of the earth is interesting.

It was, in the first instance, by observing glacial phenomena on a comparatively small scale, or as they exist now, that Agassiz came to the conclusions on which he based his great theory. His earliest observations were made in his own alpine country, adjoining Neufchatel. The huge glaciers there discoverable may be poetically called "eternal," but they are still subject to change. The texture of their component ice is not solid, but spongy, or, at least, penetrated by chinks and pores. When the heats of summer occur, they partially affect these icy masses, and the water sinks naturally into such vacuities. This water as naturally freezes in the winter season, and in freezing, expands, causing a general dilatation of the glacier con-

cerned. It is loosened, and moves down the mountain side in greater or smaller portions, and with a velocity proportioned to its position and to the obstacles in its way. These obstacles, however, where they are at all moveable, are caught up by it, and are hurried along to the foot of the slope. Wherever that may be, the transported glacier will almost certainly be placed in a lower temperature, and will melt, depositing all the stones and earth collected in its passage. Even before the eyes of Agassiz, huge mounds were thus formed; and, if we count upon the operation of the same agency for a great length of time, the results, it may be imagined, must have been immense. The Swiss knew these mounded depositions well, and called them *moraines*.

Besides the transporting action of the glacier, it has also an effect upon the slopes which it passes over. It carries off some parts, and levels others to a smooth shape, leaving the rocky masses untouched. That many of our Scottish mountains especially, have undergone this action, and that the lower grounds display the deposits, was discovered by Agassiz, in company with Dr. Buckland, in 1840, while he was on a visit to Great Britain. It was soon afterwards found that glacial scratchings, remains of moraines, and blocks which had been carried by ice were not confined to Scotland. Dr. Buckland recognised them again and again in Wales and the north of England, where moraines and erratic blocks are to be seen in all parts of the country. It is, therefore, certain that in our island there must have been at one time huge glaciers as large as those now found on the Alps. I have referred to "glacial scratchings" for, besides levelling some parts and rounding off others, the glacier often leaves striæ or furrows in its course, caused by the heavy bodies it has collected. These are sometimes so marked upon very hard rocks as to give a striking idea of the force of the originating movement.

There are various other circumstances connected with glaciers worthy of notice, but my object here has been simply to explain the great theory which made Agassiz so specially famous. In applying it to a practical explanation of much that is to be seen on the face of the globe, the transporting power of icebergs by sea must also be fully taken into account. Nor can it be denied that there are many proofs of the action of standing water, as in the case of the parallel roads of Glenroy, and many others where level lines or beaches are observable. But, though exposed in a detail here and there to some critical objections, the glacial theory of Agassiz was and is a noble contribution to advancing science. It does not explain all, but it explains much; and, though observations on the transporting power of ice had been

made before, it was left for Agassiz to base it on anything like a general hypothesis.³

In the year 1846 Agassiz left Europe for the United States. It was not his intention to make his home there, but his genial enthusiasm in the cause of natural science proved so contagious, that scarce a twelve-month was requisite to make America his most congenial home ; and when he had finished his course of lectures at the Lowell Institute, and had made a scientific tour of observation through the country, he found a place provided for him as Professor of Natural History in the Scientific School of Cambridge, Mass., founded, after his arrival in the States, by the munificence of the Hon. Abbott Lawrence. Obtaining an honourable discharge from his duties in Europe, he entered, in 1848, upon his labours at Cambridge. He also, from 1847 to 1850, discharged the duties of Professor of Zoology and Geology in the Medical School of Charleston, South Carolina ; and, 1851, those of Professor of Comparative Anatomy in the same College. In 1854, in conjunction with MM. A. Gould and Max. Perty, Agassiz published the work entitled *Universal Zoology and General Sketches of Zoology*, "containing an account of the structure, development, classification, &c., of all types of animals, living and extinct." He had sent forth, four years before, in 1850, his *Tour of Lake Superior*. It would be very pleasant, if I had time, to make many extracts from this most agreeable narrative : to introduce you to the retired major at St. Joseph's Island, the lazy population at the Sault, the drunken chief, the canoes they make, furniture, stowage, and comforts, the crews, the half-breed Indians, the Canadian French, in whom was discovered an extraordinary resemblance to the Irish, (and no wonder, as they were originally from Brittany, the *patois* of which, the Bas-Breton, is a Celtic dialect, and the people were doubtless descendants from Celts, and therefore near of kin to the children of the land "washed by a melancholy ocean"); Henry's cooking, John's genius, the Ojib-men, their simple and savage habits, the scenery of the lake, the high rocky islands and promontories, the beaches and terraces rising one above another for hundreds of feet, the Hudson's Bay Company's Forts, and the furs collected there, the northern lights, the fire in the woods, the thousands of islands, the comforts of a bed of lichen, the violent winds driving against the northern shores, the swimming cows at Fort William, the Kakabeka Falls, the dogs and the Kettles, the Indian sweating-house, the incidents

³ The statement in the text is explanatory only of Agassiz's theory, and not of present glacier theories. Agassiz hesitated to accept the Viscous Theory of Professor Forbes. For a concise statement of the various theories, see Prof. Tindall's *Forms of Water*, pp. 155-175.

of a life so monotonous and yet so varied—so unlike common life—facts in natural history ; above all, the mosquitoes, the flies little and great, the vain attempts to encounter the black flies—a consideration of which might naturally lead to other questions, how it happened, for example, that Beelzebub, the Syrian god of flies, came to be considered the representative, the personification, of the very Spirit of Evil himself. For all these, and many other curious matters, I must refer to the Narrative, only adding that there is scarcely a subject in the sciences which treat of rocks, plants, birds, fishes, shells, animals of all kinds, of land or water, which is not touched upon ; and that the productions of the regions of Lake Superior are compared not only with those of Europe of the present day, but with those of the more important recent geological periods.

(To be continued.)

WASHBURNDALE :

NOTES ON ITS PHYSICAL FEATURES AND NATURAL HISTORY.

BY W. EAGLE CLARKE, F.L.S., and W. DENISON ROEBUCK,
HON. SECS. OF THE YORKSHIRE NATURALISTS' UNION.

[In anticipation of the forthcoming meeting of the Y. N. U., in August, to investigate the Washburn Valley, it will be of service to give a summary of what is known of its fauna, with notes on the physical features of the dale, based upon our personal observations and such other materials as are at our command. The valley is, however, so secluded that it is almost unknown to Yorkshire naturalists, and we are not aware of any record of its fauna beyond a list of its Lepidoptera made for us by Lord Walsingham].

THE valley of the little river Washburn—the most important of the tributaries of the Wharfe—lies between Wharfedale and Nidderdale, and forms part of the ancient Royal Forest of Knaresborough.

In accordance with the physical structure of Yorkshire generally, and more especially with that of its mountainous western half, the slope of this picturesque little dale is from N.W. to S.E., having its highest altitude of 1,600 feet near Simon Seat, and its lowest of 160 feet at its junction with the Wharfe. In like conformity with the geography of the county at large, we find also that the steepest slopes and the most precipitous descents present themselves on the left or N.E. bank of the river ; the gentler inclines and broader slopes on the right bank. So marked is this the case in the present instance, that we find the area drained by the left bank to be but $14\frac{1}{2}$ square miles, as against $22\frac{1}{2}$ drained by the right bank. The total drainage area of the river thus amounts to 37 square miles, the waters of

which are collected into three great reservoirs for the supply of Leeds. By far the larger portion of the area drained by Washburn is elevated undulating moorland, clothed with coarse grass and bents, and including great tracts of heatherland towards the higher levels. Scooped out of these moorlands are the picturesque and narrow valleys through which flow the Washburn and its affluents. The cultivated lands are of no great extent, and do not reach further up the dale than the little hamlet of West End.

The infant Washburn rises at an elevation of about 1,300 feet above the sea-level, on Craven Moor, to the S.E. of and not very far from Stump Cross Cavern. For the first two miles of its course it is but a small peat-stream, trickling through monotonous flat grassy moorlands, devoid of visible life save when in summer they are frequented by such lovers of solitude as the curlew and the golden plover, the snipe and the lapwing. After entering the moorlands known as "Katty White's Allotment," it flows through low bracken-clad hills and receives several small tributaries, those of its right bank draining the slopes of Pockstones Moor. Here the life on its margins undergoes a change, and in spring one observes the sand-piper flitting with butterfly-like flight, uttering its merry note, almost worthy the name of a song; the ring-ouzel, too, perched on some conspicuous boulder, pours forth monotonous notes, while the dipper finds a congenial home on the rocky portions of the banks. Here also, in the season, fluttering among the rushes on the swampy margins, may be noticed the pretty little heath-butterfly and the chimney-sweeper moth, and not only here, but in similar habitats all the way down Washburn side.

On leaving the monotonous and somewhat dreary moorlands, the course of the river becomes extremely picturesque and beautiful as it flows through a gritstone boulder covered channel, abounding in deep trout-pools, and flanked by steep declivities clothed with coarse grass and bracken, diversified and relieved by grey crags and tufts of purple heather. On the right bank in one place (at about 900 feet in elevation) is a hanging plantation of tall firs, which on the July day of our visit proved (for such an isolated locality) quite an oasis of bird life. Here, in a very few minutes, were noted the spotted flycatcher, the redstart, tree pipit, willow-wren, chaffinch, wren, marsh tit, and others. Lower down are here and there stretches of swamp by the stream side, and as West End is approached we come upon a series of wall-like cliffs of shale. At West End the Washburn receives its most important feeder, the Chapelshaw Beck, which flows down a

most picturesque little valley from the west. The main valley now becomes grander in its aspect, and, perhaps a mile or two above Blubberhouses, may be considered as prettier than in any other part, the hills which immediately fringe the stream being loftier and well-wooded, and in several places overhung with fine bold crags.

About Blubberhouses itself the valley becomes wider, and the river acquires more volume. Here it is utilized for the service of man, and the waters of Washburn, gathered from a wide area of moorland country, are collected into the three fine picturesque and lake-like reservoirs at Fewston, Swinsty, and Lindley Wood, which now afford the sole water-supply of the 320,000 inhabitants of Leeds. The two upper reservoirs are geographically continuous, being separated only by a steep embankment, but between them and the lower, or Lindley Wood reservoir, intervenes about three miles of very pretty country, diversified by mixed woodlands, of which Dob Park Wood is the most extensive. The lowermost reservoir is most picturesquely situated at the foot of Lindley Wood, from which it is named, and which in summer presents a remarkable aspect from the immense abundance of foxgloves it possesses, and which, viewed from below, look not unlike regiments of soldiers. The low grounds about the river side below Lindley Woods, are in spring enlivened with the flowers of the daffodil, once so numerous that Dr. Lees remarks that they form quite a feature in the botany of the valley. After leaving the Lindley Wood reservoir, the Washburn flows first S.E. and then due S., past Farnley Park and the pretty village of Leathley, and finally—after a course of 17 miles—reaches the point about a couple of miles east of Otley, where it effects its junction with the Wharfe, or as Drayton, more than two centuries ago, in the quaint language of his ‘Polyolbion’ put it

“ Washbrook with her wealth her mistress doth supply.”

Geologically the whole district may be considered as entirely composed of the sandstones and shales of the millstone grit series of rocks, and this uniformity of geological structure produces a noteworthy effect upon the vegetable productions, as evidenced by the individual preponderance of certain gregarious species. To say nothing of the vast stretches of heather and coarse grass which clothe the elevated moorlands, Washburndale is remarkable for the great profusion of daffodils in the low country about Lindley Wood, and the immense abundance of foxgloves in the woods and lanes, to which allusion has already been made. Then the river slopes are bright green with bracken, while the roadsides are white with flowers of

Galium saxatile, and the embankments of the reservoirs with those of oxeeye. But there is plenty of scope for the botanist nevertheless, and by the river side there is diversity and abundance of floral wealth.

So far the district is almost virgin ground for the naturalist, and has hardly yet received attention, doubtless in consequence of its secluded nature and the difficulty of access to its upper and middle, or even to its lower portions. So complete has been the neglect that the present article may be regarded as almost entirely based upon the observations of not more than five individuals. Mr. Henry Brown, of Otley, who was an enthusiastic collector of lepidoptera some twenty years ago, extended his researches to Fewston and Dob Park Wood. Later still, Lord Walsingham, so well known as a lepidopterist, and the owner of extensive estates at Blubberhouses, made notes of the lepidoptera which, in a single season, he and his collector, Mr. Eedle, had observed in that vicinity. Beyond this, and with the exception of our own and a few scattered observations, we are not aware of any available information on the subject.

It is much to be regretted that all our information dates subsequently to the construction of the reservoirs, for there can be no doubt that these extensive sheets of water have materially altered the climatology of the valley, and it would have been interesting to have noted any change in the natural history resulting therefrom. The inhabitants bitterly complain that the mean temperature of the valley has been very considerably reduced; and the very stability of the ground has been affected, the village of Fewston having been ruined by land-slips, said to be accelerated if not caused by the water of the upper reservoirs.

FLORA.

With regard to the flora we are in possession of no information additional to that given at pp. 314 and 315 of "West Yorkshire," where Mr. F. Arnold Lees gives a list of the rarer plants, and refers to the abundance of the daffodils.

FAUNA.

The materials upon which the following lists are founded are the observations of ourselves and the gentlemen to whom we have already referred. They cannot, however, be regarded as much more than casual observations; and no branch of the fauna can be said to have been systematically investigated.

MAMMALIA.

No attention has been paid to the mammalia of the district, but Clarke has noted the following species:—

Bats.—Small bats have been seen on the wing at Blubberhouses, but the species not identified.

Mole.—Occurs about Blubberhouses.

Fox.—Not uncommon.

Stoat and Weasel.—Have been observed about Dob Park Wood.

Otter.—The reservoir keeper has on several occasions seen this animal on the river below Lindley reservoir.

Water Vole.—Observed in Thackray Beck.

Field Vole.—Has been found near Lindley.

Hare and Rabbit.—Common, especially the latter, on the rough bracken-clad slopes about Swinsty.

BIRDS.

The avifauna is a varied one, and its special features or characteristics are those of a sub-alpine region, traversed by a trout stream and fringed by moorlands. This is testified by the presence of the dipper, the grey wagtail, and the sandpiper on the river; and the ring ouzel, the red grouse, the golden plover, and the curlew on the moors. The reservoirs form an additional feature, being attractive to numbers of wild fowl in the winter, and no doubt some species of wading birds also find their margins an attractive half-way house when on their annual spring and autumn migrations.

Clarke has paid some attention to the ornithology of the valley, and the result is a list of 85 species, which may be tabulated as follows:—

Residents	47	} 69 annual breeding species.
Summer visitants	...	...	22
Winter visitants	...	...	5
Casual visitants	...	...	11

The species treated as casual visitors are the pied flycatcher, the mealy redpoll, the cormorant, the heron, the wild goose, the Canada goose, the mute swan, the goldeneye, the ringed plover, the terns, and the gulls.

The absence of rarities from the list is accounted for by the fact that accidental visitors can only be expected to fall under the notice of those living in the district, and as yet Washburndale has not boasted of a resident naturalist. Hence the list is not graced by the presence of anything remarkable, nor can this be wondered at since it is the production of one whose visits, like those of rare birds and the proverbial angels, are few and far between, and chiefly when on angling bent.

Missel Thrush.—Common in the wooded parts.

Song Thrush.—Common in summer in the woodlands and in the cultivated portion of the valley; less common in winter.

- Redwing.—A common winter visitant.
- Fieldfare.— do. do.
- Blackbird.—A common resident in suitable localities.
- Ring Ouzel.—Summer visitant, abundant on all the moorlands.
- Dipper.—A common resident on the river from its confluence to near its source.
- Wheatear.—Common in summer about Fewston, where I have seen it perched upon the roofs of the houses.
- Whinchat.—A summer resident, common in the grasslands.
- Redstart.—Common in summer in the woodlands up to 900 feet.
- Redbreast.—An abundant resident.
- Whitethroat.—A summer resident in Lindley Wood.
- Blackcap.— do. do.
- Goldcrest.—A resident in the Lindley Wood and about Blubberhouses.
- Chiffchaff.—A summer visitant to the woodlands.
- Willow Warbler.—A common summer visitant to the woodlands up to 900 feet.
- Wood Warbler.—A summer visitant to Lindley Wood.
- Sedge Warbler.—A summer resident on the margins of the Fewston reservoir.
- Grasshopper Warbler.—A summer visitant but not common, and only observed and heard on the margins of Swinsty reservoir.
- Hedge Accentor.—An abundant resident.
- Longtailed Titmouse.—Resident, and not uncommon about Lindley and Dob Park.
- Great Titmouse.—Resident and abundant.
- Coal Titmouse.—Resident and not uncommon.
- Marsh Titmouse.—Resident, not uncommon, occurring up to 900 ft.
- Blue Titmouse.—Resident and abundant.
- Creeper.—Resident but not common. Dob Park Wood.
- Wren.— An abundant resident.
- Pied Wagtail.—Resident and common, but less so in winter.
- Grey Wagtail.—Not uncommon on the river above Blubberhouses. I have not seen it below that village, but probably it occurs there in autumn and winter.
- Yellow Wagtail.—A few frequent the margins of Fewston reservoir in summer.
- Meadow Pipit.—A very common resident, especially on the moorlands.
- Tree Pipit.—A common summer visitant to wooded localities up to 900 feet.

Spotted Flycatcher.—Common, in summer, up to 900 ft.

Pied Flycatcher.—A few seen at Dob Park on the 1st of May, 1881.

These were probably on migration.

Swallow.—An abundant summer visitant.

Martin.— do. do.

Sandmartin.—Common in summer about Fewston, and on the river above West End.

Goldfinch.—One seen at Dob Park in May, 1881. Probably a resident species in limited numbers.

Greenfinch.—A common resident about Blubberhouses; observed also in Lindley wood.

Sparrow.—An abundant resident in the villages.

Chaffinch.—A common resident.

Linnet.—A not uncommon resident.

Mealy Redpoll.—Several were shot one winter at Fewston, by Mr. Grange, of Harrogate. An irregular winter visitant.

Lesser Redpoll.—A particularly common resident about Fewston and Blubberhouses.

Bullfinch.—Not uncommon in the hillside plantations between Blubberhouses and West End.

Yellow Bunting.—A common resident.

Reed Bunting.—A few haunt the margins of Fewston reservoir, where they breed.

Skylark.—A common resident.

Starling.— do.

Magpie.—Common in and about the woodlands, where it is resident.

Jackdaw.—A resident at Leathley, but not numerous.

Hooded Crow.—A few visit Dob Park wood in winter.

Rook.—A resident. There are fine rookeries at Fewston and Blubberhouses.

Swift.—An abundant summer visitant.

Nightjar.—A summer visitant, not common, and hitherto observed only about Blubberhouses.

Kingfisher.—This species appears to be a very uncommon resident, and has only been observed above West End. Perhaps this scarcity is accounted for by the absence of suitable nesting haunts in the shape of steep sandy banks.

Cuckoo.—A common summer visitant.

Tawny Owl.—A resident in Dob Park Wood.

Sparrow Hawk.—Resident in Lindley Wood.

Merlin.—In very limited numbers on Blubberhouses Moor in summer; more widely dispersed in winter.

- Kestrel.—A not uncommon resident about Fewston, Dob Park Wood, and Lindley Wood.
- Cormorant.—One seen by Lord Walsingham on Fewston reservoir, in the early autumn of 1881.
- Heron.—Frequently observed on the reservoirs, which it visits for food. These birds are, in all probability, from the heronry at Harewood.
- Wild Goose.—Species uncertain. A party of six or seven observed flying over Blubberhouses on the 16th of January, 1881.
- Canada Goose.—Several flying about Lindley on the 18th of March, 1882. Escapes from some ornamental water in the neighbourhood.
- Mallard.—Resident, breeding in the vicinity of the reservoirs, on which it may be seen with its young in the summer. Very numerous in winter.
- Teal.—Common in winter on the reservoirs.
- Widgeon.— do. do,
- Goldeneye.—On the 18th of March, 1882, a fine old drake was observed on the river where it enters Lindley reservoir.
- Wild Duck.—In addition to the above species, which Clarke has identified, several other species of wild duck frequent the reservoirs in winter, but have not afforded him an opportunity for identification.
- Ring Dove.—A resident in Lindley Wood.
- Pheasant.—Resident in limited numbers in Lindley and Dob Park Woods.
- Partridge.—Not common, in the lower portion of the valley, about Lindley and Dob Park.
- Red Grouse.—An abundant resident on the moorlands, especially those of Blubberhouses, where Lord Walsingham, on the 28th of August, 1872. shot with his own gun 842 grouse—the largest bag on record.
- Land Rail.—A summer visitant, but not common, Blubberhouses.
- Waterhen.—Resident in limited numbers about Dob Park.
- Golden Plover.—In summer a common resident on the moorlands.
- Ringed Plover.—Several observed on the margins of Swinsty reservoir in September, 1880, and again in late May, 1881, when it is possible they had bred there.
- Lapwing.—Common about Fewston, Blubberhouses, and on the moors. In June and July, large flocks composed of young and old birds frequent the margins of Fewston reservoir.
- Woodcock.—A resident, breeding in Lindley and Dob Park Woods, but most numerous as an autumn and winter visitor.
- Common Snipe.—A resident; not uncommon on the moorlands. In summer the old and young are frequent on the shores of Fewston reservoir.

Common Sandpiper.—Common in spring and summer from the confluence to nearly the source of the river, and extremely abundant on the three reservoirs.

Curlew.—Common on the mooriands in spring and summer.

Tern.—Species uncertain; probably the common tern. In the late summer small parties are frequently to be seen on the reservoir.

Gull.—Species uncertain. During unsettled weather in spring and summer, gulls are not uncommon on the Swinsty and Fewston reservoirs. From their size they appear to be either the herring or the lesser black-backed gulls.

REPTILES AND AMPHIBIANS.

These, like the mammalia, have not received special attention.

Clarke notes the following :—

Common Lizard.—On the dry moorlands.

Common Frog.—Abundant.

Common Toad.— do.

FISHES.

Minnow.—Abundant in the reservoirs and in Thackray beck.

Golden Tench (a variety of the Common Tench).—Lord Walsingham has introduced this fish into Fewston reservoir.

Loach.—Occurs in Swinsty reservoir.

Trout.—Abundant, especially in the river above Blubberhouses and in the reservoirs. In the latter it attains to a large size.

Loch Leven Trout.—This interesting species has been introduced into the river by Lord Walsingham.

Grayling.—Has been observed in some numbers about Dob Park, going up stream to spawn. It is questionable if this species is not now resident in Lindley reservoir.

Sharpnosed Eel.—Occurs in the reservoirs.

MOLLUSCA.

The very scanty list of mollusca here given is based upon the few specimens which casual visits to the valley have yielded to Roebuck, and as a matter of fact it represents the product of but a few hours' actual collecting. Further research will add numerous species, although the district is not one from which a very rich result may be expected, owing to the uniformity of the geological structure, and more especially its deficiency of calcareous rock. The presence of *Zonites excavatus*, and the absence of limestone-frequenting species, are sufficiently demonstrative of this.

Limnæa peregra.—Common in Fewston reservoir.

Ancylus fluviatilis.—Common in streams at Blubberhouses, in Dob Park Wood, and running into Lindley Wood reservoir. It would be of interest to ascertain its altitudinal range in the district.

Arion ater.—Abundant round the margins of the reservoirs, and occurs as high up the dale as Hoodstorth.

A. hortensis.—Common (and variable) round Fewston reservoir.

Limax agrestis.—Abundant round the margins of the reservoirs, also as far as the upper limit of cultivation at West End.

L. arborum.—One at Gill Bottom, near Swinsty reservoir, and one (immature) under a stone near West End.

Zonites excavatus.—In the upper portion of Dob Park Wood.

Z. cellarius.—Common in the churchyard at Fewston, and occurs as high up the dale as Hoodstorth.

Z. nitidulus, *Helix rufescens*, and *H. rotundata*, common in Fewston churchyard.

Helix hortensis.—Near Lindley Wood.

H. pulchella.—Has been found under stones at Old Camp, near Fewston.

COLEOPTERA.

Of the beetles, only four well-known and conspicuous species have been identified :

Cicindela campestris, the tiger beetle.—Common near West End (W. E. C.)

Cychrus rostratus.—Margin of Swinsty reservoir.

Melolontha vulgaris, the cockchafer.—Washburn valley (D. Rhodes).

Lampyris noctiluca, the glow-worm.—Common on the margins of Lindley Wood reservoir (W. E. C.)

LEPIDOPTERA.

The list of lepidoptera is mainly from the observations made by Lord Walsingham (and by his lordship's collector, Thomas Eadle) in the vicinity of his shooting-box at Blubberhouses. Lord Walsingham's visits to his estates are usually short, and devoted to grouse-shooting, but in 1882 he made, at our request, notes of the species observed. To these we add others from the observations made near Fewston about twenty-two years ago, by Mr. Hy. Brown, of Otley, and from casual notes made by ourselves and others. The authorities are given for all except Lord Walsingham's observations.

Pieris rapæ.—Lindley Wood (W. E. C.) and Blubberhouses.

P. napi.—Leathley (W. D. R.) and Blubberhouses.

- Anthocharis cardamines*.—Common about Fewston (H. Brown, W. E. C.) and Blubberhouses.
- Argynnis selene*.—In 1873 Mr. F. Arnold Lees noted it as “plentiful in glades and bushy places near Lindley Wood.” It does not appear to have been seen since, and it would be interesting to ascertain if it was exterminated by the construction of the Lindley Wood reservoir.
- Vanessa urtica*, *V. Io*, *V. atalanta*.—Fewston (H. Brown).
- Satyrus janira*.—Very plentiful near Dob Park (H. Brown, W. E. C.) and Leathley (W. D. R.)
- Chortobius pamphilus*.—Very abundant in all damp hollows from Washburn source to Lindley Wood.
- Polyommatus Phlœas*, *Lycæna alexis*.—Abundant at Fewston (H. Brown).
- Smerinthus popæli*.—Fewston (J. W. Speck).
- Hepialus velleda*.—Abundant on the moorlands near the source of the Washburn (W. E. C.), and at Blubberhouses.
- H. humuli*.—In 1882 Eadle took at Blubberhouses varieties which in the decidedly pinkish tinge of the hind wings approached the Shetland ones.
- Bombyx rubi*.—Larvæ abundant on Swinsty Moor (H. Brown).
- B. callunæ*.—Blubberhouses.
- Lasiocampa ilicifolia*.—When collecting at Blubberhouses in 1882, Eadle thought he saw this species, and Lord Walsingham writes that he has always thought the locality a likely one for it.
- Rumia cratægata*.—Common at Fewston (H. Brown) and Blubberhouses.
- Selenia illunaria*, *Phigalia pilosaria*, *Amphidasis betularia*, *Tephrosia biundularia*, Blubberhouses.
- Eupisteria heparata*.—Blubberhouses.
- Acidalia fumata*.—Fairly common at Blubberhouses.
- Cabera pusaria*, *C. exanthemaria*.—Blubberhouses.
- Macaria liturata*, *Fidonia stomaria*, *F. piniaria*.—Blubberhouses.
- Hybernia progemmaria*.—Dob Park Wood (W. E. C.)
- Larentia cæsiata*.—Blubberhouses, common.
- Emmelesia albulata*.—Blubberhouses.
- Eupithecia lariciata*.—Very abundant at Blubberhouses.
- E. nanata*, *E. minutata*.—Blubberhouses Moors.
- Melanthia albicillata*.—Mr. John Grassham has taken this species at Lindley Wood.
- Melanippe tristata*.—Blubberhouses.

M. montanata.—Common at Blubberhouses, where, as Lord Walsingham informs us, in 1882 Eadle took a variety very like the extreme northern form.

Coremia propugnata, *C. ferrugata* var.—Blubberhouses.

Tanagra chærophyllata.—This pretty species is common on grassy ings along the whole course of the Washburn (W. E. C. and W. D. R.) Near Fewston (J. W. Speck,) Blubberhouses, common.

Dicranura vinula.—Fewston (J. W. Speck).

Notodonta camelina, *N. ziczac*.—Blubberhouses.

Cymatophora flavicornis.—Found in Blubberhouses and near Dob Park Bridge (W. D. R.)

Nonagria fulva, *Hydræcia nictitans*, *Xylophasia rurea*, *Miana arcuosa*, *Caradrina alsines*, *Agrotis porphyrea*, Blubberhouses.

Triphæna pronuba.—Lower Platts (W. E. C.)

Noctua brunnea.—Margin of Fewston reservoir (W. D. R.)

Hadena dentina, *Anarta myrtilli*—Blubberhouses.

Plusia gamma.—Abundant throughout the valley.

Botys fuscalis, *Crambus dumetellus*, *C. culmellus*, *C. hortuellus*, *Phycis carbonariella*, *Tortrix unifasciana*, *T. viburnana*, *T. icterana*, *Peronea Schalleriana*.—Blubberhouses.

Peronea Caledoniana.—Swarms on the Blubberhouses moors.

Penthina cynosbana, *Pardia tripunctana*, *Sericoris lacunana*, *Sciaphila subjectana*.—Blubberhouses.

Sciaphila octomaculana.—Larvæ taken in 1882 at Blubberhouses, in flowers of a *Hieracium* or nearly-allied plant.

Bactra lanceolana, *Phoxopteryx myrtillana*.—Blubberhouses.

Pædisca occultana.—Many larvæ on larch at Blubberhouses in 1882.

P. Solandriana *Coccyx hyrciniana*, *Dicrorampha plumbagana*, *Cochylis Smeathmanniana*, *Endrosis fenestrella*, *Coleophora cæspititiella*, *Lithocolletis alnifoliella*, *Nepticula myrtillella*, *Æcophora stipella*, *Argyresthia spiniella*, *Gilechia teriella*, *G. thrasonella*, var. *cladiella*.—Blubberhouses.

Hyponometa evonymella.—Plentiful in Dob Park Wood (H. Brown). Blubberhouses.

HYMENOPTERA.

Several species of bees and ants have been observed, but the specimens and notes having been mislaid, we are unable to mention any other than

Bombus lucorum, which is common round the reservoirs.

DIPTERA.

Hæmatopota pluvialis.—This—the “Cleg”—is abundant throughout the dale.

Of the other groups of animals no observations appear to have been made, and there is consequently a wide field for investigation. As the object of the present paper is to stimulate research, more especially upon the day of the excursion of the Y.N.U., the writers will be pleased to have further notes and lists, whether made then or at any other time, and these they propose to incorporate with the supplementary lists which they hope to insert in a future number of the *Naturalist*.

Leeds, July 18th, 1883.

Short Notes and Queries.

ALGÆ NEAR MIRFIELD.—Mr. C. P. Hobkirk recently sent me a most interesting alga from near Mirfield. It proves to be *Ædogonium Landsboroughii*, Hass. It was in fine fruit, and is an addition to our list of West Riding algæ, as also are the six first mentioned of the following, which I found mixed with the *Ædogonium*:—*Spirogyra insignis*, Hass., *Hydrianium heteromorphum*, Reinsch., *Cosmarium ornatum*, Ralfs., *Closterium Leibleinii*, Ktg., *C. acerosum*, Schrenk., *Nitschia linearia*, Sm., *Spirogyra longata*, Vauch., var. *a. communis* (Hass.) in conjugation, *Oscillaria Froelichii*, Ktg., *forma tenuior*, Rabenh., *Cledophora glomerata*, L. (in attenuated form), *Pleurotenium baculum*, Breb., *Cosmarium margaritifera*, Turp., *Synedra splendens*, Ktg. (some being 119mm. in length), *Diatoma elongatum*, *Cymatopleura elliptica*, Breb., *Pleurosigma acuminatum*, Grun., *Melosira varians*, Ag., and other small diatoms. After keeping the gathering a few days in an open dish, there was a rich supply of rotifers, *Dinocharis tetractis*, Ehrh., being very conspicuous with its long forked foot with two horns at the base.—WM. WEST.

WREN'S NEST.—On the 11th inst. I was present when a person found the nest of the common wren, which had the means of ingress narrowed to a very small hole. During examination out flew a corder bee (*Bombus muscorum*), the nest contained two wren's eggs smeared with honey, and a comb about the size of a large date, containing larvæ of the bee. Land rails are numerous here this year.—C. C. HANSON.

Epipactis ensifolia.—I have often looked for this plant at the original station at Jackdaw Crag, near Stutton, where it was first found by the late O. A. Moore, but always without success. Once I went, along with Mr. Moore, and we diligently looked over the place, but the plant was nowhere to be found. In June of this year, Capt. Thompson, of Tadcaster, told me his son had found it about half-a-mile from the first-named habitat, and I went and saw nearly a score plants in full flower; in nearly every case they were under beech trees.—JOHN EMMET, Boston Spa, July, 1883.

GREEN SANDPIPER.—I received a note from Rev. J. Chaloner, of Newton Kyme, last month, in which he says:—"I saw a rare bird here

on the 28th June, viz., a green sandpiper, which is the fourth I have ever seen, one of which I killed. Graham, the bird-stuffer, a short time ago told me they were not only very scarce, but that a nest had never been found."—JOHN EMMET, Boston Spa, July, 1883.

Rainfall for June.

	Height of gauge above sea level.	Rain-fall.	No. of Days	TOTAL FALL TO DATE.		Date of heaviest Fall.	Amount of heaviest Fall.
				1883.	1882.		
HUDDERSFIELD (Dalton) ... (J. W. Robson)	Ft. 350	In. 3·74	18	16·28	*14·57	29	0·92
HALIFAX...(F. G. S. Rawson)	365	3·99	18	21·24	27·02	26	0·94
LEEDS ... (Alfred Denny)...	183	3·42	19	13·44	†10·62	29	1·00
HORSFORTH ... (James Fox)	350	3·88	19	15·73	‡15·03	29	1·02
PATELEY BRIDGE...(E. Warburton, M.R.C.S., L.S.A.)	436	3·26	13	18·24	§15·82	25	1·30
BARNSELY ... (T. Lister) ...	350	3·32	15	14·98	14·37	25	0·90
INGBIRCHWORTH (do.)	853	5·28	18	22·06	20·79	29	1·35
WENTWORTH CASTLE (do.)...	520	3·80	12	17·26	15·04	29	0·98
GOOLE ... (J. HARRISON) ...	25	1·87	12	11·51	14·57	25	0·70
HULL (Derringham) (Wm. Lawton)	10	3·11	9	9·14	11·82	25	0·76

* Average to date for 17 years, 1866-82. † Average of 29 years, 1853-62 & 1865-83.

‡ Average of 14 years, 1870-83. § For 4 years, 1880.

Rainfall at Scarborough is 2·67 inches, of which 2·03 fell from the 25th to 30th inclusive.

Reports of Societies.

BARNSELY NATURALISTS' SOCIETY.—Meetings, July 3rd and 18th.—The botanists gave account of various flowering plants noted in a local excursion. July 17th, on Thorne Waste, all three species of *Drosera*, *Andromeda polifolia* abundant, *Peucedanum officinalis*, *Thalictrum flavum*, *Typha latifolia*; July 19th, *Hydrocotyle vulgaris*, *Carex pulicaris*, *Ranunculus Lenormandi*. Mr. Lister observed on Langsett Moors and Brookhouse, ring-ouzels, lapwings (both numerous), twite, stonechats, none of which were noted in our lowland tracts; also swallow and martins in Cutgate, near the Derbyshire boundary. The black tern, as well as water birds recorded last month, noted at Ingbirchworth. The nightingale an earlier date than the one given last month (May 1), it ceased singing early in June, and safely reared its brood. One was heard singing as late as June 23rd, at Campsall. Kingfishers have bred generally in safety. Swifts seen once or twice at Gawber; &c.—T. L.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY. — Monthly meeting, June 25th. Mr. S. L. Mosley, of Huddersfield, read a paper entitled "Natural History Education," in which he alluded to the desirability of a more extended knowledge of Natural History subjects, especially of botany and entomology, believing as he did that a large amount of the injury done to food-crops, &c., through insect agency, might be prevented or diminished by a more extended knowledge of the life histories of the insects themselves. He suggested that lessons on Natural History might be taught in board schools with great advantage to the scholars; and he alluded to the excursions of the Huddersfield Board School children, conducted by himself, and to the great interest taken in these matters by most of the children. A number of interesting entomological exhibits were shown during the conversazione which followed.

MANCHESTER CRYPTOGRAMIC SOCIETY.—Monthly meeting, Mr. W. H. Pearson, president, in the chair.—The hon. secretary brought before the notice of the society a new British moss which had been recently sent to him by Mr. Boswell, of Oxford, who had determined its identity with the *Bryum gemmiparum* of De Notaris (see *Naturalist*, vol. viii., p. 185). The secretary also exhibited specimens of *Mylia Taylori* with colesules, collected near Bala last month. Mr. George Davis, of Brighton, sent specimens of *Leptodon Smithii*, in fruit, for distribution. Mr. Cash also distributed specimens of *Myurella julacea*, which he had recently collected at Ingleborough. Mr. James Percival sent a living specimen of *Cinclidium stygium* in fruit from Malham, and in his letter recorded the finding of *Cypripedium Calceolus*.—THOS. ROGERS, Hon. Sec.

MANCHESTER CRYPTOGRAMIC SOCIETY.—At the usual monthly meeting, Dr. Carrington, F.R.S.E., in the chair, Mr. James Cash exhibited a specimen of the rare British moss, *Gymnostomum calcareum* in fruit, which had been gathered during the present month in Monsal Dale, Derbyshire, by Mr. G. A. Holt. Dr. Carrington placed upon the table a large number of letters from eminent cryptogamic botanists in the earlier part of the present century, who had been in correspondence with the celebrated Lancashire botanist, Edward Hobson. Many of the letters had reference to the collection of mosses made by Hobson at that time, copies of which are now in our Free Reference Library and Cheetham College. Dr. Carrington interested the members most pleasantly for the rest of the evening by reading letters from George Caley, W. Wilson, Dr. Greville, Sir W. Hooker, Lyell, Bree, Schleicher, Dr. Taylor, James Dalton, and Sir J. W. Jardine. The letters were placed in the hands of Mr. J. Cash for compilation and future reference.—T. ROGERS, Hon. Sec.

PORT ELIZABETH NATURALISTS' SOCIETY.—The ordinary meeting of this Society on June 7th—Mr. C. R. Read presiding—was entirely devoted to the exhibition of specimens. Mr. Farquhar brought with him a few coleoptera, and a very remarkable stunted crab, from the mouth of Shark's River. The chairman shewed a fine marine shell (*Scalaria*), and Mr. Leslie samples of soil from De Beer's Mine. The secretary exhibited

a good assortment of triton shells of various sizes, and five species of star fishes. In speaking of the progress of the society, Mr. Bairstow announced that if, at the next annual meeting, it could be proved satisfactorily the naturalists had made sufficient headway to warrant such a course, the constitution of the society would be entirely changed and placed upon a thoroughly sound basis. The society did not require useless, inanimate patronage. It lacked practical aid and hard-workers—students, observers, and collectors. The latter compose an inseparable trio when results are considered.

YORKSHIRE NATURALISTS' UNION.—YORK, July 14th.—The third meeting for 1883 was held at York, for the purpose of investigating Strensall Common and Sandburn Woods. Although the day was remarkably fine, the attendance was very small—another proof that secluded localities and those difficult of access are popular with the members. One party, under the guidance of the Rev. W. C. Hey, M.A., alighted at Warthill station, and soon afterwards divided into two sections—one bent on captures in entomology, and the other botanically inclined. Both these, after investigating Sandburn Woods, devoted themselves to the Natural History of the Common. In addition to these, a party composed of conchologists and microscopists approached the Common from Strensall. All assembled at Strensall station and took the 5-36 train for York, where a meat tea was awaiting them at the Exhibition Refreshment Rooms. The general meeting was held in the large room over the Savings Bank. The Rev. W. C. Hey, M.A., occupied the chair. The minutes of the Filey meeting were taken as read, and on the roll being called, nine societies were found to be represented, viz., Beverley, Dewsbury, Huddersfield, Leeds (2), Scarborough, Selby, and York (2). The following new members were proposed and duly elected:—Mr. Walter Morrison, High Sheriff of Yorkshire, Tarn House, Malham; the Rev. J. S. Tute, of Markington Vicarage, Ripley; and Mr. Thomas Gough, B.A., B.Sc., F.G.S., of York. A vote of thanks was accorded to the Rev. W. C. Hey for the kindly interest he had taken in the arrangements for the meeting, and for his guidance during the day. The reports of the sections were then taken. For the Entomological Section Mr. G. T. Porritt said the lepidopterists were well satisfied with their work. At Sandburn *Epione vespertaria* was well out, and in beautiful condition; and other species taken or seen on the same ground included *Argynnis Selene*, common but very worn; *Satyrus Hyphanthus* plentiful, and included the variety without rings; *Chortobius Pamphilus* and *Lycæna Alexis*, both abundant; *Hesperia Sylvanus*, plentiful; *Zygæna filipendula* and *Z. lonicæræ* abundant, especially the latter; *Lithosia rusomella*, common; *Tortrix viburnara*, abundant; *Sciaphila nubilana*, common; *Trochea piniperda*, larvæ common; *Acronycta menyanthidis*, larvæ; and many others. On Strensall Common he had taken a beautiful and extraordinary black variety of *Eubolia palumbaria* in perfect condition; also *Euthemonia russula*, very fine; *Crambus*

pascuellus, *Eupæcilia angustana*, &c., &c. Mr. P. F. Lee, secretary for phanerogamic botany, reported, upon the day's proceedings, that the total number of phanerogams, ferns, &c., of London Catalogue observed on the Common, as well as at Warthill and near the village of Strensall, was 258. Of these, note should be made of the following, as they include some good things rarely met with at the Union's excursions:—*Drosera intermedia*, *Polygala vulgaris*, sub. sp. *depressa*, *Stellaria glauca*, *Hypericum elodes*, *Radiola millegrana*, *Spiræa Filipendula*, *Carduus pratensis*, *Pyrola minor*, *Scutellaria minor*, *Daphne Laureola*, *Habenaria bifolia*, *Carex dioica*, *C. pilulifera*, *C. distans*, sub-sp. *fulva*, *Aira caryophyllea*, *Festuca myurus*, sub.sp. *sciuroides*, *Nephrodium Oreopteris*, *Botrychium Lunaria*, *Lycopodium inundatum*. The Cryptogams (for which Mr. G. Masee reported) appertaining to heathy swamps were abundant; good fruiting specimens of the following were obtained:—*Pilularia globulifera*, *Sphagnum rosellum*, *S. acutifolium*, *S. squarrosum*, *Meesia uliginosa*, *Lastræa Oreopteris*, *Lycopodium inundatum* barren. Amongst algæ and fungi the most noteworthy were *Volvox globator*, *Chætophora tuberculosa*, *Mougeotia genuflexa*, *Meridion circulare*; *Omphalia campanella*, *O. umbelliferus*, *Thelephora terrestris*, and *Tubulina cylindrica*. For the Geological Section no report was presented. In Vertebrate Zoology Mr. Clarke, secretary, reported that most of the specimens announced in the circular had been observed, and in addition to these the curlew. The sandmartins, numerous on the common, were nestling in the turf-clad marker's butts—the only habitat offered in the neighbourhood. The water vole among the mammalia, the lizard (*Zootoca vivipera*) among the reptiles, and the trout and stickleback among the fishes, were also observed.

MICRO-AQUATICS AT STRENSALL.—On our recent Y. N. U. visit to Strensall Common, I was the only collector of micro-aquatic plants, and I found a rare store of "good things,"—some new to Yorkshire, and I almost think new to England, as certain desmids which I found have only been reported from Wales (A. W. Wills, of Birmingham, in his famous Capel-Curig gathering), and Ireland (W. Archer, F.R.S., of Dublin). When verified, I will send a full list, but at present will only mention the following as a sample:—*Microspora fugacissima*, *Aptogonum desmidium*, *Glæocystis rupestris*, *G. ampla*, *Cosmarium pyramidatum*, *C. margaritifera*, *C. cucurbita*, *Euastrum binale*, *E. elegans*, *E. didelta*, *Xanthidium fasciculatum*, *X. octocorne*, *Zygnema stagnale*, *Z. stellinum*, *Staurastrum dilatatum*, *S. furcigerum*, *S. anatinum*, *S. aristiferum*, *S. inflexum*, *S. margaritaceum*, *Arthrodesmus convergens*, *A. incus*, *Polyedrium tetrahedricum*, *Pediastrum Ehrenbergii*, *P. Boryanum*, *Sphærozosma vertebratum*, *Anabaina circinalis*, *Volvox globator* (T. Hick), ditto, (W. B. T.) It is to be noted that Diatomaceæ were but few in number, and that many common confervæ and desmids are conspicuous by their absence from this gathering.—W. B. TURNER, Leeds, 24th July.

Original Articles.

THE PRINCIPAL PLANTS OF MALHAM.

By WM. WEST.

As there is to be a ramble of the Yorkshire Naturalists' at Malham, on the first of September, I thought that a list of the rarer plants that can be collected there would be opportune. I can vouch for the occurrence of every plant I mention, having collected them all myself. I have collected few of the lichens there are there, and still fewer fungi, though the district will yield many interesting plants belonging to these groups, if they be properly looked for, especially lichens, a fair collection of which I have among my unexamined specimens :—

Ranunculus penicillatus	Sedum Telephium
R. auricomus, with large perfect petals	Saxifraga granulata
Trollius europæus	S. hypnoides
Thalictrum montanum	S. tridactylites
Actæa spicata	Parnassia palustris
Draba incana	Cornus sanguinea
D. muralis	Adoxa Moschatellina
Cochlearia alpina	Galium sylvestre
Thlaspi occitanum	Valeriana dioica
Arabis hirsuta	Scabiosa columbaria
A. thaliana	Carduus nutans
Helianthemum vulgare	C. crispus
Viola hirta	C. heterophyllus
V. lutea	Carlina vulgaris
V. amœna	Gnaphalium dioicum
Alsine verna	Leontodon hispidus
Sagina nodosa	Taraxacum erythrospermum
Hypericum montanum	Lactuca muralis
H. hirsutum	Crepis paludosa
H. perforatum	Hieracium caesium
Geranium pratense	H. pallidum
G. sylvaticum	H. Gibsoni
G. sanguineum	H. murorum
G. lucidum	H. gothicum
Rhamnus catharticus	H. vulgatum
Anthyllis vulneraria	H. vulgatum var. maculatum
Hippocrepis comosa	Campanula latifolia
Rubus saxatilis	Vaccinium Oxycoccus
R. cæsius	Menyanthes trifoliata
Rosa pimpinellifolia	Polemonium cœruleum
R. mollissima	Veronica Anagallis
Geum intermedium	Pedicularis palustris
Potentilla alpestris	Thymus Serpyllum (white-flowered)
Pyrus rupicola	Myosotis sylvatica
Dryas octopetala (nearly at Arncliffe)	M. collina
Circæa intermedia	M. cæspitosa
Hippuris vulgaris	Pinguicula vulgaris
Ribes Smithianum	Primula farinosa

Plantago media
 Polygonum Bistorta
 Salix nigricans
 S. repens
 Potamogeton lucens
 P. densus
 P. perfoliatus
 Orchis incarnata
 Gymnadenia albida
 G. conopsea
 Habenaria viridis
 Epipactis ovalis
 Paris quadrifolia
 Convallaria majalis
 Narthecium ossifragum
 Juncus glaucus
 Blysmus compressus
 Scirpus pauciflorus
 Eriophorum latifolium
 Carex dioica
 C. pulicaris
 C. fulva
 C. lepidocarpa
 C. capillaris

C. teretiusecula
 C. pilulifera
 C. ampullacea
 C. vesicaria
 C. paludosa
 C. disticha
 C. remota
 C. binervis
 C. hirta
 Sesleria cœrulea
 Avena pubescens
 A. alpina
 A. flavescens
 Koehleria cristata
 Poa nemoralis
 Festuca loliacea
 F. duriusecula
 Asplenium viride
 Cystopteris fragilis
 Aspidium lonchitidioides
 Polypodium Robertianum
 Ophioglossum vulgatum
 Botrychium Lunaria
 Selaginella selaginoides

Among plants that have been introduced are the following five :—

Meconopsis cambrica
 Hesperis matronalis
 Rumex scutatus
 Lamium maculatum
 Tilia intermedia

Sphagnum acutifolium
 S. acut. var. deflexum
 Gymnostomum tortile
 G. curvirostrum
 Weissa viridula var. densifolia
 Seligeria pusilla
 Ditricum flexicaule
 D. flex. var. densum
 Trichostomum tophaceum
 T. mutabile
 T. crispulum
 T. crisp. var. elatum
 Barbula recurvifolia
 B. rigidula
 B. revoluta
 B. tortuosa
 B. intermedia
 B. ruralis
 B. subulata
 Encalypta vulgaris
 E. vulg. var. pilifera
 E. streptocarpa
 Racomitrium lanuginosum
 R. canescens
 Zygodon viridissimus
 Z. Nowellii
 Ulota Bruchii
 Orthotrichum saxatile
 O. enpulatum

O. Lyellii
 Splachnum sphaericum
 Funaria calcarea
 Bartramia Cœderi
 Breutelia arcuata
 Zieria julacea
 Bryum bimum
 B. pallens
 B. pseudotriquetum
 B. rosum
 Cinclidium stygium
 Mnium cuspidatum
 M. affine var. elatum
 M. rostratum
 M. serratum
 M. stellare
 M. subglobosum
 Fontinalis antipyretica var. gracilis et
 gigantea
 Fissidens crassipes
 Antitrichia curtispindula
 Neckera crispa
 N. complanata
 Homalia trichomanoides
 Anomodon viticulosus, with fruit
 Pseudoleskea catenulata
 Cylindrothecium concinnum
 Orthotrichum intricatum
 O. rufescens
 Brachythecium glareosum
 B. rivulare
 Eurhynchium myosuroides
 E. striatum
 E. piliferum
 E. Swartzii

E. Teesdalii
 Rhynchostegium tenellum
 R. murale
 Plagiothecium pulchellum
 Hypnum revolvens
 H. scorpioides
 H. filicinum (several varieties)
 H. commutatum (in various forms)
 H. falcatum
 H. virescens
 H. rugosum
 H. cupressiforme (several varieties)
 H. chrysophyllum
 H. stellatum
 H. stel. var. protensum
 H. giganteum
 H. Schreberi
 H. stramineum
 H. scorpioides
 H. splendens

Marchantia polymorpha
 Conocephalus conicus
 Asterella hemisphærica
 Frullania Tamarisci
 F. dilatata
 Lejeunia echinata
 Radula complanata
 Porella lævigata
 P. platyphylla
 P. rivularis
 Cephalozia Sphagni
 Chiloscypus polyanthus var. rivularis
 Lophocolea bidentata
 Scapania æquiloba
 Plagiochila asplenioides (in variety)
 Jungermannia riparia
 J. Schreberi
 Aneura multifida
 Metzgeria furcata (a large form)

Collema flaccidum
 Leptogium lacerum
 Cladonia pyxidata
 C. uncialis
 C. rangiferina
 Usnea barbata
 Evernia furfuracea
 E. prunastri
 Ramalina farinacea
 R. fraxinia
 R. farinosa
 Peltigera canina
 P. polydactyla
 Solorina saccata
 S. limbata

Parmelia olivacea
 P. saxatilis (in variety)
 P. physodes do.
 P. perlata
 Physcia parietina (in variety)
 P. stellaris do.
 Placodium murorum
 Lecanora subfusca
 L. calcarea
 L. parella
 L. rupestris
 Pertusaria fallax
 P. communis
 Lecidea cœruleo-nigricans
 L. capillaris
 Arthonia astroidea
 Graphis scripta
 Endocarpon miniatum
 E. min. var. complicatum
 E. rufescens
 E. fluviatile
 Verrucaria calciseda

Pleurotus hypnophilus
 Tremella mesenterica
 Æcidium albescens
 Æ. violæ
 Æ. crassum
 Puccinia hieracii
 P. adoxæ
 Protomyces chryso-splenii
 Urocystis violæ
 Triphragmium ulmariae
 Stigmatæa Robertiani
 Peziza stercorea
 Dothidea graminis

Oocardium stratum (not recorded
 before)
 Arthrosiphon alatus do.
 Calothrix mirabilis
 Scytonema myochrous
 Spirogyra nitida
 Hormiscia zonata
 Zonotrichia calcarea
 Chroolepus aureum
 Pinnularia viridis
 Meridion circulare
 Amphora ovalis
 Synedra ulna
 Coconema cymbiforme
 Nostoc rupestre
 Oscillaria irrigua
 Epithemia turgida
 Gomphonema acuminatum

Bradford,

August, 1883.

CAMPYLOPUS BREVIFOLIUS, SCH.

C. SUBULATUS, EJUSD.

BY H. BOSWELL.

IN the hope of finding something further about the *Bryum gemmiparum* lately alluded to, and perhaps of falling in with it in some other stream, Mr. Ley and I have lately visited Breconshire, and explored a good deal of it together, but without success. We found the *Bryum* only near the original spot where it was first met with by Mr. Ley, in May, nor did we obtain anything else of much interest, though we explored a good many miles, till our last day, when we fell in with a moss by the side of the Wye, which is remarkable in more points than one.

At first glance it rather reminded one of *Campylopus fragilis*, yet was different from any form I had seen of that moss, which varies a good deal. Arrived at home, I soon, with the aid of the microscope, found it to be identical with the *C. brevifolius*, of Schimper's *Bryol. Europ. Suppl.*—which also appears to be identical with *C. subulatus* of the same author, and either name fits the plant well enough, though the latter will claim priority of date.

Its much shorter pointed leaves and narrower cells at once distinguish it from *C. fragilis*, and bring it nearer to *C. Schimperi*, but that has a cluster of diaphanous vesicular cells near the base of the leaf on each side, absent in *brevifolius*.

But though agreeing very well in the leaf structure, there was one great difference apparent. *C. brevifolius* is described by Schimper, and by Dr. Braithwaite, in the sixth part, lately issued, of his "British Moss Flora," as a dwarfish species, and with this account specimens from Forfarshire, Italy, and Germany entirely agree. Grown on dry granitic or basaltic rocks, they present a very starved appearance, and are barely half-an-inch in height; the Wye plants, on the contrary, have grown freely, and make much handsomer specimens when dried—their aspect being so different, that I could hardly persuade one or two of my friends to accept the determination. In fact, though the leaves present no tangible character, this aspect of the moss is so different from that of the forms hitherto known, that it may be well to mark it as a variety, characterised thus:—

C. brevifolius, Schpr.

C. subulatus, ejusd., Braithw.

var. *elongatus*.

Tufts broad, extensive, solid and dense. Stems slender, elongate, 1 to 2 inches, copiously radiculose below, repeatedly innovating, with fasciculate branches above; branches without radicles. Leaves as in the minor form.

Hab. Muddy banks of the Wye, near Builth, in company with *Tortula cylindrica*, *Hypna*, &c.

LOUIS AGASSIZ.

By REV. S. FLETCHER WILLIAMS.

(Continued.)

IN the winter of 1865, having long been engaged with untiring zeal in the cultivation of his favourite pursuits, Agassiz was compelled by the state of his health to rest from work, and seek change of scene and climate. "Europe," he says, "was proposed; but, though there is much enjoyment for a naturalist in contact with the active scientific life of the Old World, there is little intellectual rest. Towards Brazil I was drawn by a life-long desire. After the death of Spix, when a student of twenty years of age, I had been employed by Mastius to describe the fishes they had brought with them from their celebrated Brazilian journey. From that time, the wish to study this fauna in the regions where it belongs had been an ever-recurring thought with me; a scheme deferred for want of opportunity, but never quite forgotten." But Agassiz was quite unwilling to visit Brazil on a mere vacation tour. To him, as to all true scientific workers, complete rest was distasteful. On the other hand, he was conscious that he could effect little working alone. "I could not forget," he wrote, "that had I only the necessary means, I might make collections on this journey which would place the Museum in Cambridge (U.S.) on a level with the first institution of the kind. But for this a working force would be needed, and I saw no possibility of providing for such an undertaking." Whilst he was still considering where to apply for aid in this emergency, Mr. Nathaniel Thayer, unasked, offered to pay all the expenses, personal and scientific, of six assistants. Agassiz accepted this munificent offer. Let it be remarked, in passing, that subsequently Mr. Thayer did much more than he had promised, continuing to meet all the expenses which were incurred until the last specimen was stored in the Cambridge Museum. The assistants who sailed with Agassiz were, Mr. James Burkhardt, the artist; Mr. John G. Anthony, conchologist; Mr. Frederick C. Hartt and Mr. Orestes St.

John, geologists ; Mr. John A. Allen, ornithologist ; and Mr. George Seeva, preparator of specimens.

The results of this celebrated expedition are described by Agassiz and his wife in the charming work entitled *A Journey in Brazil*. Agassiz justly remarked that they served to show "that their year, full as it was of enjoyment for all the party, was also rich in permanent results for science."⁴ After this voyage Agassiz devoted a large share of his time to the examination of the immense Brazilian collections stored in the Museum at Cambridge. Before long, however, his health began to show signs of failing him again, and the work of examination proceeded more slowly than he had hoped and anticipated. His scientific activity, however, was not over. He took a part in the great controversies of the day, gave a series of lectures in New York on the Geology of the American Continent, and in the summer of 1871 joined an exploring expedition to the South Atlantic and Pacific shores of the Continent. A careful exploration was made of the celebrated Sargasso sea, and a nest-building fish was discovered in that vast bed of oceanic vegetation ; and other important contributions were made to natural science. A course of lectures on "The Method of Creation" afforded him the opportunity of stating his decided objections to Mr. Darwin's theory of Natural Selection, and of propounding his own view that species do not insensibly pass into each other, but that each has its own appointed period, and is not connected, except in the order of time, with its predecessor. His career closed unexpectedly in 1874, among a people whose love he won by his warm-hearted, earnest, and active nature. Abundant were the proofs of their full appreciation of him, in the liberality of Mr. Abbott Lawrence and of Mr. Thayer ; and to these were added, in 1873—a year before his decease—the gift by Mr. Anderson, a rich tobacco merchant of New York, of the island of Penikese, one of the

⁴ Agassiz was constantly sending to the Cambridge Museum such vast and apparently endless numbers of specimens from Brazil that one of the trustees, and Agassiz's most intimate personal friend, Mr. George Ticknor, wrote, in January, 1866, beseeching him to desist, as "it would not be possible to erect all the buildings and provide all the scientific service, attendance, and materials necessary to protect and maintain in good condition such masses of specimens, and make them intelligible and useful." Besides, the collections were already much larger than Agassiz could submit to such investigations as he intended to make, even should he live to a fabulous age ! Further, says Mr. Ticknor, "those who know best assure me that the time you are now giving to the accumulation of specimens—which may, after all, perish for the want of the means needful to protect them—might, in their judgment, be better employed for your own fame, and for the advancement of such scientific investigations as you can make better than any man alive, and without which these same vast collections might as well remain in their blind kegs, in the dark cellar where they are hidden away, and so your vast personal labours and disinterested sacrifices, in bringing them together, be mainly lost."—*Ticknor's Life*, Vol. II., pp. 386-87.

Elizabeth islands north of New York, with funds to establish there a Marine Naturalists' School. The last year of Agassiz's life was spent chiefly on this island, training up a group of young naturalists. When he died he left both hemispheres, wherever science is honoured, in mourning; and he left behind him a name with no soil upon it to stain its honour, and the reputation of one who in every relation of life had nobly and purely done his part—who, as husband, parent, citizen, philosopher, was blameless among men.

To give any really intelligible account of Agassiz's enormous labours through his lifetime would require the compass of a good-sized treatise. I must content myself with the remark that he worked with a definite aim, and that his studies were undertaken with reference to some general question, and made a test of the value and soundness of some general principle. "The papers and works upon echinoderms aimed at a classification of these animals, and a better appreciation of their structural differences from the other types. The monographs upon shells, living and fossil, were prepared with a view of testing the range of distribution of species in past ages, and the limits of their special characters. The researches on fossil fishes are intended to show the relations of living and fossil species, and their embryonic development in one of the most extensive classes of the animal kingdom, the existence of which upon earth may be traced back to the earliest periods in which animal life was called into being. The investigations upon the glaciers were called forth by a desire to connect the history of the physical changes our globe has undergone with the phenomena exhibited by the developments of the organic kingdom." Everywhere in his works we discover a tendency to the most extensive generalisations; while in every instance the knowledge of the facts, a candid study of the most minute relations of his subjects, was his constant aim in all his investigations. It is true that some of his generalisations are now of little interest. For instance, in his time naturalists and theologians were in a heated discussion on the unity of the human race. The doctrine of the immutability of species was pushed by some to such an extreme that they declared it incredible that the different races of men could have descended from a single pair. Agassiz was an advocate of this view, maintaining that the human race had had, in its several distinct types, separate stocks of originality, both as to time and place; and to his own generation his own name was a terror to orthodox interpreters of the Bible. Even in 1872 Dr. Charles Hodge made the assertion that the unity of the human race is denied by "a large and increasing class of scientific

men.”⁵ It would gratify a good deal of curiosity if the learned doctor had informed his readers from what ranks this “large class of scientific men” who disbelieve in the unity of the human race is receiving so many recruits; for it seems to appear on the face of almost all recent works scientifically treating the subject of vegetable or animal life, that the question of the day is not only whether the human races are of common origin, but whether the whole animal kingdom may not have descended in unbroken lines from one progenitor.

On this point Agassiz held very decided opinions. His searching and comprehensive inquiries into nature led him to the belief of distinct types of the animal kingdom, and to the belief of specific creations of those distinct types; and the theories of Darwin have had no opponent so able and thoroughly scientific as he. I will quote from him a passage which sums up his views. In 1863 he wrote as follows:—“One important truth already assumes great significance in the history of the growth of animals; namely, that whatever the changes may be through which an animal passes, and however different the aspect of these phases at successive periods may appear, they are always limited by the character of the type to which the animal belongs, and never pass that boundary. Thus, the Radiate begins life with characters peculiar to Radiates, and ends it without assuming any feature of a higher type. The Mollusk starts with a character essentially its own, in no way related to the Radiates, and never shows the least tendency to deviate from it, either in the direction of the Articulate or Vertebrate types. This is equally true of the Articulates[and] emphatically true of the Vertebrates.....These results are of the highest importance at this moment, when men of authority in science are attempting to renew the theory of a general transmutation of all animals of the higher types out of the lower ones. If such views are ever to deserve serious consideration, and be acknowledged as involving a scientific principle, it will only be when their supporters shall have shown that the fundamental plans of structure characteristic of the primary groups of the animal kingdom are transmutable, or pass into one another, and that their different modes of development may lead from one to the other. Thus far embryology has not recorded one fact on which to base such doctrines.”⁶

The argument is here somewhat mis-stated. Darwin’s principal point is to prove that each of these types has developed into its various

⁵ *Systematic Theology*, Vol. II., pp. 77.

⁶ *Methods of Study in Natural History*, by G. L. Agassiz, Boston, 1871, pp. 302, 304.

orders, genera, and species. Back to the point at which the characteristics of the class appear, the analogical argument from embryology is very strong. Previous to that stage of development Darwin would go only so far as the momentum of his analogical argument at the beginning of the classes would carry him. If, however, a naturalist has been brought by plain analogies to believe in only four distinct lines of genealogical descent, it is difficult to stop there, although there may be no further accessible facts on which to base a positive argument, just as in the realms of astronomy we can hardly help applying our general conclusions to regions of space beyond the reach of the telescope. Unless there is counter evidence we may sometimes extend our generalizations a long way beyond the bare facts, and throw the burden of proof upon those who deny such extension. This is akin to the argument known in mechanics as the method of proof by gradual approach.⁷

But, whatever we may think of some of Agassiz's generalisations, we must all admit that his productions testify to an amazing fund of knowledge, to an equally amazing fertility of genius, and to an almost incredible industry.

What I note, in addition to the vast knowledge and intellectual greatness of the man, is his admirable and noble character. He had a remarkable sweetness of disposition. There was always around him a sunny atmosphere, and it is said by his most intimate friends that none could be with him without feeling the magnetism of his great, warm heart. His pupils—and they are alike numerous and cultivated—bear consenting testimony to his cheerful and affectionate spirit, his cordial interest in their prosperity and success, and his large, strong sympathies with all that appeals to generous human sensibilities. He inspired them with all the ardour of his own bright and pure enthusiasm, and nothing that was mean or selfish could thrive in the earnestness of the pursuit of truth in which he engaged them. It is easy, therefore, to see how they revered and loved him. There could be no better evidence of his genial, affectionate, sympathetic disposition than the power that he had over ardent and gifted natures, and the

⁷ Agassiz's candour in stating *facts* was such as sometimes to convert his students to the *doctrine* he was confuting. So recently as March 4th, 1883, the Rev. George Batchelor, in a sermon in Unity Church, Chicago, said :—"I studied under Asa Gray and Jeffries Wyman at the time when in their respective departments—botany and comparative anatomy—they were compelled to admit the doctrine of evolution ; and I listened to or read the lectures in which Agassiz stated the facts upon which he based his system with so much fairness and candour that he converted to the doctrine of evolution, which he opposed, his whole class, including his son, who succeeded him, and who now carries on his work."—*Chicago Times*, March 5th, 1883.

sweet impressions he left on the lives of so many of the truest and most interesting people in both America and Europe.

There was in him, too, a simplicity, a child-like naturalness, as admirable as it was instinctive. With the half-educated—those ambitious merely of the *name* of learning—there is often noticed a conceit of knowledge, an ostentation of attainments, an assumption of superiority, a kind of dogmatism and arrogance, which are as repulsive as they are absurd. There was no shadow of this in Agassiz. With all his mental grandeur and vast acquirements, he was still the humble pupil of nature, the unpretending citizen, the quiet, urbane, courteous gentlemen. In his simple, natural way he went about his work intent upon accomplishing the ends of science, and oblivious apparently of what the world was thinking of him. In his lectures, his private instructions and social intercourse, his travels, and his fatiguing and exacting labours, he carried a serene and artless spirit, whose sincerity was winning and impressive. He was utterly free from the affectations of the pedant, and the robust genuineness of the man had a wholesome and stimulating flavour that made his society delightful.

(To be concluded.)

Rainfall for July.

	Height of gauge above sea level.	Rain-fall.	No. of Days	TOTAL FALL TO DATE.		Date of heaviest Fall.	Amount of heaviest Fall.
				1883.	1882.		
HUDDERSFIELD (Dalton) ... (J. W. Robson)	Ft. 350	In. 3·20	16	19·48	*17·45	21	0·95
HALIFAX... (F. G. S. Rawson)	365	3·11	19	24·35	31·48	21	0·83
LEEDS ... (Alfred Denny)...	183	3·25	22	16·69	†13·12	20	0·90
HORSFORTH ... (James Fox)	350	3·89	20	19·62	‡18·44	21	0·98
BARNSELY ... (T. Lister) ...	350	3·80	20	18·78	17·69	20	1·06
INGBIRCHWORTH (do.)	853	4·52	22	26·58	25·23	21	1·22
WENTWORTH CASTLE (do.)...	520	3·40	15	20·66	18·53	2	1·06
GOOLE ... (J. HARRISON) ...	25	2·84	18	14·35	18·48	20	0·75
HULL (Derringham) (Wm. Lawton)	10	3·12	17	11·36	14·94	2	0·85

* Average to date for 17 years, 1866-82. † Average of 29 years, 1853-62 & 1865-83.

‡ Average of 14 years, 1870-83.

Short Notes and Queries.

CUCKOO'S EGG IN RING OUZEL'S NEST.—On the 19th May I found a ring ouzel's nest on Harden Moor, which was then approaching completion. A few days after, two of my boys visited the nest, and found it to contain three eggs, one of which they brought in addition to a strange egg, which I at once recognised as that of a cuckoo. This is the first instance that has come to my knowledge of the cuckoo consigning its charge to the care of this species; and this curious fact in its economy is the more surprising since there were, within a short distance of the nest in question, two titlark's nests, both of which contained fresh laid eggs.—E. P. P. BUTTERFIELD, Wilsden, June 4th.

DUNLIN AT MALHAM, &C.—During a ramble to Malham on Whit-Tuesday, my brother and I were much interested in observing the dunlin (*Tringa variabilis*) about a marshy place near Malham Tarn. My attention was attracted to it from hearing some strange notes which I did not remember having heard before, and going surreptitiously in the direction indicated by the sound, I got within half-a-dozen yards of what I took to be the male bird, which was perched upon a wall. We searched some time for the nest, but without success, as we felt sure the female was sitting somewhere not far away. Its tameness somewhat surprised us, a missile being necessary to be thrown in order to make it fly, although only a few yards of water separated us. The number of birds breeding about the Tarn and moor was remarkable, and their cries bewildering—but still, I thought, according well with surroundings so wild, and in many respects unique.—E. P. P. BUTTERFIELD, June 4th.

ENTOMOLOGICAL NOTES.—On June 2nd, Mr. Geo. Tindall and I had another search in the Green Farm Wood, Doncaster, for the larvæ of *Phycis betulella*, and each of us succeeded in finding specimens, mostly nearly full-grown, on the birch leaves. In the same wood, too, we collected larvæ of *Tethea subtusa* from poplars, a species which does not seem to have been hitherto recorded from Doncaster. During May three beautiful *Acronycta alni* appeared in my breeding cages, one of them from the larva I found in Edlington Wood, Doncaster, on August 5th last.—GEO. T. PORRITT.

—GRASSINGTON.—On August 5th, I took *M. expolita* (one specimen), flying leisurely in the hot sunshine about guelder rose (*Viburnum opulus*) in Grass high wood, Grassington, and saw one, if not two more. It was in much better condition than the one I took at the same place last year, and perhaps if the date of my visit had been fixed a little earlier, or I had stayed in the wood longer, I might have taken a few more specimens. I also took one *C. unidentaria* near Threshfield. My brother, who paid us a visit a few days previously, turned up *L. olivata* freely about the highway in Grass wood, and I took one at Threshfield,

and beat a few from spruce firs in Grass high wood. Mr. Carter and myself took *Tortrix icterana* commonly at the same place last June.—E. P. P. BUTTERFIELD, Wilsden, August 20th.

—LEPIDOPTERA IN ABBOTT'S WOOD, SUSSEX.—On May 23rd, in company with Mr. W. H. B. Fletcher, of Worthing, I had a few hours' collecting in Abbott's Wood, Hailsham. We hoped to get a good series of *Agrotera nemoralis*, but it seemed to be only just getting out, as only four specimens were beaten out of the hornbeams. The season indeed seemed to be as late as here in the north, and many species I took there near the same date some years ago were not seen at all. Those taken or observed included *Gonepteryx rhamni*, common; *Argynnis Euphrosyne*, abundant; *Syrichthus Alveolus*, *Thanaos Tages*; *Nola cristulalis*, at rest, head downwards as usual; *Venilia maculata* and *Tephrosia consonaria*, both common; *Ephyra pendularia*, *Asthena candidata*, abundant; *Eupithecia plumbeolata*, very fine; *E. abbreviata*; *Coremia propugnata*; *Platypteryx lacertula* and *P. falcula*; *Herminia barbalis*, common; *Ennychia octomaculalis*; *Roxana arcuana*, &c., &c.—GEO. T. PORRITT.

—OCCURRENCE OF *Chesias obliquaria* AT DONCASTER.—I was engaged setting some captures on the 14th of June, rather late, with the window before me partly open, when I became aware of the presence of moths attracted by the gaslight, by their scorched bodies falling on the table in front of me. Looking up, I saw several moths at the window and on the wall, on capturing which I was surprised to find a fine fresh *C. obliquaria*. This is, I believe, the first record of its occurrence in Yorkshire.—G. TINDALL, July 24th, 1883.

BOTANICAL QUERIES.—Referring to the *Naturalist* of the past month of August, under "Short Notes and Queries," page 20, would not the old name of *Epipactis ensifolia* be better expressed by *Cephalanthera ensifolia*? Those, like myself, who take the "Student's Flora" as the standard work on British plants think so. [Both names were sent to us, and we, unfortunately, crossed out the later one, and did not notice it until too late.—Eds. *Nat.*]—In the same part, under "Reports of Societies," *Peucedanum officinale*, a very rare plant of salt marshes, and known previously to occur at only two or three south-coast stations, is recorded for Thorne Waste. If a *Peucedanum* at all, is it not more likely to be *Peucedanum palustre*?—At the Bank Holiday Meeting, Aug. 6th, of the Yorkshire Naturalists' Union, in the Washburn Valley, three good plants were observed, viz.—*Viola tricolor*, sub-sp. *lutea*, var. *amœna*; *Carex paniculata*; and *Asplenium Ceterach*. Some of us wondered why these do not appear among "The Rarer Plants of the Washburn Valley District," given in "West Yorkshire."—P. F. LEE, Sec. Bot. Sect., Y.N.U.

NOTICES OF BOOKS, &c.—"The British Moss-Flora, by Dr. Braithwaite, Part VII."—We have now received another part of this grand work, containing part iii. of the *Dicranaceæ*, and must at once take

the opportunity of again congratulating its talented and industrious author on the care and labour he has already taken in producing this lasting monument of his industry and zeal in moss-lore. The plates, six in number, are even superior to those previously issued, and leave nothing to be desired either in detail or execution. Amongst other alterations in nomenclature on Wilson's *Bry. Brit.*, we notice that *Dicranum virens*, *D. polycarpum*, *Cynodontium Bruntoni*, and *Rhabdo-weissia fugax* are referred to *Onchophorus*, which also includes *O. Wahlenbergii* and var. *compactus*, *O. strumifer*, *O. gracilescens* (*Cynodontium*, Sch. Syn.), and *O. crispatus* (*Weissia denticulata*, Sch. Syn.); whilst *Trichostomum glaucescens* becomes *Selania caesia* (Vill.) Lindberg.

Reports of Societies.

BARNSELY NATURALISTS' SOCIETY.—Meeting 14th Aug., the president, Mr. T. Lister, in the chair.—The new list of British birds drawn up by the Ornithologists' Union was laid on the table—the standard of nomenclature so much needed to be uniformly used. Letters from Mr. R. Creighton confirmed his report of May 6 that the black redstart, waxwing, and greenshank all occurred near Hemsworth. There are but one or two instances of the black redstart in Yorkshire, and only one of its occurring in May, which was in Cornwall; it is chiefly a winter visitor in the southwest of England. Three instances of the waxwing have occurred in the Barnsley district within two years. The greenshank is equally rare. He also records the black-headed gull, and sandpipers at Hemsworth dam; the latter breed there, also in the Dearne valley, and at Ingbirchworth and Dunford reservoirs. In excursions to Langsett and Mickleden moors to the Derbyshire border, increased numbers of ring-ouzel, twites, or mountain linnets (young and old), were seen, also kestrel, plovers golden and green, in abundance. Curlews are reported breeding on these moors. Swifts, young and old, numerous near Monk Bretton Abbey—very rare in Barnsley of late years. Mr. E. Hailstone reported on July 20th, a tern over Walton Lake. Hawfinches and gold-crested wrens have bred at Round Green; goldfinches at Middlewood Hall, Darfield.—T. L.

BRADFORD NATURALISTS' SOCIETY.—Meeting July 24th, Mr. J. W. Carter, the president, in the chair.—Mr. Illingworth described a ramble about Witherslack, and amongst the insects he exhibited were *H. auro-raria*, *E. russula*, *L. Atecis*, &c. He also exhibited a live young cuckoo and the tit-lark's nest in which it was taken, on Baildon Moor. Mr. Soppitt exhibited a number of parasitic fungi, among which was one growing on *Lactuca muralis*, viz, *Puccinea rubigo-vera* from Hawksworth, the bird's nest fungus, and a smut on *Bromus mollis*. Among the insects exhibited by the president were, one new to the district (*P. dentatus*), from Shipley Glen, and *T. tapetzella*, a small moth, the larva of which feeds on

cloth. Mr. Andrews reported a fungus, *Boletus luridus*, found at Grasington, which has not been recorded before in this district. Mr. West gave a list of sedges found about Hawksworth. Mr. Waddington sent a specimen of *Rhagium inquisitor*, from Horton, a species new to the district.

MEETING, August 7th.—Mr. Soppitt gave a report of a ramble with the Y.N.U. to Washburn valley, where were found *Nephrodium Oreopteris*, *Equisetum hyemale*, and *E. limosum* (*E. hyemale* not recorded before), also, *Uredo bifrons* and *Synchytrium taraxaci* also new, and *Carex paniculata*, found there for the first time. Mr. Firth reported having observed the cole titmouse at Shipley Glen. Mr. West gave an account of a walk over Thornton moor, with a description of the various species of scale mosses found there.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting, July 30th, the Rev. S. F. Williams occupying the chair in the absence of the president.—Mr. A. O. Walker (Chester) read a paper entitled “A consideration of some of the causes affecting the distribution of the Lepidoptera of Great Britain,” in which he showed, by a comparison of the lepidopterous fauna of several districts, that the number of species of butterflies and moths whose larvæ feed upon trees became much more numerous than those whose larvæ feed upon herbaceous plants, as we proceed easterly or south-easterly. Meteorological observations show that the easterly and south-easterly portions of our island are warmer, therefore drier, than the north or north-west, and from this fact, and the known injurious effects of wet food upon caterpillars, he deduced the principal cause affecting the distribution of at least tree-feeding lepidoptera as being the presence of more or less moisture in the atmosphere. The paper led to an interesting discussion.

YORKSHIRE NATURALISTS' UNION.—WASHBURNDALE, Aug. 6th.—The Bank Holiday Monday this year was planned for the exploration of the secluded and picturesque valley of the Washburn, the meetings being held at Otley. There was a heavy shower of rain in the forenoon, but the weather cleared up at noon, and was afterwards brilliantly fine and sunny. Three parties had been arranged for. Of these, Mr. Clarke led a party from Poole Station past the pretty village of Leathley, through Lindley Wood and round the reservoir to Otley. Other members drove from Otley to Blubberhouses, and under the guidance of Messrs. Grassham and Roebuck, who were kindly and ably assisted by Mr. Thomas Harrison, Lord Walsingham's agent, explored the valley upwards to West End. Returning to Blubberhouses the party returned to Otley by conveyance. Other members explored Washburn individually, and others again did not explore it at all, but visited Otley Chevin and other parts of the main dale of Wharfe. The tea and meetings were all at the White Horse Hotel, Otley. At the general meeting, Mr. J. W. Davis, F.S.A., of Halifax, president of the Geological Section, presided.

The minutes were taken as read. On the roll-call it was found that the 60 or 70 members present during the day represented 14 societies, viz :—Barnsley, Wakefield, Elland-cum-Greetland, Bradford Naturalists, Leeds (3), Goole, Selby, Huddersfield Lit. and Scient., Dewsbury, Halifax, Ilkley, and Shipley. The following new members, having been duly proposed and seconded, were elected :—Mr. J. F. T. Spiking of Birstall, Mr. J. S. Hurst of Copt Hewick Hall, near Ripon, Rev. Henry Smith of Redcar, Mr. G. H. L. Rickards of Poole, near Otley, Mr. R. Paver-Crow, J.P., of Ornshams Hall, near Boroughbridge, Dr. S. H. Kerr, M.A., of Otley, and Mr. James Backhouse, jun., of York. Thanks were then unanimously voted, on the proposition of Messrs. John Grassham, Leeds, and Vincent Taylor, Ilkley, to Lord Walsingham, Mr. Ayscough Fawkes, J.P., of Farnley, and the Leeds Corporation, for permission to visit their estates and the margins of the reservoirs, and to Mr. Harrison, Lord Walsingham's agent, for guiding one of the parties. There was a little discussion as to the Union being represented at the Southport meeting of the British Association, and it was agreed that in case of the inability of the president to attend, his place should be taken by Mr. C. P. Hobkirk, F.L.S., of Huddersfield, a member of the Y.N.U. executive. The sectional reports were then given. For the Botanical Section Mr. P. F. Lee, Dewsbury, secretary of the section, stated that the picturesque little valley had during the day yielded 252 different species of the flowering plants, ferns, charas, &c., contained in the London Catalogue of British Plants. Of these, 13 were ferns—without doubt a goodly list, considering the limited area worked—among them being *Asplenium Ceterach*, *Nephrodium spinulosum*, *N. Oreopteris* (abundant on the margin of Dob Wood), and *Polypodium Phegopteris*. In the list of phanerogams collected were the undermentioned, as representing the best finds :—*Ranunculus Lenormandi*, *Viola tricolor*, sub-sp. *lutea*, var. *amcena* (on the summit of the left bank of Washburn Dale), *Malva Moschata*, *Gnaphalium sylvaticum*, *Lactuca muralis*, *Campanula latifolia*, *Linaria minor*, *Veronica montana*, *Galeopsis Tetrahit*, sub-sp. *speciosa* (*G. versicolor*, Curt.), *Humulus lupulus*, *Typha latifolia*, the broad-leaved Helleborine, *Epipactis latifolia*. On the margin of a mill-race in the lower part of the valley were fine tussocks of the great paniced sedge, *Carex paniculata*, with nearly 4ft. stems; the graceful *Aira caryophyllea*, and *Chara flexilis*. Mr. H. T. Soppitt reported having seen and collected 33 species of fungi, amongst which were *Helotium æruginosum*, *Calocera viscosa*, *Coleosporium campanulæ*, *Puccinea poarum*, *Uredo vacciniiorum*, *Boletus luteus*, *B. flavus*, *Lactarius rufus*, *Marasmius rotula*. For the Geological Section its president, Mr. Davis, reported that it had been intended to drive from Harrogate to Blubberhouses, and thence walk down the valley to Otley, but the weather during the early part of the day being unfavourable, a short excursion was made to the millstone grit quarry at Little Wonder, Harrogate, where the president gave a brief outline of the geology of the district,

mentioning the anticlinal of Yoredale rocks, forced to the surface southwest of the town, the numerous faults in connection with which gave rise to the several springs for which Harrogate is so famous, and the general arrangement of the kinder scout grits, whose outcrop may be seen, for example, at Birk Crag. The party then proceeded by rail to Otley; the weather had cleared up, and the valley of the Wharfe was seen to great advantage—the outcrop of the sandstone at Great Almer Cliff, and the undulating but hilly country to the north of the river, and the precipitous cliffs constituting Otley Chevin on the south, presenting a very pleasing picture. The ascent of Otley Chevin was made, the exertion being well repaid by the magnificent view obtained from the summit. The whole of the hills opposite are composed of kinder grit, which dipped southwards under the Chevin; the third grit series being exposed on the slope of the hill, surmounted by the upper thick-bedded grit of that series, being the same bed of rock of which the Cow and Calf are composed. The south slope of the Chevin dips under the rough rock and coal measures beyond Yeadon. For vertebrate zoology Mr. W. Eagle Clarke, F.L.S., as secretary of the section, reported that most of the resident and summer visitants amongst the birds of the district had been observed, but no additional species had been added to the list furnished in last month's *Naturalist*. A kingfisher had been observed at Lindley—a fact which is worthy of mention, as the bird is extremely rare in the Washburn. In the other classes of vertebrates, no species had been added to the lists given in the August number of the *Naturalist*. In the absence of the officers of the Conchological Section, Mr. W. Denison Roebuck stated that two additions—*Limax lævis* and *Pisidium pusillum*, both from Blubberhouses—had been made to the Washburn shell-list, but that the species (and individuals) observed during the day were very few in number, including only *Limax agrestis* and *L. arborum*, *Arion ater*, *A. hortensis*, *Helix rufescens*, *Limnæa peregra*, *Ancylus fluviatilis*, a *Zonites*, and *Cochlicopa lubrica*, all from Blubberhouses except the *H. rufescens*, which was from the lower part of the valley. For the Entomological Section, its president, Mr. Geo. T. Porritt, F.L.S., of Huddersfield, who had been obliged to leave before the general meeting, left a report to the effect that the weather had considerably spoilt collecting, but that in any case the locality would probably have proved very unproductive. One party had worked Washburndale, but only very common species had been noticed, and those who went over Otley Chevin had found the ground equally unproductive. Some species, usually common on such ground, were quite absent. The only noteworthy species was *Penthina sauciana*, which he had found rather common on the bilberry hills at Otley Chevin. He also noticed the following, hitherto unrecorded for the district:—*Metrocampa margaritata*, *Larentia pectinaria*, *Cidaria immanata*, *Sciaphila virgaureana*, and *Ablabia pratana*, common.—A vote of thanks to the chairman concluded the meeting.—W. D. R., W. E. C.

Original Articles.

WM. WILSON'S TOURS IN SCOTLAND AND IRELAND. 1827-1830.

BY JAS. CASH.

(*Read before the Manchester Cryptogamic Society, April 16th, 1883.*)

THE HIGHLANDS : 1827.

My communication this evening must necessarily be discursive. If I trespass, as I may have to do, upon ground not strictly cryptogamic, I shall ask you to forgive me for the sake of the individual who is the subject of the sketch. This attempt to follow Mr. Wilson in his early wanderings, in Scotland and Ireland, must be regarded rather as a reminiscence than an historical record. The materials at my command are unfortunately meagre. The memoranda left by Mr. Wilson of his Scotch and Irish trips—1827-1830—are not sufficiently copious to enable anyone to construct a complete and connected account of all that he did ; nevertheless, the Journal he made at the time, and the correspondence which I have been permitted to inspect, form together a record sufficiently entertaining, in my judgment, to be worth preservation.

Mr. Wilson's first trip to Scotland was in the year 1827, and it was made at the instigation of Dr. (afterwards Sir William) Hooker—then Professor of Botany in the University of Glasgow—who saw in his well-directed enthusiasm the foundation of a great botanical reputation. But for the encouragement he received from Dr. Hooker, Mr. Wilson certainly would never have continued his studies with the ardour and success that he did.

Getting to Glasgow was not so easy in those days as it is now, when we can leave Manchester at midnight, breakfast in Glasgow, and be botanising at Killin before noon. Before railways shortened the distance between us and the Highlands there were Lancashire botanists courageous enough to do the journey on foot. Mr. Wilson, however, was under no such necessity. On Saturday, the 16th June, 1827, he took a passage on board the steam-packet "William Huskisson" (which sailed from Liverpool about four in the afternoon), and landed at Greenock at half-past nine on the following (Sunday) evening. On the Monday he continued his journey, by boat, and reached Glasgow the same afternoon. After spending a day with Professor Hooker, he joined an excursion party, which the Professor had arranged, to Breadalbane, travelling by way of Dum.

barton to the head of Loch Lomond, thence through Glen Falloch and Glen Dochart to Killin. The party put up at the Lochay Bridge Hotel—then, as now, a rendezvous for botanists. On the Thursday they visited the Falls of Lochay; next day they ascended Craig Cailleach; and on the Saturday they attacked Ben Lawers. There was a Mr. Brown of the party, but whether Mr. Robert Brown, of whom Hooker once wrote that he was “the greatest botanist of this or any age,” is uncertain. At the week-end, Dr. Hooker and several of his friends left Killin, but Mr. Wilson and Mr. Brown remained. Monday was occupied by the latter in visiting Ben Lawers, whilst Mr. Wilson botanised near Killin. He records the finding of *Trientalis europæa*, but does not specify the exact locality, though it was most probably in Finlarig Park, where the plant was gathered by Hooker himself on a subsequent visit.

Mr. Wilson had come prepared to make a long stay at Killin; he took lodgings in the village for two months. During that period he visited Ben Lawers several times. He also ascended Mael Ghyrdie and other mountains, and made an exploration generally of the district. His attention seems to have been directed chiefly to flowering plants, for, in the few memoranda which he has left of this trip, I find but two mosses—*Tetraplodon mnioides* and *Oligotrichum hercynicum*—mentioned. On Craig Cailleach he gathered *Juncus castaneus*, and studied the difference between *Juncus biglumis* and *J. triglumis*—satisfying himself that they were “abundantly distinct.”

Mr. Wilson’s stay at Killin extended until the end of August. His solitude was broken by a visit which he received from two German gentlemen, Messrs. Von Ovenhuysen and Von Decken, who were devoted to the study of mineralogy, and one of them also to botany, and who brought with them a note of introduction from Prof. Hooker.

On the 16th of August Mr. Wilson records his finding of *Sedum villosum*, *Gentiana nivalis*, and other rarities, upon Ben Lawers. On the 21st of that month, on Mael Ghyrdie, he gathered *Juncus trifidus* and *J. castaneus*. Quitting Killin on the 29th, he walked through Glen Ogle, and by way of Loch Earn Head and Loch Lubnaig, to Callander, where he took coach to Stirling, en route for Glasgow. I ought to mention that, before leaving Scotland, Mr. Wilson paid a visit to Campsie, no doubt to see if he could find “the famous *Weissia tenuirostris*,” which had been such a bone of contention between Hooker and Taylor, but apparently without success. He mentions, however, the finding of *Lysimachia thyrsoflora* in two localities.

The results of his sojourn in the Highlands on this occasion were,

some time afterwards, embodied by Mr. Wilson in a paper which appeared in Hooker's *Botanical Miscellany*.

After spending a week in Glasgow with Professor Hooker, Mr. Wilson sailed for Liverpool *via* Greenock, on the 7th September.

That Mr. Wilson's visit to Prof. Hooker was an agreeable one is proved by a letter which I find dated Mar. 7th, 1828. The Professor wrote to his friend—"I have not had the pleasure of hearing from you since you left Glasgow; nevertheless I can assure you you have often been in my mind, and the short visit you paid us has frequently been mentioned in my family as one we should be very glad to have repeated. I am reminded of you, too, not unfrequently when I come to some of the beautiful specimens of plants from the Highlands, with which you have supplied my herbarium." Then, after anxiously enquiring after Mr. Wilson's health and present pursuits, and whether he has collected any mosses or other cryptogamia during the winter, the writer adds:—"Have you carefully gone over your alpine collections made last year? And have you any observations to offer upon any rare or doubtful species? I think you could give me a list of previously unknown habitats for some of the scarce alpine plants, which will be useful in the second edition of my *Flora Scotica*, on which I must soon be engaged. * * * * Your success in the Highlands last year was not such, I fear, in your estimation as to induce you to make an excursion of a similar kind this year; but, should you feel disposed, we shall be very glad to see you at our house; and if you wish to gather *Astragalus campestris*, *Sonchus cæruleus*, *Carex rariflora*, and *Saxifraga rivularis*, on the mountains of Clova, though I cannot go there myself, you will find Drummond an admirable guide."

In a subsequent letter (June 22) Dr. Hooker mentions the fact of his having abandoned the idea of bringing out a second edition of the *Flora Scotica*, and his determination to publish, instead, the *British Flora*. "I would," he says, "never have thought of such a thing whilst Sir James Smith was living, but now I feel myself fully at liberty to do so; and my general plan will be the same as that of my *Flora Scotica*. Whatever observation you make, I wish (if you approve of the way in which I have printed your Breadalbane notes) you would also let me print in your name in the future numbers of this journal, for not only will you thereby be correcting important existing botanical errors, but you will promote a spirit of inquiry in this walk of science, and I shall profit by your remarks in my future systematic works."

SCOTLAND AND IRELAND : 1829-30.

An invitation to Mr. Wilson from Prof. Hooker resulted in his paying a second visit to Glasgow and the Highlands in the summer of 1829, prior to his making an extended trip through the south of Ireland. There was no want of cordiality in the invitation. Mr. Wilson's health had been for a long time delicate, and Professor Hooker desired that he should undertake the journey, hoping that he would profit by it physically. "I still hope," he wrote (Jan. 20th, 1829) "that in the summer your health and your inclination will allow you to come northwards. I wish you to know more of Mr. Arnott, and something of Dr. Wallich, and I desire to have you with us again in the Highlands." Mr. Wilson was preparing critical notes for the first volume of Dr. Hooker's forthcoming *British Flora*. "Take ample time," Dr. Hooker wrote (Feb. 2, 1829) "in selecting notes and specimens of plants for me; and I know well, from some little experience, how valuable they will be to me and the public. * * Keep your mind and your time occupied in the way you do now, and be assured that the result will be advantageous both to your health and to science." Acknowledging a parcel of plants, accompanied with notes, Professor Hooker wrote: "The plants and the notes upon them are exactly what I could wish them to be, and such as I could receive from no one else. But I fear you have devoted your attention too zealously to this subject. In regard both to the work on mosses, and the *British Flora*, it will be yet twelve months before they are published, and it is both to my interest and to that of the public to go to press as late as possible. There is, therefore, abundance of time for any observations that occur to you, and I had much rather that you would relax from your ardent devotion to the descriptive department of botany, and spend your time in the country, or where you will be more freed from mental occupation. By this means you will, I trust, sufficiently recover your health to enable you to undertake a voyage from Liverpool to Glasgow, and then go into the Highlands with me and some brother botanists. There, too, we may gather plants, but, then, you must do as I do—you must consider this excursion as undertaken for the purpose of pleasure, and not of hard study. We will then, too, talk about plants, without letting them occupy too much of our attention. * * * Now, my dear friend, let me assure you that you will render me the greatest service by withdrawing for a time from all mental occupation, and thus fitting yourself for a visit to the North, which you know, two years ago, was beneficial to your health. I am expecting Mr. Henslow, of Cambridge, will join our

party ; so will Mr. Arnott and some others, whom you will like to see, but who, like myself, reckon upon the excursion as a relief from our studies at home, and as a relaxation that will the better fit us for them afterwards. I calculate on setting off on the 23rd of June. Come as much sooner as may be convenient to you, and you will find a bed and a hearty welcome prepared for you. * * All here desire to be most kindly remembered to you."

Mr. Wilson left home on the 19th of June, and did not return to Warrington until the 31st of March following—the intervening period being spent in Scotland, Ireland, and Wales in the health-inspiring pursuit to which he had devoted himself. From his journal of the voyage north we learn that on the 19th of June he sailed from Liverpool to Glasgow (paying cabin fare, 25s.), and reached his destination on the evening of the following day. On the 23rd of June he set out with Dr. Hooker and party for Killin, travelling *via* Dumbarton and Loch Lomond. Next day they botanised upon Craig Cailleach, and on the 25th upon Ben Lawers. Mr. Wilson did not leave Killin until July 4th ; on that day he travelled *via* Stirling to Glasgow, and spent a week in the society of Prof. Hooker and other naturalists, one of whom was Dr. Walker-Arnott, who during Mr. Wilson's stay returned from a botanical tour in Skye, bringing with him specimens of *Eriocaulon*.

On the 15th of July Mr. Wilson quitted Glasgow for Dublin, reaching the Irish capital on the following evening. "I went," he says, "to a filthy tavern, which I soon quitted." Six days later he sailed for Cork. Very soon after his arrival there we find him at work, and his first search—happily successful—was for *Hookeria læte-virens*. The entry in his journal under date Thursday, 23rd July, is as follows:—"Went to Dunscombe's Wood for *Hookeria læte-virens*, which I at length found in a shady wet part of the rivulet, immediately above the watering place, overgrown with brambles."

Here I pause for a moment to say something about this beautiful moss ; and I am glad to have the opportunity which this entry affords me—even if there were no other evidence on the point—of correcting an error into which the editor of Professor Harvey's Memoir has, no doubt, unwittingly fallen. The editor says [Mem. p. 20,] that in the summer of 1831, Harvey, visiting Killarney, with his friend Mr. Fennell, found *Hookeria læte-virens*, "a moss heretofore unnoticed as an Irish plant," that by means of this discovery he introduced himself to Sir William, then Dr. Hooker, curator of the Botanic Gardens at Glasgow ; and that thus began an acquaintance which quickly ripened into a warm and lasting friendship.

The species was first observed by Dr. James Drummond in this very place to which Mr. Wilson had received directions, namely Dunscombe's Wood, in the year 1816. The first description of the moss, accompanied by a figure, appeared in Hooker and Taylor's *Muscologia Britannica*. Writing of it in 1830, Prof. Hooker says: "only one station is known for this moss, namely in the south of Ireland, in a wood in the vicinity of Cork, where it grew near a spring, whose temperature is considerably higher than that of the surrounding atmosphere." The figure in English botany was from specimens gathered by Mr. Wilson at the time of which we write, *i.e.* 1829. Harvey was, however, the first to detect the moss at Killarney—rather, we may imagine, to Wilson's chagrin, for, had he not, but two years before, gone over the very spot where it grew?

Harvey, who was a young and enthusiastic botanist, made *Hookeria læte-virens* a medium of introduction to Prof. Hooker, as appears by the following letter, which I quote from his memoir. He was a Quaker, and that will account for the quaintness of the phraseology:—
 "Respected Friend: Having discovered two new habitats for the beautiful *Hookeria læte-virens* which I am anxious to have inserted in the forthcoming volume of the *British Flora*, I take the liberty of enclosing specimens, trusting to thy goodness to excuse this want of a personal introduction. As the plant occurs in plenty in one of the situations attached, I think it highly probable it may be found in many other places, and very extraordinary it should be overlooked by J. T. Mackay, as it is found within three or four yards of his habitat for *Trichomanes*. I have had no opportunity of comparing Cork specimens, but my plants do not appear of a deeper or brighter green than *H. lucens*. The fruit, unfortunately, was old, many of the capsules had fallen, and many of the opercula; but it appeared from the number of broken foot-stalks to have been in plenty. Should thou think this letter worth replying to, thou wilt address me as under, and permit me (again apologising for taking the liberty to address thee) to subscribe myself very respectfully thine—W. HENRY HARVEY, Summerville, Limerick, 7 mo. 13, 1831."

Thus it is clear Harvey did not himself claim priority in the discovery of *Hookeria læte-virens*. It is not a little singular that some years later he found the moss growing in the greatest luxuriance in the vicinity of Cape Town, South Africa. It is apparently a sub-tropical species, and Schimper goes so far as to say that it is alien to the European flora.

On the 28th of July Mr. Wilson prepared for a journey to Killarney.

Riding to Macroom, he walked thence 13 miles to Millstreet, carrying a heavy burden. Next day he had a still more fatiguing walk to Killarney—21 miles. He was able on the 30th to begin botanising, and he records in his journal of that date, observing, on the Kenmare road, *Arbutus unedo*. He gathered *Rhyncospora fusca*, *Pinguicula lusitanica*, and *Hymenophyllum Tunbridgense*. Reaching Turk Cascade, he found barren specimens of the rare *Trichomanes radicans*; and on the 31st he gathered this fern in a fertile condition. His time appears to have been occupied for some days in gathering and drying flowering plants, the monotony of the occupation being relieved by a visit from Dr. Dickson, “a zealous botanical student,” who came with a letter of introduction to him from Prof. Hooker.

About this time, Mr. Wilson wrote an account of his doings to Prof. Hooker, who replied as follows:—“On my return last evening from a visit to my friend Mr. Lyell, at Kinnordy * * I had the great pleasure to find your letter from Killarney. To use a Scotch expression, I was *wearying* to hear from you; but I am concerned at your not having been more successful. I fear that the whole of Great Britain is too uniform in its vegetable productions for any one portion to yield *you*, advanced as you are in the botany of this country, any very abundant harvest. You are perhaps too late for phænogamous plants, and the rains have certainly been against you; but I am still of opinion that the south of Ireland will afford a more abundant harvest than any other part of the British Islands for cryptogamia. Indeed you seem to have already gathered many of these—such perhaps as are already known. But that cannot be a bad country which has given you a new *Hypnum* and a new *Hymenophyllum*. I quite long to see these two novelties. If you like to draw up a few notes respecting them, I will send them in your name to *English Botany*, where they will be a thousand times more interesting than the bad species of willows and roses there represented. *Hookeria læte-virens* (not yet figured in *English Botany*), *Trichomanes brevisetum* (*T. radicans*) *Eriocaulon*, the *Pinguiculæ*, not a few *Jungermannia variores*, &c., &c, must not stand for nothing.”

On the 6th of August Mr. Wilson transferred his quarters to the house of a Mr. Casey, at Kenmare. Next day he walked to Drumouchty lake, south of the town, and had some excellent botanising. He found, amongst other things, *Pinguicula grandiflora*, and was engaged until three in the afternoon gathering *Eriocaulon*. Returning homeward he observed *Sium verticillatum* and a variety of *Mentha hirsuta*.

August 8th was wholly occupied by Mr. Wilson with drying and examining the plants he had gathered. A few days later he gathered more of the rare *Pinguicula*, and he also records the finding of specimens with fruit of *Tortula tortuosa*. One or two quaint entries which appear in his journal about this time are amusing. For instance, under date of Sept. 6th, he wrote: "Up late, feverish. Very fine, sunny day. Caught and executed a few fleas."

The first mention I find of *Daltonia splachnoides* is on the 9th of September, Mr. Wilson having come upon that rare moss during a visit to Cromagloun. On the 10th, he writes: "Walked to Turk mountain and ascended a woody glen. Found *Daltonia splachnoides* with ripe capsules." He climbed that day to the summit of Turk, and returned to his lodgings at night much fatigued. Amongst his gatherings during the journey was *Pimpinella magna*, which was found growing in Muckcross woods.

Another visit was made to those woods on the 12th of September. Mr. Wilson then found *Jungermannia Mackayii* in fruit, *Zygodon conoideus*, *Z. viridissimus*, *Hypnum tenellum*, &c. Four days later he gathered more of *Daltonia splachnoides*, and found *Jungermannia calyptritolia*. At Cromagloun, on the 19th, he came upon a large patch of *Daltonia*—most of it ripe; also a "large quantity" of *Trichomanes radicans*.

Mr. Wilson seems to have lost no time in communicating to Prof. Hooker his finding of *Daltonia splachnoides* and other good things. He received a letter from the Professor, dated October 18th, 1829, in which the writer said: "I had great pleasure in receiving your letter yesterday, and I can no longer delay replying to it and congratulating you, as I do most cordially, on your success in discovering a new and so good a habitat for *Daltonia splachnoides*. If there was one moss more than any other that I wished should be found by you it was this very moss, for I think I may call it *inter muscos rarissimus*. I wrote directly to inform Arnott of it, for, long as he has studied mosses, he has never been able to obtain the smallest morsel of this, and actually offered to an Edinburgh botanical student, who possessed a little specimen given him by Dr. Taylor, a guinea for it. The young man, though really no botanist, would not part with it. I told Mackay in my letter to him that if anyone could rediscover *Daltonia splachnoides* in Ireland it would be you. * * * You are assuredly adopting the only plan for becoming well acquainted with the cryptogamic plants of any particular district; and I wish the same were more practised by those who seek phænogamous plants—they examine countries too hastily."

In a former letter Prof. Hooker had asked Mr. Wilson to pay attention to the rubi and willows of the south of Ireland, and this Mr. Wilson seems to have done, for the Professor now writes: "Mr. Borrer will be happy to see you; he has most kindly undertaken to describe the roses, rubi, and willows for my *British Flora*. Among your roses he finds a new one, which has gratified him much."

During the remainder of Mr. Wilson's stay in Ireland (from the beginning of October to the end of January) I do not find any record in his *Journal* of new discoveries. It is, however, certain that within this period he found in the district where he was then botanizing, the moss which, first named by Wilson *Glyphocarpa cernua* in Hooker's *Journal of Botany*, was afterwards re-named by Bruch and Schimper after the discoverer, *Bartramidula Wilsoni*. He made a gathering of *Daltonia splachnoides* at Turk mountain on the 4th October—the fruit being then fully ripe—and also a gathering of two much commoner mosses, *Hypnum brevirostre* and *H. loreum*. On the 15th of that month he records the finding of *Daltonia splachnoides* in abundance, and he took the opportunity of laying in "a good supply." At that time he observed *Arbutus unedo* in flower. On the 7th November, *Hypnum blandum* (*H. illecebrum*) was gathered near Dunkerron, and in the neighbourhood of Kenmare.

(To be continued.)

LOUIS AGASSIZ.

By REV. S. FLETCHER WILLIAMS.

(Concluded.)

A LITTLE incident of Agassiz's life is told, which I merely mention because it gives a key to his character. Once, in the small cabinet of a college, which he was examining with a good deal of interest, and where he was just as modest as if all the scientific treasures of the earth were before his eyes, a singularly-formed turtle-shell from the Mississippi was shown him, with the request that he would name the species to which it belonged. Taking it into his hand, he said, with all the candour of an unspoiled child, "I don't know this." The confession was surprising, as the study of turtles was known to be a favourite branch of investigation with him, and here he was profoundly learned. In a few minutes, however, he quietly remarked—"Oh! I see—it is a malformation," which it really was, though it required vast knowledge of this sort of creatures to detect the fact. We can all imagine how the common-place professor, desirous of keeping up a name for knowledge, would have managed to conceal his ignorance.

One mark of Agassiz's greatness was in his freedom from all vain ostentation, all pretence of learning, to secure attention to himself. The cause of truth was infinitely dear to him; and he saw such boundless wealth in the storehouses of the universe that his mind always kept the attitude of a humble learner and a patient inquirer of nature's manifold and majestic meanings. It was the candour, modesty, simplicity, and perennial freshness of spirit in connection with his massive intellect, which enabled him to pursue with such eagerness and success the studies that have rendered his name immortal. The frame of mind in which he lived was suited to the happiest prosecution of his chosen labours, to the search for and the recognition of the wondrous truths of nature. It was enough for him to find what the record of creation said, and in the presence of the august revelation he was lowly and docile as a child.

And this leads me to mention one more feature of his character, which, blended with the others, expressed his nobleness,—and that is, his reverent spirit. He realised deeply the grandeur and the uses of life. All that related to man's interests and place upon the earth was sacred to him. In his investigations of this mysterious frame of things he felt that he was searching out the thoughts of God. There was constantly before him what (to him) was evidence, drawn from purely scientific sources, of the Almighty's creative wisdom; and I could quote to you paragraph upon paragraph from all his works in which he adduces testimony wherein he sees the manifestation of a mind as powerful as it is prolific, the acts of an intelligence as sublime as it is provident, the marks of goodness as infinite as wise, the palpable demonstration of the existence of an author of all things, ruler of the universe. Indeed it is but truth to say that the whole of his works might be called, with justice, treatises upon the highest forms of evidence given by zoology to the doctrine that God, the Creator, is a mind, a thinking and self-conscious Intelligence. This doctrine is, in Agassiz's view, the only foundation upon which an intelligent study of zoology can be grounded. With him the aim of science is something more than the grouping of facts under a general formula. This may be obtained by empiricism, in some cases more successfully than by science. The aim of science is to detect the thoughts of the Creative Mind. To the school of Positive Philosophy the knowledge of the processes or laws of nature is the only subject worthy of investigation, and the school thinks it very unscientific to assume that thinking is not a function of the brain, and that there is an essential difference, an impassable gulf, between inorganic matter

and living thinking beings. "But," says Agassiz, "I shall not be prevented by any such pretensions of a false philosophy from expressing my conviction that, as long as it cannot be shown that matter or physical forces do actually reason, I shall consider any manifestation of thought as evidence of the existence of a thinking being as the author of such thought, and shall look upon an intelligent and intelligible connection between the facts of nature as distinct proof of the existence of a thinking God, as certainly as man exhibits the power of thinking when he recognises their natural relations."⁸ Again and again, too, he maintains that classification is a philosophical study of the highest importance, since it is an attempt to understand the Infinite Wisdom.⁹ His pervading principle is, that a natural system must have an actual existence in nature, but that it consists not simply in actual differences of physical manifestation, but in the intangible differences of plan or conception in the Creative Mind.¹⁰ He maintained for Natural History that it shows the whole creation is the *expression of thought*, and not the *product of physical agents*; and that, regarded in that light, it gives *scientific* evidence of God's working in nature.¹¹ This is what he read in the disclosures of the sciences; and testimony such as his must have enormous weight. His daily thought was all vital with the consciousness of the Infinite Supreme. So he lived face to face with the glorious and solemn facts of a present Deity. Reading so constantly the records of the divine wisdom, and penetrated so deeply with a sense of life's object and possibilities, he bore about with him a spirit of reverential awe,—a recognition of God that was both an inspiration and a joy. In such a habit of life his heart could never grow old.

The poetical tribute which Longfellow addressed to him on his fiftieth birthday so vividly portrays his beautiful career, that it will form a fitting conclusion to this paper:—

" It was fifty years ago,
 In the pleasant month of May,
 In the beautiful Pays de Vaud
 A child in its cradle lay.

⁸ See the First Chapter in the Essay on Classification in *Natural History of the United States*.

⁹ See Second Chapter in Essay on Classification, *Ibid*.

¹⁰ Agassiz also referred the phenomena both of the origin and the distribution of species of plants and animals directly to the Divine Will; but his theory here, as Professor Gray observes, "may be said to be theistic to excess."

¹¹ See *Tour to Lake Superior*, pp. 144, 146.

And Nature, the old nurse, took
 The child upon her knee,
 Saying, "Here is a story-book
 My Father has written for thee.

'Come, wander with me,' she said,
 'Into regions yet untrod,
 And read what is still unread
 In the manuscripts of God.'

And he wandered away and away
 With Nature, the dear old nurse,
 Who sang to him night and day
 The songs of the universe.

And whenever the way seemed long,
 Or his heart began to fail,
 She would sing a more wonderful song,
 Or tell a more marvellous tale.

So she keeps him still a child,
 And will not let him go,
 Though at times his heart beats wild
 For the beautiful Pays de Vaud.

Though at times he hears in his dreams
 The Ranz des Vaches of old,
 And the rush of the mountain streams
 From glaciers clear and cold ;

And the mother at home says, 'Hark !
 For his voice I listen and yearn ;
 It is growing late, and dark,
 And my boy does not return !''

85, Everton-road, Liverpool.

Short Notes and Queries.

BIRDS NEAR HALIFAX.—In this district, during the past summer, most of the moorland and woodland birds have been very plentiful. The twite, ring-ouzel, wheatear, skylark, and yellow-hammer have been numerous on the uplands and high moors ; plovers have also nested. The redstart, spotted flycatcher, white throat, lesser redpoll, sand martin, whinchat, meadow pipit, grey and yellow wagtails, have all appeared fairly numerous in the most suitable localities. The song and missel thrush have been more common this summer than for several seasons. Starlings in flocks have also been abundant. The moorhen, common sandpiper, water ouzel, and landrail have all nested in the district. Willow wrens have been plentiful in the woods. The nightjar, partridge, kingfisher, and swift have been observed in the locality. In addition to those mentioned, all the common species which annually nest in the neighbourhood have bred very freely this summer, and young birds of most kinds are numerous.—F. G. S. RAWSON, Sept. 10th.

DISTRIBUTION OF *Tectura testudinalis* IN YORKSHIRE.—In the pages of *The Naturalist* of Jan., 1879, I published the occurrence of the above mollusc at Whitby, and laid claim to the honour of having discovered and published its most southerly habitat. No sooner was this done than some Leeds conchologists drew my attention to a record on this very shell in the Supplement of Dr. Jeffrey's "British Conchology," which I had overlooked. Since then I have had some correspondence with Dr. Jeffreys, and incidentally this shell was mentioned. To Yorkshire conchologists I am sure this paragraph of the doctor's letter will be interesting: "Mr. Leckenby got his Yorkshire specimens of *Tectura testudinalis* from Staithes, together with Dogger Bank shells; I believe they were dead." Now as quaint old Staithes—where circumnavigator Cook served his apprenticeship to a grocer—is a little fishing village ten miles N.W. of Whitby, my claim is sustained. As no conchologist will reckon flotsam and jetsam, even if from the Dogger Bank, as equal to the shells which are gathered alive on their feeding grounds, I laid no claim to a dead shell, which I found of this animal in Robin Hood's Bay, six miles further south than Whitby.—HY. CROWTHER, Beeston Hill, Leeds.

Larentia ruficinctata &c., IN YORKSHIRE.—Having seen, in the programme of the Yorkshire Naturalists' Union's excursion on Sept. 1st, that Malham is supposed to be the only locality in Yorkshire for *Larentia ruficinctata*, it may be of interest to your readers to know that I have captured about Oughtershaw, Langstrothdale, in Craven, at an elevation of 1200 feet above the sea-level, at the sources of the Wharfe, several specimens of this insect, one at the beginning of August this year. I have also taken *Chortobius Davus* in this district, and *Erebia Blandina* at Buckden.—TREVOR BASIL WOODD, Oughtershaw Hall, Langstrothdale Chase, Skipton.

[Mr. Woodd has very kindly sent me specimens of the above for inspection. The *Erebia Blandina* and *Larentia ruficinctata* are well-marked specimens of the ordinary types; but the *C. Davus* are very curious. They are smaller than any *Davus* I have noticed before, and the markings are just about between the Thorne Waste specimens, which are all of the variety *Rothliebii*, and the Scotch form which is the ordinary type of the species. They are, indeed, just what one would expect a hybrid between *C. Davus* and *C. Pamphilus* would be; and as the large South European variety *Lyllus*, Esp., of *C. Pamphilus* expands from 1 to 1½ inches, and has *marginal eyes* on the underside of the hind wings, it is just possible these specimens may be referable to it. A long series of Oughtershaw specimens must decide that.—G. T. P.]

Scoparia conspiciualis AND *Dicrorampha herbosana* AT GRASSINGTON.—I took a *Scoparia* last June in Grass High Wood, Grassington, which I did not recognize, and have had it in the corner of one of my store boxes until last week, when I sent it to Mr. C. G. Barrett, along with a few local Tortrices. He has, however, returned it me, named *S. conspiciualis*,

which is a good addition to the lepidopterous fauna of Upper Wharfedale, and happily confirms Mr. Porritt's surmise (see *Nat. N.S.* . viii., p. 27) that he had seen it at the Union's excursion to Grassington in 1882. Another species amongst others taken there by my brother may be worth recording, viz., *D. herbosana*.—E. P. P. BUTTERFIELD, Wilsden, Bingley, Sept., 1883.

[The interest of the capture of *S. conspicualis* at Grassington is further enhanced by the fact that the specimen was taken in June, as it points strongly to there being two broods during the year of this comparatively recent addition to the British list. Previously the species had only been recorded as occurring in August.—G. T. P.]

Nephrodium cristatum.—A CORRECTION.—Dr. F. Arnold Lees has kindly called my attention to an erroneous statement in my List of York Ferns (*Naturalist*, July, 1883, pp. 178 and 181), with regard to the first finding of this fern at Askham Bog. Mr. West and I certainly discovered it in September, 1875, without having the least idea that it had been previously found there: but as Dr. Lees has referred me to more than one previous record of it, I hasten to correct the error. He says: "In Watson's 'Topographical Botany' (1873-4) it stands recorded for the south-west division of Yorkshire, with a query for the mid-west division also. Askham Bog comes within the latter area. Mr. John Hardy, now of Manchester (formerly of Sheffield), first added it to the Yorkshire flora, having got it on the border of Thorne Waste. In 1872 I confirmed that "find" by gathering it there myself in small quantity in a boggy, bushy place. In 1873 I gave the S.W. division of Yorks. to Mr. Watson for it. A year, or perhaps two, later (certainly before 1875), when I lived at Leeds, Mr. Henry Ibbotson told me it grew on the bog at Askham. He had, I understood, found it himself. It occurs in a MS list of his which I hold, furnished to me when I was preparing my work on 'West Yorkshire' (including the Ainsty). I went to the bog and gathered a frond or two myself; as you say, it is very scarce, and peculiar in habit of pinna-insertion, &c. To Mr. Ibbotson, who is a good botanist, and discovered it independently of you, belongs the credit of leading me to gather it and publish it in 1875 for Askham Bog, in 'West Yorkshire' (p. 324-5)." Of course I have no further wish to claim to have first discovered this fern in Yorkshire, and would have corrected the error earlier had not temporary absence from England prevented me. Probably I should not have overlooked these previous records had I not been for some years separated from Yorkshire and its botanists.—ROBT. MILLER CHRISTY, Canada, Aug. 25th, 1883.

A LIST OF FLOWERING PLANTS AND FERNS growing in Lincolnshire (north and south divisions), recorded from those Vice-counties in the Bot. Record Club Reports, for 1875 to 1882, which are omitted from those Vice-counties in the 2nd edition of "Topographical Botany," by Rev. W. Fowler, M.A. :—

LINCOLN NORTH, 54.

1. *Clematis Vitalba*, † (54), 1878 Rep., p. 8
155. *Silene anglica*, 1881-2 Rep., p. 185
247. *Rhamnus frangula*, 1877 Re., p.p. 211 and 234
291. *Ornithopus perpusillus*, 1876 Rep., 160
384. *Callitriche platycarpa*, 1876 Rep., p. 162
592. *Arctium intermedium*, 1881-2 Rep., p. 192
818. *Teucrium scorodonia*, 1875 Rep., p. 107
1040. *Epipactis palustris*, 1881-82 Rep., p. 196
1213. *Carex elongata*, 1881-82 Rep., p. 198
1218. *Carex eu-arenaria* (as occurring inland as well as on the coast), 1879 Rep., p. 61
1232. *Carex acuta*, 1880 Rep., p. 138
1303. *Aira caryophyllea*, 1875 Rep., p. 112
1310. *Avena pubescens*, 1880 Rep., p. 139
1322. *Glyceria plicata*, 1880 Rep., p. 139
1384. *Polystichum angulare*, 1880 Rep., p. 139
1410. *Botrychium lunaria*, 1875 Rep., p. 113

LINCOLN SOUTH, 53.

135. *Viola Reichenbachiana*, 1879 Rep., p. 52
257. *Anthyllis vulneraria*, 1879 Rep., p. 54
345. *Rosa tomentosa*, 1881-82 Rep., p. 188
528. *Asperula cynanchica*, 1879 Rep., p. 57
652. *Cineraria campestris*, 1877 Rep., p. 285
905. *Plantago Coronopus*, 1877 Rep., p. 220
950. *Rumex palustris*, 1881-2 Rep., p. 227
1056. *Habenaria viridis*, 1880 Rep., p. 137
1234. *Carex eu-flava*, 1880 Rep. p. 138
1420. *Equisetum maximum*, 1880 Rep., p. 139

The following species recorded in the reports are also omitted, but because considered nowhere indigenous in Britain, and as such, not traced out comitally at all in the "Topographical Botany."

273. *Tripolium hybridum* (par. 53), 1877 Rep., p. 211
650. *Senecio saracenicus* (par. 53), 1880 Rep., p. 136
653. *Doronicum Pardalianches* (par. 54), 1877 Rep., p. 218

Nepeta Cataria.—This plant is queried "an escape," in Top. Bot. edition 1, and the query is not erased in edition 2, although in the Bot. Rec. Club Reports for 1877, p. 241, and elsewhere, it is proved to occur abundantly, and under no circumstances entitling it to be suspected.

REVIEW.—"The Natural History of Hastings and St. Leonards and the Vicinity," First Supplement, 1883, 1s.—We have been very pleased to receive from the Rev. E. N. Bloomfield, a copy of the first supplement to the fauna and flora of the Hastings district, published in 1878, by the Hastings and St. Leonards Philolsophical Society. No better proof of the great usefulness and energy of the Sussex naturalists is required than

this supplement, as in the five years that have elapsed since 1878, no less than 1500 species in the various orders have been added as new to the district investigated. More than half of the whole list is devoted to the various orders, comprising the insecta; then follow the birds; additions to the various orders of plants, including hepaticæ, lichens, fungi, fresh-water algæ, &c. An addition to the former little work, is an entirely new list of the coleoptera, and the insects altogether number the grand total of 3513, made up as follows:—

Coleoptera	1271
Lepidoptera	1012
Hymenoptera:—	
Terebrantia	87
Ichneumonidæ	212
Fossores, &c.	77
Cynipidæ	13
Anthophila, &c.	123
Hemiptera:—	
Heteroptera	238
Homoptera	102
Diptera	285
Neuroptera	48
Trichoptera	23
Other insects	21
	3513

Special care has been taken to submit doubtful species for determination to the leading specialists in the various groups, thus thoroughly avoiding the too common fault of incorrect nomenclature by incompetent compilers, and which invariably renders such lists, to a great extent, useless for scientific purposes. We congratulate the Society most heartily on its work.

OBITUARY.—HENRY HARPUR CREWE.—We deeply regret to have to announce the death of the Rev. H. Harpur Crewe, M.A., which event took place on September 7th, at the Rectory at Drayton Beauchamp, Tring, at the comparatively early age of 54. Mr. Crewe's reputation as a lepidopterist will be as lasting as it was extensive, for his knowledge of the British species of the large genus *Eupithecia* was unrivalled in Britain or elsewhere. For many years this genus was his favourite and especial study, and the minutest details in the careful descriptions of the larvæ of almost every species have been read with delight by all who take interest in the group. I believe too, that almost the last (perhaps the last) specimens of *Noctua subrosea* taken in Britain were captured by Mr. Crewe. In a letter I have from him, dated from Drayton Beauchamp Rectory, January 27th, 1872, he writes: "Do you know of anyone who

has taken *N. subrosea* of late years? In 1852, just after I left college, I took a number of wasted specimens at sugar about seventeen miles from here, by the side of a very old forest pond which has since been drained and cultivated. It may exist there still. I have never visited the locality since." For the last nine years or so, Mr. Crewe had not done much active collecting, but was still always ready and pleased to assist others in the science he loved so well; and many, including myself, have in him lost an old and valued friend.—G.T.P.

Reports of Societies.

BRADFORD NATURALISTS' SOCIETY.—Meeting Sept. 18th, Mr. J. W. Carter, president, in the chair.—Mr. Bennett gave an account of a ramble in Lincolnshire, and exhibited a specimen of the fungus *Polyporus squamosus*. Mr. Soppitt described a visit to Ingleton, and showed *Puccinea Andersoni* and *P. clinopodi*, found in Helks Wood. He also reported having seen *Gentiana amarella* in flower. Mr. W. D. Roebuck, of Leeds, gave a very interesting lecture on "Slugs," illustrated by a collection of living specimens sent to him for the occasion by Mr. Ashford, of Christchurch. Mr. B. Spencer exhibited specimens of *Inula dysenterica*, *Melilotus officinalis*, and *Achillea ptarmica (flora plena)*. Mr. Andrews, *Veronica anagallis*, *Aconitum Napellus* and *Malva sylvestris*.—JOHN EASTWOOD, Hon. Sec.

HUDDERSFIELD NATURALISTS' SOCIETY.—Meeting September 10th, Mr. Clarke, v.p., in the chair.—Mr. Clarke exhibited a number of plants, including *Polygonum aviculare*, var. *microspermum*, new to the district. The chairman called attention to the show of wild flowers which took place at the Exhibition on the 27th August. 313 species had been laid upon the tables, all with cards giving their scientific and common names, and other particulars. The number might have reached 400 if a sufficient number of competent persons had been there to arrange them. Several ladies contributed handsome bouquets of wild flowers. Mr. S. L. Mosley exhibited a living scorpion (probably *scorpio* sp.) taken from logwood in the town. Vol I. of "The Geological Survey of England and Wales" was added to the library.—S. L. M.

HULL NATURALISTS' SOCIETY.—Last Bank Holiday a few members of the society went for a trip to Spurn Point. Nothing need be said of the ride to Withernsea, nor of the drive to Easington, nor of the walk from the latter place to Kilnsea, where the work of the day commenced, except to observe that right opposite this village there is what may be called a sea of mud, some 15,000 acres in extent. Why is this not reclaimed? Fancy 15 farms of 1000 acres each, or, if divided still more, it would form a small colony. A good view of the moon-shaped ridge forming the Point, with the lighthouses in the distance, may be obtained from this

place. Going a little way to the left, we are soon on the narrow peninsula. One of the first plants observed was the common ragwort (*Senecio Jacobæ*), almost every plant of which was covered with the beautiful caterpillars of the cinnabar moth (*Euchelia Jacobæ*). The flora is not an extensive one, but very pronounced in type, being almost exclusively marine, and the few inland plants that occur are so eaten by the rabbits as to be past identifying. Here, almost side by side, may be seen *Salicornia herbacea*, *Suaeda maritima*, and *Salsola kali*. There are few places where the mechanical influence of plants can be better observed than here, for were it not for the subterranean stems and roots of some half-dozen varieties of plants holding the sand together, there is little doubt but Spurn Point would have been washed away long ago, for the ridge at the top is in some places not more than 18 inches wide. The most valuable of these plants for this purpose are *Elymus arenarius*, *Triticum junceum*, *Psamma arenaria*, *Carex arenaria*, *Hippophae rhamnoides*, *Convolvulus Soldanella*, and *Eryngium maritimum*, which are here found abundantly. The following are selected from about 30 species of birds seen, a few of which were shot by an enthusiastic member of the party:—Little tern (*Sterna minuta*), a summer visitant which breeds at Spurn, arriving in May and leaving in September; herring gull (*Larus argentatus*); ringed plover (*Ægialis hiaticula*); common wheatear (*Saxicola ænanthe*), a summer visitant, and local; common curlew (*Numenius arquata*), resident and local, and so shy and suspicious as to have given rise to a saying in the Hebrides that “To kill seven curlews is enough for a lifetime”; rock pipit (*Anthus obscurus*) with nest and young. This latter bird is said to be plentiful, but always solitary, finding its food chiefly at and within high-water mark, where it runs with remarkable ease along the sand; its nest is made of bents or other plants growing near the sea. The choicest specimen seen or procured was the Manx shearwater (*Puffinus anglorum*), which had flown against the lighthouse the previous night and been captured by the keeper. Twenty-three species of lepidoptera were observed, representing the following groups, viz:—Diurni, Nocturni, Geometræ, and Noctuæ, the rarest species taken being the lyme grass moth (*Tapinostola elymi*). After a pleasant, though rather heavy walk, the extreme point was at last reached. Here we found a great quantity of *Cakile maritima*; here also we refreshed the inner man, then rounded the point, visiting the lighthouse people. Two of us then made a very hasty inspection of the pre-historic kitchen midden on the coast just opposite the village, but found nothing except oyster shells. Evidently somebody keeps a very sharp look-out at this interesting locality.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting, Aug. 27th, the president (Mr. S. J. Capper) in the chair.—Mr. J. L. R. Dixon read a paper entitled “A comparison between the structure and function of the eyes in the various groups of insects,” in which he described, with

the aid of well executed diagrams, the various modifications which are found in the eyes of insects, and gave his reasons for believing that the function of the facets in the compound eyes is that of accommodation, their focal lengths varying. He believed the use of the simple eyes (*ocelli*) was merely for the purpose of the perception of light. The meeting terminated with the usual *conversazione*.

MALTON FIELD NATURALISTS' EXCURSION.—On Thursday, September 13th, the Malton Field Naturalists' Society had a delightful excursion to Egton Bridge and Goathland Moors. Both ladies and gentlemen were in the party, and left by early trains for Grosmont. From thence they wandered up the Esk Valley to Egton Bridge, or through the lovely Arncliffe Woods (with the kind permission of Mr. White), and to the village of Glaisdale, where a halt was made. The site of the Brigantian village was next explored, also the moor below the Roman road, and forward to Brick Hole for the picturesque cascades, Thomasin Foss and Mill Foss; after which the party reassembled at the Goathland Hotel for tea. The botanists had a successful day amongst the ferns and mosses, and some fine examples of the oak and beech fern, and other rarer species were secured. The district traversed is a most lovely one, and the naturalists much enjoyed this their last excursion of the season.

MANCHESTER CRYPTOGRAMIC SOCIETY.—Monthly meeting, August, Captain Cunliffe in the chair.—The hon. secretary read a number of letters from corresponding members of the society. Mr. G. A. Holt sent a number of mosses as a contribution to the society's herbarium, amongst them being some rare local mosses, including specimens of *Mnium stellare* and *Gymnostomum calcareum* in fruit, from Derbyshire. The secretary exhibited specimens of *Campylopus brevifolius*, a very rare British moss, hitherto only recorded in Scotland. The moss had been sent by Mr. Boswell, he having discovered it last month on the banks of the Wye, near Builth. Dr. J. B. Wood, of Broughton, sent washed-out specimens of the same gathering to show that in the length of stems it differed from the description given in Bryol. Eur. The secretary presented specimens of *Campylopus paradoxus* from Abergynolwyn; *Dicranum arcticum* from Ben Mac Dhui; and several interesting New Zealand hepatics. Mr. W. H. Pearson exhibited specimens of *Marsupella alpina*, collected on the Glyders, North Wales, by Mr. E. M. Holmes; and specimens of a lichen, *Dermatocarpon Garovaglii*, by Mr. George Davis on the coast near Brighton. Mr. Pearson's exhibits were distributed amongst the members present. Captain Cunliffe exhibited and distributed a number of good cryptogams which he had recently gathered at Barmouth, amongst them were *Philonotis rigida*, *Isopterygium demissum*, and *Hypnum purum*, in excellent fruiting condition; amongst the ferns were *Asplenium lanceolatum* and *Hymenophyllum tunbridgense*. Mr. Wm. Foster exhibited four most elegant and fairy-like forms of *Athyrium filix-femina* in a living condition. They had been grown in a little back yard in the neighbour-

hood of Salford. These elegant varieties were first raised by Mr. Thos. Glover, of Manchester, some fifteen years ago.

MONTHLY MEETING, Sept. 17th, Mr. W. H. Pearson, vice-president, in the chair.—Mr. T. Rogers exhibited specimens of *Sphacelaria plumigera*, a recent addition to our list of British sea-weeds. The specimens were gathered in July, on muddy rocks at low water, Llanfairfechan, by Mr. J. Cosmo Melville, F.L.S., who very kindly sent specimens for distribution. Mr. Pearson laid upon the table for examination fasciculus I. of Holmes' *Algæ Britannicæ*, which included specimens of the *Sphacelaria*. He also exhibited three new hepatics: *Cesia latifolia* (Lindb.), *Lepidozia Wulfsbergii* (Lindb.), and *Riccia pedemontana* (Steph.). Dr. John Roberts sent a fresh-water alga from Anglesea, and this, upon examination by Mr. West, proved to be *Chaetophora endivæfolia*. About the same time Mr. Melville had also collected the same species in Lynn Coron, Anglesea, specimens of which were mounted in a dried form for exhibition. Mr. West, of Bradford, sent several interesting species and varieties of British mosses, including the rare *Fissidens rufulus* in fruit, specimens of which were distributed at the meeting. Mr. Harry Searle, of Ashton, sent vegetating spores of *Chara*, which he had been recently cultivating. The hon. secretary distributed fresh-gathered specimens of *Plagiothecium sylvaticum* in fruit; and Mr. Cash, who had just returned from some classic cryptogamic localities in Scotland, sent a packet of *Tortula papillosa* from Ayrshire for distribution. Mr. G. A. Holt sent specimens of *Mylia Taylori* with perfect capsules; these he had found at Linton, Yorkshire.—THOS. ROGERS, Hon. Sec.

YORK AND DISTRICT FIELD NATURALISTS' SOCIETY.—Meeting September 12th.—Mr. Wilkinson exhibited the following plants:—*Scirpus tabernæmontani*, *Scutellaria minor*, both of which were collected near Strensall, and are considered to be new to the district; also specimens of *Drosera rotundifolia*, *D. anglica*, *D. intermedia*. He also exhibited, on behalf of Mr. Henry Ibbotson, specimens of *Dianthus Armeria* and *Bromus racemosus*, var. *Bellottii*. The former he reports to be nearly extinct in the neighbourhood, and the latter has recently been discovered on Clifton Ings. The chairman exhibited a box of fine insects, sent to him by Mr. S. J. Capper, of Huyton Park, Liverpool, containing amongst others the following species:—*Selidosema plumaria*, *Eupithecia pulchellata*, *E. debiliata*, *Scotosia dubitata*, *Cymatophora ridens*, *Catocala sponsa*, *Plusia interrogationis*, *Notodonta trepida*, *Limacodes asellus*, and *Bombyx trifolii*. The hon. secretary, Mr. Prest, exhibited a specimen of that rare tortrix, *Mixodia rubiginosana*, taken by himself at Sandburn, and new to Yorkshire; also a large and beautiful series of *Cidaria immanata*, amongst them some remarkable varieties, a long series of *Noctua neglecta*, also taken at Sandburn, many varieties of *Hypsipetes elutata*, and specimens of *Nonagria brevilinea*, *Meliana flammea*, and *Leucania albipuncta*.—W. Prest, Hon. Sec.

Original Articles.

THE WOOLHOPE CLUB AT HEREFORD.—FUNGUS FORAY.

By H. T. SOPPITT.

DURING the first week in October the Woolhope Club held their sixteenth annual fungus foray.

For several years past I had read graphic accounts of the Woolhope meetings with considerable interest, and this year, having received an invitation, coupled with a most interesting programme, was determined to be present.

Monday, Oct. 1st, arrival at Hereford, was the first item announced on the circular, and on that date I accordingly made my way thither.

On arriving at Hereford I noticed a gentleman on the platform, and judging from his general contour, thought must be a fungologist; upon making his acquaintance found I was right, for the gentleman in question was no less a personage than Dr. Bull, who at once informed me where I should find Canon Du Port and Mr. Broome, who had already arrived. At that moment a train steamed into the station, bringing Dr. Cooke and Dr. Wharton from London, and immediately afterwards Dr. Carlyle from Carlisle.

Tuesday, Oct. 2nd.—The first excursion took place by rail, to Ludlow, for Moor Park and Woodeves Coppice. There was a good muster, the weather being very fine, and each one being provided with a basket.

On arriving at Ludlow, waggonettes were in waiting, and the party eventually reached Woodeves Coppice, where fungi occurred in profusion.

To some, all was fish that came to the net was a rule, judging from the pretty coloured specimens of *Ag. laccatus* and other common highly-coloured species in their baskets, whilst others only gathered rare and critical species, and placed each species in separate paper bags.

Cortinarii were extremely abundant.

Hearing a shout in the distance, and fearing something had gone wrong, I hastened to the spot, and found half-a-dozen of the party surrounding several specimens of the rare *Strobilomyces strobilaceus*.

Our baskets gradually got filled, and the party slowly retraced their steps to Moor Park.

On the way back, I recognised a voice in the wood, and found Mr.

Plowright, who had arrived later and followed the party, with Mr. Phillips and Rev. J. E. Vize.

At two o'clock, the whole of the party had reached the mansion in Moor Park, where a most sumptuous luncheon was provided by Mr. Forster; after which the gardens and conservatories were inspected.

Near the park entrance several monstre specimens were gathered of *Polyporus giganteus* and *P. dryadeus*, also large examples of *Boletus Satanus*. Later on in the day, the party was hospitably entertained at Abbey Villa, Ludlow, by Messrs. Fortey, and subsequently returned to Hereford, where the bulk of the fungi was deposited in the museum.

In the evening the party met at the house of Dr. Bull, where the Rev. Canon Du Port read an instructive paper on the "Colours of Fungi," and was followed by a paper on "Recent Researches upon the Uredines," by Mr. C. B. Plowright. The latter dwelt chiefly on the connection of *Puccinia arundinacea* (not *magnusiana*) with *Ecidium rumicis*.

Wednesday, Oct. 3rd.—Most of the party were up early studying the fungi, and towards nine o'clock the clouds assumed such a threatening attitude, that only four of us ventured on the Dinmore excursion. We were somewhat at a disadvantage, as our baskets had to be filled during a continuous downpour of rain which lasted several hours; however, we were well repaid by the many good things we took back, and by the charming scenery about Dinmore. All the hedges were covered with *Clematis vitalba*, and many other rare flowering plants occurred in the woods. Arriving back at Hereford we found most of the party still busy with the fungi.

Shortly afterwards the whole of the party got scattered at various dinner parties in the district, after which a meeting took place in the Woolhope Club Room, where an elaborate paper was read by Dr. Wharton (on behalf of Dr. Stewart) on the "Chemical Constituents of Fungi," followed by Mr. C. B. Plowright, on "Jensen's Discoveries concerning the Potato Disease."

Thursday, Oct. 4th, was the Club day. Three large waggonettes left Hereford for Hayward Forest and Bryngwyn, several miles out, and where fungi were again abundant.

A fine specimen of the tawny owl was taken from a trap and bagged by one of the party.

On returning to Hereford upwards of seventy sat down to the public dinner at the Green Dragon, at which the *Chanterelle* was served (badly cooked).

Dr. Bull made a brilliant speech, and Dr. Cooke followed with a

humourous paper on "A Missing Chapter from the Tramp Abroad." Later on, the party adjourned to the house of Mr. T. Cam, where several papers were read and a fine collection of drawings inspected, sent for exhibition by Mr. Masee, of Scarborough. At this stage of the proceedings I took my departure from Hereford, and arrived home at three in the morning.

Friday, Oct. 5th., Dr. Carlyle informs, me was spent at Ledbury, where several good things were collected, including *Ag. Bucknalli*. The evening was devoted to the reading of papers, &c.

Saturday, Oct. 6th.—The visitors took their departure.

WM. WILSON'S TOURS IN SCOTLAND AND IRELAND. 1827-1830.

BY JAS. CASH.

(Read before the Manchester Cryptogamic Society, April 16th, 1883.)

(Concluded.)

SCOTLAND AND IRELAND : 1829-30.

On the 17th of February, 1830, Mr. Wilson sailed from Dublin for Holyhead, where he spent some time botanising. On the 18th, during a walk to Trefriw rabbit warren, he gathered, amongst other things, *Desmatodon nervosus*. This moss he again found three days later in another locality. He also gathered *Gymnostomum conicum* (*Pottia Starkeana*, var. β), *Phascum muticum*, *P. rectum*, and *Grimmia maritima*. After this he went to Yr-allt-Fawr, and succeeded in finding *Hypnum illecebrum* and *Grimmia trichophylla*. Of *Hypnum illecebrum* he saw plenty afterwards at a place called Bryn ddû. He continued to botanise in Anglesea and about Bangor until near the end of March, visiting Llyn Ogwen and Twll ddû; also Cadnant, where he gathered *Pterogonium gracile*, *Grimmia trichophylla*, &c. In the previous year he had been fortunate in discovering, near this place, the rose which was named after him—*Rosa Wilsoni*.

On the 29th of March Mr. Wilson left Bangor on foot and walked to Abergele, putting up there at the "George IV." inn. I wish we botanists could record of every hostelry we enter what Wilson says of this: "Bed, comfortable, 6d.; breakfast 8d." On the 30th he walked to Foryd (I suppose Rhyl was not then known even by name) and going on board the tidal packet, which sailed at two a.m. on the 31st, he landed at Liverpool after a four hours' sail. Proceeding homeward on one of the Bridgwater packet boats, and leaving his

baggage to be forwarded by canal from Runcorn, he walked to Paddington, which place he reached about dusk, after an absence from home of about nine months.

This narrative would be incomplete if I did not read to you some of the correspondence which arose out of Mr. Wilson's sojourn in Ireland. On the 23rd December, 1830, Prof. Hooker wrote to Mr. Wilson as follows:—"My dear Sir: You will, I am sure, think that I pester you with letters, but the occasion upon which I now write to you is this: I was yesterday examining your lichens, and among them I found one which interested me exceedingly. You have marked it 84 in your MSS.; and again, it is one of two lichens in your number 212 (the barren state.) The genus is *Sticta*. There is no British *Sticta* that at all approaches to it, either in habit or in character. But there is one, a foreign one, a native, too, of the Isle of France [Mauritius,] which I can hardly distinguish from it, at least some of its states—and that is *Sticta macrophylla*, which I have figured in the first number of my *Botanical Miscellany*. Do compare your plant with it, if you have the number of the *Miscellany*, making allowance for the figure being made from the finest specimen I had, and of that variety '*Apotheciis marginalibus*,' whereas I have specimens of *Sticta macrophylla* as small as your plant, and with the apothecia scattered. In the paper marked 212, the barren plant is the *Sticta*, the fertile one *Parmelia tiliacea*. You will see in the former the little pits or hollows (*cyphellæ*) embedded in the downy lower surface of the frond, which are characteristic of the genus *Sticta*. Of your other lichens No. 171 is *Sticta sylvatica*. * * Pray have you much of the above new *Sticta*, or is there any person in the country who can gather more of it? Can you spare a specimen for Sowerby to draw,* and one for Mr. Borrer? Either Mr. Borrer or I will describe it for *English Botany*, unless you will do so.—Yours, &c., W. J. HOOKER."

Absence from home prevented Mr. Wilson answering this letter until the 7th of February. The absorbing question between them was—who, in Ireland, could be depended upon to gather the famous lichen? Wilson thought of J. T. Mackay, the author of *Flora Hibernica*, but Mackay was living in Dublin, and might not immediately be visiting the south. Hooker suggested Harvey, who lived at Limerick. This was apparently the first time that Wilson had heard of the young Quaker botanist. "There is," Hooker wrote, "a very zealous Irish botanist (and a Quaker), who is about to publish a work on new cryptogamic plants, but particularly algæ. He draws very

* For *English Botany*.

nically, and will engrave the plates himself. As soon as the spring approaches, he will visit the south of Ireland, and I have particularly urged him to seek for the *Sticta macrophylla*, which he will do if we will send him the exact particulars of the station. No one can do this so well as yourself, and I have now to ask the favour of you to communicate with him ; and I am sure, if you wish it, he will gather the *Sticta* for you, and any other plant you may express a wish to have, and that he may chance to fall in with. His address is 'W. H. Harvey, Esq., Summerville, Limerick.' In the spring he will make Killarney his head quarters for some time." * *

Mr. Wilson lost no time in communicating with Harvey, and sent him full particulars of the habitat of the *Sticta*. In writing, he also sent Harvey specimens of *Hypnum demissum* and *H. micans*, with a request that he would look out for these novelties also ; and on the 9th of Feb., Harvey replied, telling Wilson of his contemplated journey, and also mentioning the fact of *Hookeria laete-virens* being abundant at Turk Waterfall, and in fruit.

Dr. Hooker happened to be preparing for the press his second volume (the Cryptogamia) of the *British Flora*, and on the 22nd March, 1832, he wrote to Wilson : "I am working now at the lichens, and have printed about one-third of that family. - Your *Sticta* is, unquestionably, the most interesting British individual of the tribe. I shall be greatly disappointed if, after the full statement of the locality you have given to Mr. Harvey, he should fail to find it. With his correspondence I did not doubt you would be pleased ; and he is as much gratified in being put into correspondence with you."

In April of that year Harvey went to Killarney. Though he was, as we may believe, interested in the search for *Sticta macrophylla*, yet he found opportunity for other work. He was at that time just twenty years old, and, as is the case with most young enthusiasts in Natural History, his pursuits were somewhat varied. They embraced bird-stuffing and shell collecting. Mosses and *Jungermannia*, flowering plants and sea-weeds, were alike welcome to him. In this particular journey he records the finding of *Turbo politus*, a rare shell, at Bantry, and also a new species of *Lymnea (involuta)*, very distinct from any other, most like *Lymnea glutinosa*, but differing abundantly. (Memoir, p. 25.) But it is very surprising to find that the editor of the Memoir makes no mention of the commission given to Harvey with regard to *Sticta macrophylla*. At the end of April Hooker received a letter from Harvey announcing his success ; thereupon Hooker wrote to Wilson : "I have just heard from Harvey, and his letter is accompanied by specimens of the *Sticta*. It was very soon in fruit."

Harvey's letter to Wilson, upon his return to Limerick, is worth reproducing, as it relates not only to the precious lichen, but also to some of the musci for which Wilson had asked him to be on the look out:—"Limerick, 5 mo. 3rd, 1832.—Dear Friend: My journey to Killarney was unfortunately limited, by unavoidable circumstances, to the first week in April, and if I had not seized that opportunity of going, I saw no prospect of being able to visit it for the season. I may get there again for a week in August, but it is quite uncertain.

"This early travelling prevented me from getting many things, and I am sorry to say that I have got hardly any of thy requisites. To take them *seriatim* :

"*Hypnum demissum* : Thou must have miscalculated the time of throwing up capsules. I could find none but old withered fruit, with here and there a very young seta peeping up. Of course I have none to send thee.

"*Hypnum micans* : I found a few small patches, but no fruit.

"*Sticta macrophylla* : I gathered a good share of this, the principal part of which I have sent to our good friend Dr. Hooker, but I have reserved two or three specimens for thee. Dr. Hooker bespoke it long ago, and as he said he was 'sorely in want,' I deemed it right, in the first place, to relieve his necessities. If thine are very pressing I will keep them in view next trip. I gathered but little fruit, but I found it on several patches at Cromagloun, also in the one thou mentions at Turk cascade. At the first station I found one or two little scraps with marginal fruit.

"*Hookeria læte-virens* : I can give thee barren specimens, but I did not find a single capsule, and the station is much injured. I found a new station for this plant, and guess where? On the wet dripping rocks opposite the station chair at Turk, growing among thy *Marchantia irrigua* ! Thou seems to have a strange fatality with regard to this moss.

"*Marchantia irrigua* : I gathered young fruit, which I can give thee, but took no drawing or description, seeing the fructification was only in embryo. The capsules had not burst their calyptra. The male fruit I am uncertain of ; what I called such, grew on the same frond as the female.

"*Zygodon conoideum* and *Gymnostomum (Zygodon) viridissimum* I have for thee. The latter was not in abundant fruit, but I have got a tolerable supply. It grows in this neighbourhood also, on elms, but seldom throws up a fruit stalk.

"*Jungermannia Hutchinsiae* grows in every mountain stream, but I could find no trace of fruit.

“*Jungermannia curvisolia* : I can give thee a few bits, with ripe capsules.

“*Tortula tortuosa* : The wall is re-sodded, and the plant destroyed. Oh, Goths and Vandals ! I found it, however, in other places, but with young setæ, which are, of course, of no value.

Bryum [*Mnium*] *cuspidatum* with numerous setæ I could not find. On the border of the Lake, however, I found *Bryum* [*Mnium*] *rostratum* in that predicament.

“These are, I believe, most of thy Killarney plants which were to be seen. *Pinguicula grandiflora* was only just spreading its leaves. I shall bear thy Glengarriff habitats in mind, should I visit that place this summer. I found thy experience of the greatest use at Killarney. Since I wrote thee, I have compared thy *Chara aspera* with Aghardian specimens, and am convinced they are totally different. It is either *Chara galioides* of that author, or a new species ; but the specimens of *C. galioides* I examined were very imperfect, and I could form no certain opinion. If thou can afford me a specimen of thy *Chara*, I shall be much obliged.

“Pray write me to say how I can send thee a parcel, and how it is to be directed.

“I remain very truly and respectfully thine,

“W. H. HARVEY.

“P.S.—Could thou possibly contrive to join Dr. Hooker’s party to the Highlands in June ?”

With reference to the enquiry in the postscript, I may say that Wilson did not visit the Highlands that year. Harvey, however, formed one of Dr. Hooker’s party, and a very happy time he seems, from his Memoir, to have had.

Before closing, allow me to refer briefly to two of the mosses which Harvey had been asked specifically to look for—*Hypnum demissum* and *H. micans*. One of these (*H. demissum*) was discovered by Mr. Wilson during his Irish trip in 1829-30. *Hypnum micans*—or, as it is now called, *Leskea micans*—was so named by Mr. Wilson, and a description of the species first appeared in Hooker’s *British Flora*. The localities given in *Bryologia Britannica* are : “On shady rocks in the south of Ireland, not yet found in fruit. Near Glengarriff, Miss Hutchins. Cromagloun mountain and at Fila Doun, near Killarney, W. Wilson.” The other species was figured by Mr. Wilson, and was first described by him in the *English Botany Supplement*. The localities given in *Bryologia Britannica* are as follow : “On shady rocks in mountainous districts, Cromagloun mountain, near the upper lake of Killarney, and

near Glengariff, Ireland, 1829." The Beddgelert locality in North Wales, mentioned in *Bryologia*, was a subsequent discovery by Mr. Wilson.

Rainfall for September.

	Height of gauge above sea level.	Rain-fall.	No. of Days	TOTAL FALL TO DATE.		Date of heaviest Fall.	Amount of heaviest Fall.
				1883.	1882.		
HUDDERSFIELD (Dalton) ... (J. W. Robson)	Ft. 350	In. 5·68	19	27·18	*23·68	28	1·64
HALIFAX... (F. G. S. Rawson)	365	7·70	19	34·62	35·94	29	1·55
LEEDS ... (Alfred Denny)...	183	4·15	23	22·61	†18·07	28	0·84
HORSFORTH ... (James Fox)	350	4·80	18	26·52	‡25·17	28	0·86
BARNSELY ... (T. Lister) ...	350	5·21	19	25·06	22·23	28	1·44
INGBIRCHWORTH (do.)	853	6·98	17	35·87	31·48	28	1·30
WENTWORTH CASTLE (do.)...	520	4·99	18	26·89	23·40	28	1·32
GOOLE ... (J. HARRISON) ...	25	4·87	19	20·47	22·51	28	1·01
HULL (Derringham) (Wm. Lawton)	10	3·94	20	16·48	20·06	10	1·15

Scarborough Rainfall for September 3·79: 0·93 above average.—A. ROWNTREE.

* Average to date for 17 years, 1866-82. † Average of 29 years, 1853-62 & 1865-83.

‡ Average of 14 years, 1870-83.

Short Notes and Queries.

SLUG NEW TO YORKSHIRE.—I have a most important discovery by my indefatigable friend Mr. W. West to announce to the readers of the *Naturalist*. It is *Limax cinereo-niger*, one of the most recent additions to the British list of mollusca. Mr. West found it on the 15th October, feeding on a fungus "*Cortinarius*" in Shipley Glen, Mr. Soppitt being with him on the occasion. The species is a large one, and very handsomely marked. Its nearest ally is the familiar *Limax maximus*, so well known for its being conspicuously spotted and striped with black. Our new species, on the contrary, differs from it in being uniformly coloured, generally black or extremely dark cinereous, but it always has the keel and a central line on the back in continuation of it pale, generally dirty-white. There are other marked differences between the two species, in the character of the rugosities on the back, and in respect of the colouring of the sole of the foot. In *L. maximus* the rugosities are only moderately developed, and the foot-sole is uniformly pale in colour; but in *L. cinereo-niger* the rugosities are very large and strongly developed, and the foot-sole is divided longitudinally into three parts, of which the two outer ones are dark-coloured, and only the inner one is pale.

Another proof of their abundant distinctness is afforded by the researches of Ferdinando Sordelli, who demonstrated by careful dissection that there are important differences in the internal structure of the reproductive organs in the two species. *L. cinereo-niger* seems to be very rare in Britain, for the specimen of which I write is the first I ever saw, and of the records there are only about three which can be apportioned to it or its varieties in Britain; but on the Continent it is well known and not uncommon. I will take advantage of this opportunity to say that I shall be extremely pleased to receive consignments of living slugs (which should be sent in air-tight tin boxes) from any part of the British Isles, especially the more remote districts. I am working at their distribution and variation, and wish to have all the species, *common*, as well as rare, from *every* county. So far I have had assistance from various correspondents, and nearly every parcel I have received has been productive of novelties for the British fauna, so utterly unworked have the slugs been up to this time. Mr. J. H. Salter sent me from Waterford a large number of forms, including *Testacella Maugei*, var. *viridans*, and the magnificent var. *bicolor* of *Arion ater*, both new to Britain. Mr. R. Renton, of Fans, near Earlston, N.B., has also sent numerous fresh things from that district, and Mr. E. J. Elliott, of Stroud, has been even more successful; while my old friend Mr. C. Ashford, of Christchurch, Hants, has sent me specimens of all which occur with him, including a puzzling series of a species (or variety?) which will afford much material for study. I am almost inclined to believe that I am on the track of a new species (new to Britain, that is). I shall be glad to receive the common species of as many more districts as possible, and it is my intention to publish notes from time to time upon such consignments as I may be favored with.—W. DENISON ROEBUCK, Sunny Bank, Leeds, Oct. 18th, 1883.

FOX SHARK, &C., AT BRIDLINGTON QUAY.—Mr. Thomas Boynton, of Ulrome, writes me that on the 19th inst. a specimen of the thrasher, or fox shark, 11ft. long, was landed by some fishermen at Hornsea. Towards the end of August, two porbeagles were also taken by fishing-boats in Bridlington Quay. One of the latter is preserved by a Beverley bird-stuffer, and measures about 5ft. in the dried state. Sharks and their allied species appear, from fishermen's reports, to have been unusually numerous this autumn on our coast, probably attracted by the large shoals of herrings, of which extraordinary catches have been made. Though unconnected with Natural History, it may interest some of your readers to learn that Mr. Boynton has found and dug out near his village one of the primitive lake dwellings hitherto chiefly found in Switzerland, and fixed the site of at least four more. It is said to be the first instance of such a discovery in England. It has been recently examined by Dr. Munro, a gentleman deeply versed in the subject, and probably a report will appear in one of the scientific journals.—N. F. DOBREE, Beverley, 22nd Sept., 1883.

Testacella haliotidea, var. *scutulium* IN YORKSHIRE.—Referring to Mr. Butterell's record in the *Naturalist* for July (vol. viii., p. 186), I have seen one of the specimens, and on examination it proves to belong to the variety *scutulium*. So have other British specimens when carefully examined, and as a matter of fact there is doubt as to whether the typical form of the species occurs in the British Isles at all. At all events there is no direct evidence of its existence, and if any naturalist meets with it, he would confer a benefit on science by publishing the record. While writing, it may be placed on record that Beverley is not the only Yorkshire locality for *Testacella*. Mr. John Emmet, of Boston Spa, has on several occasions informed me and others of its occurring there in nursery gardens. In this case, not having seen specimens, I am unable to state to what form they appertained. These seem to be the most northerly localities for the species, so far as actual records show.—WM. DENISON ROEBUCK, Leeds, Oct. 5th, 1883.

NATURAL HISTORY NOTES FROM WHARFEDALE.—The following species may be added to the list of Upper Wharfedale shells given in June number of the *Naturalist*:—*Zonites fulvus*, *Helix pygmaea*, *Helix sericea*, *Helix concinna* (young), *Vertigo pygmaea*, *Carychium minimum*, all from Grassington, and Deepdale near Grassington.—GEORGE ROBERTS, Loft-house, August, 1883.

HUDDERSFIELD EXHIBITION.—NATURAL HISTORY DEPARTMENT.—It may not perhaps be generally known to our readers that nearly the whole of the Natural History collection of the late "Squire" Waterton has been kindly lent, and is now on view, at this Exhibition. The collection includes the cayman on which Waterton made his famous ride, beautiful specimens of humming-birds, a small chimpanzee, the celebrated "non-descript," armadillos, many strange and curious species of crabs and lobsters, a splendid arrow tube about 10ft. long, and specimens of the arrows tipped with the wourali poison, &c., &c. This collection is all in one room, which also contains many other specimens of interest to the naturalist. In another room the geologist and mineralogist will find much to interest them. There is a splendid collection of almost all known kinds of precious stones; a collection of agates lent by Prof. Jno. Ruskin; a fair series of coal-measure and other fossils; recent echinoderms, crustacea, mollusca, corals, sponges, glass models of marine invertebrata; about thirty species of mosses; cases of moths and butterflies; anthropological and ethnological photographs; a fine series of plates and diagrams illustrating vegetable morphology and histology, lent by the Linnean Society of London; Miss Ormerod's six diagrams of British insects injurious to farm produce; and, finally nearly 300 cases of British birds. Again, in Room No. 6, SCIENTIFIC INSTRUMENTS, there is a splendid display of various instruments for scientific research, far too numerous to particularise, but amongst them may be mentioned the following:—A number of first-class microscopes and implements; a

splendid selection of tuning-forks and vibrative bars, lent by the late President of the Royal Society, Dr. Wm. Spottiswoode; lantern and microscope lamps; models of horizontal steam engines; steam hammer; Channel Tunnel boring machine, &c., &c. The scientific and Natural History student will find much to interest him for a whole day, irrespective of the other exhibits, and would be well repaid for a visit.

LEPIDOPTERA NEW TO YORKSHIRE.—Among some micro-lepidoptera I took in the neighbourhood of Huddersfield during the present year, and which I recently submitted to Mr. C. G. Barrett for determination, I find are three species hitherto unrecorded for the county. *Sciaphila perterana* I took near Crosland Moor in July. *Tinea merdella* swarmed in July, in the old lot of wool in New-street, alluded to at vol. viii. *Nat.*, p. 94; and the pretty *Gelechia gemmella* I found flying in plenty in September, in the old rough field adjoining Lepton Great Wood. Two other species are new to the South-west Riding, viz: *Gelechia desertella* and *G. similella*, both of which I took on Crosland Moor in July.—GEO. T. PORRITT.

NOTICES OF BOOKS, &c.—“The Annual Report and Transactions of Wakefield Naturalists’ Society, 1883.”—Contains lists of papers read, account of local rambles, &c. The library seems to be at present only a small one, but may probably soon be increased. The most useful part of the “Transactions” is the list, so far as published of the fauna and flora, which shows that the society is doing good local work. These lists include the shells—a very full one—migrant birds, with dates of arrival; hymenoptera, coleoptera (geodephaga only), and vertebrates. Other departments of zoology, and also the botany and geology, are promised in future issues.

—“The Practical Naturalist,” No. 9, vol. i., contains simple and initiatory papers on skinning and preserving reptiles; a short life-history of *Vanessa Io*; notes on the recognition of the common minerals; notes of meetings; lists of macro-lepidoptera on the wing during June from seven districts, &c. We presume, though it is not so said, that this work is intended for beginners, and if it will only induce some of our young people to commence and continue the study of some branch of Natural History, it will do good service.

Reports of Societies.

BRADFORD NATURALISTS’ SOCIETY.—Meeting Aug. 21st, the president in the chair.—Mr. Soppitt reported a visit to Grange, and exhibited specimens of *Epipactis latifolia*, a species of tamarisk, and a fungus commencing its growth on the juniper and completing it on the hawthorn. He also showed a live young nightjar, found at Black Hills, Bingley Wood, and reported that he had observed *Hepialus sylvinus* there. Mr. Andrews exhibited a specimen of *Anagallis tenella* found in Shipley Glen, and a number of plants from Devonshire, among which were *Euphorbia*

amygdaloides, *Erythroea pulchella*, &c. Mr. Illingworth gave an account of an excursion to Kendal, and showed a hornets' nest taken there, and a specimen of the glow-worm; he also exhibited a piece of a meteorite which fell in a field near Kendal. The president reported a ramble over Harden Moor with Mr. Butterfield, and exhibited *Scoparia pyralalis* and *S. ambigualis* from Shipley Glen (the former new to the district), *Tortrix icterana*, from Grassington, and the following from Harden Moor:—*S. coarctalis*, *T. viburnana*, *P. sauciana*, *E. angustana*, *P. caledoniana*, and *P. monticolana*, the three last being new to the district. Mr. West read an interesting paper on "Lichens," and exhibited a large number of specimens collected in various parts of the country.

MEETING Sept. 4th, the president in the chair.—Mr. Bennett read a paper on a visit to the Fisheries Exhibition, London, describing some of the various objects of interest to be seen there. Mr. Soppitt gave an account of a ramble over Barton Moor, where, among other things, he found *Xenodochus carbonarius* and *Puccinea lychnidiarum*. In the excursion with the Yorkshire Naturalists' Union on the 1st September he met with *Actæa spicata* and *Puccinea sessilis*, the latter a very minute fungus; also *Serratula tinctoria*, which is an addition to the list of flowering plants of the district. Mr. Kershaw exhibited a collection of insects from the Isle of Man, among which were three species not found in this district. Mr. Ward gave an account of a ramble through Wensleydale, with remarks on the geological formation of the district. He also gave a report of a visit to the Huddersfield Exhibition, and of the Natural History objects shown there. The remainder of the evening was spent in the examination of microscopical objects exhibited by Messrs. A. J. Kershaw, J. E. Fawcett, J. Faull, and B. Spencer, among which were a number of slides containing objects illustrating the paper on lichens read by Mr. West at the last meeting.

FILEY MEETING, Y.N.U.—CONCHOLOGICAL SECTION.—The Rev. W. C. Hey, president of the section, reported that owing to the unfavourable weather but few species had been observed, and these were mostly of common occurrence. The best find was *Pupa ringens*, of which one specimen was taken. *Limax (Amalia) marginatus*, found in the Ravine, was also an addition to the Filey list. Altogether the following species were seen—17 land, 3 freshwater, and 22 marine:—*Arion ater*, *A. hortensis*, *Limax agrestis*, *L. marginatus*, *Succinea putris*, *Vittrina pellucida*, *Zonites crystallinus*, *Z. cellarius*, *R. nitidulus*, *Z. fulvus*, *Helix nemoralis*, *H. hortensis*, *H. hispida*, *H. virgata*, *H. ericetorum*, *Cochlicopa lubrica*, *Pupa ringens*, *Planorbis spinorbis*, *Limnæa peregra*, *L. truncatula*. Marine: *Saxicava rugosa*, *Lupraria elliptica*, *Solen siliqua*, *Venus striata*, *Mactra stultorum*, *Donax anatinus*, *Anomia ehippium*, *Tellina tenuis*, *T. balthica*, *Cyprina islandica*, *Trochus cinereus*, *T. helicinus*, *Purpura lapillus*, *Helcion pellucidum*, *Patella vulgata*, *Chiton cinereus*, *Littorina litorea*, *L. obtusata*, *L. nidis*, *Buccinum undatum*, *Lacuna vincta*, *Rissoa striata*.

HUDDERSFIELD NATURALISTS' SOCIETY.—Meeting Sept. 22nd, Mr. A. Clarke, v.p. in the chair.—Mr. Allen Godward exhibited Solomon's seal from a new locality near Thunder Bridge; also *Gentiana Amarella* from the same district. Mr. F. Ellis exhibited five specimens of *Oporabia filigrammaria*, taken this season near Meltham, Huddersfield; Mr. Mosley, a very beautiful nest of the long-tailed tit, sent to him by Mr. Kerry, of Harwich, for figuring in his work on "British Birds." Mr. Clarke gave a very interesting lecture on "Fungi," illustrated by a good collection of freshly-gathered specimens.

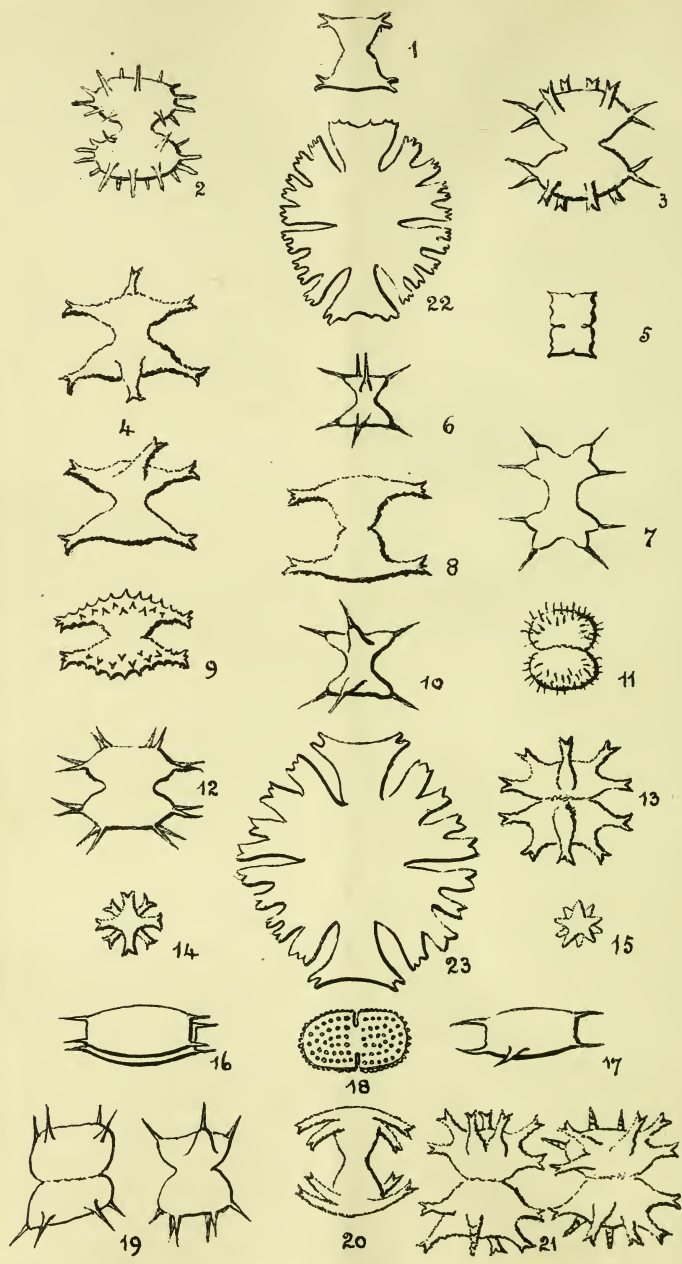
MEETING October 8th, Mr. A. Clarke in the chair.—The chairman exhibited about 30 species of fungi, including *Lactarius serrifluus*, new to the district. Mr. Morley exhibited a nest of the Dartford warbler, made entirely of flower stems and flowers of *Aira flexuosa*, and sent to him for figuring in his "British Birds," by Mr. Fredk. Bond, F.Z.S. Nine of the Ordnance Survey maps, which had been purchased to represent the Society's district, were laid on the table.

YORKSHIRE NATURALISTS' UNION.—MALHAM, Sept. 1st.—The closing meeting for 1883 was devoted to the exploration of Malhamdale, including Malham Tarn and Plateau, the picturesque scenery of Gordale Scar and Malham Cove, and resulted in much useful work being done. Only one party was arranged—a geological one—but other members grouped themselves into small parties for the time being, and others again pursued independent researches. A few botanists and conchologists who took the field early in the forenoon, made their way to the plateau on which Malham Tarn is situate. Here they were entertained to a sumptuously-provided luncheon at Malham Tarn House by the High Sheriff of Yorkshire (Mr. Walter Morrison), to whose kindness and hospitality during the day the Union was much indebted. After luncheon the conchological party were provided with boats by Mr. Morrison, and devoted the afternoon to the exploration of the molluscan fauna of the Tarn, with a satisfactory result. The botanists were led by Mr. Morrison and his gardener to various localities on the Moor, and they also were able to render a good account of themselves. The geological party which had been arranged by Mr. J. W. Davis, the president of the section, met at Settle about noon, and walked eastwards. They first visited Langcliffe Scars and the Victoria Cave, and then made for Malham Moor, proceeding by way of Stockdale Farm. The line of the great Craven fault runs in this direction. To the north are the limestone scars of Langcliffe, whilst the raised grounds to the southward constitute the millstone grit of Kirby Fell, the highest point of which, Ryeloaf Hill, is 1794 feet above sea-level. The division between the two formations is very distinctly marked by the character of the vegetation, the limestone being covered with the even green herbage characteristic of the Craven district; whilst the millstone grit of the other side is clothed with sedges and heather. The party then proceeded across the moors to the place where the water from the Tarn sinks—to re-appear again at the foot of

the Cove. The waters collected in Malham Tarn from the hilly district beyond form the source of the river Aire, and half-a-mile from the lower end of the Tarn the stream which issues from it sinks into one of the pot-holes so characteristic of the mountain limestone. In this instance the orifice is filled to the top with loose round stones. The opening is exactly on the line of one branch of the Craven fault. Proceeding from the "Water Sinks," the party passed between the great cliffs worn by the stream, which had made its way in that direction before finding its present channel. The geologists came out at the top of the Cove, and having passed over the limestone pavement, they made a slight detour to the right, and descended to the valley, making the best of their way along the course of the stream to Malham village. Here all parties met, and tea was served, and the usual meetings held at the Buck Hotel. The general meeting was presided over by Mr. Walter Morrison, High Sheriff of Yorkshire. The minutes of the previous meeting were taken as read. Fourteen societies were found to be represented, viz:—Beverley, Bradford (Naturalists'), do. (Scientific Ass.) Dewsbury, Elland-cum-Greetland, Halifax, Keighley, Liversedge, Leeds (all three), Wakefield, Shipley, and York and district. The individual attendance was about 50 or 60. Eleven new members were elected, viz:—Mr. Geo. W. Oldfield, M.A., Harrogate; Mr. John W. Morkhill, Killingbeck Lodge, Mr. R. M. Jaques, Easby Abbey, near Richmond; Rev. Canon J. J. Pulleine, Kirby Wiske, near Thirsk; Mr. Wm. Bethell, J.P., D.L., Rise Park, near Hull; Mr. R. D. Horne, Leyburn; Mr. A. D. H. Leadman, Boroughbridge; Mr. John Hutton, Solberge, near Northallerton; Mr. T. E. Buckley, F.Z.S., Millerton, Invernesshire; Mr. Henry Wilson, Cottingham, near Hull; and Mr. Robert Mortimer, of Fimber, East Riding. A new Society was unanimously admitted into the Union on the motion of Mr. P. F. Lee, seconded by Mr. J. W. Davis, viz., the Doncaster Juvenile Naturalists' and Scientific Society, numbering 24 members. A hearty vote of thanks was then presented to Mr. Morrison for his kindness and hospitality to the members, and for the permission granted to the Union to ramble over his estates. This was proposed by Mr. J. W. Davis, seconded by Mr. Washington Teasdale, F.R.M.S., of Leeds, and, after being unanimously adopted by the meeting, was responded to by Mr. Morrison. The Sections were then called upon to report, the first being the Geological, for which its president, Mr. J. W. Davis, F.S.A., F.L.S., F.G.S., of Halifax, gave the account which we summarise at the beginning of this article. In the absence of the officers of the Vertebrate Section, Mr. Leonard Gaunt, of Farsley, reported that of birds had been observed 19 resident species—the rook, kestrel, merlin, mallard, lapwing, snipe, kingfisher, chaffinch, linnet, sparrow, redbreast, hedge sparrow, meadow pipit, ringdove, dabchick or little grebe, coal tit, blue tit, pied wagtail, and wren—and four migrants—the wheatear, redstart, swallow, and house martin. In mammalia only a field-mouse had been reported; of amphibians the frog only, and of

fishes trout and stickleback, both in Malham Tarn. On behalf of the secretary of the Conchological Section (Mr. J. Darker Butterell) and himself, who had been working the Tarn during the afternoon, Mr. W. Denison Roebuck reported that they were very well satisfied with the result of their investigation, although time had not permitted of the examination of more than about a third part of the Tarn. The fauna proved to be somewhat richer than might have been expected from the height of the Tarn above sea-level (nearly 1300 feet), and several of the species found exhibited interesting tendencies to variation. One of the most interesting was **Limnæa stagnalis*. var. *fragilis*, sub-var. *variegata*, the second time of its occurrence in the British Isles. It was abundant on *Potamogeton lucens*. Others were **Sphærium corneum*, var. *nucleus* (common), *Pisidium pusillum* (common), **Valvata piscinalis* (a few, approaching var. *acuminata* in form), **Bythinia tentaculata* (dead shells), **Planorbis nautilus* (one specimen), *Pl. contortus* (very abundant, though small in size), **Limnæa peregra* var. *ovata* (dead shells). Under logs of wood close to the margin of the Tarn were specimens of *Limnæa truncatula* var. *minor*, and a dwarf form of *Succinea putris*, together with two species of slugs, **Limax lævis* and *Limax agrestis*. On the river Aire, where it issues from the Cove, were found specimens of *L. peregra* var. *ovata*, and *Ancylus fluviatilis* var. *albida*; several of these were additions to the recorded fauna of the district. To land-shells not much attention was paid during the day, as this branch of the fauna is comparatively well known, whereas of the freshwater forms of the Tarn absolutely nothing whatever had been recorded. The list of land-shells included *Arion ater*, *Zonites crystallinus*, *Z. alliarius*, **Helix aspersa*, *H. nemoralis*, *H. arbustorum* and var. *pallida*, *H. hispida* and var. *sub-rufa*, *H. sericea*, *H. rufescens*, *H. rotundata*, *H. rupestris*, *Clausilia rugosa* and var. *dubia*, *Pupa umbilicata*, and *Cochlicopa lubrica*. The species and varieties marked with the asterisk (*) are new to the district. The total number of forms observed was 31. In Entomology Mr. G. C. Dennis (in the temporary absence of the secretary of the section, Mr. E. B. Wrigglesworth), reported as follows:—Very limited was the time which we were able to devote to the entomology of the district. Our route lay from Settle by way of Victoria Cave to Malham Tarn and Cove, and we did not leave the Old Town until one p.m. We did, however, by dint of hard work and much scheming, manage to secure about 24 species of coleoptera—none of them unknown, though many not common. Had an entomological party been formed, and confined their attention to Malham and the district about a mile round, we should have had more to record. The following are the coleoptera taken during the day's excursion:—*Cychrus rostratus*, Linn., near Victoria Cave; *Nebria complanata*, Linn., above Victoria Cave; *Lebia cyanocephala*, Linn., Malham Cove; *Patrobus excavatus*, Payk., Settle; *P. assimilis*, Chd., Malham; *Hydroporus picipes*, Fabr., Malham Tarn; *Colymbetes pulverosus*, St., Malham Tarn; *Acilius sulcatus*,

Linn., Malham Tarn ; *Gyrinus bicolor*, Payk., Malham Tarn ; *Silpha thoracica*, Linn., near Malham ; *Agelastica halensis*, Linn., near Malham ; *Graptodera oleracea*, Linn., near Malham ; *Crepidodera aurata*, Foudr., near Malham ; *Phyllotreta undulata*, Kutsch, near Malham ; *Aphthona cœrulea*, Payk., near Settle ; *Thyamis brunnea*, Redt., near Settle ; *T. melanocephala*, Gyll., near Victoria Cave ; *Coccinella obliterata*, Linn., Malham ; *C. bipunctata*, Linn., near Malham Cove ; *Scymnus discoideus*, Ill., Malham ; *Ocyopus oleus*, Mull., above Victoria Cave ; *Xantholinus tricolor*, Fabr., Settle-road ; *Othius melanocephalus*, Gr., near Malham ; *Lithocharis obsoleta*, Nord, near Settle. For the Botanical Section the secretary, Mr. P. F. Lee, reported upon the day's work. The botanists had mustered in force, and enjoyed to the full the various routes taken in this classic hunting-ground. The total number of phanerogams, ferns, &c., of the London Catalogue of British Plants, collected or observed at Gordale Scar, Cove, in smiling Airedale from Bell Busk, and on the route from Settle to Malham, was 291, thus making the last ramble the best of the season in point both of numbers and rarity of specimens. After partaking of the High Sheriff's hospitality at the Tarn House, we worked the Tarn Bog, and under the guidance of Mr. Morrison himself, with his head gardener, we saw some flourishing specimens of the great English sundew, *Drosera anglica*, planted last year by the High Sheriff, with the hope they may establish themselves. The bog also yielded us an additional district plant, the interesting *Serratula tinctoria*, var. *monticola*, having almost sessile and larger flower-heads than the type. In the grounds at the Tarn House are successfully cultivated many rare alpine and ferns, both foreign and district plants. The rarest of the many good things noticed during the day were the following, mostly fruiting :—*Actæa spicata*, *Draba muralis*, *D. incana*, the variety of the alpine penny-cress, *Thlaspi occitanum*, *Viola lutea*, *Geum intermedium*, *Sedum Telephium*, var. *purpurascens*, *Galium sylvestre*, *Carduus heterophyllus*, *Polemonium cœruleum* ; a dwarf mountain form of *Myosotis sylvatica*, *Primula farinosa*, *Salix repens*, var. *argentea*, *Potamogeton lucens*, *P. densus*, *Orchis latifolia*, sub-sp. *incarnata*, *Carex capillaris*, *C. fulva*, *C. vesicaria*, *Sesleria cœrulea*, and *Asplenium viride*. Mr. H. T. Soppitt of Bradford, who had been paying attention to the fungi, reported that the district was peculiarly rich in epiphyllous species. Amongst those gathered was *Æcidium prenanthis*, accompanied by *Puccinea prenanthis*, *P. sessilis*, *P. poarum*, and several *Phragmidia*. Of the larger species very few were seen ; these included *Ag. squarrosus*, *Ag. mollis*, *Ag. infundibuliformis*, and *Helvella lacunosa*. Altogether, about 50 species were gathered.—A vote of thanks to Mr. Morrison for occupying the chair, brought the meeting to a close, after which the members drove to the station to catch a Midland express which it had been arranged should be specially stopped for their convenience at Bell Busk station. A small party of members received still further attention from Mr. Morrison, and stayed over Sunday to enjoy his hospitality at the Tarn House.—W.D.R.



W.B.T. ad et lith.

Oct 1883.

Original Articles.

THE ALGÆ OF STRENSALL COMMON.

BY W. BARWELL TURNER, F.C.S., F.R.M.S., &c.

PLATE VII.

WHEN I paid a visit to Strensall with the Y.N.U. on July 14th last, it happened that I was the only collector of aquatic algæ. The amount of material collected was, unfortunately, then but small, as I only had three small bottles and two little tubes, and I soon found that they were very inadequate to my wants. It is a matter for regret that more gatherings were not then secured, as our visit took place after a short period of dry weather; and the pools were in better order (our brethren of the net and bottle will understand this), than they had been for some time. On arrival at Leeds, I arranged for a thorough examination of my plants, and soon succeeded in making out a tolerable list; but, during my work, I found that I came across numbers of things either unknown to me or very puzzling, so I was fain to seek assistance. My first thought was of Dr. M. C. Cooke, to whom I wrote, but was sorry to find him suffering from ill health and over work; so in my dilemma, I was very grateful to find a helping hand in my friend Mr. A. W. Wills, of Birmingham, who is a well-known authority on the subject, and who kindly gave me the benefit of his assistance with the Desmidiæ. After working some time, it became apparent that our material was not adequate to a thorough investigation, so, at Mr. Wills' request, I went again to Strensall on July 29th, when I was able to secure a larger collection, but found the place in very poor condition for work, as heavy rains had intervened. One accident occurred with (to me) deplorable results, with respect to my first gathering—I had worked over part thereof, and wished to have a clean bottle handy for transferring, so emptied one for the purpose, when to my amazement and disgust I found I had thrown away the contents of a bottle I had not thoroughly examined, and with it my chance of positively being assured of the existence of two rare species, specimens of which I had already found in the said bottle, and had sketched them by way of note. For the latter I am thankful, as, although my second journey was productive of sundry novelties, I did not again find the forms alluded to, viz:—*Staurastrum Pringsheimii* and *S. anatinum*; also the form which I believe to be *S. megacanthum*. I have accordingly entered these in my list, with a query attached to them.

As mentioned in my short note lately (Aug. N., p. 24), *diatoms* were very few as to species found, and those but common ones, though I think *S. spicula* is a new record.

The Algæ are such as one would expect to find in such a habitat, though several common species and genera were not seen, but they probably exist.

As might be anticipated, fresh-water rhizopods were plentiful, with some of the smaller entomostraca, &c.; among these I may mention *en passant*, *Arcella vulgaris*, *Diffugia proteiformis*, *Actinophrys sol*, *Trachelocerca viridis*, *Kerona mytilus*, *Canthocamptus minutus*, and *Amœbæ*. The pretty Infusorian *Dinobryon sertularia* was abundant.

It may be as well to mention that the drawings of Desmidiæ are usually made (by common consensus of opinion) to a uniform scale of 400 diameters, and this is a good rule in papers which relate to the controversial side of botany; but on the present occasion I have thought well to violate it in order to show more of the strange forms which desmids present. On another point—that of measurement—I quote Mr. Wills (Midland Nat. 1881, p. 41). “The unit .01 m.m., is recognised by continental botanists under the symbol μ , and the dimensions of the Desmidiæ are recorded in the following manner:— ‘e.g. Long. = 21 μ ; Lat. = 20-21 μ ; Lat. isthmi = 5 μ .’ It is only in this country that the barbarous notation of inches and their decimal parts still lingers.” These remarks now apply to all micro-metric work. I trust the reference to this will be excused, for though a small matter of detail, it is yet important, and saves much comparison and calculation.

In the accompanying list there are many forms in the genus *Cosmarium*, and several in that of *Closterium*, as yet undetermined. I think, moreover, that the *Staurastræ* will repay further search.

For the filamentous algæ and diatoms I have not given all the “authorities,” deeming such as are given to be sufficient for the Union lists, and some I have not at this moment.

Four specimens have a query against them. Of three I feel tolerably sure, having drawn them under the microscope; of the fourth (*S. Pringsheimii*) my drawing is not quite satisfactory, though *very* near the form.

Finally, I must roundly state my opinion that in the various descriptions of new species by many authors, too many varieties have been exalted into species. To anyone curious on this point I refer Dr. M. C. Cooke’s remarks on the forms of *Tetrachastrum* in “*Grevillea*” for March, 1881.

The specimens marked with an asterisk are, I think, new to England; though either Mr. Archer, of Dublin, has found them in

Ireland, or Mr. Wills at Capel-Curig, in Wales. To the latter gentleman my best thanks are due for his kindly assistance and cordial co-operation.

ALGÆ.

Batrachospermum vagum, var. *tenuissimum*, Ag.
Chætophora tuberculosa, Hooker
C. elegans, Hs.
Draparnaldia plumosa, Ag.
Coleochaete scutata, Breb.
Conferva floccosa, Ag.
Ulothrix mucosa
Mougeotia genuflexa, Ag.
Zygnema Vaucherii, var. *stagnale*, Kirsch.
Z. anomalum, R.
Z. stellinum, Vaucher.
Z. Ralfsii, Hs.
Zygonium ericetorum, var. *aquaticum*, De B.
Spirogyra nitida, Dillwyn.
S. tenuissima, Hs.
Mesocarpus scalaris, Hs.
M. parvulus, Hs.
M. nummuloides, Hs.
Œdogonium vesicatum, Lyng.
Œ. delicatulum, Kz.
Microspora fugacissima, Thurst.
Bulbochæte setigera, Ag.
B. rectangularis, Wittr.
Echinella articulata.
Anabaina circinalis, Bory.
Volvox globator, Linnæus.
Gonium pectorale, Müller.
Pediastrum Boryanum, Turb.
 „ „ *B. tetras*.
 „ „ var. *granulatum*, Kz.
P. Ehrenbergii, Br.
P. pertusum, Kz.
Pandorina morum, Bory.
Scenedesmus quadricauda, Turp.
S. obliquus, Turp.
S. acutus, Meyen.
Sorastrum spinulosum, Ng.
Rhaphidium falcatum, Rab.
Polyedrium tetrahedricum, Ng.
P. enorme, R.

Oscillatoria nigra, Vaucher.
Leptothrix ochracea, Kz.
Apiocystis Brauniana, Ng.
Chlorococcum gigas, Grun.
Eremosphæra viridis, De B.
Botryococcus Braunii, Kz.
Glæocystis rupestris, Lyng.
G. ampla, Kz.
Chlamydococcus pluvialis, Br.
Palmella hyalina, Breb.
P. mucosa, Kz.

DIATOMACEÆ.

Achnantheidium lanceolatum
Synedra lanceolata
Gomphonema geminatum
Tabellaria flocculosa
Pinnularia radiosa
Cocconema lanceolatum
C. parvum
Stauroneis spicula
Diatoma elongatum
D. vulgare

DESMIDIEÆ.

Gonatozygon Ralfsii, De B.
Hyalotheca dissiliens, Breb.
H. mucosa, Ehr.
Didymoprium Borreri, R.
D. Grevillei, Kz.
Desmidium aptogonum, Breb.
D. Swartzii, Ag.
Sphærozozma vertebratum, R.
S. excavatum, R.
Micrasterias papillifera, Breb.
M. crenata, Breb.
M. denticulata, Breb.
M. rotata, R.
M. Crux-Melitensis, Ehr.
Spondylosium pulchellum, * Archer's form a, Bail.
Euastrum elegans, Breb.
E. pectinatum, Breb.
E. binale, R.
E. binale, var. *elobatum*, Ld.
E. verrucosum, Ehr.

- E. ansatum*, Ehr.
E. didelta, R.
E. oblongum, R.
Arthrodesmus convergens, Ehr.
A. incus, Hs.
Docidium baculum, Breb.
D. clavatum, Kz.
D. clavatum, var. B. with projecting suture
D. nodulosum, Breb.
 * *Cosmarium truncatellum*, Perty
C. undulatum, var. *minutum*, Wittr.
C. botrytis, Men.
C. margaritifera, Men.
C. orbiculatum, R.
C. globosum, vel. *bioculatum*, Breb.
C. cucumis, Cor.
C. Meneghinii, Breb.
C. quadratum, Breb.
C. cucurbita, Breb.
C. pyramidatum, Breb.
C. undulatum, var., Cor.
C. crenatum, R.
C. ornatum, var., R.
 * *C. proemorsum*, Breb.
C. amoenum, Breb.
Xanthidium armatum, Breb.
X. cristatum, Breb.
X. fasciculatum, Ehr.
X. fasciculatum, var. B. *polygonum*, Ehr.
X. octocorne, Ehr.
Staurastrum teliferum, R.
S. orbiculare, R.
S. punctulatum, Breb.
S. alternans, Breb.
S. dejectum, Breb.
- S. arachne*, R.
S. læve, R.
S. avicula, Breb.
 * *S. inflexum*, Breb.
 * *S. anatinum* ? C. and W.
S. margaritaceum, Men.
S. furcigerum, Breb.
 * *S. pseudo-furcigerum* ? Reinsch
S. polymorphum, Breb.
S. cristatum, Breb.
S. hirsutum, Breb.
S. aculeatum, Men.
 * *S. megacanthum* ? Ld.
S. tetracerum, R.
S. gracile, R.
 * *S. Seibaldi*, Reinsch
 * *S. Pringsheimii* ? Reinsch
S. pilosum, A.
S. aversum (or *brevispina*, Breb.) Ld.
S. spinosum, Breb.
S. paradoxum, Meyen
Penium Brebissonii, Men.
P. digitus, Breb.
Closterium setaceum, Ehr.
C. lineatum, Ehr.
C. lunula, Ehr.
C. Dianæ, Ehr.
C. acutum, Breb.
C. costatum, Cor.
C. juncidum, R.
C. angustatum, Kz.
C. Leibleinii, Kz.
C. attenuatum, Ehr.
Tetmemorus Brebissonii, R.
T. granulatus, R.
Spirotænia condensata, Breb.

POSTSCRIPT.—Since compiling my lists in September I have to make the following additions, &c. : *Xanthidium aculeatum* (Ehr.) ; *X. Brebissonii* (R.) var. β ; *Staurastrum cuspidatum* ; *S. polymorphum* (both Breb.) ; *S. vestitum* (R.) . The existence of *S. Pringsheimii* I have proved by finding other specimens. I find that the specimen on plate, fig. 19, is *Staurastrum dejectum*, var. γ *connatum* (Lundell, Desm. Suec.), a variety new, I believe, to England. One curious form occurs, a *Micrasterias*, apparently combining the characters of *M. crenata* and *M. truncata*. Concerning these, Ralfs says, p. 76, "I have seen some specimens which make it doubtful whether they be really distinct." The gathering is yet far from being "exhausted," for I have a number of forms which still defy my efforts to clear up their identity. To the Diatoms are added *Nitzschia lanceolata*, *N. minutissima*, *Navicula amphirhynchus*, and *Stauroneis phænicenteron*.

REFERENCES TO PLATE VII.

1. *Staurastrum avicula*, a rather taller form than Ralfs'.—2. This may possibly be either a *Staurastrum* or *Xanthidium*. The blunt spines are peculiar.—*Staurastrum* sp.?—4. *Staurastrum anatinum*; if not *anatinum* it is a very near form. Two positions shewn.—5. *Euastrum binale*; generally distributed on heaths.—6. *Staurastrum aristiferum*. 7. *Xanthidium octocorne*.—8. *Staurastrum Sebaldi*: previously discovered as a British plant by Mr. Wills in 1880, at Capel Curig. 9. *Staurastrum aculeatum*: generally distributed, but not common.—10. *Staurastrum megacanthum*? so like, that I deem it the true species. See remarks on No. 8.—11. *Staurastrum pilosum*: not common.—12. *Xanthidium fasciculatum*.—13. *Staurastrum furcigerum*: this and the one preceding it are very common.—14. *Staurastrum inflexum*: see No. 8.—15. *Staurastrum margaritaceum*: a widely-distributed species.—16. *Xanthidium* sp.? pronounced to be so by Dr. M. C. Cooke; species doubtful, possibly a deviation from *X. octocorne*. 17. *Xanthidium* sp.? Copy of one drawn by me from a Welsh specimen of Mr. Wills, to compare with No. 16.—18. *Cosmarium amœnum*: Ralfs gives habitats Ambleside and Dolgelly, not common.—19. *Staurastrum* sp.?—20. *Staurastrum arachne*: Ralfs says "Dolgelly, very rare; Aberdeen."—21. *Staurastrum pseudo-furcigerum*? This form approaches the species mentioned, but yet may be only a variety of *S. furcigerum*, No. 13; see remarks on No. 8.—22. *Micrasterias papillifera*: generally distributed, but not common.—23. *Micrasterias Crux-Melitensis*: a rare species.—Nos. 1 to 21 are $\times 260$, Nos. 22, 23 $\times 275$ diams.

 WHARFEDALE ENTOMOLOGICAL NOTES.

By J. W. CARTER.

THE following observations were made by my friends Messrs. J. Firth, of Bradford, E. P. P. Butterfield, of Wilsden, and myself, during a walk from Silsden to Grassington, on the banks of the Wharfe, from Addingham, on the 23rd of June last. In the evening in Grass Wood, we tried the attractive mixture known as "sugar," but not a single specimen visited it. It was our intention to remain in the neighbourhood of Grassington the whole of the following day, but owing to an unfortunate circumstance—one of our party being taken seriously ill—we were compelled to leave very early in the morning.

As the insect fauna of Wharfedale is very imperfectly known, we think it advisable to give a complete list of our captures.

- N. mundana*. Larvæ commonly at Burnsall.
L. complanula. One larva, at Bolton Woods.
H. humuli. Grassington.
B. callunæ. Larvæ in Gill Beck Wood.
O. bidentata. Grass Wood.
P. pilosaria. Larvæ, Bolton Woods.
I. lactearia. Grass Wood.
A. candidata. do.
V. cambricaria. Bolton Woods and Barden.
C. pusaria. Bolton Woods.
F. piniaria. Gill Beck and Grass Woods.
A. ulmata. Bolton and Grass Woods.
H. defoliaria and *aurantiaria*. Larvæ very abundant in Bolton Woods.
O. dilutata. Larvæ, Bolton Woods.
L. pectinitaria. Gill Beck Wood.
L. cæsiata. do.
E. alchemillata. Grass Wood.
E. albulata. Common from Bolton Woods to Grassington.
E. decolorata. Grass Wood.
E. lariciata, very common. Gill Beck and Grass Woods.
E. vulgata. Near Addingham.
M. tristata. Very abundant, Gill Beck Wood.
M. rivata. Gill Beck Wood.
M. subtristata. do.
M. montanata. Everywhere.
M. fluctuata. Bolton Woods.
C. propugnata. do.
C. ferrugata. Gill Beck and Grass Woods.
C. corylata. Bolton Woods.
C. suffumata. Grass Wood.
N. camelina. Bolton Woods.
T. batis. Grass Wood.
S. ambigualis. Barden and Grassington.
S. pyralalis. Grassington.
C. pratellus. Common, Silsden Moor.
T. ministrana. Common.
T. icterana. Grass Wood.
S. lacunana. Gill Beck Wood.
P. cynosbana. Common from Bolton Woods to Grassington.
B. lanceolana. Common, Silsden Moor.
P. myrtillana. Common, Gill Beck Wood.

- C. ulicetana. Silsden Moor.
 E. maculosana. Near Bolton Bridge.
 C. stramineana. do.
 L. prælatella. Grass Wood.
 M. calthella. Bolton Woods.
 A. viridella. do.
 G. syringella. Grass Wood.

In Coleoptera we noticed *Melolontha vulgaris* in Grass Wood; *Aphodius rufipes*, Grassington; *Leistus fulvibarbis* and *Patrobus excavatus*, near Bolton Bridge.

Valley-street, Bradford.

NOTES ON A FEW NEW EUROPEAN MOSSES.

BY GUSTAV LIMPRICHT,

(Translated).

Orthotrichum subalpinum (n. sp.).—This I collected in the sub-alpine region of the Riesengebirges, about 1,250 metres high, growing on *Sorbus Aucuparia*, in July, 1871. Specimens agreeing in every particular have been collected by Venturi in the Tyrol, and distributed by him as *Orthotr. stramineum foliis crispatis*, Vent.

The characteristics of *O. sub-alpinum* may be thus summarised in the more prostrate growth of the small tufts, in the slender, crisped (when dry) leaves, with broadly rotundate points, in the very contracted cryptoporen stomata, in the color and shape of the inner peristome and cilia, and lastly, in the remarkable size and nature of the spores.

Orthotrichum Rogeri Schimp. Syn., Ed. II., p. 332, is the only species which requires any notice in the consideration of *O. subalpinum*. As, however, Dr. Carl Müller, of Halle, the possessor of Bridel's original specimens, has repeatedly assured me that my plant in no degree is identical with *O. Rogeri* Brid., I have preferred, in order not to further confuse matters, to publish it under a new name.

The description of *O. Rogeri* differs very much in the various bryological works, and in herbariums and exsiccatae are to be found many specimens under this name which are mostly to be referred to *O. pallens* Bruch., which may easily be distinguished by the pseudo-phaneroporen stomata. These forms of stomata deceived even the acute de Notaris, who in the Epil. d. Briol., Ital, p. 311, judged them

erroneously to be as in *O. pallens* Bruch., and *O. microcarpum* de Not., l. c., p. 107, "Stomata normalia."

Bryum (Cladodium) micans, (n. sp.), discovered by the Rev. Chr. Kaurin, in damp peaty places, at the foot of the Olmberget mountain near Opdal Dovrefield, Norway, in August, 1881, and again in October, 1882, communicated to me as *Bryum arcticum* forma minor. This species comes near to the typical *Bryum arcticum*, Bryol, Eur. tab., 335 excl. fig. 1, 1 b. and 6, but is, however, distinguished from it as follows:—The color of the tufts (of the leaves and mid-rib), is never reddish, the leaves are on their upper half, always entire, the nerve is only shortly excurrent, the capsule is regular (only curved in the neck), and polished, the teeth of the outer peristome are more deeply colored, broader and longer, and their cross-bands are more numerous, and formed as in *Bryum pendulum*, the cells are smaller and in the neck-part very irregular, the papillae broader, and not so prominent, the spores are larger and almost might be called of an ochre-yellow color. It grows upon the naked turf.

Bryum (Cladodium) arcuatum (n. sp.) Synonym. *B. arcticum* forma maxima. Kaurin in litt. Collected on damp shady rocks, near Opdal, Norway, July, 1882, by Rev. Chr. Kaurin. This species resembles in habit, *Bryum uliginosum*, forma elongata Schimp., which Jenson has also in the Dovrefield collected and contributed to Rabenhorst's Bryotheca Europ. sub., no. 274.

Bryum (Cladodium) Opdalense, (n. sp.) Collected by Rev. Chr. Kaurin, in damp sandy places upon the banks of the Driva, near Opdal, Norway, and communicated to me as *Bryum purpurescens*, var.

Bryum (Cladodium) autumnale, (n. sp.) Collected by Rev. Chr. Kaurin, near Opdal, in damp sandy places, October, 1882, and repeatedly sent to me as *Bryum purpurescens*, Br. Euro. *Bryum purpurescens*, Bryol, Eur. tab., 336, and *Bryum purpurescens*, nr. 462 in Breutel Musci. frond. exsicc. from Labrador, agree well with each other in every particular. From these, *Bryum autumnale* differs essentially; it resembles very much in shape of leaf *Bryum opdalense*, and might perhaps possess the nearest relationship to *Bryum Lindgreni*, of which I have only seen two imperfect stems.

Bryum (Eubryum) sypshinctum (n. sp.), discovered by Rev. Chr. Kaurin, on the 7th August, 1882, with ripe capsules, in sandy places near Opdal, Norway, growing with *Bryum opdalense*.

This plant comes far nearer to *Bryum cirratum* H. and H. than to *Bryum bimum* with which Kaurin joins it. The specimens which I possess from Schimper, Juratzka, Milde, and from the North German

plains agree with each other pretty well, therefore I look upon this Norwegian plant not as a variety of *Bryum cirratum*, but raise it provisionally as a distinct species.

Bryum Archangelicum, Br. and Sch. I have recently been enabled to compare, through the kindness of the Rev. Chr. Kaurin, a small original specimen of Angstroem's, from the Royal Museum, Stockholm, and I am now convinced that my *Bryum tauriscorum* (n. sp.) (*Bryum inclinatum* plano-operculatum Breidler in Sched) belongs to it. The special characters for *Bryum archangelicam* are the flat operculum, the insignificant basilar membrane of the inner peristome, and the yellowish red-like dull spores, which last measure 0.027 mm., and are granulate.

WHERE ARE THE INSECTS ?

BY S. L. MOSLEY.

THIS has been the cry of almost every Entomologist for the last two or three years, and the cry has been well founded, and has met with many answers. One person thinks that it is the wet spring, which has killed off all the lepidopterous larvæ; another thinks it is the mild winter; a third attributes it to the high winds, which have blown the larvæ from the trees; another thinks that it is due to the prevalence of ichneumon flies, but Dr. Capron tells us that ichneumon flies have been scarce too. Another thinks that there are too many collectors, a suggestion which alas, is only too true, but in rather a different sense from that in which the writer puts it. I dare say that there are few readers of this journal, who have not heard of such a thing as an insectivorous bird; but did they ever consider what an insectivorous bird means? If it be true that a pair of blue tits, as has been calculated, destroy 600 caterpillars a day, during the breeding season; if it be true that a flock of 300 rooks destroy 162,900 crane flies per day, as I myself have borne witness, what must be the amount of destruction of insects carried on by the whole bird population of this country? Let us try and make an approximate guess! Previous to the passing of the Wild Birds' Protection Act, I have seen a flock of starlings in one of the midland counties, which contained from 50,000 to 100,000; take the lowest number and say 50,000 for the whole county, and the same for each of the 40 counties of England—2,000,000. Now each of the following birds are

insectivorous during the breeding season, and according to my experience, are as common as the starling :—

- | | |
|-------------------|-------------------|
| 1. Hedge sparrow. | 8. Yellow hammer. |
| 2. Robin. | 9. House sparrow. |
| 3. Willow wren. | 10. Linnet. |
| 4. Pied wagtail. | 11. Swallow. |
| 5. Tree pipit. | 12. Martin. |
| 6. Meadow pipit. | 13. Sand martin. |
| 7. Skylark. | 14. Swift. |

Reckoning these at the same rate as starlings, gives us 30,000,000. Now say that there are only half as many of each of the following birds :—

- | | |
|--------------------|------------------|
| 1. Whinchat. | 10. Greenfinch. |
| 2. Wheatear. | 11. Twite. |
| 3. Sedge warbler. | 12. Wood pecker. |
| 4. Black cap. | 13. Wren. |
| 5. White throat. | 14. Cuckoo. |
| 6. Blue tit. | 15. Nightjar. |
| 7. Ray's wagtail. | 16. Partridge. |
| 8. Common bunting. | 17. Quail. |
| 9. Chaffinch. | |

The latter 17 species would give us 17,000,000 individuals, which added to the previous numbers gives us 47,000,000. There are also many insectivorous birds which are fairly common, such as the wood wren, chiff-chaff, lesser white-throat, stonechat, blackcap, garden warbler, &c., &c., which I have not enumerated, but say in round numbers that there are 50,000,000 insectivorous birds in this country during May, June, and July. This will be 25,000,000 pairs; reckon each pair to destroy as many caterpillars as the blue tits, 600 a-day, during say one month, $30 \times 600 = 18,000$. Now, multiply 25 millions by 18,000 and we get the amazing number of 450,000,000,000, the number of caterpillars destroyed by small birds during *one month* in the year. Has any reader of the *Naturalist* any idea what these numbers represent? Let us try and form some idea. Say a pint measure would hold 500 caterpillars, that would give us 900,000,000 pints, and about the same number of lbs. If we now reduce these lbs. to tons, we find that we arrive at the enormous sum total of 401,785 tons. Let us simplify it still more, and say that they would fill over 200 railway trains, each train having 20 waggons, holding 10 tons!! These figures are perfectly astounding, and I can scarcely credit my own calculations. Remember that these calculations are but for one month out of twelve; but if we allow the same numbers for the whole of the year, it is enough to turn the stomach of any thinking

Entomologist. Also bear in mind that these calculations are based upon a flock of birds seen before the passing of Bird Acts, and it is only fair to assume that they have considerably increased since then—perhaps doubled—and as I have gone as far as I am able in figures, I leave each one to reckon the rest for himself.

These bird laws have interfered with the balance of nature, and made a blunder they cannot repair; but I may return to this subject again.

Beaumont Park, Huddersfield.

LIST OF SHELLS

COLLECTED OR OBSERVED ON JULY 2ND AND 9TH,
IN
THE NEIGHBOURHOOD OF SOUTH MILFORD.

BY GEORGE ROBERTS.

Sphaerium lacustre. Common in the ponds about Milford Junction; some on caddis cases. Many dead and open shells were lying on a dry bank, having been taken out of the water by mice or shrews.

Pisidium nitidum. Common on caddis cases.

Bythinia tentaculata.

Valvata piscinalis. Milford.

Physa fontinalis.

Limnaea peregra and *L. truncatula*.

Succinea putris.

Vitrina pellucida.

Zonites nitidulus, *Z. nitidus*, and *Z. purus*.

Helix nemoralis. I collected altogether about 30 specimens, five, four, and one-banded, the prevailing colours being various shades of red, which is the colour of the soil in the district, but a few were yellow. They occur generally, but few together, mostly on the nettles in the hedges, and some on the top of the hedges. One specimen of *Nemoralis* has the lip white. Near Milford I noticed a snail-stone on which about half-a-dozen *nemoralis* had been broken by a thrush. There were no fragments of *Cantiana* shells, though the latter was abundant in the hedge close by. Amongst the few I picked up there are several of the *major* form with depressed spire, one fine trochiform specimen with one band, and one or two entirely destitute of epidermis.

H. arbustorum. Near Fairburn, on nettles which had been mowed, in company with *Cantiana rufescens*, and variety *hybrida* of *Nemoralis*.

H. cantiana. Abundant in all the hedges, both moist and dry, in all stages of growth. Apparently the commonest of the *Helices*.

H. rufescens. Frequent.

H. pulchella. On a wall near Milford.

H. hispida. Common; many greyish in colour and very hispid, apparently intermediate between *hispida* and *sericea*. A few are rufous, and destitute of hairs.

H. hispida, var. *nana*.

H. caperata.

H. ericetorum. On a high bank at Newton lime quarry. All the adult shells I saw were dead; the young were suspended beneath blades of grass.

H. rotundata.

Pupa marginata.

Clausilia rugosa.

Zua lubrica.

Z. lubrica, var. *lubricoides*.

I saw no *Helix hortensis*, and *H. aspersa* seems to be confined to gardens and old walls near houses. The soil here is red, lying on red sand or clay.

Lofthouse, Wakefield.

Rainfall for October.

	Height of gauge above sea level.	Rain-fall.	No. of Days	TOTAL FALL TO DATE.		Date of heaviest Fall.	Amount of heaviest Fall.
				1883.	1882.		
HUDDERSFIELD (Dalton) ... (J. W. Robson)	Ft. 350	In. 4·67	18	31·85	*27·25	24	0·67
HALIFAX... (F. G. S. Rawson)	365	6·11	17	40·73	40·44	25	1·02
LEEDS ... (Alfred Denny)...	183	2·59	25	25·21	† 20·77	3	0·59
HORSFORTH ... (James Fox)	350	2·96	13	29·48	‡ 29·08	17	0·40
BARNSELY ... (T. Lister) ...	350	3·35	21	28·41	27·10	17	0·69
INGBIRCHWORTH (do.)	853	4·73	17	40·60	36·42	17	0·82
WENTWORTH CASTLE (do.)...	520	3·97	17	30·86	27·81	17	0·71
GOOLE ... (J. HARRISON) ...	25	3·83	21	24·30	26·77	3	0·64
HULL (Derringham) (Wm. Lawton)	10	4·35	20	18·85	23·20	1	1·11

Scarborough Rainfall for October, 3·47: 0·93 above average.—A. ROWNTREE.

* Average to date for 17 years, 1866-82. † Average of 29 years, 1853-62 1865-83.

‡ Average of 14 years, 1870-83.

Short Notes and Queries.

Regulus cristatus AT ELLAND.—This morning, during the bright sunshine, whilst walking in Elland town-fields, I observed a flock of about a dozen, more or less, of the goldcrest (*Regulus cristatus*), hovering under the decaying leaves of the sycamore, picking off a kind of green fly, or plant louse which were adhering to the under side. They were very active, similar in their motion to titmice, and uttering a low note which may be spelt "zit, zit." Mr. Cunningham writes to the *Halifax Courier* that he also saw a flock (no doubt the same) in the People's Park. I heard the redwing on the 7th inst.—C. C. HANSON, West Vale, Oct. 21st, 1883.

GOLDFINCHES NEAR BINGLEY.—As I was coming over Hope-hill (960 feet), with a friend on Nov. 11, a party of goldfinches flew close past us. I had just remarked that some of the thistle-heads were "drilled," but the droppings I thought indicated that it was the work of birds which were superior in size to the goldfinch. It is, I believe, just thirteen years this November since I saw any about this locality.—E. P. P. BUTTERFIELD.

LATE MACKEREL AND HERRING ON YORKSHIRE COAST.—I think it is worth recording how extremely late mackerel and herring have been taken, this autumn, off the Yorkshire coast. The former were exposed for sale, in quantity, in the Hull shops, freshly caught in Bridlington bay, down to the 20th October. Herrings are still offering in the shops to-day, taken at the same place. The mildness of the weather no doubt explains it.—N. F. DOBREE, Beverley, 14th Nov., 1883.

ENTOMOLOGICAL NOTES FROM BINGLEY.—Last week I received a few insects (of the names of which I had some doubt) from Mr. Barrett, which I had sent him for determination; and although one or two are not in such good condition, he says they may be safely named as follows: *Scoparia atomalis*, *S. conspicualis*, *S. perterana*, *P. sordidana*, *P. semifusca*—all of which are additions to the local lepidoptera of this district; *S. atomalis*, of which I sent him two specimens I took on Blackhills in July. There were scores of *Scopariæ* flying about at the same time as I took these two, but whether they were all of this species (if it be a species) I cannot say. I called them *ambigualis* when I took them, and I confess I am puzzled with them now. *Conspicualis* I thought was a small *cembralis*, with which I had had it placed. It was taken, I believe, by my brother last year in the neighbourhood. I have another, however, which I have taken in the district this year—*S. perterana*. I picked it out from amongst some *subjectana* in the neighbourhood of Blackhills. Mr. Firth showed me an insect yesterday, which I take to be this species; he took it in Shipley Glen this year. *P. sordidana* and *semifusca* I beat from alder trees about a marshy piece of ground in the park adjoining Bingley Wood on the 22nd September last. On the 3rd instant I was on Harden Moor, and *E. gelatella* was very abundant—nay,

actually swarmed. They arose at every step, and there must have been thousands.—E. P. P. BUTTERFIELD, Wilsden, Nov. 12th, 1883.

ENTOMOLOGICAL NOTES.—Recently I bred a fine series of *Pterophorus zophodactylus* (Loewii), from larvæ sent from near Dorchester, found feeding on flowers of *Erythraea centaurea*; and some beautiful *Gymnancycla canella* from larvæ sent to me last year by the Rev. E. N. Bloomfield, M.A., found on *Salsola Kali* at Camber, near Rye. I have also added to my collection several *Eupithecia pygmaea* and *Pterophorus teucris*, taken near King's Lynn by Mr. E. A. Atmore during the past year. Amongst some insects sent me to name from Scotland by Mr. Jas. Hinchliffe, of Alva, was a fine example of the variety *angelicata* of *Eupithecia albipunctata*, a form which seems previously to have been noticed only in Yorkshire and Staffordshire. A still more interesting find is that of *Acronycta myricæ* in Ireland. Mr. F. De V. Kane sent me for determination a specimen bred from a pupa he found on the face of a rock on a wild exposed headland, at Galley Head, a most unusual situation, and where Mr. De V. Kane says the larva could not have fed on *Myrica gale*, but probably on close-shaven thrift. He also turned up *Hecatera serena* and *Neuria saponariæ* in Ireland, and *Dianthæcia cæsia* in three different localities there. It is worthy of record, too, that the still rare *Hydrilla palustris* was taken at Wicken Fen again this year.—G. T. PORRITT.

WASHBURNDALE SHELLS.—I wish to add to the list of shells taken on the occasion of the Yorkshire Naturalists' Union excursion on the 6th August, which is printed on p. 40 of this volume—the name of *Limnæa auricularia*, of which I took a single specimen at the upper, or Blubberhouses end of Fewston reservoir, where no doubt it may be regarded as being common.—WM. DENISON ROEBUCK, Sunny Bank, Leeds, Nov. 9th, 1883.

NOTE ON *Testacella*.—My name having been mentioned by Mr. Roebuck as to the occurrence of *Testacella* at this place, I may state that, so far as I remember, my shells resembled *haliotidea*, but I think it likely they were *scutulium* after all. I am sorry I have no means of clearing up the point, as I have no specimens. I was much surprised when I first found the shell here some seven or eight years since, in Padman's nursery. I have only seen two or three specimens within that time, but think there are many more, and they only require looking for. They probably come with flowering plants, or ferns, from the south or from France, being imported in the soil of plant-pots, either in the egg or in the mature form. All the specimens I saw could be traced to the nursery, and I cannot think they are natives here. Possibly our friend Mr. Butterell's shell at Beverley may have a similar history. I never heard that anybody had noticed it for Yorkshire until I communicated with Messrs. Taylor and Roebuck, several years ago. There is no reason why this should be its most northerly appearance. I presume it might be

found in Aberdeen under similar conditions to those named. Perhaps some of our friends may examine a few nurseries, particularly the soil and pots and crocks, when plants are being re-potted.—JOHN EMMETT, Boston Spa, Nov. 21st, 1883.

Trombidium phalangii AT GORDALE SCAR.—Upon the occasion of the visit of the Yorkshire Naturalists' Union to Malham, on Sept. 1st last, I found a specimen of the harvest spider (*Phalangium*), covered with the parasite *Trombidium phalangii*, about half way up the ravine where the stream comes down at Gordale Scar. This may perhaps be worth noticing.—GEORGE W. OLDFIELD, Harrogate, Nov. 1st, 1883.

Reports of Societies.

BRADFORD NATURALISTS' SOCIETY.—Meeting Oct. 2nd, the president in the chair.—Mr. Illingworth exhibited a specimen of the vapourer moth (*O. antiqua*), which he captured in front of the British Museum; also a cluster of eggs of the same species, taken at Camberwell Green. Mr. Terry sent a box of insects taken at Witherslack, among which were *Hesperia sylvanus*, *L. Alexis*, *C. Davus*, *Carsia imbutata*, *H. auroraria*, *Mixodia Schulziana*, &c. Mr. Wood described a visit to Edinburgh, and gave a geological description of Arthur's Seat. He then read an interesting paper on the geological formation of the Bradford district, and illustrated it with a number of fossils collected in the vicinity of Bradford. Mr. West exhibited a specimen of *Cuscuta epithymum* from Chislehurst, found on gorse and heather, and also a large number of drawings of various species of algæ.

MEETING Oct. 16th, the president in the chair.—Mr. Kershaw exhibited a specimen of the long-eared bat (*Plecotus auritus* from Essex; Mr. Carter a small box of insects containing *C. geniculellus*, *M. furuncula*, and *A. gilvaria*, from the South of England. Mr. Soppitt reported having seen *Vanessa cardui* at Saltaire, and that Mr. Butterfield had captured one at Wilsden. He also gave an interesting account of a fungus foray he had attended at Hereford, which extended over four days, and exhibited specimens of *Helvella lacunosa* from Heaton Woods, *Craterella cornucopoides*, *Strobilomyces strobilaceus*, and *Cantherellus cinereus*, from Ludlow. Mr. Riley exhibited a box of insects from Glasgow, among which were *D. fagella*, *F. atomaria*, and *C. graminis*; he also read an interesting paper on "Entomology," illustrating it with a number of specimens of butterflies and moths. Mr. West showed specimens of alpine plants, *Astrantia major*, *Smilacina bifolia*, *Aristolochia clematidis*, and *Lloydia serotina*, the last-named from Snowdon; also a number of seaweeds from Cornwall, Wales, &c.—JOHN EASTWOOD, Sec.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting, Oct. 29th, the president, Mr. S. J. Capper, in the chair.—A paper was read by Mr. Henry Capper on "Darwinism and Beauty." After reviewing Dr. Darwin's theory of the development of beauty through the agency of

sexual selection, he pointed out that although this theory threw much light upon the subject, it also left much unexplained; for instance, why the colours and markings produced should be of a most refined type, or why beauty should exist throughout nature. They had, therefore, to look for something beyond; and since man's intellect was capable of appreciating, and to some extent, imitating this beauty, and since it was highly improbable that it had been created solely for his gratification, they were irresistibly led to the conclusion that it was the product of an intellect alike in kind, but immeasurably grander than man's own. The paper led to an animated and interesting discussion. Mr. F. M. Pierce exhibited a specimen of *Labidura gigantea*, taken in his office, Tithebarnstreet, Liverpool; and Mr. von Sobbe and Mr. Wilding some recently captured and bred lepidoptera.

MANCHESTER CRYPTOGAMIC SOCIETY.—Monthly meeting, September. Dr. Carrington presided, and reported some of the proceedings of the Biological Section of the British Association during its late meeting at Southport. The president also distributed a few specimens of the characteristic mosses of Southport, which he had collected during his visit. Mr. Wm. West, of Bradford, sent a number of mounted slides of British marine and fresh-water algæ for exhibition, and also a number of beautifully executed tracings of figures of cryptogamic plants, which were much admired for the skill and patience required for their delineation. Mr. W. H. Pearson exhibited a new British moss, *Tortula paludosa*, which had been sent by Mr. Davis, of Brighton. The specimen had been collected by Mr. W. Mullen in the Clydach valley, Abergavenny, in August last. Mr. Pearson also exhibited the rare British hepatic, *Dumortiera irriqua*, collected in East Sussex by the Rev. E. N. Bloomfield; Mr. George Burgess, of Prestwich, exhibited a number of mosses from the neighbourhood of Malham.—T. ROGERS, Hon. Sec.

YORK AND DISTRICT FIELD NATURALISTS' SOCIETY.—Meeting October 10th, Mr. G. C. Dennis in the chair.—The chairman exhibited the following insects, taken by himself at Bishop's Wood, near Selby:—*Nonagria fulva*, *Teras caudana*, a long series of *Pædisca ophthalmica* *P. sordidana*, and *Pterophorus trigonodactylus*; the hon. sec. (Mr. Prest) a fine series of *Sesia chrysidiformis*, *Tephrosia extensaria*, *Macaria notata*, *Eupithecia satyrata*, *Cidaria silaceata*, *Psyche reticella*, *Anesychia funerella* and *decemguttella*, and the rare tortrix *Ephippiphora nigricostana*. Mr. Wilkinson brought for exhibition a fine collection of well-mounted specimens of rare plants, most of them collected by himself during the present season:—*Geranium sanguineum*, *G. lucidum*, collected at Malham; *G. rotundifolium* from Somerset; *G. sylvaticum* (Teesdale), *G. striatum* (Scarborough), *G. pratense*, *G. pusillum*, *G. molle*, *G. dissectum*, *G. Robertianum*, *G. columbinum*, *G. pyrenaicum*, collected near York. Mr. Prest, on behalf of his son, Mr. C. S. Prest, exhibited the jawbone of the Indian shark, and the saw of a large sawfish, brought by him from the East Indian coast.—W. PREST, Hon. Sec.

Original Articles.

THE SEA BIRDS AT FLAMBOROUGH.

BY JOHN CORDEAUX, M.B.O.U.,
PRESIDENT OF THE VETEBRATE SECTION Y.N.U., 1883.

By far the most plentiful of the various tenants on the cliffs we have visited to-day is the common guillemot ; the allied variety known as the ringed guillemot, *Uria lacrymans*, is not common. Out of eight guillemots clustered together on a ledge near the upper part of the cliff at Speeton, six were the common species, and two were ringed guillemots—but this was quite an exceptional circumstance. Guillemots return with remarkable regularity to their nesting quarters, visiting the neighbourhood soon after Christmas, and may be seen off Flamborough in large numbers in the early spring, They congregate at this cliff in April, and commence laying in May ; only one egg is laid on the bare cliff, and the cliff-climbers allege that if this is taken, and repeated, the same bird will go on till she has laid nine or ten eggs. This, however, is directly contrary to the observations of Mr. George MacLachlan, formerly the lighthouse keeper at Barra Head, and one of our most careful observers on the West Coast of Scotland. He states that if the first egg is taken, a second is laid, and then a third ; if this is taken the bird lays no more that season. If left undisturbed the guillemot will return year by year exactly to the same spot. If the eggs are taken, the guillemots shift their ground, it may be only to the next ledge, and become much shyer. Mr. MacLachlan sprinkled the birds on a certain ledge with red paint, and the birds on a continuation of the same ledge with blue paint. He then went down and took the eggs, and found that the blue and red spotted birds had changed places with each other. Normally only one egg is laid in the season. The guillemots know their own eggs, and if one is interchanged during the absence of the female, she will shift it back with her feet. Incubation is performed in an upright position ; the young is hatched in 21 to 24 days, and after remaining for about three weeks on the cliff, where it is fed both by the male and female, it is carried down to the sea on the back of the parent. The Flamborough boatman states that this is done at high water, when there is a considerable depth at the base of the cliff, and more frequently in the quiet of the evening. Usually the young bird falls off before reaching the sea, or is thrown off by the parent bird. At Barra Head Mr. MacLachlan states, the young bird is grasped by the wing, near the shoulder, and not carried, as a rule, on the back of the parent.

The male bird does not assist in incubation, nor does he feed the hen when sitting. If the young bird is hatched, and the female killed, he will, however, continue to bring up the nestlings.

There are now three sets of cliff-climbers who obtain their livelihood during the season by plundering the sea-fowl on these cliffs. Many of the eggs find their way to the egg collectors and curiosity shops, some are eaten and used in cookery; and it is said *tous* are sent to Leeds, where they are used (the albumen) in the process of manufacturing patent leather. This wholesale destruction is much to be regretted. No eggs should be taken after the first of June. The weight of a full sized guillemot is about 24oz., the egg between three and four.

Scattered about, either singly or in small communities on the cliffs, are numerous razorbills. Their habits are much the same as the guillemot; they lay one egg, either on the ledge or cleft in the cliff. The young bird is also carried down to the sea by the parent birds. Both the male and the female bird assist in incubation. Mr. Edward McCarron, the light-keeper on the Traraght Rock, off the Blasket Island, Tralee, states in his report for 1882-83, Irish Stations—"The parent birds relieve each other while hatching. I actually saw a razorbill come up to another which was on the egg, peck it, when off it went, and the new comer took its place. The razorbill is a more active bird on the wing than the guillemot."

Of puffins there are large numbers on these cliffs. They lay one egg, which is, as a rule, placed in some hollow or crevice in the rock. Sometimes several puffins may be found in one hole; both the cock and hen sit alternately. When the young is hatched, it is fed by the parents until such time as it is able to fly down to the water. The old birds carry sprats, syle, and sand-eels in their beak up to the rock; they hold them dangling on each side of the bill, suspended like a grey fringe or beard. A puffin will thus carry easily from 20 to 30 small fish or eels. They are grasped between the nose and eyes, and held much in the same manner as when a knife is struck into an apple. Even when the puffin is shot they do not fall out, but remain firmly attached to the sides of the beak. I have frequently seen puffins fishing for prey at great distances from their nesting quarter. At Barra Head it is said to go fifty miles for its food; the necessity therefore, of carrying a considerable supply at once becomes apparent.

The kittiwake nests in some numbers on the Bempton cliffs. The nest is a slight cavity of mud and sea-weed beaten and trampled together, lined with finer materials, as dry grass, and often placed on such a narrow ledge as to leave scarce room for the bird to turn

round. Three eggs are laid. The young birds, when they first appear at sea—conspicuous by the black spots on the side of the head—are called “mackerel birds,” because they usually appear at sea with their parents at the time these fish are approaching the coast in August.

Other sea-birds seen during the excursion were a cormorant and a few herring gulls. The herring gull nests in considerable numbers on the cliffs north of Filey Brigg—a locality where two pairs of cormorants are nesting this year, also several rockdoves.

A large flock of lapwing were seen in the fields above Specton, showing that these birds had already congregated.

Wheatears, meadow pipits, and pied wagtail.

Had time permitted, I should like to have told you something about the migration of birds on to the Yorkshire coast in the autumn of 1882, especially of that great flight of goldcrests, one wing of which touched the Faroes and the other crossed the Channel Islands—a migration which, commencing in August and continued through September, rose to its height in October, and gradually decreasing to November—altogether over 92 days.

Again, of that large flight of jays which, early in October, took three days to pass Heligoland, travelling from E to W in a strong south-easterly gale.

And, scarcely less wonderful, of the immense flights of the common hedge-sparrow, which, passing Heligoland early in October, occurred at the same period in such large numbers in Holderness and North East Lincolnshire.

May I be permitted to trust, however, that an opportunity may be given us of meeting together at some central place, as Leeds, during the winter, when we may have leisure to enter more fully into the details of the various excursions made by the Union during the year, and the general results to be derived therefrom.

[The above Notes are the substance of the remarks made by Mr. Cordeaux while presiding over the Filey meeting (June 11th, 1883) of the Y.N.U.]

NATURAL HISTORY NOTES FROM SOUTH AFRICA.

(Continued.)

BY S. D. BAIRSTOW, F.L.S.

A POOR benighted lunatic, “once upon a time,” was run in by a benighted policeman, charged with the possession of “a ’ighly dangerous hincubation, yer honner.” P.C.’s potations of three-star

cognac dimmed his recollection of English grammar. I suppose incubus was the word intended. Now, I also plead guilty to this soft impeachment—not the brandy, but the incubus. It must be cast off. I have tried to limn a cheerful picture, to cull from Nature's bouquet a few bright flowers, to speak fair for all I've seen and heard. Have I not advanced the Diptera to a front position, and solemnly published their order—grand? I have! In token thereof I hereby attach my mark, X. Henceforth must I be just. I *spoke* of Nature: I *speak* on Gnat-ure. *Bombylius* and *Andrax*, ye may number amongst ye the fairest of all created fairies; atomic *Culex* and blue-blooded Daddy Longlegs,* ye may lay claim to veneration: but I love ye not—and wherefore? Because of yours! Are ye not allied to man's chiefest foes—the mosquitoes? against whom Burns might have thundered—

• “Ye hypocrites! are these your pranks,
To murder men, and gie God thanks?”

and screamed aloud in very sleepless restlessness—

“For shame! gie o'er—proceed no further—
God won't accept your thanks for murther.”

The quality of mercy is not strained, excepting towards mosquitoes and house-flies.† I count intolerable heat by day and night, aching bones and tired limbs, as naught; but the stings and buzzes of imps of darkness and damp ticklings of moonlight imps, as intolerable, *impardonable*, fiendish. I am satisfied with the theory of “use in all created beings,” but draw the line at mosquitoes and house-flies, excusably mollifying outraged feelings in the notion that their breed has deteriorated whilst ours progressed; they were created check-mates to antediluvian apes, and by judicious (?) natural selection transferred their affections to culminating humankind. Dr. Spencer Cobbold, the renowned helminthologist, in his Filarian theory, champions John Chinaman. Emigration has just presented us a few samples of our pigtailed brethren. Mosquitoes will have their blood. Exchange is no robbery! Personal pain is a grand charity-syphon, and occasionally, when I have been compelled to jump from my couch irritated beyond expression, abstraction guiding my footsteps towards the window, I have gazed upon the miserable forms of tick-troubled, weather-beaten, well-whipped oxen, remembering also the Tsetse-ills, etcetera, which their race is heir to,—and back to bed I turn, contented with my lot, yet full of sadness. Verily Diptera is a good name, only

* Not *T. oleracea*.

† Colonists from the old country.

equalled by Dip-terror. *Vale* mosquitoes! *Vale* house-flies! Ye cannot prove malicious. It is too late, my friends: *the winter draweth nigh!*

My researches among the Orthoptera in schoolboy's happy home were decidedly acute, if somewhat exclusive. They were nearly confined to the house cricket and cockroach. I never progressed much with No. 1; superstition, dread of ill luck, barred the way, and I studied economy at long ranges. But No. 2 was most ardently pursued. It is not unlikely that the flattened intestines of slippered Blattas are this day adhering to certain wall-papers in a certain home-stead. An itinerant vermin-killer, quite expert in the noble art of catching cockroaches and killing them against the palms of his hands, was wont to pay periodical calls at our house for purposes of pest extermination. Unfortunately he fell in love with the kitchen-maid—a damsel of forty-five years—who rejected him, after mature deliberation. He wooed, popped, and lost, notwithstanding a fair bank balance to his credit, and increasing trade returns. Moral: cockroaches were evidently fairly prolific to remunerate a hawking executioner. However Mr. Smouser dropped visiting us, and my researches continued. Now in this country (O blissful fact!) although I am minus 2 re Diptera, I am plus 1 re Orthoptera. I am not bothered by cockroaches, and a solitary house cricket—bless his pertinacious windpipe!—does duty for a pet canary. Apparently the crickets in South Africa domineer over cockroaches as domestic pets. This is easily explained (1) because we have a scarcity of ancient tenements; (2) cement and plaster are in great demand for building material, and crickets are partial to semi-damp abodes. But I conceive it is with insects as 'tis with Kafirs—civilization means demoralization. My sweet songster becomes a bore. He takes advantage of board and lodging. I *concede* the kitchen to him—he *adopts* the sitting-room. Briefly, he waxes fat and impudent. Kindness kills good manners. A Kafir of Kaffraria is a noble animal; a cricket of the Veldt is a fine old fellow.

Walking in the land of Orthoptera, or Screechdom, will amply repay an observant tourist. The air reverberates in stridulatory music, and beneath each stone there lies concealed a patron cockroach or protean relative. It may be caprice which suggests to my mind the thought that insects replace our birds as songsters; and granting their melodies *are* a trifle monotonous, they are welcome neighbours, and I bear them no ill-will. Of Cursoria the *Mantidæ* are most interesting, whilst the largest species are most commonly met with. Nothing can

exceed the extreme delicacy and variableness of tint exhibited by some of the lovely green gods, who practically are not so green as they look. They revel amongst our garden creepers, particularly convolvulaceous plants. When I study the character of a god at home, I am forcibly reminded of the street-corner pharisees, "watching and *preying*"—outwardly all that is sublime, the quintessence of sincerity; inwardly—third-class sinners. And the goddess is not a whit purer-minded than her lord, but exemplifies a mournfully suspicious combination of Venus and Charybdis. See the beautiful creature modestly hiding in the recesses of her leafy home! See the implacable gluttoness gripping the feeble captive, and ravenously devouring it in greedy haste!

The *Mantidæ* excel in the noble art of buffoonery, substituting facial for verbal expressions. It may be that they can actually wink, for of all existant creatures I never met a funnier-looking ungodly god than the so-called Hottentot.* This remarkable external gift is but an index to one more potent and internal—advanced instinct—I had almost said wisdom. What attitudinarians they are! *swaying* to and fro on their legs as if each position assumed gave them discomfort; as if every limb was a separate and distinct member acting independently of the rest. How craftily they wag their heads! how clerically spread out their arms! how tenaciously enclose their fists! I place one on the table and pretend to rap it with my finger. The god, uncertain if the blow shall fall, *shrinks* back upon its legs in a most arrogant manner, signifying "I won't move unless I wish." I have heard of taming gods, and am persuaded from personal experience that the notion is not unreasonable. Vital durability favors experiments.

Many species of *Phænæ* occur in the Colony. Mole-crickets fly "over the garden wall" and make a rush with their trowel-legs at our lamps, and terrify the inmates of our rooms. A pretty green *Ephippiger* (?) frequents and mimics willow-leaves. It has a peculiarly-shaped convex thorax, and produces a shrill sound with its wings. These, in closing together, clasp suddenly like a spring; hence the sound. The apparatus may be examined and proved after the insect is killed. Friend Roebuck, if he sees my paper, will expect a word or two about locust swarms. Friend Roebuck will be disappointed. I can only recount with accuracy those things which I have seen. There are colonists, old stagers, who remember such occurrences, but their differences of opinion and relation are material. History sometimes is another term for dogmatism, masking too, perversion and

* Hottentot or Malay God—an accepted vulgar name throughout the Colony.

hap-hazard surmise, so that to quote particularly from hearsay devolves a medley encumbrance. Apart from swarms, I quickly observed a peculiarity of locust domestic life. I lift the veil of privacy and perceive that some species pair in their pupal stage. There is another problem I should very much like in solution. When I first left England* for this country I used to enjoy an early promenade on deck. A few days past Madeira on the 10th of September, 1880. in lat. $21^{\circ} 20''$, long. $17^{\circ} 56''$, a phenomenon appeared. Suddenly there swarmed aft an immense number of insects—Lepidoptera—one specimen only, a locust, excepted. I netted or boxed many species, chloroformed them with the Doctor's assistance, and transferred to a safe abode, as I vainly imagined. On nearing Cape Town, to my utter annoyance a colony of vile little carnivorous pests had taken possession, and cleared nearly every treasure, leaving only legs and *debris* of their victims to tell the tale. At the S. A. museum I identified a splendid *Sphinx*, taken at rest on the poop, as *Chærocampa idricus*. Very curiously the Rev. Mr. Shaw, of Madagascar (a fellow passenger) recognised one or two insects which occurred on that island. A few butterflies and gaily-coloured birds were fluttering about the rigging in a state of exhaustion, but all the moths I picked up, when I first saw them were dormant.

Now, was there any selection of kinsmen, or essential partisans, any pre-arrangement of spontaneous migration? Why, then select a solitary locust? What outside agency impelled the flight of creatures from different localities? Or if such a multitude of colonising insects were wandering aimlessly, or by compulsory ejection, or a preconcerted signal, for their native shore, and met casually or purposely, or neither, within the limited area of a ship's deck; what proportions of vastness or meagreness did the swarm assume at starting? Our passengers remarked the visiting moths cleared next day as fitfully as they appeared. Ah! ah! a collector was aboard. I have long and firmly believed that local weather diaries compared together will aid us in determining causes of insect swarms quite as efficiently as local "presence" records. Winds sweep existences from land to water: why not from land, across water, to land?† The Blosop (*Pueumora*)

* s s. Balmoral Castle, Capt. J. Winchester.

† ON DIT.—A tremendous swarm of caterpillars invaded Port Elizabeth some years ago, causing much annoyance to the inhabitants. A land wind swept them into the ocean. I have often picked up insects on the sea-beach complete strangers to me, although I am willing to confess these may have been blown from the bush, and formerly escaped notice. There are frequent reports from up-country of processionary larval invasions. Some of them only disappeared when travelling into rivers (!)

has been well blown up by popular writers, so I need not dilate upon it. A remarkable and apterous locust, *Hetrodes pupa*,† which presents, on account of numerous spines, a most formidable front to the enemy, is sure to attract a stranger's attention.

(To be continued.)

CAPTURES OF LEPIDOPTERA IN THE BINGLEY DISTRICT IN 1883.

BY E. P. P. BUTTERFIELD.

S. conspicualis. In looking over the various species of *Scopariæ* taken in this district this season, I find I have one *S. conspicualis*, but do not remember the exact locality where I got it.

A. gerningana. Common on Blackhills.—I found this species quite plentiful near the Shooting house on Harden Moor.

P. mixtana. Scarce on Harden Moor.

P. comparand. Common, Beckfoot; and also Nab Wood, near Saltaire.

P. Schalleriana. Not common.

P. Caledoniana. Common, Harden Moor; abundant, Rombold's Moor; and I also saw it at the foot of Ingleborough, in August.

P. hastiana. I am not quite sure that there was not an error in recording this species for this locality. I took a few above Morton on the Moor, last September, and sent one of them to Mr. Barrett to name; he named it *hastiana*, but it was much worn, and I now think it might have been *Caledoniana*.

D. Læstingiana. One taken on Shipley Glen, by Mr. John Firth.—I have not seen this species in the immediate neighbourhood.

D. Forskaleana. One taken by my brother at Apperley Bridge, and another by myself at Shipley Glen, are all that I know of in this district.

A. Conwayana. Only near Harden Beck.

P. Lecheana. Scarce, Bingley Wood.

P. picana. Not uncommon on Blackhills.

P. prælongana. Only once in a wood near Shipley Glen.

P. sauciana. Common, Blackhills; abundant in Harden Clough.—My brother also saw it on Pendle Hill last August.

S. dealbana. Common, Cottingley Wood.

C. politana. Common, Harden Moor and Barden.

† Authority—Trimen.

- C. favillaceana*. Common, Bingley Wood.
- P. myrtilana*. Abundant about *vaccinium*, Blackhills and Barden.
- G. campoliliana*. Very common about shallows at Beck foot, Bingley.
- G. geminana*. Swarms about bilberry at Blackhills and Harden Clough.
- P. ophthalmicana*. Taken in a wood near Shipley Glen by Mr. Firth.
- P. occultana*. Common on fir on Blackhills.
- E. bimaculana*. Abundant, Blackhills.
- E. circiana*. Only one taken in this district.
- E. Pflugiana*. Common at Shipley Glen ; not so common at Wilsden.
- E. Brunnichiana*. Common near this village and Cottingley Moor.
- P. monticolana*. Common on Harden Moor. This was the commonest insect I saw at the foot of the western slope of Ingleborough. I also took one by an old wall-side near this village.
- S. coniferana*. I took one on fir on Blackhills about August.
- D. herbosana*. One taken by my brother at Grassington ; he also brought me another from an old wall side close to the village. I afterwards took it commonly at the same place.
- C. cana*. Scarce ; only one taken.
- E. nana*. Scarce, in Hirst Wood, near Saltaire.
- E. atricapitana*. Scarce, Blackhills.
- E. maculosana*. One near Bolton Bridge.
- E. angustana*. Common, Harden Moor and Blackhills.
- C. stramineana*. Common at Beckfoot and Bolton Bridge.
- A. osseana*. At Wilsden ; abundant, Grassington.
- E. gelatella*. Abundant, Blackhills.
- S. emortuella*. Very common, West Beckfield, near Cottingley.
- T. fulvimitrella*. I took another of this beautiful insect on an alder tree near Bingley Wood last June.
- L. prælatella*. One at Wilsden, and at Grassington.
- M. unimaculella*. One taken by Mr. Firth, Shipley Glen.
- P. porrectella*. Common, Wilsden.
- H. sequella*. I have bred one or two from pupæ taken from ash in Bingley Wood.
- H. nemorella*. Not uncommon about Wilsden.
- H. harpella*. Common.
- P. quercella*. Not scarce, Bingley Wood.
- A. nitidella*. Common, Goit Stock.
- A. Andereggiella*. Wilsden.
- A. Gædartella*. Cottingley Wood.

Short Notes and Queries.

“WHERE ARE THE INSECTS?”—Mr. Mosley has put a question which deserves the attention of every naturalist—using that word in its widest acceptance; but I take leave to doubt whether its true answer is in accordance with his inference—namely, that the scarcity of insects during the past year is due to recent legislation in regard to birds. I abstain from criticizing Mr. Mosley’s estimate of the bird-population of England, beyond giving my opinion that it is exaggerated; but one thing to me is obvious. No Act of Parliament can make a cup that is full hold any more, and no Act of Parliament can have made birds with which this country was already fully stocked more numerous than before. Now this was the case with nearly all the species Mr. Mosley names, and accordingly on those species recent legislation has had no effect whatever. They are species that without exception have never been subjected to direct and continued persecution that could have thinned their numbers, because it is only persecution of that kind at the breeding season that has such an effect. Again, it is notorious that in the numbers of our commonest birds, such as those named by Mr. Mosley and several more, there has been within the last few years a very great diminution. It is perfectly clear to me that the excessive severity of several winters in succession, and, still more, the inclemency of two springs, destroyed the individuals of some species of birds to such an extent as had not been known for many years—certainly not within my memory. Whether these exceptional seasons have produced the scarcity of insects I do not pretend to say. Finally, I would submit that Mr. Mosley’s assertion that “the bird-laws have interfered with the balance of Nature” is wholly incorrect. The only possible effect they could have would be to restore that balance, which, in the case of wild fowl and sea birds, had been so rudely upset by continued and direct persecution during the breeding season—a persecution that was rapidly leading to the extermination of not a few species, a result that, I presume, Mr. Mosley himself would deplore.—ALFRED NEWTON, Magdalene College, Cambridge, 3rd Dec., 1883.

“WHERE ARE THE INSECTS?” In the last number of the *Naturalist* Mr. Mosley offers a sensational explanation on the above subject, in which, I think, he oversteps all reasonable bounds. Let us examine the basis from which Mr. M. obtains such wonderful results. It is nothing less than an assertion that the *whole* of the insect-eating birds of England destroy 300 caterpillars each per day. This, I maintain, is much too large a number, even if they fed on caterpillars alone, which is not the case, and I doubt if larvæ form more than 25 per cent. of their food. That a pair of blue-tits are calculated to destroy 600 caterpillars per day during the breeding season may be true, but then these tits are pre-eminently caterpillar hunters, and a pair might destroy 600 small, but not moderately-sized caterpillars. But Mr. M. bases his calculations on a pint measure containing 500 caterpillars, and which he estimated to weigh about one pound, and consequently 600 caterpillars would weigh almost one and a quarter pounds. There is no doubt birds are gifted

with good digestion, but the idea of a *wren* or any of the small birds in Mr. M.'s list (and 80 per cent. of his list are small birds) eating *rather more than half a pound per diem* is incredible. Yet Mr. M. credits every insect-eating bird in England with an equal daily performance, including in his lists such species as the swallow, the martin, the sand martin, and the snipe ! How are these birds, which spend almost the whole of the day circling in the air, each to obtain 300 caterpillars daily ? The absurdity of accusing these species of such a daily consumption of caterpillars reflects much upon Mr. Mosley's want of sufficient ornithological knowledge to handle such a subject. The same remark also applies to his wish to have your readers believe that such species as the twite, the quail, the nightjar, the Ray's wagtail, and the woodpecker are equally as common British birds as the chaffinch and the greenfinch. I have no hesitation in saying that Mr. M. will not find many, if indeed any, sympathisers with him, should he wish to have the numbers of the species of birds he condemns in any way diminished : and I also, as a dweller in the country, assert they are not by any means too numerous. In conclusion, I would remark that Mr. Mosley has shown an over-anxiety to make out his case against the birds, as bats, shrews, &c., must destroy more insects than many of the birds which he has specified can do ; but he himself admits he can scarcely credit the results of his own ingenuity.

—THOMAS CARTER, Burton House, Masham.

LEPIDOPTEROUS CAPTURES NEAR YORK.—C. Porcellus, one specimen. Strensall Common, 1883 ; Z. Æsculi, one specimen, Tadcaster, 1882 ; L. Mesomella, abundant, Sandburn, 1883 ; C. Plantaginis, larvæ at bottom of coot's nest amongst reeds in splash on Strensall Common, 1882 ; E. Apiciaria, common at Askham Bogs, and fairly so on Gutter side, Clifton Ings, York, 1883 ; E. Fasciaria, Sandburn, seven or eight specimens, 1882, two specimens, 1883 ; P. Syringaria, one specimen at Sandburn, 1883 ; P. Cytisaria, one, Sandburn, 1883 ; G. Papilionaria, seven specimens, Sandburn, 1883 ; P. Bajularia, seven or eight specimens, Sandburn, 1883 ; A. Blomeraria, two specimens at Helmsley, 1882 ; E. Punctaria, a few, Sandburn, 1883 ; A. Strigilaria, Strensall and Sandburn, fairly common, 1883 ; E. Minutata, several at Sandburn, 1883 ; T. Firmata, one, Strensall, 1882 ; C. Unidentaria, two or three, Sandburn, 1883 ; D. Furcula, larvæ from Strensall Common, 1883 ; H. Popularis, Sandburn and York, 1882 ; G. Trilinea, common at sugar, Sandburn, 1883 ; A. Valligera, fairly common at sugar, Sandburn, 1883 ; O. Suspecta, seven or eight specimens, Sandburn, 1883 ; A. Aprilina, nine or ten specimens, Sandburn, 1882 ; H. Protea, fairly common, 1882 and 1883.—W. HEWETT, 26, Clarence-street, York.

ENTOMOLOGICAL NOTES.—I have just added to my collection a series of Sussex specimens of *Scoparia ingratalis*. The species is very closely allied to *S. pyralalis*, and is probably often passed over as that insect. I have also received specimens of *Cryptoblabes bistriga* and

Phycis adelphella, bred from larvæ found near Colchester; and *Crambus ericellus*, taken at Invergarry.—G. T. PORRITT.

Coleophora currucipennella AT DONCASTER.—In a box of insects caught at Green Farm Wood, near Doncaster, kindly named for me by Mr. W. Warren, of Cambridge, is a specimen of *Coleophora currucipennella*.—GEO. TINDALL, Doncaster.

NATURAL HISTORY NOTES FOR THE BARNSELY AND SOUTH YORKSHIRE DISTRICT.—We have had a few rare bird-occurrences in Barnsley and South Yorkshire District.—Oct. 13th, I examined at Wakefield, a handsome short-eared owl, obtained at Ardsley; also the arctic tern, killed Oct. 1st, and the Slavonian grebe, obtained between Wakefield and Barnsley in May; also a nightjar, obtained Oct. 10th, a late occurrence. Mr. Hailstone wrote me an account of a peregrine falcon at Walton, Oct. 9th, which stooped on a pigeon and bore it away. The keeper had informed me of one capturing a pigeon a few months ago—these, together with the osprey, recorded some time back at Walton, add to the list of our raptorial birds of recent occurrences; in addition to which are a pair of ospreys, obtained at Strines reservoir, Sept. 22th and 26th, and a marsh-harrier obtained near Barnsley at the close of October. The summer migrants, especially of the swallow family, have seldom stayed so long with us. The swift, always the first to depart, was noted as late as Sep. 28th. The sand-martin was seen at Ingbirchworth reservoir, 853 feet above the sea, on Oct. 15; same date, some were seen chasing insects in the streets of Barnsley; of the house-martin, a pair occurred at Hunningley, near Barnsley, Oct. 25th. The swallow in the town, Oct. 26th. These are the latest dates we remember, except a late brood of house-martins, Nov. 11th, a few years ago, at Pindar Oaks, near Barnsley. The chiff chaff was heard as late as Oct. 11th. Land-rails, killed by partridge shooters, up to the middle of Oct. Flocks of gulls have passed over the town, in Sept. and Oct.—I had opportunities of seeing many during the British Association's Meeting, at Southport, chiefly the common herring, the black-headed and kittiwake gulls, and immense flocks of ring-dotterels close to the promenade.—T. LISTER, Nov. 19th, 1883.

WHITE POPPY.—An albino, or pure white poppy was found here a few days ago, in an out-of-way place; stem smooth. There was no violet patch on the petals. Their whiteness resembled that of the white form of *Malva moschata*—texture very thin, glossy and silky.—JOHN EMMET, Boston Spa, Nov. 21st, 1883.

NOTICES OF BOOKS, &c.—“Transactions of the Barnsley Naturalists' Society,” Vol. iii., Pt. iii.—This part is fairly up to the average, and contains, among other papers, the continuation of Mr. Lister's “List of the Birds of the Barnsley District,” which ought to prove very useful to the ornithologists of the district. The title, however, is certainly a misnomer, as it includes the birds of Leeds, Halifax, Huddersfield, Sheffield, Doncaster, and other places, which have scarcely yet con-

sidered themselves as belonging to the "Barnsley District"! We are glad to notice the Society has made so successful an effort in its neighbourhood in enforcing the carrying out of the "Wild Birds Protection Act, 1880," an example which might be well followed by other societies.

"The Naturalist's World."—We have received the first number of this new addition to the natural science monthlies, and wish it every success. It is well printed and nicely illustrated, and if there is sufficient room for it among other journals of similar character, it will do good.

A CORRECTION.—At page 89, vol. ix., a line in my notes is omitted which renders the sense somewhat vague. It the ninth line from the bottom I am made to say, "I have one, however, which has been taken in this district—*S. perterana*." Such should be "*S. conspicualis*." *S. perterana* I took from my series of *S. subjectana* in my cabinet, and was taken, I believe, in the neighbourhood of Blackhills.—E. P. P. BUTTERFIELD, Wilsden, near Bingley, December 21st, 1883.

Rainfall for November.

	Height of gauge above sea level.		Rain-fall.	No. of Days	TOTAL FALL TO DATE.		Date of heaviest Fall.	Amount of heaviest Fall.
	Ft.	In.			1883.	1882.		
HUDDERSFIELD (Dalton) ... (J. W. Robson)	350	3.54	22	35.39	*30.26	19	0.61	
LEEDS ... (Alfred Denny)...	183	2.53	20	27.74	22.95 †	30	.400	
HORSFORTH ... (James Fox)	350	3.40	20	32.88	32.16 ‡	30	00.430	
HALIFAX...(F. G. S. Rawson)	365	5.53	21	46.26	48.55	20	0.88	
BARNSELY ... (Dr. Sadler)...	350	2.57	20	30.98	30.56	5	0.55	
INGBIRCHWORTH (Mr. Taylor)	853	3.79	24	44.39	45.07	5	0.59	
WENTWORTH CASTLE (Mr. Fisher)	520	2.98	19	33.84	31.82	5	0.63	
GOOLE (J. Harrison)...	25	2.56	20	26.86	29.45	30	0.70	
HULL (Derringham) (Wm. Lawton)	10	2.56	22	25.76	§20.99	30	0.65	
SCARBORO' (A. Rowntree)...	...	3.05	23	...	...	...	...

* Average to date for 17 years, 1866-82.

† Average of 29 years, 1853-63, & 1865-83. ‡ Average of 14 years, 1870-83.

Reports of Societies.

BARNSELY NATURALISTS' SOCIETY.—Mr. F. Batley in the chair.—Arrangements were made for the publication of the Transactions for the quarter ended Sept. 30th, and steps taken to forward the proposed exhibition for the Yorkshire Naturalists' Union meeting in March. In

ornithology, during last week of August and part of September, many waterfowl were seen by day, and others heard at night, hovering over the lights of the town; of these, eight gulls of middle size hovered over Jordan Hill and flew west on Aug. 28th. Another flock of larger gulls flew over the town west on Sept. 4th; eight woodcocks about the 30th of August flew over Cockerham, Barnsley, low enough to be observed, in a north-west direction—an early arrival. Curlews were heard whistling on the night of Sept. 1st; on Sept. 17th saw a heron flying south near Cawthorne, a kestrel at High Flatts, and another at Dodworth. There were few birds in song in August and September except the robin's autumn song; the yellowhammer, and the starling. The willow-warbler re-commenced its low sweet note, and continued until Sept. 28th. The chiffchaff's two notes were heard Oct. 11th; it was one of the last of the warblers to depart, and one of the first to arrive in spring. Kingfishers reported on all sides; a few on pools about the town, five or six bred in Cawthorne Brook. Magpies, as many as 24 in one day, smaller flocks at other times. Goldfinches, bullfinches, and goldcrests have bred safely.—T. LISTER.

BRADFORD NATURALISTS' SOCIETY.—Meeting Oct. 30th, the president in the chair.—Mr. Soppitt reported that Mr. West had found a slug (*Limax cinerea nigro*) at Shipley Glen, which is new to Yorkshire. He exhibited specimens of *Rumex dentatus* and *Puccinea ægra*, which he had received from Mr. B. Grove, Birmingham. Mr. Firth exhibited a box of insects, among which were *H. defoliaria* and *D. contaminana* from Shipley Glen, and *E. lichenea* from Plymouth. Mr. Carter showed a living specimen of *Vanessa Antiopa* which he had received in the pupa state from Toronto; *C. picata* from Kent; and the following beetles from the South of England. viz :—*Leistus spinibarbis*, *Crachinus crepitans*, *Pterostichus cupreus*, and *Silpha quadrapunctata*; he also exhibited shells found at Frizinghall, Bradford, viz :—*Limnea palustris* and *Zonites nitidulus*. Mr. Bennett exhibited a very large cluster of the fungus *Pholiota squarrosus* from Althorpe. A specimen of *Stereum purpureum* from Idle was exhibited. An interesting paper on “Animal Parasites” was read by Mr. A. J. Kershaw, in illustration of which a number of slides were shown under the microscope by Messrs. Kershaw, Bennett, and Fawcett.

MEETING, Nov. 13th, 1883, the president in the chair.—Mr. Soppitt described a ramble to Malham and Gargrave, and showed specimens of truffles from Bell Busk, also fungi preserved in spirits by Dr. Carlyle, of Carlisle. He also exhibited a number of specimens of *Myriapoda* (centipedes), including *Julus subulosus*, *J. terrestris*, *Lithobius forficatus*, *Geophilus longicornis*, and *Polydesmus complanatus*. Mr. Carter exhibited *C. propugnata* and *S. chrysidiformis* from Kent, and *Meliphora alveariella* from Huddersfield. He then reported on the work of the entomological section of the society for the past year, and stated that 74 species of

lepidoptera have been added to the list, making a total of 448 species noted in this district; to the coleoptera about 30 species have been added. Mr. Firth reported for the vertebrate section, and said 22 species have been added to the mammalia, birds 16, reptiles 5, fishes 3—making a total of 46 species. Mr. West exhibited marine shells, and specimens of polished Devonshire corals.

DEWSBURY NATURALISTS' SOCIETY.—Annual meeting, 13th December. The following were elected officers for 1884:—president, Dr. Watts; secretary and treasurer, J. Summersgill. The report stated that the society was still in a sound and flourishing condition. The botanical section showed most activity, 25 plants during the past season having been added to the local flora, which now numbers 393. Satisfaction was also expressed at the election of one of the members of this society—Mr. P. F. Lee—to the post of phanerogamic secretary, Botanical Section, of the Yorkshire Naturalists' Union.—J. SUMMERSGILL, Sec.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting, Nov. 26th, the president (Mr. S. J. Capper) occupying the chair.—The secretary (Dr. J. W. Ellis) read a paper in continuation of his previous articles on “The beetles of the Liverpool district,” this being Part iv., containing the Brachelytra, or short-winged beetles, of which he enumerated about 220 species as occurring, or having occurred, in the district, with their localities, from the observations of Messrs. Archer, Kinder, Wilding, and himself. Among these were several species which have hitherto been taken only very sparingly in Britain, and others which are very local in their habitats. During the conversazione Mr. Wilding exhibited recently captured coleoptera, and Mr. Dixon a coleopterous lignivorous larva feeding in willow wood, from Crosby.—J. W. ELLIS, Hon. Sec.

MANCHESTER CRYPTOGRAMIC SOCIETY.—Mr. W. H. Pearson, vice-president, in the chair, who exhibited three hepatics recently collected in Wales, and new to the Principality, viz:—*Scapania uliginosa* at Clogwyn-dur-Arddu, and *Marsupella sphacelata* and *Cephalozia fruitans*, at Glydr Vawr. Mr. Wm. Forster exhibited three fine varieties of *Polystichum aculeatum*, viz., *cruciatum*, *pulcherrimum*, and *corymbiferum*; these were from the fernery of Colonel Jones, Bristol. The hon. secretary laid upon the table a collection of mosses which had been presented to the society by Prof. N. Conrad Kindberg, of Sweden. The mosses were from the Dovrefield, Norway. An interesting paper was read the same evening by Mr. J. Cash on “William Wilson's Early Work as a Bryologist in Lancashire and Cheshire.”—THOS. ROGERS, Hon. Sec.

OVENDEN NATURALISTS' SOCIETY.—Monthly meeting.—The president (Mr. James Spencer) gave the annual address, the subject being “Fossil Fungi.” The paper was illustrated by enlarged drawings of fossil parasites, and also by microscopical sections of the real specimens, which were shown under the society's microscope; among these were included

some fine examples of *Peronosporites antiquarius*, *Cystopus carbonarius*, and various other fungoid spores, all of which had been found by the lecturer in the Halifax coal strata. He also showed some splendid sections of fossil pines from the tertiary strata, containing mycelia and spores of a fossil fungus in great abundance and in a beautiful state of preservation. These were compared with specimens of mycelia and fungi in sections of recent pines (Scotch fir), and the fossil tertiary fungus was found to be almost, if not altogether, identical with the recent pine fungus, which also closely resembles both in form and habit the vastly older carboniferous fungus. Some people affect to despise the study of such minute organisms as these, but the important discoveries made during the last few years have shown that the microscope is no longer a toy, but a necessary adjunct in modern scientific research. The most deadly foes with which man has to contend are not the largest beasts of the animal kingdom, nor even war and famine, but minute creatures too small to be seen by the naked eye, and which exist in such vast numbers and increase with such rapidity as to defy the power of man to contend with them. Many of the diseases affecting man, his cattle, corn, and vegetables of all kinds, are due to these minute pests. To know your enemy is half way to victory, hence the great value of the microscope; and it is no great stretch of imagination to suppose that even the study of fossil fungi may ultimately have important bearings upon the question of the health and happiness of mankind.

YORK AND DISTRICT FIELD NATURALISTS' SOCIETY.—Meeting Nov. 14, 1883, at the house of Mr. Prest, Holgate-road, Mr. G. Webster in the chair.—After the minutes of last meeting had been read, the hon. sec. (Mr. Prest) exhibited specimens of *Macrogaster arundinis*, *Demas coryli*, *Dasydia obfuscata*, *Pidonia conspicuata*, *Lobophora polycommata*, *Bankia argentula*, *Æ. grandis*; Mr. G. C. Dennis, a fine series of *Nonagria elymi*. The following plants were exhibited:—The chairman, two beautiful specimens of *Lysimachia thyrsiflora*. Mr. H. J. Wilkinson, *Aquilegia vulgaris* (Heslington), *Spirea filipendula* (Sandburn), *Vicia lathyroides* (Acomb), *Galium erectum* (Hovingham), *Astragalus hypoglottis*, *A. glycyphyllos*, *Asperula cynanchica*, *Chlora perfoliata*, *Calamintha acinos*, *Erigeron acris*, *Hypericum montanum*, *Thalictrum majus*, *Atropa Belladonna*, from Aberford and neighbourhood.

MEETING, Dec. 12th, 1883, Mr. G. C. Dennis in the chair.—Mr. Prest (hon. sec.) exhibited the following rare insects:—*Eupithecia irriguata*, *E. togata*, *Bryophila impar* from Mr. Warren, Cambridge, two specimens of *Acronycta alni* bred by Mr. J. G. Ross of Bathampton, and *Agrotis Ashworthii*, bred by Mr. C. S. Gregson, of Liverpool. Mr. G. Webster exhibited the following:—*Lathræa squamaria*, *Orobanche arenaria*, *O. cærulea*, *O. rubra*, *O. caryophyllacea*, *O. elatis*, *O. picridis*, *O. hederæ*, *O. minor*; also a fine specimen of *Naias marinum* from Norfolk.—WM. PREST, Hon. Sec.

PRIMARY CAUSES OF VARIETY IN PLANT STRUCTURE.

BY GEORGE MASSEE.

LIVING matter retains its individuality only so long as it is the seat of a definite series of physical and chemical changes ; in other words, cessation, loss of balance amongst the requisite forces, or the interpolation of an unnecessary one, are the only known causes of death. The harmonious working of the essential forces is always subject to the effects of others antagonistic, hence the variety of structure presented by plants, which, taking the simplest forms as a starting-point, illustrates the relative requirements to counteract the prejudicial effects of conflicting agencies. Water is the medium in which the greatest amount of vital activity can be accomplished with the least amount of specialisation, hence the simplicity of structure common to aquatic plants ; not because they do less work in proportion to size than other plants, but because favourable surroundings enable them to do the required amount with very simple organisation : and complication of structure increases in proportion as vegetable life recedes from its primordial aquatic birthplace. Provision against dessication is generally very manifest in plant structure, least so in Algæ, where every part of the surface is pervious to water and gaseous diffusion, and the minute, solitary, unicellular species would be the first to suffer from drought. The first departure from this primitive simplicity in the way of protection, is illustrated by such genera as *Palmella*, *Glæocystis*, and *Nostoc*, where the individuals of several generations become agglutinated together, forming colonies frequently of considerable size ; or dense felt-like strata are produced by some species of *Spirogyra* and *Conferva* ; in both instances each component plant retains completely both its morphological and physiological individuality. Such conglomerations present no approach to anything like specialisation of parts or division of labour, and the explanation that most naturally suggests itself is—resistance to drought—on the principle that a given amount of matter in one piece takes a longer time to become dry than the same amount broken up into numerous pieces. The correctness of this view is supported by the fact that the colony-forming species have a much wider distribution than their solitary relations, due to being able to survive a wider range of surrounding changes. Out of the fifty-one species belonging to the *Palmellaceæ* enumerated in Cooke's "British Fresh-water Algæ," six of the rarest species belong to four genera, in which the individuals are

isolated or in very small families; whereas four genera forming mucilaginous cell families, include twenty-one species, most of which are common. The same ratio holds good for Europe generally, as shown in Rabenhorst's "Flora Europæa Algarum." This community-forming process is far more general among fresh-water than marine algæ, and it is only when the minute species of the latter grow between tides, and so are exposed to the air for a considerable time, that this character is met with, as in *Petrocelis cruenta*, *Peyssonelia Dubyi*, certain species of *Conferva*, *Rivularia*, &c. This difference of habitat is often very marked in species of the same genus, as in the marine confervæ, where *C. tortuosa* forms fleecy tufts on rocks, which retain a sufficient quantity of water to prevent dessication during low tide; while *C. melagonium*, which never flourishes above low-water line, consists of from one to four rigid filaments. The latter is not common anywhere, while the former has a wide distribution.

Passing on to the multicellular seaweeds of more complicated organisation and in which the individual plants are comparatively large, we find the same idea of solid masses, or dense spongy tufts, characteristic of plants growing between tides. The first structure is illustrated by *Leathesia tuberiformis*, the latter, which is most general, by such plants as *Callithamnion polyspermum*, and the species of *Ceramium*; while plants growing in deep water—or if between tides, in rock pools—are of a thin membranous nature, as *Delesseria sanguinea*, *Ulva latissima*, species of *Nitophyllum*, *Rhodymenia*, &c., which soon suffer if exposed to the air. Hepaticæ form the transition from aquatic to terrestrial vegetation, and it is in this family that we meet with marked modifications of structure, for the purpose of enabling the plants to exist under conditions so far removed from those in which their progenitors flourished. The change is not abrupt. *Riccia natans* is a floating water-plant; others, as *Jungermannia inflata*, grow in peat bogs, or similar places very retentive of moisture. Many have a tufted habit of growth; in such the most evident structural departure from algæ is the differentiation of parts, while in *Marchantia polymorpha* we are introduced to an entirely new and complicated structure—the epidermis—which is waterproof, for the purpose of preventing the dry air, to which the surface of the plant is exposed, absorbing its moisture too rapidly. This additional structure necessitates the presence of at least two others, stomata and roots (at least functionally). This new waterproof arrangement does not at once become universal. Mosses which yet retain the cæspitose habit, and usually grow in wet places, have no such protection on the vegetative part, but the fruit, which is

generally elevated into the air on a stalk, has stomata; and from this point, as we ascend in the scale of vegetable development, every terrestrial plant has a cuticularised covering provided with stomata. The structural changes already mentioned have been the cause of a corresponding specialisation of parts and division of labour, unknown in the algal family, where every part of the surface served equally as an organ of nutrition, so that internal arrangements for the transmission of liquids and gases from one part of the plant to another were not required. But in land-plants the function of nutrition is restricted to those aerial parts possessed of stomata, and to the roots; and as the latter alone absorb liquids, and the aerial parts gases, so the presence of an additional complex structure—the fibro-vascular system, which acts as a conductor of materials obtained from without, to parts of the organism not capable of obtaining them directly—becomes necessary.

The life-labour of every plant may be divided into two stages: the vegetative, on which its existence as an individual depends, and the reproductive, which, owing to the limited existence of individuals, provides for the continuation of the species. This provision, in the simplest plants, is restricted to one kind, which may be asexual or sexual; but soon we meet with plants possessing the two forms of reproduction, and passing through the sequence of changes known as alternation of generations, and it will be observed that the gradual evolution of complex plants is the result of excessive development of one of the two generations, the other remaining in its primitive state, or even becoming rudimentary. In those algæ where alternation of generations is evident, the vegetative part, which is at the same time the sexual generation, constitutes the bulk of the plant, and the endless variety of form and adaptation is entirely the result of development in this part, which in such groups as *Fucaceæ* and *Florideæ* attains a high degree of specialisation, the asexual spore-bearing stage remaining very small and comparatively unchanged. This very marked inequality of development is continued in hepatics and mosses, and, as already mentioned, in *Marchantia* an attempt to meet terrestrial conditions is seen in the presence of the epidermis; but it soon becomes evident that the highly-developed sexual generation common to seaweeds and mosses cannot so readily adapt itself to new surroundings as the more undifferentiated and pliant asexual generation, which, from the ferns upwards, constitutes the mass of every plant, performs the vegetative functions, and by its marked adaptability to all terrestrial conditions has enabled vegetation to extend itself over the surface of the globe, and in proportion to its

development the sexual generation becomes more and more rudimentary. Notwithstanding the increasing specialisation of vegetative parts, all cryptogams agree in being dependent on water for effecting the important function of fertilization, consequently the organs connected with this act retain throughout their primitive simplicity; whereas in flowering plants the departure from this mode of fertilization has rendered necessary some of the most marked modifications of structure with which we are acquainted.

To the foregoing statements there are apparent exceptions, yet the sequence of development goes to prove that the leading morphological changes met with in the vegetable kingdom may, without fear of contradiction, be attributed primarily to a departure from the aquatic habitat of the earliest and simplest forms of plant life.

Oak Road, Scarborough.

NATURAL HISTORY NOTES FROM SOUTH AFRICA.

(Continued.)

BY S. D. BAIRSTOW, F.L.S.

And now for a rough glance at my early sweethearts, the butterflies and moths. They form the solace-link binding my heart from present to past—from immeasurable nigger-land to pat little Britain. It was the first bred *Populi*, *Vinula*, *Caja*, or *Carpini* gladdened *your* heart when, after weeks of patient waiting and watching, a damp-winged *imago* was seen crawling up the chrysalis cage. You—Fellow of a dozen learned societies—don't be ashamed of the reminder of a bygone characteristic. Here's my hand, old chap! It was the first fluttering, sailing *Cardui* which gladdened my heart, when by the very warmth of its welcome I was assured stomachic tumults were over, and that one friend at least was ashore, and had made an effort to salute me. I waived the flag of truce, and promised that no net of mine should ever again damage a painted lady's scaly polonaise.

Contrasting the home *Cardui* with ours, although of course they are structurally identical, they differ somewhat in their habits. If I remember correctly, *Cardui* was an irregular, fitful visitant, local where occurring, nervously disposed, frequenting flowers specially selected, and partial to individuals, rarely settling upon tree-trunks (unlike the Llanrwst *Atalanta*), walls, or palings. Here it is a true *Amicus humani generis*, fearless yet prudent, settling on anything—partial to nothing, excepting, perhaps, snug corners of verandahs, and age and natural decay seem not to weaken its flight. The larvæ I have hitherto found

only on a huge species of thistle, with variegated leaves, occurring gregariously in nests. This immediate district I do not consider a first-rate one for butterflies; and certainly not a patch on Uitenage—of which more anon—twenty miles away.

Indeed the butterflies of South Africa altogether did not strike me as being particularly rich in natural development or of number of species. I doubt not that a casual observer in his world-wide travels would under-estimate our *Rhopalocera*. Howbeit my remarks require qualifying, for I have not yet been privileged to reach elysium—Natal. The butterflies found a worthy historian in Trimen. An entomologist diving for the first time into *Rhop. Af. Ans.* pronounces the description wordy and tedious. Each succeeding dip convinces him contrariwise. They are admirable and exhaustive. A combination of Trimen's descriptions and Vollenhoven's figures for a scientific insect biography approximates perfection. Very many orders are strangely neglected here, but the butterflies cannot reasonably complain. Such names as D'Urban, Bowker, Barber, Anderson, Fairbridge, Wentworth, and others, went far in scoring on their behalf a literary success. I grant a slight disappointment concerning the butterflies of South Africa, but don't misunderstand, "coming events cast their shadows before." Shades of expected nymphs cast an all too beauteous effect on my exulting dreams, 'ere I left the old country.

View a noble *Papilio Merope** restlessly wafting his creamy wings upon a subtle air-wave; darting swiftly, mockingly beneath, to rise again, proud aristocrat, with lordly, aye, majestic ease; swooping again in sportive mood; swelling (!) his imperial thorax, flaunting his glistening robes, as if to scorn the weakly efforts, vulgar improprieties, forsooth! of incapable underlings, who strive to emulate, but fail to imitate their chief's example.

Or the modest *Lycæna palemon*,† butterfly Tom Thumb, pretty little chap, fitting amongst sequestered uncanny nooks, "quaffing fragrant nectar from the cups of gold" of pygmean flowers; ascertaining himself—somebody—caring for—nobody—exactng not homage but forcing respect. Now, lover of the beautiful, stern moralist, doff your hat, clap hands on heart, kiss the book and swear an unrestricted allegiance to the race. My best takes or observations in the district are *Pieris agathina* (1), *Pieris leverina* (1), *Eronia Eleodora* (profuse where it occurs), *Terias Rahel*, *Meneris Tulbaghia* (placed by Trimen amongst the

* Not seen in Port Elizabeth. Common, Perie bush (a grand hunting ground) and Zuurburg fond of woods. Expands 3in. 6lin.

† Smallest South African species. Occurs in Port Elizabeth. I have one specimen under 7½lin.

Nymphalidæ), *Philognoma Varanes* (seen several times, not captured), *Loxura alcides*, *Zeritis Alphaeus* (one, an immense fly, considerably larger than Trimen's limit, lin. $10\frac{1}{2}$ lin.), *Lycæna celaens*, *Zeritis Thysbe*, *Z. Thyra*, *Pyrgus elma*, and *Nisoniades Djaclaelae*.

Half a day in the Perie bush gave me *Debis dendrophilus*, *Pieris agathina*, *Papilio Merope*, *Pyrameis hippomene*, **Atella phalanta* (our solitary fritillary), *Nisoniades Kobela*, and *Lycæna Delegorgui*. My local list is not very grand, and might be largely augmented if I recorded observations. Many of the *Pieridæ* fly in tantalising manner before the collector, and then dash forward over the prickly bush. At Uitenhage many species occur, although strangers to Port Elizabeth. Floral life, both natural and imported, is much stronger there—hence the contrast.

When I lived there about eighteen months ago, the gardens bore every appearance of neglect, and weeds monopolised the fertile soil. Fennel grew rank and proved a capital recreation ground for all sorts of insects. Wild creepers stretched aloft their pliable arms in competitive haste to reach the summits where they bloomed, and whilst the leaves inveigled larval appetites, the blossoms tempted insect tongues and insect jaws. Where nectar, juicy essence is, are winged gluttons. Where big dinners locate, chameleons are certainties. I counted forty-seven of these ungainly *body-snatchers* on a quince hedge bordering my garden, one evening when I was busy nothing. The reptiles totally ignored the near approach of lighted wick. Their faculty of changing hue is yet unexplained. Their peculiarity of moving the eyes independently of one another is striking. The chameleon is a sluggard and a fool, but not such a fool as he looks. Does it not pay him to be torpid? To what law of nature does his colour-change respond? Is it a protective instinct prompting? I cannot quite accept such an hypothesis, but should prefer the idea that a rapid and metamorphic assumption misleads his prey. He cannot or will not hasten his movements, and trusts principally to the dexterity of his tongue, which, likely as not, may 'miss its shot.' I have lost, but lost awhile! I shall now turn strategist! Let me become for the nonce another creature and assimilate! But how? By change of form? That is impossible! By change of colour? Ah! I have hit the mark! Eureka! See! the fly deceived returns to its haunt. Slick glides chameleon's tongue, and slick Mons. Dipteron glides down, down, down, into the remote regions of reptilian digestion. Is my theory far fetched? Then dont accept it with scientific gusto.....

(To be continued.)

* Mr. Rous, I believe, took one in Burmah.

Notes and Queries.

CONCHOLOGICAL NOTES FROM THE NEIGHBOURHOOD OF HATFIELD CHASE.—The following notes refer to two days' collecting in the low-lying country a little south of Hatfield Chase, and near the junction of the counties of York, Nottingham, and Lincoln. The first was on the 14th April, the second on 14th of May, starting in each case from Finningley station. In April, Mr. W. Eagle Clarke and Mr. W. Denison Roebuck took the Wroot road; in the Nottinghamshire portion of it nothing was found in the roadside ditches but *Pisidium pusillum*, *Planorbis spirorbis*, and *Limnæa peregra*, all in abundance. Crossing the border into Yorkshire the two latter species were still in abundance, and with them were associated in equal plenty *Pisidium nitidum* and *Limnæa truncatula*. Soon was reached where the Gravel Drain (apparently so named from the nature of its bottom) crosses the boundary separating Yorkshire from Lincolnshire. While investigating it, Clarke had the satisfaction of re-establishing the claim of *Paludina contecta* (apparently now extinct in its former localities) to rank as a Yorkshire mollusc. He found a specimen floating on the surface down the drain, the water of which flows from west to east. He also obtained here *Limnæa stagnalis*, and his companion obtained *Valvata piscinalis*, *L. peregra*, *Physa fontinalis*, and *Planorbis vortex*. Crossing here into Lincolnshire, and investigating the ditches bordering Sampson's lane, *Bythinia tentaculata*, *Limnæa peregra*, *L. palustris*, *Planorbis carinatus*, *Pl. contortus*, *Pl. vortex*, and *Physa fontinalis* occurred plentifully, being encrusted with a ferruginous deposit at one portion of the ditch. A quantity of debris collected about the piles supporting Candy Hall Bridge, on the Black Bank Drain, produced *Valvata piscinalis*, *Bythinia tentaculata*, *L. peregra*, *Planorbis contortus*, *P. albus*, *Physa fontinalis*, and a solitary land-shell, *Zonites nitidus*. Examining the Black Bank Drain itself was disappointing, and the ditch which runs parallel with it, and at the foot of the embankment was found to be very much more productive, yielding numerous species in abundance, including *V. piscinalis*, *B. tentaculata*, *B. Leachii*, *L. peregra*, *L. palustris*, *Ph. carinatus*, and *Physa fontinalis* plentifully, together with a few specimens of *Sphaerium corneum* and *Limnæa stagnalis*. The examination of the Yorkshire portion of the same line of ditches produced the same collection of species, with the exception of *L. palustris*, and *L. stagnalis*, and also added four more species of *Planorbis*—*P. albus* (a few), *P. corneus* (local, and very young), *P. vortex* and *P. contortus* (in plenty). This finished the day's investigation, and the walk to Doncaster was productive of nothing but *Limax agrestis* near Cantley, and *Limnæa peregra*, the only inmates of an apparently promising ditch on the race course (recently cleaned out, a thing repugnant to all naturalists, especially when applied to localities for *Melicerta ringens* and other interesting forms of life, as in this case). The May

expedition was undertaken by Messrs. W. Nelson, J. W. Taylor, and W. D. Roebuck. On this occasion the line of route was entirely in Yorkshire; starting from Finningley, and proceeding due north, through Blaxton, where Nelson found specimens of *Helix nemoralis*, var. *olivacea*. At Blaxton Grange, the examination of a series of productive ditches soon provided ample employment. The only land shells taken were solitary examples of *Zonites alliaris* and *Succinea elegans*, taken by Roebuck. The water shells taken included *Pisidium nitidum*, both species of *Bythinia*, *Valvata piscinalis*, *Planorbis corneus*, *P. contortus*, *P. complanatus*, *P. vortex*, *P. spirorbis*, *Physa fontinalis*, *Limnæa stagnalis*, *L. palustris*, and *L. peregra*, all in more or less abundance. The specimens of *L. peregra* included its varieties, *ovata*, *acuminata*, and *oblonga*. The Gravel drain and adjoining ditches were next reached, examined throughout its three miles course up to Ackholme, yielding *Bythinia Leachii*, *V. piscinalis*, *Pl. albus*, *P. vortex*, *P. contortus*, *P. complanatus*, *Physa fontinalis*, *Limnæa palustris*, and *L. peregra*. From this point, a line was struck for the River Torne, which was crossed by a plank bridge; here Roebuck found a solitary specimen of *Physa hypnorum* in a shallow grassy puddle. In the river itself was found *L. stagnalis*, *L. auricularia*, *L. peregra*, *Physa fontinalis*, *Planorbis contortus* and *P. carinatus*, and *Pisidium pusillum*. At Kilham occurred *Arion hortensis* and the familiar *L. agrestis*. No further search was made until the woods in Cantley Park were reached; here careful search amongst dead leaves and the ivy which carpeted the ground rewarded us with *Vitrina pellucida*, *Zonites fulvus*, *Z. crystallinus*, *Helix hortensis* (young), *Vertigo edentula* (somewhat commonly), a single specimen of *V. pusilla*, and several *Cochlicopa lubrica*. The weather was unfavourable for land mollusca, of which very few were observed.

BADGER AT MASHAM.—On the 5th of December last, the Bedale hounds met at the Sleningford Park, the seat of John Dalton, Esq. (six miles from Masham, four from Ripon). The covers having been drawn blank, a terrier was sent up an artificial earth which sometimes holds a fox, but it shortly emerged bearing signs of having come off second best in an underground conflict. A second terrier was then procured, and both went up the earth. A confused scuffling was heard, and soon both dogs appeared, having been unable to dislodge the occupant. Spades were now brought into requisition, when, to the astonishment of all present, a fine badger bolted through the pack standing round, and escaped in the surrounding cover, the hounds not owning the scent. It is many years since a badger has been seen in this neighbourhood, though they were formerly plentiful.—THOMAS CARTER, Burton House, Masham.

REDSHANKS NESTING AT MASHAM.—On the 8th of April, 1883, a pair of redshanks made their appearance in a large marshy field, which seemed to furnish them with an abundant supply of food, for they never left it for any length of time. When disturbed, they would fly round uttering their

rich notes, but although they sometimes extended their flight to a distance of half-a-mile, they invariably returned as soon as the cause of their alarm had gone. On the 13th of May I found the nest of the birds in the centre of the enclosure. The eggs, four in number, were snugly concealed in an overhanging tuft of grass, and a few pieces of bent and grass only intervened between them and the ground. They were very richly marked specimens, and this is the first known instance of redshanks breeding in this locality. A pair of this species visited the same piece of land six years ago, but after staying a day or two they disappeared; and though they might have bred on some of the moors around, I never heard of anyone having noticed them.—THOMAS CARTER, Burton House, Masham.

NOTES ON BIRDS' NESTS FROM NORTH YORKSHIRE.—In the past nesting season of 1883, the following came under my observation :—The first nest I found, containing eggs, was on April 6th, and was that of a green peewit. The eggs were five in number, all similarly marked, and evidently produced by the same bird. There were no footsteps near the nest, so the fifth egg could not have been added by anyone. It is the first nest of this species I ever found containing more than four eggs, and though I have made enquiries of professional egg gatherers, I cannot hear of anyone having noticed this number of eggs before. This clutch of eggs was destroyed, and on May 13th, in the same field (a ploughed one), about thirty yards from the first nest, there was again a peewit's nest containing five eggs. On June 15th, when beating up a tall hedgerow, I startled a willow wren from its nest, which was built in the usual domed shape, but was placed in the top of a thick blackthorn bush, three and a half feet from the ground. In the centre of a marshy field, snugly concealed in a tussock of tall grass, and quite on the ground, was a blackbird's nest. The nearest bush was fully twenty yards distant, and as the field was bounded by fences, the birds could not have been at a loss for an ordinary site. Another blackbird's nest I found twenty-five feet from the ground, against the trunk of a large tree, in a cavity formed by the tearing off of a bough. A third was built in a wood, on the stump of a hazel bush just raised from the surface of the ground, but quite concealed by a luxuriant growth of dogs mercury. A clutch of chaffinch's eggs were perfectly blue, without any spots. In a disused chimney pot, which was blocked up not far from the top, a starling took up its abode, and though the nest was quite open to the heavens, the young ones were safely reared. A swallow built its nest inside a moveable hut on wheels (very similar to a bathing machine, and used as a cake receptacle), which had only been recently brought into a field, and was some quarter of a mile from any house. The young fledged in due course. In a cavity in the river bank, formed and occupied the previous year by a pair of kingfishers, was placed a sand martin's nest, which contained eggs when I found it. Putting my fingers inside a chaffinch's nest, and expecting to find eggs, I was somewhat startled to find it occupied by a large humble bee, which had a

goodly lump of comb and cells snugly placed under the hair lining. Built in a mass of dead leaves, which covered the ground in a wood, was a wood wren's nest, and in such an exposed situation, that when the bird left, the eggs were plainly visible from some few yards distance. There was no grass or anything green growing anywhere near the nest, which is the more remarkable because, as a rule, the nests of this species are so carefully concealed. A dead twig or two projected above the surface of the leaves round the site, but they afforded not the slightest shelter.—TOM CARTER, Burton House, Masham.

NATURAL HISTORY NOTES FOR THE BARNSELY AND SOUTH YORKSHIRE DISTRICT.—For the quarter ended Dec. 31st.—October 1, the arctic tern occurred in a pool between Wakefield and Barnsley; 7th, the grey wag-tail in Calder vale, near Horbury (it visits us in winter, and very rarely stays to breed in our lowland tracts of South Yorkshire); 23rd, redwings and fieldfares, first notice of arrivals—scarce about here. Woodcocks obtained in great numbers, from 8th about Wombwell, 9th at Sunny Bank, and a few in the Stainborough woods. A flight of eight was reported Sept. 5th; Nov. 10, a green sandpiper at Walton Lake side, reported by Mr. Hailstone's keeper; 18th, the great-crested grebe killed in a pool between Wakefield and Barnsley. The latest date of house martins is Nov. 18th, at Cliff Wood, Barnsley; of swallows, Dec. 13th, noted by Mr. Wigglesworth at Lupsitt. I don't remember such late dates as these in the South Yorkshire district. Our resident songsters have sung merrily through the Christmas and New-year season—all the thrush family, the song thrush, storm cock, and blackbird, also occasionally the starling and skylark. Kingfishers are found about streams, canals, and pools in county and town. A rare winter visitor, the siskin, has occurred in flocks close to our doors, in the railway excavation below Victoria Bridge, along with bulfinches, great and blue tits, yellow and reed buntings. Hooded crows about Ackworth, Mexbro', and Wath. A dog-otter was killed near Bolton-in-Dearne Dec. 16th, one at the same place eighteen months ago; it is the fifth captured in the Dearne valley within about two years. One fortunately escaped. The common bat (*Vespertilis pipistrellus*) was flying about on Christmas eve as on summer evenings at Wentworth Castle.—T. LISTER, Jan. 19th, 1884.

Lasiocampa ilicifolia.—The addition of a nice pair of this insect to my cabinet a few days ago reminded me that the species still wants re-discovering in our county. It used to occur regularly on the moors near Sheffield and Ripon, but has not been taken there, nor elsewhere in Britain for some years. There is very little doubt it still exists in the county, and it should be diligently searched for among bilberry in its old haunts, as well as on the moors about Grassington and other parts of Wharfedale, Blubberhouses, Bingley, on the borders of the county near Greenfield and Mossley, and other likely places. It certainly ought to be turned up this year. Who will do it?—G. T. PORRITT.

“WHERE ARE THE INSECTS?”—I am very much gratified that my communication (p. 85) on the above subject has called forth a rejoinder from so able a man as Prof. Newton, but I must beg a few lines in reply, and will try to be as courteous in my remarks as he has been in his. First, let me assure him that I have an equal love for both birds and insects, and if I were obliged to give up one, I really do not know which it would be. He says I have exaggerated the bird population of this country. I may have done; tangible statistics are difficult to obtain, but if we say half, or even if we reckon my calculation for one county as the population of all England, the results will be astonishing enough. But if a flight of goldcrests reaches from the Faroes to the Channel Islands, and if a flight of jays took three days to pass Heligoland (*Nat.* p. 95), there must be a great lot of birds somewhere. He next says that England was quite full of most of the birds I name, and that they were not subjected to persecution before the passing of the Bird Acts. Then what are the Acts for? I beg respectfully to differ with him on both these points (I am speaking of Yorkshire), for I feel quite certain that there was room for many more birds, and with the stoppage of pop-guns, the continued persecution of birds of prey, and the protection of birds and eggs, I do not see how the small birds can help but have increased. As to persecution, both birds and eggs were, and to some extent still are, shamefully persecuted; the birds, by every farmer’s man or country lad who had a gun;—they shot them for mere sport, some not even stopping to pick them up. I have heard of forty dozens of skylarks being taken out of snares by one man in one day, their necks screwed, and sent to market. Is this persecution? The eggs were hunted up in hundreds by schoolboys, placed upon a wall, and pelted with switches. Moisture dims my eyes to think of it; perhaps from my “want of sufficient ornithological knowledge.” I have known gamekeepers take a stick and beat down all the nests of small birds they could find. Is this persecution? But these matters cannot be remedied by Act of Parliament. What we want is to teach the child, from the first day it enters the school, to be kind to all living creatures; that each one has its proper place in nature, and should be respected and studied; then nature will manage her own affairs without the intervention of Acts of Parliament. What are the birds that were rapidly being exterminated? I suppose Prof. Newton alludes to the birds at Flamborough Head, where this protection originated. I happen to know something about it, and I can assure him that the accounts of the birds killed there have been greatly exaggerated. My father went there every season for twenty-one years before the passing of the Act, and killed perhaps more birds than any one man besides. He generally had with him from two to five companions with guns, and I do not deny that he was perhaps the main cause of the agitation against shooting. This, for my own part, I deeply regret; a true naturalist will never shoot a bird unless he really wants it. But, as a matter of fact, if a working man wants a day’s shooting he has as much right to have it at

the sea coast as my lord has in the covert. If he wants the birds to make money of, he has the same right as the fisherman who catches two or three hundred herrings per day. There is no moral law to interfere and say the birds do not belong to him. Before any Protection Acts were thought of, I have often heard my father say that he could never see the birds get one less. I have very little space left to reply to Mr. Carter. He does not seem to know that the fly which flies in the air has anything to do with the caterpillar. The only difference it would make to my calculation is, that the caterpillar may only produce one fly, but the fly would produce hundreds of caterpillars if permitted to live. Mr. Carter tries to ridicule my statement of a pair of small birds destroying 600 caterpillars per day during breeding-time. The calculation is not mine, but is recorded by an eye-witness. It would have been more to the point if I had said insects, but every intelligent person must see that this was intended; and I should think a single tit or creeper will destroy more than that quantity itself when searching for insects' eggs, &c., in the crevices of bark.—S. L. MOSLEY, Beaumont Park, Huddersfield.

TRANSACTIONS OF THE BARNSELY NATURALISTS' SOCIETY.—Mr. T. Lister wishes us to state that the title of his paper, as sent to the editor of the "Transactions" (*Nat.* ix., p. 104), was "Birds of the Barnsley and South West Yorkshire District." This title accords much better with the contents of the paper.

THE "REPORT OF THE 'LOCAL SCIENTIFIC SOCIETIES' COMMITTEE' OF THE BRITISH ASSOCIATION."—It is clear, from the report before us, that the committee have fully and thoroughly accomplished the work they set out for themselves in 1882. They tell us they "have communicated with all the societies known to them which appear to fall under the designation of "local scientific societies which publish their proceedings," giving to this definition a somewhat liberal interpretation, and they submit a tabular list of these societies, with notes of their publications and other particulars. They are about 170 in number, and seem, from their rules and publications, to be centres whence local scientific information may conveniently be obtained." This list of societies is the most striking feature in the report, and cannot fail to be as useful as it is interesting. It is brought up to November, 1882, and besides the full title of each society is given the head-quarters or name and address of the secretary; the number of members; the amount of the entrance fee and annual subscription; the title and size of its publications; the frequency of issue, and other remarks. We are sure the committee could not possibly have done their work better, and we have perfect confidence that it is the beginning of much useful work in future years.

CORRECTION.—On page 103 of the last number of the *Naturalist*, in the sixth line from the top, the word "snipe" has been printed in error. Instead of "snipe," read "swift."—THOMAS CARTER.

OBITUARY.—JONATHAN THORNTON.—On the 11th of January, by the death of Mr. J. Thornton, at the advanced age of 86, the Huddersfield Naturalists' Society lost another of its earliest and oldest members. Though he never made any pretension to being a scientific naturalist, he was formerly an ardent collector of botanical specimens, and his kind and genial disposition gave him a large circle of intimate friends: and, some years ago, his fellow-members of the Huddersfield Naturalists' Society showed their appreciation of his worth by electing him their president.

Rainfall for December.

	Height of gauge above sea level.	Rain-fall.		No. of Days	TOTAL FALL TO DATE.		Date of heaviest Fall.	Amount of heaviest Fall.
		Ft.	In.		1883.	1882.		
HUDDERSFIELD (Dalton) ... (J. W. Robson)	350	1·67	17	37·06	*33·74	14	0·24	
LEEDS ... (Alfred Denny)...	183	1·06	13	28·80	24·99 †	11	0·22	
HORSFORTH ... (James Fox)	350	1·43	14	34·31	32·93 ‡	15	0·35	
HALIFAX...(F. G. S. Rawson)	365	3·70	21	49·96	55·25	11	0·69	
BARNSELY ... (Dr. Sadler)...	350	0·86	18	31·84	35·71	11	0·18	
INGBIRCHWORTH (Mr. Taylor)	853	1·84	18	46·23	51·02	11	0·30	
WENTWORTH CASTLE (Mr. Fisher)	520	1·07	14	34·91	37·41	11	0·29	
GOOLE (J. Harrison)...	25	1·36	19	28·22	34·44	16	0·58	
HULL (Derringham) (Wm. Lawton)	10	1·24	22	23·04	§ 27·21	16	0·24	
SCARBORO' (A. Rowntree)...	130	2·19	23	27·99	...	15	0·46	
THIRSK...(W. Gregson)	100	1·22	...	...	...	...	...

* Average to date for 17 years, 1866-82.

† Average of 29 years, 1853-63, & 1865-83. ‡ Average of 14 years, 1870-83.

§ Average of 17 years, 1866-82—29·74.

§ Total fall of the year, 27·21 inches on 201 days. Maximum fall 10th Sept., 1·15 inches. 4·35 October fall should have been 3·35, and 1·11 greatest on the 1st, should have been ·73 on the 14th.

Reports of Societies.

BARNSELY NATURALISTS' SOCIETY.—Meeting Nov. 4th, the president, Mr. T. Lister, in the chair.—He gave a paper on "The Birds of Canada which occur in Britain," with reference to the British Association Meeting at Montreal in 1884.

MEETING, Nov. 18th, Mr. F. Batley in the chair.—The secretary laid on the table books, reports, &c., received from the Scientific and Naturalists' Societies connected with the British Association. A very able

paper was read by Mr. W. Harrison on "Air, and Sources of Disease from Impurities."—T. LISTER.

BRADFORD NATURALISTS' SOCIETY.—The first meeting of the year was held Jan. 15th. The president, Dr. H. W. Evans, occupied the chair, Mr. J. Saville described a recent ramble to the neighbourhood of Cottingley, and exhibited several plants indicating the mildness of the season; Mr. B. Illingworth, a curious malformation of the hind foot of a cow, in which the bones of the toes had all grown together. Mr. H. T. Soppitt described several recent rambles, exhibited several early plants in bloom, and reported having found a fungus, *Cortinarius ileopodius*, new to the district. Mr. J. W. Carter exhibited several rare shells, which were described by the president; Mr. J. Firth, a number of lepidoptera which pass the winter in the perfect state, which were described and named by Mr. Carter. Dr. Evans then delivered his inaugural address on "Conchology." He dwelt at considerable length on the general organisation of the mollusca, pointing out their most curious method of reproduction, the structure of the shell, and their mode of locomotion. In dealing with their habits he showed how these animals pass the winter by depositing at the mouth of the cell a kind of film to keep out the cold, whilst in tropical countries many species pass through the hot period by depositing a similar film and burrowing in the ground. Dr. Evans then referred to the carnivorous habit of a marine species that is found on the Yorkshire coast, which has a peculiar method of drilling into the shells of other species and devouring the inmates. Almost all the land and fresh-water species are herbivorous. One species (*Testacella*) feeds on earth-worms. In size, the mollusca vary from extreme minuteness to very large and gigantic species. The largest land-shells are found in South Africa, and belong to the genus *Achatina*, which is represented in this country by an almost microscopic species. The address was listened to with great interest, and a hearty vote of thanks was passed at its conclusion. Mr. West showed a drawing of an abnormal mushroom in which a second example was growing inverted out of a large specimen.

DEWSBURY NATURALISTS' SOCIETY.—January meeting, the new president (Dr. Watts), delivered his inaugural address, thanking the members for their courtesy in electing him.—He observed that, according to the syllabus of the society, addressess were to be given during the year on subjects connected with almost all branches of Natural History. Perhaps he might be allowed to mention the study of insects as peculiarly interesting, their various metamorphoses through egg, caterpillar, chrysalis, to the imago or perfect insect. It was by a process of prolonged and careful observation that physiologists had shown the various parasitic worms which infest the bodies and alimentary tracts of man and beasts—the perfect worm not being developed in the same species of animal as its progenitor, going through three changes before it arrives at maturity, and is capable of propagating its species. By this discovery physicians were enabled to point out with certainty, that by subjecting animal food to a proper heat

before its ingestion, that all danger from parasites was avoided. Then there were the bees, wasps, and ants. What studies had been opened out by watching the habits of these insects; none had been too closely watched and studied, and the president pointed out what facts had been gained respecting them, asking at last, if he endeavoured to enumerate the interesting objects for study, where to stop; how in this beautiful world every portion of which teemed with animate or inanimate books, so to speak, open for the perusal of those who care to learn or read; some, perchance, written in a language known to few; some in, for the present, an unknown tongue, but all giving pleasure by their taste, beauty, or utility. The president proceeded to give a general description of the circulation of the blood, of the organs which carry it on, from those invertebrata, wherein the circulatory apparatus consists of a slight tube, with a contractile portion, which gently moves the vital fluid to and fro, apparently without any defined or continuous current, to the vertebrate mammalia, where it attains its most complicated apparatus and course.—J. SUMMERSGILL, Hon. Sec.

HECKMONDWIKE NATURALISTS' SOCIETY.—Twenty-second annual meeting Dec. 29th, 1883, the retiring president (Mr. J. M. Barber) in the chair.—Dr. Stewart was unanimously elected president, Mr. J. Norcliff secretary, and Mr. J. M. Barber representative to the Yorkshire Naturalists' Union. A paper was then read on "The Mistletoe." The following plants, sent by Mr. W. B. Boyd, of Faldonside, Melrose, were exhibited:—*Carex rupestris*, *C. rigida*, *C. pauciflorus*, *C. vaginata*, *C. atrata*, *Saussurea alpina*, *Epilobium angustifolium*, *Veronica saxatilis*, *Tofieldia palustris*, *Lychnis viscaria*, *Pyrola secunda*, *Listera cordata*, *Gymnadenia conopsea*, *Salix reticulata*, *Juncus castaneus*, *Alopecurus alpinus*, *Luzula arcuata*, *Phlæum alpinum*. The alpine plants from Glen Callater and district, and Roxburghshire.—J. M. BARBER.

HUDDERSFIELD NATURALISTS' SOCIETY.—Meeting, Jan. 7th, Mr. A. Clarke, president, in the chair.—Mr. Mosley exhibited nest of red-backed shrike and eggs, nest of cirl bunting from Surrey, and eggs of mute swan from Newcastle, gannet from Bass Rock, and red-throated diver from Iceland; also the first flower of the year, the Christmas rose (*Helleborus niger*). The president said the publication of Transactions had been undertaken, and the report, and new catalogue of the butterflies and moths of the district, was in the printer's hands. Many valuable books had been added to the library, and it now contained works which could not be obtained in any other library in the town. He believed that the coming year would see much useful work done. The secretary (Mr. S. L. Mosley) referred to the work to be done during the coming year, the organisation of the rambles, the society's future publications, and to the fact that a museum is probably being started for the town. The matter is in the hands of the Technical School Committee, and the Naturalists' Society should do all in its power to secure a good depart-

ment of Natural History, and to do something to furnish that department. The society's cabinet might be fitted-up with local collections of insects, shells, eggs, &c., and placed in the museum. Natural History was much neglected in giving an education to the young, and children left school with very little to occupy their minds. A museum could be made a centre from which a love of nature might be made to radiate in all directions, and either a love of nature or art will, more than anything else, keep young men and young women from evil habits and intemperance.

MANCHESTER CRYPTOGAMIC SOCIETY.—Fifth annual meeting of the society, Dr. B. Carrington in the chair.—The honorary secretary read the annual report, which briefly reviewed the work done during the last year, noticing the cryptogams which had been discovered by the members and their friends, as being new to science or to the British flora. Two new continental species had been brought before their notice by a French corresponding member, and quite a number of new localities for rare species had been made known, as well as fruiting specimens of species which had not hitherto been found in this condition in Britain. The most noticeable of those being found in fruit may be mentioned:—*Gymnostomum calcareum* and *Mnium stellare*, in Derbyshire, by Mr. Holt, and *Fissidens rufulus* in Yorkshire, by Mr. West. The literary work of the society had been pleasant and interesting, including papers by Mr. Cash, on “The History of *Cinclidium stygium* as a British moss,” and the “Early Bryological Work of Mr. Wm. Wilson in Ireland, Scotland, Anglesea, Cheshire and Lancashire.” Dr. Carrington contributed a large number of letters from eminent Cryptogamic botanists who lived in the present century, and who had been correspondents of the well known artisan botanist, Edward Hobson. It was also satisfactory to know that Dr. Carrington and Mr. Pearson had issued their third Fasciculus of the *Hepaticæ Britannicæ Exsiccatae*. The following were elected officers of the society for the ensuing year:—President, Dr. B. Carrington, F.R.S.E., secretary and treasurer, Mr. Thos. Rogers. During the evening Mr. Forster exhibited a splendid series of twenty-two varieties of the common *Polypodium vulgare*, all of them very remarkable, and some of them most beautiful in form; these were from the fernery of Mr. J. M. Barnes, of Milnthorpe. Mr. George Stabler sent specimens of *Lophocolea spicata*, Tayl., collected by the late Mr. Wilson, near Conway. The species had not hitherto been recorded as growing in Wales. Mr. Stabler also sent *Jung. Schraderi* from a new locality near Sedbergh, collected by himself, Oct., 1882. Another rarity was *Bryum concinnatum* (Spruce), from the Pass of Llanberis, collected May, 1883. Mr. Cash exhibited specimens of *Andreaea sparsifolia*, which had been collected on Helvellyn, in September last, by the Rev. C. H. Waddell. The thanks of the society were accorded to Dr. R. Braithwaite, F.L.S., for all the parts yet published of his “British Moss Flora,” and to the Royal Microscopical Society for their Journal and Proceedings.—T. ROGERS, Hon. Sec.

Original Articles.

IN THE TROPICS.

BY E. DUKINFIELD JONES, C.E.

[Read before the Lancashire and Cheshire Entomological Society,
May 28th, 1883.]

IF I were asked what is the nearest approach to perfect bliss that it is given to man to enjoy, I should reply, "The sensations of a naturalist on his first entrance into a tropical forest." And especially might this be said of a naturalist whose delight is the study of the insect world. In all branches of biology the riches laid before him are something beyond the conception of the most vivid imagination, and the exquisite beauty and grandeur of the scene have an effect upon his senses that can only be described by the word "enchantment."

But with the entomologist the general feeling of delight soon gives way to a perfect absorption in his own particular study, and a complete forgetfulness of all else. His main difficulty will be to get beyond the outskirts of the forest at all, for every leaf and flower, every stick and stone, attracts his attention and calls for inspection. Indeed it is the outskirts that form the most productive and most interesting portion of the woods, especially in regard to lepidoptera, for the deeper we penetrate into the recesses of the gloomy interior the less do we find of the brilliant life that that order gives to the scene. And in the midst of the giant vegetation the butterflies confine themselves mostly to the tops of the trees, where their brilliant hues and graceful motions are delightful to look upon, but decidedly tantalizing to the man whose desire is to collect.

Before we plunge, then, into the stillness of the great primeval forest, let us follow that winding sandy road which leads through an old clearing, with here and there a patch of maize or field of the graceful mandioca, with now and again a little valley whose clear rivulet ripples happily between the moss-grown stones or glides across the sandy level of the road. Occasionally the road cuts through a spur of the forest that juts out into the open like a little promontory in the sea. And thus we shall have a variety of scene, and a constant recurrence of such spots as the butterflies delight in, and where we may watch and capture to our heart's content.

The road that I propose to take you along is one of hundreds of such that may be found almost anywhere in the forest districts of the province of San Paulo, Brazil. At any season of the year we shall

find plenty to interest us in this summer land, for even in the winter, when in the early morning the ground may be covered with a slight hoar frost, the rays of the glorious tropic sun soon warm the air and bring out countless hosts of insects of all orders. But it is in the height of summer—from January to March—that the eye is gladdened with the glories and the ear charmed with the ceaseless music of Nature's orchestra. It is then that the *Morphos* are in their prime, and the cicada fills the air with his joyous and piercing note.

But before we start on our day's excursion, I will invite you to partake of breakfast in my rancho, an elegant mansion with mud walls and grass-thatched roof, and having the luxury of a boarded floor and a cooking stove—things not usually indulged in except by the civilized stranger in this primitive land. And perhaps it will be as well if each one of you considers the invitation to be to himself alone, for I am afraid that to accommodate you all at once I should have to add considerably to the size of my house. I can only offer you a plate of boiled beans and mandioca sawdust, with an egg or a stewed fowl; unless it happens to be the day on which the baker passes, in which case I can add to the repast some sour French bread, which may be made more palatable by the addition of some yellow fat out of a tin, that is called by courtesy "butter." But one thing I can offer you that is not to be found in England, and that is a good cup of coffee. No one knows the meaning of the term until he has been to Brazil. And now, having prepared ourselves for a hard day's work, and having our nets, bottles, boxes, &c., all in order, let us start off on our rambles.

The first thing that attracts our attention is a composite plant, with clusters of white flowers which form a rich feeding ground for numbers of butterflies and diurnal moths; especially we shall notice several species of *Heliconidæ*, whose graceful shape and soft flight are so delightful and so entirely novel to the English eye. One species has rich broad patches of crimson on the upper wings, and a creamy band on the lower; in another the crimson is replaced by diagonal stripes of creamy white, and the lower wings are of the deep blue-black that forms the ground colour of both species. We shall also probably find several species of *Ithomia*, a lovely genus of the same group, whose transparent wings and dancing flight entitle them to be called the fairies of the woods. These delicate insects will often be found flitting from glade to glade in the depths of the forest, where they appear in perfect keeping with the surrounding stillness and shade, and one almost fancies them too ethereal to venture out into the light

of the open spaces. They are, in fact, essentially forest creatures, and are rarely met with in the plains away from their home in the woods. Numbers of clear-winged moths and allied species will be found accompanying the butterflies in their morning meal, and vieing with them in the brilliancy of their colouring. One group of these which seem to represent our burnets, contains the most dazzlingly beautiful little creatures—perfect gems, in fact—that glow with ever-varying tint as they move and change the angle of the reflected light that flashes from their wings. Some of them almost appear as if they had been dipped in the pigments of some evanescent rainbow, and varnished over with the dew before the colours had time to depart, so brilliant are their tints.

Tearing ourselves away from the rich harvest of this feeding ground, we proceed along the sandy road, being met at every step by swarms of gaily-coloured butterflies ; on the open spots where the banks are dried and parched by the already powerful rays of the sun, we shall make many good captures. *Pyrameis*, reminding us of our own painted lady ; *Junonia* with its lovely peacock eyes, and many species of blues, hairstreaks and skippers. Of the latter group, there appears to be no end to the species, and indeed, I have rarely had a good day's hunt without being rewarded by one or two new species ; and these are, many of them, very different from the tiny dull skippers we are accustomed to at home. Here we find a giant, two inches and three quarters in expanse, of a beautiful greenish black, with a white fringe round the edges of the wings. There we see a robust specimen, with three light brown velvet patches on the wings. Feeding on that purple flower are several yellow and black ones, with crimson head and tail. By the side of the stream we are about to cross, we shall start off dozens of different kinds, all drinking on the wet sand, and some of them gay with metallic sheen, and brilliant colouring, blue, yellow, and red, and all adding by their merry and sprightly flight to the beauty of the scene. Within the woods the smaller and more sombre-coloured skippers delight to fly, generally having a favourite spot to which they return again and again, after a little game at hide and seek with their friends. But even among these, many are adorned with colours not to be found in our English groups. To give some idea of the abundance of the skippers, I may state that I have collected over 120 species, within a radius of eight miles from San Paulo, nearly twice the number of all the British butterflies together. Some of them seem fully up to the humour of a practical joke, and delight to wait on the surface of some great sun-lit leaf, and suddenly dart out at a

passing *Morpho* or *Papilio*, and then fly back to their favourite port, the majestic *Morpho* taking no more notice of them than a selemn mastiff does of a yelping cur. Sometimes I have had a merry skipper settle on the back of my hand, where he found food suitable to his palate, in the drops of perspiration brought out by the broiling sun. I am sorry to say that many butterflies are not at all refined in their tastes, and much prefer a meal off the dung of other animals to the nectar of the choicest flowers; and I have often seen some lovely and delicate creature taking his breakfast on the filthy greasy coat of one of the Italian navvies employed upon my work. The *Paphias* are much addicted to these disgusting habits.

The little streams that I have mentioned form most wonderful collecting grounds where they cross these sandy roads; indeed I know of no more productive spots than one of these where the road is in forest. At mid-day, when the sun pours down perpendicularly on the wet sand, the butterflies congregate in myriads, settling on the ground and applying their trunks assiduously to the water. There are certain patches that seem to have an especial attraction, and on these they are so closely packed that they may be said to be like the Irishman's "snipes" that were "usually jostlin' one another." I once made a swoop at a cluster of a little white *Terias*, just to see how many I could get into the net at once, and I counted fifty-two! A large sulphur-coloured species (*Catopsilia philea*) may be taken in quantities on these damp places. Their appearance as they rest in companies of twelve to twenty, with their large wings standing up and often leaning over to one side, has a striking resemblance to a fleet of tiny yachts in full sail. And *Papilios* and *Nymphalids* without number will also be taken at the stream. A man may spend a very profitable day by sitting under the shade of a neighbouring tree, and sallying out every few minutes with his net.

And now, as the heat has become rather trying, we may as well follow the suggestion ourselves, and have a little rest. But even here we shall have plenty to interest us and fill us with delight. First, we shall notice a great blue-bodied long-legged wasp lugging a huge spider up the bank on which we are sitting, running backwards with her heavy burden held tightly in her jaws. Finding the spider rather awkward to pull through the grass with his legs sprawling in all directions, she sets to work and nips them off one after another, and takes only the fat juicy body to be the food of the rising generation of grubs. Then we shall be bothered by the tickling of a lot of little tiny bees that are following the example of the skipper and having a

good meal off the backs of our hands. These bees are about half the size of the common house-fly, and have no stings, belonging to the *Melipona* group. Some of them make their nests in the ground, others in the hollow trunks of trees. The entrance to the nest is formed of a resinous substance, and usually projects in a trumpet shape some little way from the surface of the tree or the ground. I remember once knocking off one of these trumpets that projected three or four inches from a bank at about the level of my head, not knowing what it was ; and before I had time to run, I had a swarm of bees in my hair, buzzing and burrowing in all directions, and rolling themselves up in my hair. As I did not know at the time that they had no stings, I did not quite like the appearance of things, to say nothing of the sensation of these little bees rooting about my head. But I soon managed to get them all out, and was none the worse for the affair. These tiny bees make excellent honey, and their nests are much sought after by the Brazilian peasants. The sort that nests in the ground makes especially fine honey, quite clear and colourless, and of delicious flavour. Certain kinds of the tree bees are never molested, as the Brazilians say the honey is not fit to eat. This is probably from the bees collecting from some poisonous flowers.

As we still enjoy the cool shade of our friendly tree, we hear away in the distance the strange cry of the *araponga* or anvil bird, as it clangs away on the top of some lofty pinnacle of the forest. At this distance the sound is pleasant enough, though close at hand it is harsh in the extreme. The Brazilians are very fond of keeping this bird caged, and the way in which it jerks out its ear-shattering cry is excruciating. The only thing I can liken it to, if your imaginations are powerful enough to realise the combination, is a rusty hinge with a bad cough. A long sustained note of great volume and power, that the bird sometimes indulges in is not so objectionable ; but, altogether, I think keeping *arapongas* within two miles of one's neighbour's house, is an offence against society, and ought to be put down by the law.

But now, as the heat increases, the music of the birds begins to cease, and we hear only the sound of insect life. The cicadas are in their element under the fierce heat of the sun, and seem to be trying which can make the loudest noise. They begin with a complaining sort of whirr, on a decending scale, which is repeated at intervals, the interval becoming shorter and shorter each time, till at last the sound is almost continuous, giving one the idea of revolving machinery that is set in motion and gradually gains in speed ; then the insect suddenly breaks out into the most piercingly shrill note, that reminds one of

the whistle of a locomotive. Indeed, so remarkable is the resemblance that once or twice since I have returned to England, I have suddenly been recalled to the tropic groves by the sound of an extra shrill railway whistle at a distance. I have heard it stated that the cicadas sometimes go on trying to out-do each other to such an extent, that at last they burst with the exertion. This fable has evidently arisen from the fact that the empty skins of the pupæ, with a split down the thorax, through which the perfect insect has made its exit, are very commonly found attached to the trunks of the trees.

Before leaving the subject of musicians, I may mention that I have observed that several kinds of caterpillars (species of *Perophora*) have the power of making a low musical note, so low indeed that it can only be heard when close to the ear. In one species (*P. sanguinolenta*) it is an intermittent note, the intervals varying from one to several seconds. Though the note is so faint, the vibrations can be distinctly felt when the larval case is held in the fingers. In another species the sound is similar to the above, but is continuous, lasting for several seconds at a time. Another again is intermittent as in the first species. Once when I had some of these caterpillars in my room, for several nights I heard this curious note as soon as I laid my head on my pillow. For the first two nights I tried in vain to find out where the sound came from; but on the third night I discovered a cocoon spun in a fold of the pillow-slip, and on examination it proved to be one of the *Perophora* caterpillars that had wandered away from his food and taken up his abode in the above situation!

And now that we have rested a little, let us pursue our ramble over the next spur, and down into the lovely little valley with its waving fields of maize, between whose stately stalks the ground is sheltered and kept damp by the great leaves of the pumpkin, that already shows promise of a rich harvest of its gigantic golden fruit. As we descend we shall add to our captures at almost every step. Butterflies, beetles, gaily-coloured Hemiptera, grasshoppers, Hymenoptera and Diptera—some of the latter of large size—meet the eye at every moment, and as we approach the stream that spreads out into a miniature swamp at the bottom, thousands of dragon-flies fire the air and remind us of home, for there is more resemblance between these and our own species than is the case in the other orders.

And now we will strike off to the right along that shady lane that leads into the depths of the forest. This is the favourite haunt of two species of *Morpho*, *M. Hercules* and *M. Epistrophis*, both of them giants, and the latter of exquisite beauty. These will be seen in great

numbers lazily flapping along the lane, and occasionally having a dance with one another. Three or four of them circling round and round, and glistening in the rays of the golden sunshine that falls in patches through the shade, form a picture of great loveliness, and one which will remain for years in our memories and help to enliven many a dull and dreary hour in this dark and cheerless climate of ours. Later on in the season, near the tangled mass of "taquara," or native bamboo, if we come again on a bright summer day we shall be dazzled by that still more lovely species *M. Æga*, the whole upper surface of whose wings is of such a brilliant metallic blue that each motion flashes out blue light, and the insect seems almost too beautiful to belong to this every-day world of ours. And he knows his beauty, and is very careful of it; for so afraid is he of its getting damaged that he only flies during bright sunshine, and if a cloud passes over the sun he seems to fear the rain that *might* come, and immediately settles under some leafy shade till the sunshine comes again, and he can start once more on his airy gambols. I use the masculine pronoun purposely, for it is only the male that is so gorgeously adorned. The female is a very sombre creature in comparison with her mate.

The trees at each side of the shady lane are many of them laden with epiphytal plants. Orchids, arums, ferns of graceful form, delicate cactuses, and many different kinds of *Bromeliaceæ* grow in profusion, and make each branch a garden in itself. These air plants have a special charm to an eye that has been reared in a temperate climate, where it is accustomed to see only plants that grow in the ground; and a great part of the beauty of a tropical forest is derived from them. The Bromelias are especially interesting to the entomologist, as each one forms a little reservoir of water in which larvæ of insects are found that exist in no other situation. The water stored up between the leaves of these plants soon becomes half putrid with decaying leaves and forest dust that accumulate in it, and it is anything but pleasant to turn over one of these cisterns on to oneself when climbing the trees to search for the botanical and entomological treasures they are laden with. Some of the plants grow to a large size, and contain several pints of water—enough to make a man feel very uncomfortable if it is suddenly discharged down the back of his neck!

But if we begin to botanise as well as to entomologise, we shall never get back to the rancho; and a darkening of the western sky and a distant growl warn us that it is quite time to think of getting under cover, so we will walk on a little faster and try to reach the rancho by a different road from the one we came by, that leads nearly all the

way through the woods, before the afternoon storm reaches us. These storms are of almost daily occurrence during the hot season, and usually come on between three and five o'clock, though I have experienced some heavy ones in the early morning, and when these take place we may reckon on rain for the rest of the day. But the regular afternoon storm is generally of short duration, and leaves the evening fine, cool, and refreshing after the overpowering heat of the day. The sun rises in a cloudless sky; about ten o'clock light fleecy clouds appear and float gently by, gradually accumulating in great masses as they grow. At one or two o'clock they form large towers of cumulus around the horizon, and as the day wears on an occasional flash is seen to dart through them, illuminating their crags and crevices with a glorious dazzling white. Meanwhile the wall of darkness from beneath grows blacker, and rises higher and higher until the outskirts of the cloudy pall, fringed and torn with the tension of the electric charge, obscure the sun and cast a grateful shade upon the parched soil. Then the roll of thunder is heard, a mighty wind bows down the swaying trees, a few great raindrops patter on the outstretched leaves of the wild banana and the huge Cecropias, and in a moment the fury of the storm is upon us. Umbrellas and waterproofs are of little avail in such storms as these, the former only acting as a sort of sieve that cuts the huge drops into spray, and the latter collecting the little streams into a few great rivers that flow pleasantly into your boots. When I have been caught in one of these tornadoes I have made up my mind that I was going to get wet, and I have seldom been mistaken. In the midst of the turmoil the lightning is almost incessant, and the thunder one continuous roar. But this only lasts for ten minutes or a quarter of an hour, then one or two flashes and simultaneous deafening explosions announce the end, the rain lessens, and the storm has passed away, leaving the air cool and fresh, and all Nature rejoicing. Then the evening concert begins, the crickets leading off the orchestra of toads and frogs with their endless variety of wind instruments and drums. Bye-and-bye, as the sun sinks below the horizon, and the short tropic twilight deepens into night, the concert room is lit by countless hosts of fire-flies flashing out their tiny lamps in rhythmic pulsations, with here and there a great green electric light carried on the shoulders of a huge *Elater* beetle sailing majestically through the forest glades, and we enter on the glories of a tropic night.

But all this time, while I have been talking about thunder-storms, we will suppose that we have been walking briskly on, and can now

see the friendly smoke curling up from the chimney of my rancho, showing that my man Benedicto has not forgotten that we shall be ready for another plate of beans after our long walk ; and as the first great raindrops splash upon the thirsty leaves we step indoors, and congratulate ourselves that we are "just home in time."

And now, as I have only described the delightful side of the picture, perhaps it is only fair that I should mention some of the disagreeables of a day in the tropics. The first thing that will occur to you is *snakes*. Well, there are plenty of them, no doubt, and some of them are very deadly ; but for one venomous one you will see twenty harmless ones, and all of them get out of your way as fast as they can, and seem much more afraid of you than you are of them. Of course there always is the danger of treading upon a snake coiled up on the ground, and in this case he is sure to strike at your leg, and I always on this account wear good strong boots and leather leggings when on my excursions in the woods. But I can only say that, in nearly nine years' residence in Brazil, such an accident never happened to me, and I have never been really alarmed by a snake, excepting once when I was climbing over a wall on the further side of which the ground was nearly level with the top : and as my chin reached this level I saw the head of a great snake about six feet long, waving backwards and forwards within a foot or two of my face. I need hardly say I changed my mind about getting over that wall.

What I do object to much more than snakes is the army of mosquitos which in certain districts do their best to make life a burden. But even with these I have been very fortunate, and have not been much molested by them in my forest life. In the towns they are bad enough, and sleeping without a mosquito curtain is out of the question excepting during the cool winter months. But, after all, this pest is not confined to the tropics, and we need not go quite so far as Brazil to meet with it.

An insect that has given me a great amount of trouble is the Carrapato—a minute tick that buries its jaws in your flesh and causes most distressing irritation. These little beasts are about the size of a pin's head, and hang in clusters of a thousand or so on the leaves and twigs of the bushes in the campos that are inhabited by cattle, and as the unwary victim touches the mass they drop upon him and spread all over him. If detected at once, you can brush them off by violent switching with a bunch of twigs ; but if you go on your way without noticing the enemy, they will soon find their way to your skin and will annoy you for days afterwards, unless you have your clothes well

smoked on a wood fire, which will soon clear out the little beasts. Fortunately this species is not found in the forest, and we need not always be on the look-out for them excepting in the campos; and they only appear for a few months—from April to July, or thereabouts. There are two other species of Carrapatos that I have met with, one of them being about a quarter of an inch in diameter; but these are not so troublesome as the small ones, as they are solitary in their habits, and are much easier to get hold of when they get hold of you.

Then we have the “jigger,” that lively little flea that delights to burrow under the nails of the toes; and there are several kinds of biting flies that keep the business going while the mosquito is at rest in the daytime. But all these are only just to remind us that even life in that land of sunshine is not *perfect* bliss; and though at the time they are decidedly disagreeable, the memory of them soon fades, and leaves only pure delight in recalling the incidents of a day’s ramble “in the tropics.”

28th May, 1883.

NATURAL HISTORY NOTES FROM SOUTH AFRICA.

(Continued.)

BY S. D. BAIRSTOW, F.L.S.

UITENHAGE has another attraction for insects in the shape of burly oak trees, planted by the primitive Dutch settlers, and surrounding the town a fine bush supplies sufficient allurement for more timorous and less civilised fauna. The pretty *Cyclopides metis* abounds in the gardens. So does *Diadema Bolina* and *Papilio Demoleus*. *Danais chrysippus* is common, and *Acraea horta* likewise. In Port Elizabeth these butterflies are comparative visitants, and I might mention dozens of similar instances to stamp Uitenhage one of the first collecting fields in the Eastern Province of South Africa. Query: Where are our collectors? You give the riddle up, and so do I. The term Cape *ennui* is a misnomer for Cape laziness perhaps. We recognise a defeat. We deplore its legitimacy. We hope for a remedy, but we are not wide awake to emergency, to rouse ourselves from lethargy. Let us fill our pockets with gold dust, and then we may attend to the soul elevation department. This is not our home. Why waste money and time in adorning it or embellishing our brains. Two extremes meet. We are either rashly speculative or merely callous. I submit the argument with the best intentions. Dispute it who can. And yet I

grant that it *is* difficult to get away from filthy lucre ; but if a nation progresses, the ingredients of success are scribbled with a touch of scientific warp, of artistic weft, and steeped in the dye of attraction, when considering the Cape. Offer an interesting programme, and play to a crowded house. Announce a sermon on Dry bones, and sing

“ O solitude, where are thy charms ? ”

We are behind the times, and Channing's inferences, “ science has now left her retreats, her shades, her selected company of votaries, and with familiar tone begun the work of instructing the race ” ranks in the pages of history. I feel constrained to pen these words ; not all I would, but all I dare. We are deficient in self-reliance and activity in promoting and dispersing knowledge ; but brighter days, I trust, are coming. Three years since I visited the Port Elizabeth Museum. It reeked in filth ! Change and decay in all around I saw. Delapidated specimens groaned dustily of cruel inattention. Those which escaped ruin might even then have constituted the nucleus of a good collection. Now mark ! This museum is within the Town Hall, and the jurisdiction, I think, of a club termed Athenæum—whatever that may signify ;—more properly, “ Amateur Theatrical.” The key of the door was kept under a dirty cocoa-nut mat. I paid another visit just lately to the P.E. Museum, and if I say it was a disgrace to any town, I speak mildly, most sober truth, and disregarding persiflage or peevish utterances. Nothing succeeds like success. The “ A.T.” club flourishes, and our museum makes a capital dressing-room for would-be Hamlets, but it's rather hard on slighted donors of natural history specimens.

Legal technicalities are said to bar the way of renovation. More's the pity on't.

My next expeditions yielded many species of *Bombycidae*, principally *Saturinidae*, in their larval state, and some of them attain to enormous dimensions, but appear, for the most part, as social or company grubs, playing sad havoc amongst the leaves of their food-plants. I have not found many of them to be silk producers, at which I am astonished ; but there is an ugly fellow (*Borocera postica*) feeds on mimosa that weaves a cocoon and distributes its urticating hairs amongst the web. *Liparis auriflua* is out of the running, when scratched against this tyrant. Blessed man, who never fingered his Esauic skin or habitation ! The days of Inquisition are over, otherwise the ingenuity born of fiendish inhumanity must certainly have clutched a novel torture—rubbing the naked backs of miserable captives with larval hairs from

the Cape.* Silk from these cocoons is of good quality, and possibly of commercial value when the grubs are persuaded to oblige us by omitting filamentary admixtures. I have not been fortunate enough to rear them from chrysalids. All our *Bombyces*, on account of obstacles needless to enumerate, are troublesome to manage, and where successful, the breeder is not assured of satisfactory conclusions, as lovely grubs do not always realise lovely imagines. A few species of the genus *Saturnia* grow to an immense size before the final change ensues. The two larvæ I have sketched from preserved specimens are extremely common, gregarious, and destructive. Another large and beautiful caterpillar is *Antherœa cytherea*, very common.

† *Antherœa menippe* (Fig 1, pl. 8), if partial to field or garden crops, would rank conspicuously amongst our deadly enemies, and *Bunceæ Caffraria* (fig. 2), if not so plentiful, is equally destructive. The latter possesses spines like "fretful porcupine," the former tridentate forks (fig. 1A). I have been obliged to stuff my giants with cotton wool in order to preserve them. I struggled perspiringly to inflate one for an artist's model, so you need not smile captiously at the term cotton wool. With unprofessional impatience I puffed and snorted, blew, and panted, and then tried Clarke's spray producer, "after Porritt," all to no purpose; nothing had inflated but my cheeks. I staggered to a seat exhausted and sad, appropriately yelling "Caterpillar be blowed!" The little whisper of faith suggested historical Alfred, of heroic stick-to-it fame, of brave Robert the Bruce, and, lastly, the example of some modern "Child-teacher" writ in most encouraging words, "Try, try, try again." &c. "Keep it up!" said the sprite, "Thanks! not if I know it," responded yours very respectfully: and stuffed my specimens remained. The larger *Nocturni* are naturally pretty well known, and fairly represented in S.A. Museum. Our Sphinges are numerous and varied, and my old friend *A. Atropos* poses in Port Elizabeth as a vine pest and a hive.

(To be continued.)

Notes and Queries.

NOTES FROM CAMBRIDGE.—As far as the nocturnal lepidoptera are concerned, 1883 has been a very unprofitable season here, and most of our local insects have been either exceedingly scarce or conspicuous by their absence. I worked hard at pupa digging last autumn and during

* Fig. 3. (Pl. 8) represents one of the hairs of a grand *Geometer* larva, captured in the Perie Bush. The specimen figured is slightly magnified at its apex, which is of a lovely Prussian blue; larva, bright yellow with black and irregular bands, or colliding spots interspersed on surface with short hairs.

† Authority—Trimen.

the present winter, but, I think, never with such little success. I have really taken nothing worth mentioning. *Papilio Machaon* seems to be disappearing. I remember the time (and that not so very many years ago) when I used to take it in the very suburbs of Cambridge itself, but I have not seen it lately. It may still be found in the fens, although far less plentiful than of yore. *Argynnis Aglaia*, *A. Euphrosyne*, and *Thecla betulae* are of general occurrence in this county, but I did not meet with either of them last year. *Melitæa Artemis* and *Hesperia comma* I have not seen at all of late years. A piebald specimen of the water vole (*Arvicola amphibius*) was taken in the vicinity of a village near here last September; and a perfectly white mole (*Talpa Europæa*) was caught about the same time and near the same place.—ALBERT H. WATERS, Cambridge. [I saw *Papilio Machaon* in abundance on Wicken Fen, Cambridgeshire, at the end of May, 1882.—G. T. P.]

Lastrea cristata.—*Lastrea cristata* was, I believe, first found in Yorkshire on Thorne Moor, by my now aged friend, William Casson, of Thorne. I have a fine frond of his gathering from that station in my herbarium, with the date of 1856 attached. He met with it, I believe, in considerable abundance. If Mr. John Hardy, of Manchester, found this species on Thorne Waste before that date, my supposition with regard to Mr. Casson being the first finder of the fern in Yorkshire, is, of course, a mistake.—J. BACKHOUSE, West Bank, York, Feb. 7th.

“WHERE ARE THE INSECTS?”—I do not know if Mrs. Hutchinson, of Leominster, has seen the *Naturalist* for December, but in a letter received from that lady to-day, she adds a P.S. as follows:—“We are so overstocked with small birds—they rise in flocks of thousands—that all insect life that they eat is cleared away. We rarely now see a butterfly or moth here; the last two years have been blanks.” On the contrary, Mr. Bond writes—“I do not know where all the birds have got to. We rarely see anything except sparrows and tom tits.” I can only suppose that in the latter case all the insect life at Staines has been eaten up, and the birds have had to find fresh quarters. This idea seems strengthened by the fact that the tits and sparrows have remained; the former are able to hack their lurking prey from their holes, and the latter can subsist a great deal upon household refuse. I should think the effect of this in time would be to drive the insectivorous birds entirely from the country.—S. L. MOSLEY, Beaumont Park, Huddersfield, Feb. 9th.

We notice that a contributor to the February number of the *Entomologist*, writing from Upper Norwood, takes Mr. Mosley's view in attributing the scarcity of insects to the increase of birds.—Eds. *Nat.*

Epeira diadema AND *Salticus scenicus* IN YORKSHIRE.—Noticing records of these species for Yorkshire at p. 84 of vol. vii., induces me to mention that on the 3rd Sept., 1883, I took a specimen of *Epeira diadema* (female) on a rock on the side of Ingleborough, about half-way up the mountain,

just beyond Ribbleshead Station ; it almost exactly matched the rock in colour. In the year 1881 I took several specimens of *Salticus scenicus*, the zebra hunting-spider, in a greenhouse in York. These additional localities may perhaps interest some one interested in the geographical range of this group of animals.—GEO. W. OLDFIELD, Harrogate, 13th Feb., 1884.

SUPPLEMENT TO THE VERTEBRATE FAUNA OF YORKSHIRE.—Messrs. W. Eagle Clarke and W. Denison Roebuck, Leeds, are preparing a supplement to their "Handbook of the Vertebrate Fauna of Yorkshire," and would be glad to receive notes of additions or corrections to that work, or notices of the occurrence of any species of quadrupeds, birds, reptiles, or fishes in Yorkshire, which their friends may be pleased to communicate. As they wish to publish the supplement in the April magazines, it is hoped that information may be sent in immediately.

REVIEW.—"Transactions of the Huddersfield Naturalists' Society.—Part I."—We are very pleased to find that the Huddersfield Naturalists' Society has decided to publish annually a part of "Transactions." Part I., just issued, is before us, and we congratulate the Society on the result of the beginning of its venture. The Part contains the Annual Report of the Society for 1883, including the work done by the Geological, Botanical, Vertebrate, and Entomological Sections, from which we find that much useful work has been accomplished. The report of the last-mentioned section, however, does not give an adequate idea of what was done in Entomology during the year ; for few, we imagine, will concur with the remark that "the feature of the year has been the abundance of the Autumn moths at lamps," when the fact remains that seven species of lepidoptera were discovered quite new to the district (three of them indeed new to the county) ; yet, although it is a good many years since such an occurrence took place in the Huddersfield district, no allusion whatever is made in the report either to the circumstance or to any of the species. The names of all new additions to the fauna and flora ought surely to be most prominent items in the reports on the work done in the district. Then again, the report says, "several species which have only occurred singly before, were this year extremely abundant." We are much interested to know what species are here alluded to, as we certainly neither heard of nor noticed anything of the kind ourselves. The feature of the Part, however, is "A Catalogue of the Lepidoptera found in the Huddersfield District." There are lists of both the Macros and the Micros, and as they seem to be complete and accurate so far as the district is known, they will doubtless prove of great value to the younger lepidopterists of the Society and neighbourhood. The summary gives 339 Macros and 327 Micros, or a total of 666 species as having been taken in the district. The Macros have been well worked up, but the number of Micros will no doubt be considerably increased as years go by. The price of the Part to non-members of the Society is 1s. 6d. and may be had from the Secretary, Mr. S. L. Mosley, Beaumont Park, Huddersfield.

OBITUARY.—WILLIAM BÜCKLER.—Lepidopterists throughout the country will have heard with intense grief of the sudden death of Mr. William Buckler, of Lumley House, Emsworth. The warmth and enthusiasm of his correspondence endeared him to every one with whom he had such an acquaintance, and the formation of a friendship made with him in this way was, we suppose, claimed with pride by almost every lepidopterist in Britain who had spent a few years in earnest study of the life histories of this group of the British insects. For twenty-five years Mr. Buckler devoted his energies to the delineation of the larvæ of our British lepidoptera, and not only with his beautiful figures, but in his lucid and careful descriptions (which are so well known to every reader of the "Entomologists' Monthly Magazine"), he had no rival. Our own correspondence with him commenced early in 1868, and we have just been looking over the mass of information about larvæ contained in the letters received from him after that date. Truly he "died in harness," for the first paper, extending to nearly seven pages, in the current number of the "Ento. Mo. Mag." (February, 1884), on "The Natural History of *Aglossa pinguinalis*," is written by him under date "January 2nd, 1884." A week later, on January 9th, he had passed away, from an attack of bronchitis, at the age of 69. It is reported his figures of larvæ will probably be published by the Ray Society, and that Society we are sure could not be engaged on better work.—G. T. P.

Rainfall for January.

	Height of gauge above sea level.	Rain-fall.	No. of Days	TOTAL FALL TO DATE.		Date of heaviest Fall.	Amount of heaviest Fall.
				1884.	1883.		
HUDDERSFIELD (Dalton) ... (J. W. Robson)	Ft. 350	In. 5·75	21	2·93	*33·74	22	1·26
LEEDS ... (Alfred Denny)...	183	4·04	18	4·04	1·86 †	23	0·70
HORSFORTH ... (James Fox)	350	3·77	19	3·77	2·46 †	22	0·92
HALIFAX... (F. G. S. Rawson)	365	8·72	24	8·72	8·40	22	1·80
BARNSELY ... (Dr Sadler)...	350	3·68	18	3·68	3·37	23	0·82
INGBIRCHWORTH (Mr. Taylor)	853	7·32	21	7·32	6·55	22	1·50
WENTWORTH CASTLE (Mr. Fisher)	520	4·29	17	4 29	4·69	23	0·85
GOOLE (J. Harrison)...	25	3·60	18	3·60	2·12	23	0·78
HULL (Derringham) (Wm. Lawton)	10	2·82	14	2·82	1·51 §	23	0·69
SCARBORO' (A. Rowntree)...	130	2·99	17	1·16 ||	...	23	0·56
THIRSK... (W. Gregson)	100	4·42	17	4·42	...	3	0·89

* Average to date for 17 years, 1866-82.

† Average of 30 years, 1853-62, & 1865-84.

‡ Average of 15 years, 1870-84.

§ Average of 34 years, 1850-83.

|| Average of 18 years.

Reports of Societies.

HECKMONDWIKE NATURALISTS' SOCIETY.—Meeting, January 26th, 1884.—The president (Mr. J. A. Erskine Stuart) gave an interesting report on the natural history of the month, exhibiting a variety of floral specimens, wild and from the garden, forwarded by Dr. C. Stuart, of Chrinside, Berwick. Reports of local ornithology and botany were also given by the members; amongst other records was that of a thrush's nest, containing four eggs, having been found on Dec. 24th, 1883, at Overthorpe, near Thornhill. The president afterwards read a paper on "Diseases of Plants."

HUDDERSFIELD NATURALISTS' SOCIETY.—Meeting, Feb. 16th, Mr. J. Shaw in the chair.—Mr. T. W. Woodhead named a number of plants in flower. Mr. Mosley stated that he had just returned from Rainworth Lodge, in Nottinghamshire, where he had been staying, sketching varieties of birds from the very rich collection of the owner, Mr. T. Whitaker, F.L.S., for the purpose of publishing figures of them in his work on "British Birds." He exhibited his sketch book, containing over 70 figures, most of them exceedingly rich; he also exhibited an egg of the tufted duck, presented to him by Mr. Whitaker, and taken on the ponds at Rainworth Lodge, the only place in Britain where this bird is known regularly to breed.

MANCHESTER CRYPTOGRAMIC SOCIETY.—Dr. B. Carrington, F.R.S.E., in the chair.—The hon. sec. exhibited Continental specimens (in fruit) of *Tortula paludosa*, a species of moss which has recently been added to the British flora, barren specimens of the same having been found in Wales. The Continental specimens have been gathered by Dr. J. B. Wood and Professor W. P. Schimper, in Switzerland, 1872. Mr. W. H. Pearson read a short paper on a collection of Hepatics from Norway and Sweden, which had been sent to him by Prof. N. C. Kindberg, of Sweden; altogether, about 60 species were enumerated, amongst the rarest being *Gymnomitrium coralloides*, *Scapania subalpina*, *Jung. Kunzei*, and *J. saxicola*. Specimens were then distributed by Mr. Pearson; he also exhibited specimens of *Scapania irrigua* (new to Derbyshire), collected at Kinder on November last, by Messrs. Whitehead and Holt. Mr. Pearson brought before the notice of the society Professor Massolengo's recent work on the *Uridineæ Veronensis*. Mr. Cash exhibited a moss new to Europe, *Fontinalis Ravani*, which had been discovered in 1882, and sent to him by M. de Buysson, a French corresponding member of the society. The moss appears to have a more delicate habit than any British species of the genus. Mr. Stanley exhibited under the microscopic, the spores and spore cases of *Selaginella*; he also exhibited a micro-photograph of Thomas Brittain, a former vice-president of the society. Mr. George Burgess exhibited a number of freshly gathered mosses from Ingleton and Derbyshire.—T. Rogers, Hon. Sec.

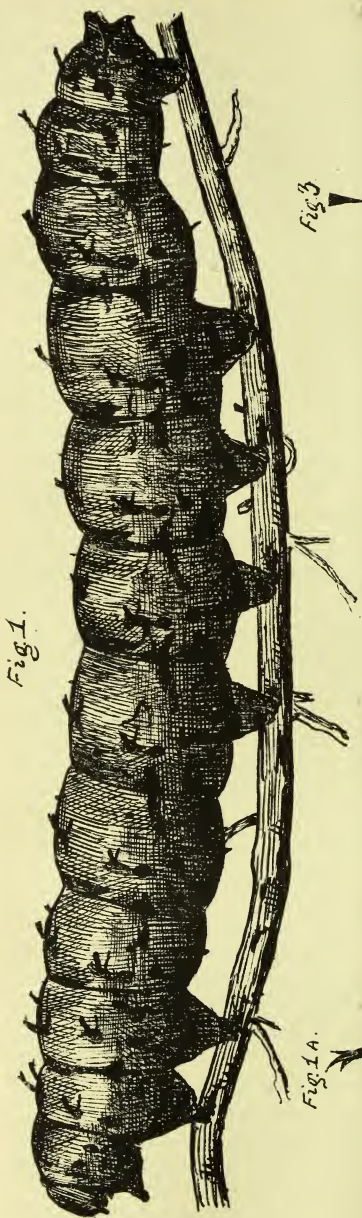


Fig. 1.

Fig. 3.

Fig. 1A.

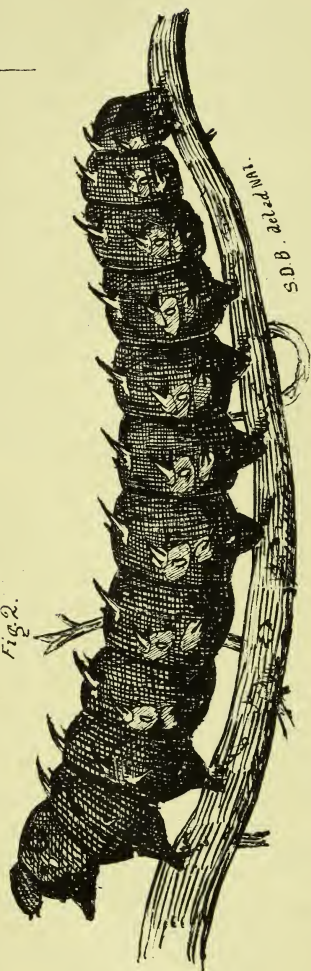


Fig. 2.

Wm. Peck
S.D.B.

Original Articles.

NATURAL HISTORY NOTES FROM SOUTH AFRICA.

(Continued.)

BY S. D. BAIRSTOW, F.L.S.

* * * NOTE.—Owing to the absence of both Editors from Huddersfield, Plate VIII. was accidentally omitted from the last number, but is given this month; and the last sentence in Mr. Bairstow's paper (p. 136) ought to have appeared as the beginning of the present part.

OUR Sphinges are numerous and varied, and my old friend *A. Atropos* poses in Port Elizabeth as a vine pest and a hive-robber, whilst by many up-country agriculturalists it is held in terror and superstitious awe.

The *Chelonidæ* contain some lovely species, several of which I doubt not hibernate as larvæ, as at home. One of our most striking moths, *Pais decora*, I have taken during the season, flies over grassy plains, and is readily boxed. It resembles *Abraxas grossulariata*, both in flight and metamorphoses. The larva, pupa, and imago exhibit coincident forms of colour. Several of the *Zygænidæ* swarm where they locate, and are always welcome friends. At Rondebosch—a delightful retreat near Cape Town—I saw thousands of them pursuing their revels beneath the glare of a fiery sun. *Procris nebulosa* is not uncommon, but a moth (sp. ?) I was pleased to greet as a *Procris* never fell to my net in the old country. I have not yet discovered a solitary *Hepialus*,* but should suppose the genus is represented. To speak of Geometers, Noctuas, and Micros—

I would if I could, but I can't,
If I could *when* I would, then I dar'nt.

To integrate such a history necessitates the combined efforts and researches of a complete nation of lepidopterists. Monographic mention elevates one to insult the rest. Mr. Spiller mentions a few Natalian moths† that are recorded also from Great Britain, and I notice a species of *Plusia*, closely allied to *gamma*.

The hemipterous fauna of South Africa, says Dr. Buchanan White, F.L.S., is “pretty well worked,‡ although a great deal remains to be
N.S., VOL. IX. APR., 1884.

* Since penning this, *Hepialus antarcticus* is registered from Cape Town in the S.A. Museum Blue Book.

† *S. Convolvuli*, *S. Celerio*, *C. Nerii*, *A. Atropos*, *D. Pulchella*, *S. Sacrararia*, *Heliothis Armigera*. (*Ent.*, vol. xiii., p. 83.)

‡ The only book on this order known to me is Stahl's *Hemiptera Africanæ*, which covers the entire continent.

done, especially amongst the smaller species." Such a summary applies to the majority of natural orders. Large insects as curios, readily find their way to other countries, and animals which tickle the drum of human amazement are unearthed from their native habitats. We are neither deficient in stinging bugs nor stinking bugs, lovely bugs, ugly bugs, and noisy bugs. I submitted a small collection of them to Dr. White, gathered haphazard in different parts. One of our most interesting bugs, by reason of its leafy shape, which bars the way of detection, is *Phyllomorpha paradoxa*, Sparm. I took one on my coat sleeve a short time ago, and have seen several belonging to other naturalists. The specimen I sent to Dr. White came to grief *en route*, but I have since ensured its name in accordance. Dr. White names also the following species :—*Reduvius erythrocnemis*, Germ., a powerful biter ; *Lygoens elegans*, Wolf., a pretty thing, common on *Ornithogalum*, &c. ; *Pseudoflata postica*, Spin., a delicate green Homop., extremely local ; *Scantius Forsteri*, F. ; *Mictis curvipes*, F. ; and a water bug, *Appasus luridus*, Germ., "occurs also in Egypt," White. We have a fair number of *Cicadae*, of yell-erlasting fame. Dr. White notes *Platypleura hirtipennis*, var. b., and *P. stridula* probably, though not altogether agreeing with it.

The *Arachnidæ* differ materially from the foregoing, inasmuch as they have scarcely been studied at all. This is the more strange when we reflect how much of interest is absorbed in the one word spider, and how ignorant we remain of the habits of scorpions and of ticks, three families classified together but infinitely apart. What connecting link exists between the two former is vaguely defined, and their homologies are questionable. Those who have paid any attention to the economy of the scorpion would be astonished when told that science places the beast on the same platform with the spider. To see a life-to-life encounter between a *Tarantula* (?) and its supposed brother is but to increase the wonder. One fights like the condensed phantoms of all Furies. The other more calmly awaits, sneak that it is, until weakness intervenes, when it spurs to the rife contest, and a spider's *requiem* is pronounced. But it seems to me that classification of the future will depend not upon the habits of animals, relationship of economies, or forms, but upon affinities of internal structure, and comparative resemblance of vital organs. Dr. D. Astley Cresswell, during a recent visit to the Colony, collected and took with him some living scorpions for anatomical purposes, but I have not yet learned whether he succeeded in his endeavour. We shall score one for Science when the relative positions of scorpions and crustaceans are indelibly fixed and generically defined.

Mons. Eug. Simon, to whom I forwarded a small number of S. A. *Arachnidæ*, remarks in the preface to his list—"All your spiders are of great interest. A genus *Colophon*, recently described by Rev. O. P. Cambridge, is new to me, and another is new to science, and allied to *Themisoides* of South America.....The scorpions are also good.".....

That much sound work remains to be done in this most attractive order, the following list, from an eminent naturalist who makes it his study and delight, will certainly demonstrate. I give it *verbatim* after M. Simon.

SPIDERS.

Colophon Natalensis, O. P. Cambr. (one specimen); *Nov. gen.*, allied to *Themisoides* (two specimens); *Lyiola pulea*; *Neniga*; *Phlegra, sp. ignota*; *Drassis, sp. ig.*; *Palpimanus, sp. ig.*; *Misumena, sp. ig.*; *Thomasius, sp. ig. (pulla)*; *Selenops, sp. ig.*; *Eresus Africanus*, C. Koch. female; *Lithyphantus, sp. ig. (f. sp.)*

SCORPIONS.

Loimura, sp. ig.; *Battsus, sp. ig.*, probably *villosus*, Peters. *Lityus lineatus*, C. Koch.

I have heard many travellers speak of dangers in South Africa. Tigers, reptiles, &c., &c. I do not believe one word of it. Big game is timid, wild animals flee at man's approach. Ticks are far stronger foes. You cannot shoot, spear, crush them. You are powerless. Walking or sitting, they inhabit your trousers. Sleeping they inhabit your flesh. Collector, they infest your beetles and bees, they appropriate your shells. Botanist, touch not that flower! Glorious *Protea periiifolia*, tempt him not so tantalizingly. Your fluffy beauty is distorted with a myriad ticks. Your envelope contains a pandemonium of insect horrors. If I pluck you from your native velvet, your parasites will suck my native blood and smear my native legs, and I can only pomade them out after the damage is done—for remonstrance is in vain.

This insect phlebotomizing is possibly designed to maintain the balance of human strength. Dame Nature is more intimately acquainted with æsculapian tactics than we are, and she has some motive for designing blood-sucking quacks, to practise in tropical or sub-tropical countries. Her human subjects are at liberty, notwithstanding, to kick against the pricks when they are sharply pointed. I have assigned to the *Arachnida* a very subordinate place in my list. Lovers of the order may justifiably give it a more elevated footing. The

remarkable or attractive neuropterous insects of Southern Africa were popularised long ago, and very few *amateur* collectors reach home unrepresented with a formidable ant-lion or dragon-fly. *Libellulæ* of all sizes and colours abound, not only near the banks of streams and rivers, but on upland flats in time of drought, when a glimpse of half-a-pint of water, fresh or stagnant, would seem a miracle. We have also innumerable species of *Phryganidæ*, whose architectural skill is never at a nonplus, and I possess a few gnat-like creatures yet undetermined. But to conclude my brief sketch of impressionable insectography without an allusion to our wonderful termites, even at the risk of desecrating Mr. Smeathman's sanctum, I am powerless. The world is fond of change. Fashion propels animation—animation, fashion. Any sort of a social lion will answer the purpose *if* that lion becomes popular. When Londoners are really hard-pressed for a novelty, let them bribe authorities at the Zoo to import a shipment of termite ant-hills. Provided all goes well I guarantee a splendid hit *if* an evacuation can be managed at the approach of sightseers. I have seen one flight of termites, and I count that moment one of the happiest in my life. They came not in myriads but in unceasing streams.

“ They fell to earth I know not where.”

Mr. J. Martin, of Swansea, a recent visitor to this country, stayed for some time near the Katberg, and had ample opportunity of watching their habits. I received several specimens by post, they had dropped their wings in transit, excepting one which retained the left posterior until its death. He told me that when he plunged his stick into some of their abodes, he found them ready for swarming. A few months ago I visited the farm of a friend near Maitland Mines. Arriving early in the morning, I discovered many termites on the ground and in the river, and numbers of birds snapping them up with avidity. Whilst we were breakfasting a gentleman remarked that within a couple of hours of their appearance he could not find a solitary specimen. This was not entirely my own experience, but almost. Mr. Martin made some most valuable notes on the habits of termites, and I should be glad to read them in due course in the pages of the *Naturalist*.

We do not derive serious inconvenience from white ants in this immediate district ; but they are a complete pest in some parts of the country. L'hermite de Winterhoek writes me as follows :—“ The only extraordinary symptom of activity which I have observed lately, was

in the case of termites or white ants, which are, during the warm season, such a pest in this country. It is very seldom during the winter that they appear above the surface, but on the 13th of this month (August) the ground was darkened by swarms of those insects, hastily carrying to their nests the dry leaves and stems of the plants* of which I send you by this post a specimen. On the 8th we had a fall of snow, and it kept extremely cold until the 13th, which was a warm day, whilst from the 14th the thermometer lowered again. There are houses in this neighbourhood which their owners have been compelled to abandon altogether, the ants having taken possession of them, from the floor to the ceiling. I have tried lime and various other means to expel them, but have so far succeeded only partly to keep them aloof from places imbibed with Calvert's disinfectant. Teak wood is said to be the only kind which they do not pierce. Information on the subject would prove very beneficial to the farmers of South Africa."

Respecting Vertebrata my first impressions are scarcely worth recording. Mammals (Rodents or a few small and common Carnivora excepted), kept without my reach, and the reptiles I avoided until I learnt a little more about the "pisenous" species. I don't mean to say that I have not seen a jackal monkey, baboon, porcupine, or any ordinary brute. I desire their skins better than their friendship; but I certainly was pleased in spotting a fine Monitor Lizard, common in our valley stream. I was glad to secure a handsome hawksbill turtle, cast up by the sea waves.† Its interior was a perfect mess of shell pottage. Our common tortoise is, I believe, *Testudo Græca*, but the great berg tortoise, the starry, and the trap tortoise, occur also in some districts. We have a great variety of non-poisonous snakes, and some really lovely species. I have met and run away from a puff-adder—a most deadly reptile. I have been called in by my next door neighbour to measure the proportions of a sweet little night-adder. When first seen, it was passing over a lady's naked foot. That lady remarked to her good man—"My love! (I think that was the expression, perhaps it was dear! I really don't recollect), there is a snake on my foot!" That lady was a Joan d'Arc. The good man grasped a lead weight and smashed that night-adder's laterals just as they were disappearing

* One of the *Chenopodeæ*, a true *Salicornia*.—R. Hallack.

† Probably gone astray. A visitor from eastern seas. We have also a green turtle. Some of these in the up-country districts are taken of tremendous size, over six feet long.

through a hole in the wall. Mind! this is a rank exception to the rule of safety. I repeat—reptiles will “git,” as the Yankees say, if they only git half a chance.

When I first dipped my pen into the ink, I had intended to demolish a thousand details in few words, but, proceeding, letter has succeeded letter, and I am writing still. The order of things is reversed, and it may be that my first impressions, when totted down, bear the epitaph

“Here lies little matter in much room.”

So be it! If you think I am going to sit down to a quiet dish of hash without gravy, or task without pleasure, it is an egregious error. But no! you have conceded me space for intervening moral and philosophical discursions, and I am happy. There is one sentimental sigh yet to eject, or rather a diversion to entertain. How gladly your Yorkshire weavers rise with the lark, bolt a scanty breakfast, rush breathlessly to catch a lazy excursion train, suffer the stuffy atmosphere of a third-class smoking compartment, risk the penalties of railway accidents, impatiently submit to never-ending stoppages, delays, and ticket inspections, waste eight hours travelling for a two hours' revel in the delights of one snatching peep at the rolling sea, or a ramble on the orange peel bespattered beach. And here I may view the lordly ocean any moment. Such an ocean too! Gaze across from the N.W. angle of Algoa Bay to the opposite shore. Trace the hazy line of pearly white sand which separates true land from true water. Raise your eyes and define the junction of mountain and sky. Leslie, paint nature truly, and your effort is adjudged a fraud. Turner, turn'er attention to that threatening sky, those angry breakers, and imitate action on canvas. Museful poet, does your poetic license avail sufficiently? Ransack the mine of thought and imagine when you cannot find. No appropriation, however sublime, will serve you here. Nature's beauty has oft been studied, but never spoken. Grand old ocean, you lack an impossible champion. I love you when your bosom heaves in mighty anger, or gently sways in smooth complacence. I love you in a thundering roaring temper, and I love you when the rage subsides. Nay, if beneath your glassy surface is concealed a treacherous heart, I love you still. Dash your sprayful arms against the whitened strand, or ripple softly on the shore, I care not. I love you in any mood and upon all occasions. They call you vile and fickle. I think you are genuine and constant, and most assuredly aristocratic if length of lineage is veritable proof. I too would cast away the shuttle and

suffer much to gaze at your lofty presence for one moment's pleasure. And as I love my liege, so do I revere his subjects, and of these I shall now speak.

(To be continued.)

NOTES ON THE VERTEBRATE FAUNA OF YORKSHIRE,
1881-1883.

BY WM. EAGLE CLARKE, F.L.S., AND WM. DENISON ROEBUCK.

It is our intention to prepare from time to time—annually if possible—a report upon the vertebrate fauna of Yorkshire, in which we propose to embody not only notices of the rarer and more interesting occurrences in the county during the period covered by the scope of the report, but also such records of older date as may have escaped our attention during the compilation of our “Handbook of the Vertebrate Fauna of Yorkshire,” together with such emendations and corrections of the statements contained therein as may seem to be called for.

The scope of the present report includes the period of time which has elapsed since the publication of our Handbook in the autumn of 1881 down to the end of 1883. The records in our hands for the present year are reserved for a future paper. This report includes notices of the kind above indicated concerning 87 species, of which the following ten appear to be additions to the Yorkshire list:—*Rhinolophus hipposideros*, *Emberiza rustica*, *Torpedo hebetans*, *Raja maculata*, *Auxis rochei*, *Trachypterus arcticus*, *Regalecus grillii*, *Engraulis encrasicolus*, and *Orthogoriscus truncatus*. But in addition to these there are various occurrences we have to record which are of special interest, such as those of *Vespertilio Nattereri*, *V. mystacinus*, and *Delphinus tursio* among the Mammalia, of *Turdus varius*, *Cyanecula sp?* *Cypselus melba*, *Botaurus lentiginosus*, *Ardea garzetta*, and the breeding in the county of *Querquedula circia* and *Spatula clypeata* among the Birds, and the occurrence of *Brama Raii*, *Mugil septentrionalis*, *Regalecus Banksii*, *Ctenolabrus rupestris*, *Nerophis aquoreus*, and *Atherina presbyter* among the Fishes.

The Numerical Summary of species now stands as in the following table, the British forms being also given for comparison:—

	YORKSHIRE.	BRITAIN.
<i>Mammalia</i> :		
Terrestrial ...	32	45
Marine ...	13	26
<i>Birds</i>	307	380
<i>Reptiles</i> :		
Terrestrial ...	4	7
Marine	2	2
<i>Amphibia</i>	6	7
<i>Fishes</i> :		
Freshwater ...	32	53
Marine ...	123	196
	519	716

A few preliminary remarks on the chief features of the following report will not be without interest.

The MAMMALIA of Yorkshire were for the most part so well known at the time of publication of the Handbook, that but little is required by way of addition or correction, except so far as regards the two groups—the Bats and the Cetaceans—which appear to be always the most imperfectly studied mammals in any district.

With regard to the Bats, the result of Roebuck's investigations has been that, with the assistance of correspondents, the geographical range of some of the forms in Yorkshire has been studied to some purpose. One species is added to the list, and two others—hitherto only recorded for the county on the strength of isolated occurrences—have been fully confirmed as inhabiting the county, one of the latter indeed proving to be a common and widely distributed form. There is yet good work to be done in this group, for Daubenton's Bat—which is sure to be found sooner or later—has not yet been detected. Yorkshire appears still to remain the northern limit of the range of the Noctule, as Mr. R. Morton Middleton informs us that its reported occurrence in South Durham was not confirmed.

The study of the Cetaceans is much more difficult from their habitat and large size, and our only hope is that a competent naturalist may be at hand in the event of the capture of animals of this order.

BIRDS.—Numerically the Yorkshire avifauna remains at 307, the addition of the Rustic Bunting being counterbalanced by the subtraction of the Barbary Partridge. Should, however, specific rank be accorded to Pallas's Great Grey Shrike, as is done by Mr. Seebohm, this form would also rank as an addition.

Here it will be advisable to call the pointed attention of our readers to the two paragraphs at the head of p. xxxvii. of the Introduction to our Handbook, which appear to have been overlooked by some of our critics, who might there have learned that we never allowed or recognized the claims of such dubious records as those of Richard's Pipit, the Purple Martin, the Great Black Woodpecker, the Hairy Woodpecker, the Little Owl, the Acadian Owl, the Harlequin Duck, the Passenger Pigeon, the Virginian Colin, the Sooty Tern, and the Laughing Gull. None of these are included in our numerical summaries, although in the body of our work we felt it quite within our duty to give the evidence of their occurrence for what our readers might consider it worth.

REPTILES AND AMPHIBIANS.—As to these groups there is nothing to remark except that it is very desirable that naturalists should keep a look-out for further occurrences of the Natterjack Toad in the county. As to the so-called Sand Lizard, we have not yet been satisfied that the animal occurs so far north, the Northumbrian occurrence hinted at on p. xli. being a myth.

As to the FISHES—the least-investigated class in our fauna—we are pleased to be able not only to add seven species to the list, but to give a variety of further particulars and additional occurrences of interesting forms; and it may be as well to remark that to the severe storms which prevailed in early April, 1882, we owe several records of pelagic and abyssal forms, such as the Torpedo and the Deal-fish, and other rare species. No doubt had naturalists been more numerous in our sea-board towns and villages, others would have been detected.

The numbers which are prefixed to the names are intended to correspond to those used in the Handbook.

MAMMALIA.

1. *Rhinolophus hipposideros* (Bechst.). *Lesser Horse-shoe Bat*.

This species—an important addition to the Yorkshire fauna—is not uncommon at Eavestone, near Ripon, where it is taken by Messrs. James Ingleby and William Storey, from both of whom Roebuck has received specimens in the flesh, and one or two alive (Zool 1882, p. 186; Nat. 1882, p. 166).

12. *Vespertilio Nattereri* Kuhl. *Reddish-gray Bat.*

Two specimens were sent in the flesh to Roebuck by Mr. W. Storey of Pateley Bridge, who captured one of them on the 24th of May, 1883, in Harefield Wood, near that place, and the other in the same habitat a few days later.

15. *Vespertilio mystacinus* Leisl. *Whiskered Bat.*

This species, which our work was the means of introducing to the Yorkshire fauna, may now be considered as a widely distributed and fairly numerous form in the county. Roebuck has had specimens from Harrogate (Grange), Eavestone (Ingleby), Pateley Bridge (Storey), Ben Rhydding (Smethurst), &c.

23. *Martes sylvestris* Nils. *Marten.*

Specimens are recorded as having been killed in Raydale and in Kexby Woods, near York (Field, Oct. 1, 1881, p. 504).

28. *Meles taxus* (Schreb). *Badger.*

Stragglers continue to be reported from time to time, as at Yarm, Sleningford, &c.

} 42. *Hyperoödon rostratum* (Chem.) *Common Beaked-whale.*} 43. *H. latifrons* Gray. *Broad-fronted Beaked-whale.*

Mr. Southwell informs us that *H. latifrons* has been proved to be the male of *H. rostratum*, thus diminishing the Yorkshire list by one species.

50.—*Globicephalus melas* (Trail). *Pilot Whale.*

One was captured off Flamborough, in February, 1865, and recorded as the "Ca'ing Whale, *Globicephalus deductor*" (J. Freeland Young, Field, Feb. 25th, 1865.)

53. *Delphinus tursio* Fab. *Bottle-nosed Dolphin.*

One stranded near Goole, Oct. 4th, 1881, the identification of which was confirmed by Mr. Thomas Southwell (Bunker, *Naturalist*, 1881, p. 66).

BIRDS.

5. *Turdus varius* Pall. *White's Thrush :*

Additional occurrences: Rimswell, near Withernsea, one shot during the first week in November, 1881, and now in the collection of Mr. R. T. Burnham, of Rimswell, where Clarke has seen it.

Waplinton Manor, near Pocklington, one shot in early January, 1882, (Backhouse, *Zool*, 1882, p. 74; Inchbald, *Field*, 1882, p. 201).

8. *Turdus torquatus* L.. *Ring Ouzel*.

The solitary instance of this species nesting near Beverley must now be considered doubtful.

11. *Cinclus melanogaster* C. L. Brehm. *Black-breasted Dipper*.

Seebohm having expressed a doubt as to the occurrence of this species or race in Britain, Clarke forwarded him the Welwick specimen for examination, with the result that it was considered an undoubted example of this form.

(To be continued.)

Notes and Queries.

GOOSANDERS AT NEWTON KYME.—I saw nine behind my house on the River Wharfe. I never saw birds in such magnificent plumage, but I could not get a shot at them. It is very unusual to see so many together. J. CHALONER, Newton Kyme, March 6th, 1884.

BANKS' OARFISH—*Regalecus Banksii*.—In April, 1882, I recorded the capture of this fish on the Yorkshire coast, and as the local newspapers may not fall into the hands of all your readers, I extract the following from the Bridlington Gazette of last week:—"On Tuesday, a fine specimen of the ribbon fish was driven ashore on Flambro' rocks, during the late heavy gale; the length of the specimen is 15 feet 3 inches, 18 inches wide, and about 4 inches thick. On the fisherman approaching, it rose up in the air, moved in a serpentine fashion, but was stunned by a stone and easily captured. It was eventually sold to Dr. W. Whittaker, of Scarbro', and is now in the hands of Mr. Thompson, taxidermist of that place, for preservation, and with the intention of exhibiting it in London and the provinces. A bid of £25 was made on behalf of the British Museum authorities." The specimen I recorded in 1882 was 19 feet long, but as Couch's largest was 15 feet 6 inches, the present is a notable capture. The style of motion mentioned above, conforms pretty well to that given to Couch, by fishermen, on a similar occasion. "It came on with a gentle lateral undulating motion, shewing its crest and a small portion of the head above the water."—N. F. Dobrée, Beverley, 1st March, 1884.

Tectura testudinalis, Müller, IN YORKSHIRE.—In the *Naturalist* for October, 1883, page 53, I have read Mr. Crowther's remarks respecting the occurrence of this species at Whitby. On referring to my note book, I find I collected living specimens ten years ago, at Flamboro', on the rocks, at extreme low water; and my friend Mr. Cash, of Halifax, informs me that he met with it in the same place last summer. I may also state that in August last I dredged it in 20 fathoms water, off Port

Soderic, Isle of Man, but chiefly dead shells. This however, is not a new locality, as the late Prof. Edward Forbes, in his "Malacologia Monensis," page 34, mentions *T. testudinalis* as occurring "on the under surface of stones at very low water, Ballaugh." The Manx shells I obtained are smaller, and not so prettily marked as the Yorkshire specimens. Much has been written about the migratory habits of this species, and it would be interesting to learn whether it may not be found much further south than the localities hitherto recorded.—GEO. H. PARKE, Furness Abbey, February 1st, 1884.

Rainfall for February.

	Height of gauge above sea level.	Rain-fall.	No. of Days	TOTAL FALL TO DATE.		Date of heaviest Fall.	Amount of heaviest Fall.
				1884.	1883.		
HUDDERSFIELD (Dalton) ... (J. W. Robson)	Ft. 350	In. 1·57	16	7·32	*5·51	23	0·60
LEEDS ... (Alfred Denny)...	183	1·94	14	5·97	3·27 †	1	1·16
HORSFORTH ... (James Fox)	350	2·30	18	6·07	4·76 ‡	1	1·19
HALIFAX... (F. G. S. Rawson)	365	4·12	22	...	11·78	2	1·21
BARNSLEY ... (Dr Sadler)...	350	1·78	16	5·46	5·70	1	0·72
INGBIRCHWORTH (Mr. Taylor)	853	2·92	20	10·24	10·50	1	0·91
WENTWORTH CASTLE (Mr. Fisher)	520	1·87	17	6 16	7·33	1	0·70
GOOLE ... (J. Harrison)...	25	1·22	11	4·82	4·36	1	·50
HULL (Derringham) (Wm. Lawton)	10	1·44	16	4·26	2·92 §	1	·72
SCARBORO' (A. Rowntree)...	130	1·75	17	4·74	1·76 ||	1	·85
THIRSK... (W. Gregson)	100	1·52	15	5·94	...	1	0·57
MASHAM (Thos. Carter) ...	269	2·31	19	7·66	...	1	0·46
SHADWELL (Geo. Paul) ...	...	2·19	14	5·94	..	1	...

* Average to date for 17 years, 1866-83.

† Average of 30 years, 1853-62, & 1865-84. ‡ Average of 15 years, 1870-84.

§ Average of 34 years, 1850-83. || Average fall for Feb. (18 years).

Reports of Societies.

BARNSLEY NATURALISTS' SOCIETY.—Meeting March 18th, Mr. T. Lister in the chair.—The chief business was in connection with the results of the exhibition got up for the visit of the Yorkshire Naturalists' Union. Letters were received, and personal communications given, expressing favourable opinions of the exhibition, the annual meeting, and the lectures of Mr. J. G. Baker, president of the Union, Mr. W. F. de V. Kane,

of Dublin, and Dr. Brady of Sunderland. Local excursions were proposed for the season, the first of which is to be Edlington and Conisborough. Little to remark as to birds: a flight of long-tailed tits seen about the gardens, Silkstone, Feb. 22; chaffinch, song first noted Feb. 15; the yellow-hammer sang on the 16th; pied-wagtails again noted Feb. 19th, and now becoming frequent; they partially migrate to warm parts of England in winter, grey wagtails coming in late autumn and leaving in spring; kingfishers frequently noted every winter. The most unusual occurrence has been a pair of wheatears, Jan. 17th, on Staincross common; they are usually summer visitors, leaving for warmer southern counties in late autumn. I saw a kestrel, Jan. 7th, hovering low and darting to a hedge bank, near Sandal; saw siskins again in railway cutting below my house at Victoria Crescent, but not in such great numbers as were reported about Christmas. A heron was brought for my examination, Jan. 12th, shot at Brough: several were seen up to the close of the month. Mr. Bond, of Wombwell, reports many sparrow-hawks, kestrels, and gulls; and two more otters making about seven in the Dearne valley in two years: these are desired by the land proprietors to be protected. From Hems-worth woods and reservoir, which are under wise protection, little grebes, goosanders, herons, sparrow-hawks, kestrels, gold-finches, and gold-crested wrens are reported by Mr. Creighton, who thinks that the bird and gun acts, and trespass laws, are causing some scarce birds to increase in numbers.—T. LISTER.

BRADFORD NATURALISTS' SOCIETY.—Meeting held Jan. 29th, 1884. Mr. Carter presided. Mr. Firth described a ramble to Shipley Glen, and reported having seen the dipper, creeper, blue titmouse, cole titmouse, magpie, thrush, missel thrush, wren and robin. Mr. Soppitt gave an account of a ramble about Saltaire, and reported having found a fungus (*Mycena hyemalis*) which he considered very early. Mr. Carter exhibited a box containing the whole of the British representatives of the genus *Zygæna* (burnet moths), and pointed out their specific characteristics. Mr. Firth exhibited a number of moths which pass the winter in the perfect state, including *D. templi*, *C. vaccinii*, *C. miata*, *S. dubitata*, &c. Mr. Shackleton, of Keighley, showed a number of mosses collected in various localities. Mr. Soppitt then gave his lecture on "Heterœcism of certain Fungi," which he said signifies a species which commences life on one plant and completes it on another. He gave as an illustration the corn-mildew, which is so destructive in the corn-growing districts, but has not been found here. It commences its growth on the barberry (*Berberis vulgaris*), and completes it on the corn. The lecture was illustrated by a number of specimens of fungi in different stages of their growth.

MEETING held Feb. 12th, 1884, Mr. Soppitt in the chair.—Mr. Soppitt reported a ramble about Seven Arches, near Bingley, and in Shipley Glen, and named a number of flowers he had seen; he also found

the following shells : *Zonites aliaris* *Z. crystallinus*, and the fresh-water mussel. He also reported having seen the grey wagtail. Mr. Carter exhibited a box of beetles from Reading, but as he had only just received them, they had not been named. Mr. Bennett exhibited with the oxy-hydrogen light a series of photographic views of Irish scenery, and views taken in the vicinity of the Falls of Niagara, accompanied by explanatory readings by Mr. H. S. Ward. Mr. West exhibited a number of specimens of plants found in different parts of Ireland, some of which had not been found elsewhere.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting Feb. 25th, in the Free Library ; the president (Mr. S. J. Capper,) in the chair. A paper entitled “Reminiscences of Burnt Wood, Staffordshire”—communicated by Mr. Joseph Chappell (Manchester)—was read, in which the author (who was present) detailed his experiences of several excursions into that district, special allusion being made to the captures of the exceedingly rare *Notodonta bicolora* by himself and a friend, specimens of this insect in various stages being exhibited by him. The Rev. S. Fletcher Williams followed with a paper on “Henry Thoreau, the American Poet-Naturalist,” in which were vividly portrayed the life and character of this extraordinary student of nature and persevering observer of the habits of the animals of his native woods. During the conversazione, the Rev. H. H. Higgins exhibited the collection of insects intended for the circulating museum for educational purposes.

MANCHESTER CRYPTOGAMIC SOCIETY.—Dr. B. Carrington, F.R.S.E., in the chair.—The honorary secretary exhibited and presented to the society specimens of *Amblystegium porphyrrhizum* which had been gathered at Southport, 1875. He subsequently made some remarks on its discovery, detection, and its position as a British moss. Mr. W. H. Pearson exhibited some specimens of hepatics which he had received for determination from Prof. N. E. Kindberg, of Sweden, which had been collected in Spitzbergen by R. Gyllencreutz. They were *Marchantia polymorpha*, *Sauteria alpina*, and *Blepharozoa ciliaris*. Mr. Pearson also exhibited *Plagiochila tridentata* from Llanberis, collected in May, 1883, this being a new locality for this rare hepatic. Mr. George Burgess exhibited a number of freshly-gathered mosses from the neighbourhood of Delamere ; amongst them was the interesting *Tetraphis pellucida* in abundant fruit. Two pamphlets in French were placed upon the table, presented by R. du Buysson, a corresponding member of the society—the one being an analytical key to the mosses belonging to the family *Grimmaceæ*, and the other was entitled “Mouses et Hepatiques de L’Allier,” par l’Abbe V. Berthoumien et R. du Buysson, 1883. Mr. J. Cash read a first portion of the letters and correspondence of Edward Hobson, which he had kindly arranged at the wish of the society. The portion read proved extremely interesting to the members.—THOS. ROGERS, Hon. Sec., 27, Oldham-road, Manchester.

YORK FIELD NATURALISTS' AND SCIENTIFIC SOCIETY.—The first meeting of this newly organized society was held in the Albert Rooms, Stonegate. The following specimens were brought by members for exhibition:—Mr. Alfred Waller, four new British plants, *Naias alaganensis*, *Ononis horrida*, *Agrostis nigra*, and *Chara braunii*; Mr. Robert B. Cooke, a group of British marine shells—*Pinna pectinata*, *Anomia ephippium*, and *Pecten maximus* from Brixham, *Pecten varius* and *Nassa reticulata* from Torbay, *Fusus antiquus* and *F. gracilis* from Lynn, and *Cypræa Europæa* from Sheldon, South Devon. The hon. sec. (Mr. S. Walker) exhibited a series of the local *Erebina epiphron* and *Dicranura furcula*. Mr. Bailey's box contained eggs of the following birds:—Capercaillie (*Tetrao urogallus*), grey plover (*Squatarola helvetica*), heron (*Ardea cinerea*), spoon-bill (*Platalea leucorodia*), black stork (*Ciconia nigra*), also a large species of sea star (*Asterias*) from Brisbane. Mr. Robert Dutton showed a cabinet drawer of lepidoptera, containing *Chelonia plantaginis* *C. villica*, *Arctia fuliginosa*, *A. urticae*, &c. The president read a paper on "*Bacillus tuberculosus*," and showed a specimen under the microscope. Having explained the method of preparing the specimen, he said that Koch had first described these bacilli, which were delicate thread-like bodies from one-quarter to one-half as long as the diameter of the blood corpuscule. They behaved in a characteristic manner with certain of the aniline dyes. Koch had cultivated them for weeks and months apart from the body, and then inoculated animals with them, producing the characteristic disease by this means. Without entering before that non-medical audience upon the great question of the pathology of tuberculi, and its relation to consumption, the lecturer said he might at any rate point out that here was a definite botanical organism, found under very peculiar conditions, and therefore interesting to all naturalists. Certain people were prone to tubercular diseases. It was markedly hereditary. It prevailed especially under special hygienic and geographical circumstances. This and many other facts seemed to show that whether or not the bacillus was the cause of the disease, at any rate it required a specially disposed animal-tissue for its soil. Of course, so far, the case was on all fours with that of the yeast-plant, which also required a special soil, viz., one containing sugar, to produce alcoholic fermentation. A vote of thanks was accorded the lecturer at the close of his able and interesting address.—SAML. WALKER, Hon. Sec.

YORKSHIRE NATURALISTS' UNION.—22ND ANNUAL MEETING, BARNSLEY, TUESDAY, MARCH 4TH, 1884.—This was a very successful meeting, and in honour of it the Barnsley Naturalists' Society had organized an extensive and admirably arranged Exhibition of Natural History objects. This was opened at about half-past two by Mrs. T. E. Taylor, of Dodworth Hall, after which the visitors proceeded to inspect the various objects shown. The business meetings commenced at 4 p. m., when the General Committee met to receive the report of the Executive. There were present several

of the permanent members of that Committee, besides delegates representing the Societies at Huddersfield, Barnsley, Heckmondwike, Wakefield, Holmfirth, Liversedge, Ovenden, Rastrick-cum-Brighouse, Honley, Leeds (3), Bradford (3), Goole, Selby, Sheffield, Dewsbury, Malton, Halifax, Doncaster, Beverley, York, Ilkley, and Shipley. The chair was occupied by the President, Mr. J. G. Baker, F.R.S. The minutes of the previous annual meeting having been taken as read, the following new members of the Union were elected :—Rev. H. E. Fox, M.A., of Durham, Messrs. F. Priestman, ex-mayor of Bradford, Thos. Pratt of Ripon, J. Rawlinson Ford of Leeds, A. Paterson of Doncaster, Arthur Roberts of Keighley, Henry Marsh of Leeds, W. E. Brady and George Rose of Barnsley, and J. A. Erskine Stuart, of Staincliffe, near Dewsbury. The ten following members were then chosen as additional permanent members of the General Committee :—Messrs. J. C. Burrell of Sheffield, W. N. Cheesman of Selby, J. E. Clark, B.A., B.Sc., &c., and Geo. C. Dennis of York, N. F. Dobrée and J. Ambrose Ridgway, F.R.A.S., of Beverley, W. Gregson of Baldersby, J. H. Rowntree of Scarborough, M. B. Slater of Malton, and J. J. Stead of Heckmondwike. The Annual Report and Balance Sheet were then read by Mr. W. Eagle Clarke, F.L.S., of Leeds, one of the Secretaries, as follows :—

22ND ANNUAL REPORT.

The progress of the Yorkshire Naturalists' Union during this the 22nd year of its existence has been steady and well-sustained, and the Executive Council have to congratulate the members on the fact that the new constitution which was adopted at the last annual meeting has worked in an extremely satisfactory manner. The modifications which it introduced were mainly in the direction of the further development of the British Association principle of government, and it is to one of these modifications that the Executive Council, which now addresses the members for the first time, owes its existence. They have to report that one of the Union's objects has been promoted during the year by means of the publication of the two instalments of the Transactions, and the other by a successful series of field-meetings, at which (as will appear by the reports of the Sections) sound and useful observational work has been done.

THE FIELD MEETINGS

held during the year—for each of which was prepared the customary circular descriptive of the natural history and physical features of the neighbourhood visited—were five in number, one for each of the districts into which Yorkshire is now divided for this purpose. The places visited were as follows :—

Doncaster, Whit Monday, May 14th.

Filey, Monday, June 11th.

Strensall Common, Saturday, July 14th.

Washburn Valley, Monday, August 6th.

Malham, Saturday, September 1st.

The interest taken in the meetings was well sustained, the attendance averaging about 60 at each. At some of them the Union was indebted to local gentlemen for permission to visit their estates, and to Mr. Winter Cockill and the High Sheriff of Yorkshire for their generous hospitality to the members who visited Doncaster and Malham respectively. The Strensall meeting in July was disappointing so far as regards the attendance, but on the other hand the largeness of the attendance when the Union visits places which are but little known or more than usually difficult of access is a source of encouragement, evidencing that members are fully alive to the cardinal importance of the exploration of little-known districts.

THE SOCIETIES

which constitute the Union are now 39 in number, an increase of four during the year, the newly-added Societies being the following :—

	NO OF. MEMBERS.
Shipley Field Naturalists' Club	28
Bradford Microscopical Society	61
Rotherham Naturalists' Society	63
Doncaster Juvenile Naturalists' and Scientific Society ...	24
	176

The statistics which are furnished by the secretaries of the different Societies show that the Union now includes 2408 Associates and 326 Members, or 2734 altogether, an increase of 361 Members and Associates during the year.

THE MEMBERSHIP

of the Union itself—as distinguished from that of the various individual Societies—has now to be considered in a new aspect. The Annual Subscribers of former years are now designated Members, and have increased in number during the year, the figure now standing at 326.

The Executive Council would now again urge upon the attention of the Associates the desirability of their supporting the Union in its work by becoming Members. There is much valuable matter awaiting publication in the Transactions, for which additional funds are needed ; and it may be pointed out moreover that the penny per head which is contributed by the associated Societies for their members can only be looked upon as a nominal retaining-fee, much more money being spent upon the Associates than the Union receives from them. It can therefore be fairly expected that Associates and others who take an interest in the investigation of Yorkshire Natural History and are able to contribute towards its financial encouragement, should assist by enrolling themselves as Members.

PUBLICATIONS.

Parts 5 and 6 of the Transactions have been issued to the Members during the year, while Part 7 is printed and will be circulated immediately, and Part 8 is in preparation. Special attention has been given to this most important branch of the Union's work, and your Executive venture to think that their report upon this head is a satisfactory one.

It is also a matter for satisfaction that the year has witnessed the completion of the printing of Mr. Porritt's long-expected "List of Yorkshire Lepidoptera," the

first completed memoir which the Union has issued, and also the first completed attempt to catalogue the indigenous Yorkshire forms of that important group of insects.

“THE NATURALIST,”

which has since its foundation nine years ago been the recognized organ of the Union, having been conducted under its auspices by Messrs. Hobkirk and Porritt at their own risk, will, on the completion of the current or ninth volume, become the property of the Union, the present Editors having decided to relinquish the office which they have held so long and so worthily, and which they originally undertook at the Union's request. In their stead Messrs. Roebuck and Clarke have been appointed the Editors of a new series, which is to be commenced in August next.

THE PRESIDENCY.

Your Executive have now to announce that the important office of President has been offered to and accepted by the Right Hon. Lord Walsingham, M.A., F.L.S., F.Z.S. a naturalist whose tenure of it will add yet further distinction to that which it derives from former occupants of the chair; and they will conclude their report by the expression of their sense of the obligation under which the Union and all its Members have been laid to the distinguished author of “North Yorkshire,” who this day ceases to be our President, by his acceptance of the highest mark of respect and appreciation which it is in our power to bestow.

After some discussion, the report and balance sheet (as appended) were unanimously adopted on the motion of Mr. J. W. Davis, seconded by Mr. A. Clarke, president of the Huddersfield Naturalists' Society. The excursion-programme was then considered, and the recommendations of the Executive (with the alteration of one of the dates from Saturday to Thursday) were accepted as follows:—

Maltby Common and Roche Abbey, Thursday, May 8th ;
 Sherburn, for Bishop's Wood, Whit Monday, June 2nd ;
 Hawes, Saturday, July 5th ;
 Spurn Point, Bank Holiday Monday, August 4th ;
 Helmsley, Wednesday, Sept. 3rd.

For the next Annual Meeting there were two invitations presented—from Beverley, and one from Doncaster. The delegates from those towns having spoken in support of the invitations, motions were duly made and seconded in favour of each. On being put to the vote, the majority was found to be in favour of Doncaster. Various dates were proposed, but eventually Tuesday, the 3rd of March, was decided upon. Proceeding to the election of officers, the President stated that his successor had already been chosen, the office having been accepted by Lord Walsingham, M.A., F.L.S., F.Z.S. The two retiring Secretaries—Messrs. Wm. Denison Roebuck and Wm. Eagle Clarke, F.L.S., both of Leeds—and the ten retiring members of the Executive Council—the Revs. W. Fowler, M.A., Liversedge, and W. C. Hey, M.A., York, Messrs. J. W. Davis, F.L.S., Halifax, Thos. Birks, jun., Goole, C. P. Hobkirk, F.L.S., Dewsbury,

G. T. Porritt, F.L.S., Huddersfield, E. B. Wrigglesworth, Wakefield, J. J. Stead, Heckmondwike, B. Holgate, F.G.S., Leeds, and H. T. Soppitt, Bradford—were all re-elected, and Messrs. B. Holgate and W. B. Russell, LL.B., of Leeds, were again chosen as auditors. This concluded the business of the General Committee. Tea was then served, after which the various sections met and elected their officers as follows :

VERTEBRATE ZOOLOGY :

Mr. John Cordeaux, M.B.O.U., Great Cotes, president (re-elected) ;
Mr. James Backhouse, jun., York, secretary.

CONCHOLOGY.

Rev. W. C. Hey, M.A., York, president ;
Mr. J. D. Butterell, Beverley, secretary ; both re-elected.

ENTOMOLOGY :

Mr. G. T. Porritt, F.L.S., Huddersfield, president ;
Mr. E. B. Wrigglesworth, Wakefield, secretary ;
Mr. S. L. Mosley, Huddersfield, recorder in Economic Entomology :
all re-elected.

BOTANY :

Mr. Thos. Hick, B.A., B.Sc., Harrogate, president ;
Mr. P. F. Lee, Dewsbury, secretary for phanerogamic botany ;
Mr. Geo. Masee, Scarborough, secretary for cryptogamic botany :
all re-elected.

GEOLOGY :

Mr. J. W. Davis, F.L.S., F.G.S., Halifax, president :
Mr. J. E. Wilson, Bradford, and Rev. E. Maule Cole, M.A., Wet-
wang, secretaries : all re-elected.

The Annual Public Meeting was held in the evening in the large room of the Public Hall, when there was an attendance of about 300, and the chair was taken by Mr. J. G. Baker, F.R.S., F.L.S., president of the Union, who was accompanied on the platform by the Mayor of Barnsley and other gentlemen. The Annual Report having been read and the Excursion programme announced for the information of the members generally, the Presidential Address was delivered, Mr. Baker taking for his subject "The Fathers of Yorkshire Botany." Dr. Lancaster, the president of the Barnsley Naturalists' Society, presided during the delivery of the address, and at its close a vote of thanks was enthusiastically accorded to Mr Baker, on the motion of Mr. Chas. Wemyss, of Cannon Hall, seconded by Mr. W. F. de V. Kane, M.A., of Dublin. Mr. Baker having replied to the vote, resumed the chair, and a vote of thanks to the Barnsley Naturalists' Society for their cordial reception of the Union, was moved by Mr. A. H. Allen, F.I.C., &c., of Sheffield, seconded by Mr. E. B. Wrigglesworth, of Wakefield, and cordially voted. Mr. Thos. Lister replied, after which the meeting closed.



Figured from water-worn Specimens. Coast: Abou Day.

Original Articles.

NATURAL HISTORY NOTES FROM SOUTH AFRICA.

(Continued.)

BY S. D. BAIRSTOW, F.L.S.

The marine Mollusca, or rather sea-washed specimens of impressionable shells, for excepting *Turbo*, *Patella*, *Bullia*, *Twaitella*, *Haliotis*, *Triton*, *Chiton*, *Pleurotoma*, and a few others (univalves, bivalves excepted) occurring near or upon the shore or rocks, we have seldom an opportunity of taking living animals, and for many reasons dredging is expensive and dangerous. Probably if these difficulties could be removed there would be a magnificent field for the collector around the east coast of Southern Africa. Scarcity of rain is our agricultural curse. Peculiarity of river courses is one of the banes of progression and enterprise, and around the Algoa coast stream or river in rapid succession cuts into the land, and renders locomotion difficult, and navigation dangerous. This impacability of African rivers has bothered the mental powers of all our famous travellers, and a big obstacle it is to remove. The physical features of our dark continent are truly perplexing. Drifting sands and sand barriers along the coast. Inland yawning chasms, and stubborn kloofs surprising us by the suddenness of their appearance. Scarcity of water where plenty is wanted; abundance where useless or rejected. Mountain blocks and brackish karoos. These circumstances all combine and scorn human effort. Likewise the ocean jeers at expert navigators. Not satisfied with reefy custodians or personal surf muscles,* with jutting capes or Samsonian waves, not satisfied to link current to current in one tempestuous rushing torrent—a marine river—passing with fearful velocity round the southern point, we must needs have minor currents cropping up unawares, and deceitful shifting stream beds. Add to these submerged plateaux of connected rocks, and bristling semi-hidden reefs, add stiff south-easters, and you may form a mild conception of

* As I write, news arrives of a tremendous tidal wave observed at East London, Port Alfred, and other coast ports. It was slightly felt here. Capt. Webster, Com. Currie, S.S. "Hawarden Castle," reports great strain on his ship's cable, and violent plunging of the vessel. At East London the tide rose considerably. Tide gauges at various places indicated curious irregularities. Says the E.P. Telegraph—"The origin of this tidal wave may probably be ascribed to remarkable volcanic action of unusual severity reported to have occurred in the Straits of Sunda, where the physical features of the place have undergone considerable changes."

the reasons which mitigate a shell-collector's dredging ardour. That good stuff lines the border bottom of our quaint old ocean I am sure. How to get at it is another question, and we are compelled to accept what his eccentric whim may cast ashore. Against such opposition Rous calculates as a good day's work the bagging of one fair shell, and so do I. More than once have I tramped my twenty miles o'er rocks and sand, on naked feet, to return with one decent *Terebratula*,* or one *Marginella*, or one *Cypræa*. Now and then a capital haul turns up: *Kraussia rubra*, or *Terebratula radiata* in quantities after a sea-breeze, and other shells in due order, but very seldom is this the case.

The localisation of shells on this coast is noticeable. Walking on the sand towards Port Elizabeth, until the Zwartkops river is reached, vast quantities of bivalves, *Donax*, *Venus*, *Mytilus*, and sometimes *Pinna*, are found; then past the town round by Cape Recife a break occurs, when they re-commence and continue to the next pile of rocks, and so on indefinitely. But it is impossible to connect a fixed law proving the habitats or peregrination antics of Algoa mollusca, although aching limbs through useless roving have relegated my hopes of new finds in distant solitary spots, and although I have proved most conclusively the value of a site selected. I know just where to go to risk the taking of a decent *Pupillia* (see Pl. ix., Fig. 5). I know that from the Beacons to Recife is a good ground for *Conus tinianus*, *C. rosaceus* (Fig. 3), and our eagerly sought for *Voluta Bullata*. I know one sequestered sand nook anent a mighty cave, where a certain *Spirula* is a dead certainty. I would it were otherwise. Of *V. Bullata*, from fifty-four collected specimens I have managed to secure one really handsome (Fig. 1, nat. size). Our representative collections show a deficiency in marine fauna, but I do not believe the one figured can be beaten in any African museum. Next to *Bullata* I have prized *Marginella Mosaica* (Fig. 2) seldom obtained in good condition. I count upon six species of this genus from P. E., but I cannot state accurately without comparison. Of these *M. piperata* is decidedly most abundant. I have classed a yellow species independently, but it is probably only a mimetic form of the last named. The variety, if variety it is, appears constant in size and colour. Port Alfred is richer in species of the genus, and I have one from that locality not mentioned by Krauss, awaiting christening. *Cyprovulum Capensis* is decidedly fitful, as regards worthy specimens. *Cypræa edentula* occurs this year in thousands, and some are lovely shells with purple bands,

* We have three *Terebratule*—one wanting a name.

which fade rapidly. *Luponia Algoensis* is a *rara avis* known to me by name only. Doubtless it may escape detection sometimes from its similarity to the former. *C. moneta* (sp. ?) has been taken—come astray! *Trivia oniscus*, one of my favourites, is fairly common, and I have a smaller one not yet determined. *Typhis* (Fig. 6) is a scarcity here but abundant at the Kowie. One of my prizes is the large *Turritella* (Fig. 4), somewhat water-worn, but bearing evidences of fulvous striæ and markings. I picked it up during a Society ramble from Colga to Zwartkops. Unfortunately the outer lip of aperture is partly broken at the dotted line (*vide fig.*), but the shell, if not a cast-away from foreign seas, is a rarity.

The *Tenthia* figured on plate (Fig. 7) was first dredged by Mr. Rous near the mouth of the Zwartkops (aboard the steam-tug "James Searle"), since when numbers have been secured by various fishermen. I am endeavouring to obtain a specimen of the living animal from which to make a drawing. The figure was taken from a shell given to me by Mr. Rous. Cuttles abound in the sea, and I fancy their shells might be turned to some commercial advantage. In my beachian rambles I have met scores of fishermen in search of "sea-cats" for bait. I give an account of the method of capture employed, as expressed to me by a cute member of the craft:—"I lugs 'em hout wi' my 'ookstick. I smashes 'em hon the rocks huntil they're slickered. I turns 'em hinside hout, I 'angs 'em hon the 'ook, and when I'se got 'em hon, I works ontill I've got henuf, and then I goes 'ome and 'as refresherments!" Short, sweet, sufficient! I may here mention my welcome friend *Argonauta argo*, the glorious Paper Nautilus, to be looked for after a south-easter anywhere along the beach, a cephalopod luxury to the eyes of naturalist Cræsus, Lazarus, European, Colonial, or nigger, &c., &c. We have numerous species of *Fissurella*, of which the small *hiatula* is commonest, but it is hard to procure good specimens of the large ones in the adult stage. Mr. Woodward remarks twenty-two species of *Trochus* from S. Africa. I have only taken three or four on the Algoa coast, and none in remarkably good condition. The fragile *Triton dolarius*, with its shady green epidermis, is very abundant at all times, and I find the epidermis preserves moderately well.

This genus is largely developed, and I have bagged some living monsters. They are extremely hardy, surviving after immersion in scalding water. Ancient specimens lose all their exterior beauty, and the rich bloom of colour disappears, enveloped in hideous punctated excrescences of carbonate of lime, and conglutinate rubbish. Our

great *Ranella* is seldom taken in good condition. I received one minute species selected from a few thousand common shells from Port Alfred, which was submitted to Mr. Woodward and determined *Ranella hastula*, Reeve. At a first glance it looked like a flattened *Scalaria*, and, occurring simultaneously, might be overlooked. Since then Mr. Farquahar has obtained it on our coast. That gentleman possesses also a splendid *Oliva*, and various other shells awaiting recognition. We have two, if not three, species of *Haliotis*. Of *Buccinidæ*, *Bullia semiplicata* (vide Woodward's diag.) generally visits us in broken parts. *B. annulata* I never saw alive, but suspect it occurs quite close to the shore; and the common *B. achatina* came sidling across my path with no instinctive forethought (!) during the first of many beach rambles, and insinuatingly demanded attention as an item of impressive Natural History. Since then I have made a point of watching these most friendly carnivorous mollusca. The tide is gradually casting ashore one of these immense *Medusæ*. Here it comes, now settling its great smooth barrel-carcass on the sand, patiently awaiting decomposition, atmospheric or aqueous, or perhaps animal dissection. A family of *Achatinæ* is located somewhere about the vicinity. By some subtle communication the stranger is either seen, smelt, felt, or heard—it matters not which—and a regiment of snailly gluttons is soon established on the spot, gaining recruits at every moment,—all propelled by sordid selfishness, dread of losing a thumping dinner. To notice surroundings before *Medusa* arrives, and again after *Medusa* has arrived, is to wonder where such numbers of hungry elves have sprung, and why these were not perceived before. They draw nigh from the sea and wet sand to the point *Medusa*, seldom from the earlier washed drier parts, and their tracks, increasing in complication with the addition of each fresh arrival, nevertheless denote a wonderful unity of interest, viz: pacification of appetite. Is their normal food jelly-fish? Then they never need starve, for plenty comes ashore of size pro-digeous.

(To be continued.)

LASTRÆA CRISTATA NEAR THORNE: ITS DISCOVERER AND ITS HISTORY.

BY F. ARNOLD LEES.

It was with genuine pleasure I read James Backhouse's note (March No., p. 137); for the date he gives of the presumably earliest Yorkshire specimen gathered by William Casson helps not a little to clear away some of the mist in which the early history of this rare fern, in

its connection with our county, is shrouded. It were much to be desired that our veteran botanists would give us more than they do of the information stored up in their herbaria, before it is for ever too late to convey it with the force of a *personal witness*—an element often undervalued—without which the dry record even of a duly dated and localised specimen in a collection is not unfrequently liable to a not-to-be-rebutted, if un-provable, assertion of ‘transposition of label,’ ‘inadvertent confusion,’ &c.; more especially in those cases where the fact happens to be singularly notable, or in one way or another subversive of some closet-naturalist’s pet latter-day generalisation! No one who has had much to do with the overhauling of herbaria but must admit that something more or less inexplicable to him is always found; and therewith comes the not-to-be-satisfied wish that he could have the author at his elbow to settle with the desiderated oral particulars such critical points of interest as are otherwise peculiarly liable to be misconstrued, or read variously.

What has been published as to the occurrence of *Lastreæa cristata* in South Yorkshire is worth recounting. Edward Newman, in the first edition of his *British Ferns* (1844), makes no mention of it as a Yorkshire plant at all. Henry Baines, in his *Flora of Yorkshire* (1840), does not name it as a Thorne plant, or indeed at all; either, if my view be correct as to the ‘*Aspidium cristatum*’ given (loc. cit., p. 123), as occurring ‘on Plumpton Rocks, near Knaresbro’, being not our *Lastreæa*, but the cristate-fronded variety of the male fern (*L. Filix-Mas*.)* Dr. Carrington says this Plumpton plant appears to have been *L. spinulosa*, but that does not occur on the rocks in question, *L. Filix-Mas* (in three or four varieties), and *L. dilatata*, with *Polypodium vulgare* only growing thereon.

Later by fourteen years, Baker, in his *Supplement to Baines* (1854), gives *L. cristata*, judiciously, as ‘incognit,’ remarking on the necessity for re-observance.

* NOTE.—I am, perhaps, confirmed in this by the very earliest record for the ‘*cristatum*,’ in connection with Yorkshire, which occurs. Jonathan Salt, in his MSS. *Flora Sheffieldensis*, 1800 (in the library of the Sheffield Lit. and Phil. Society), has ‘*P. cristatum*.—In woods not uncommon,’ and he had, undoubtedly, no knowledge of the species under consideration, yecept ‘Ehrhart’s’ bog-fern by Newman. There was a *Polypodium cristatum* of Linnæus; but the name as used by writers from 1800 to 1840, clearly shews that they had rather the original *Polypodium spinulosum* in view; although Newman (l. c., p. 216) distinctly says he could not make out *Lastreæa spinulosa* to be either the *Polypodium spinulosum*, as supposed by Willdenow, or the Linnæan *P. cristatum*, as supposed by Bolton and Withering.

Next, we are presented with a curious record, the warrant for which I have not been able to clearly ascertain. In Miall and Carrington's *W. R. Flora* (p. 57) occur the words—' *L. cristata* (crested brake-fern), Thorne Moor, near Doncaster, *Baines?*' This query I can only assume to have been put to shew some doubt as to who really was the authority for some rumour which reached them as to the fern growing there. Whether they doubted the correctness of the station, or the species, I have no means of knowing; but probably the latter, for the authors give '*Lastræa cristata*' amongst a number of other names (p. 93) probably erroneous. Could a forgetting of the name of the communicator have inspired a doubt, and so led to the mark of interrogation? It is worth remembering, as to this, that the *Flora* was issued in 1862—a date seven years subsequent to that in which Mr. Casson's specimen in Herb. Backhouse was gathered—yet none of the names (Backhouse, Casson, or Hardy) appear in the list of contributors from whom records or specimens were received, given at the end of the work.

I, myself, first gathered *Lastræa cristata* in August, 1872, along with *Lathyrus cristata* and *Peucedanum palustre* (only again re-found in 1883, by Henry Johnson, of Barnsley), in a bushy, boggy place (an alder car if I recollect rightly), not on the 'Waste' exactly, but upon the less open border much nearer Thorne. I hit upon the one station after much roundabout rambling; but previously in 1870-71, or early in 1872, I had received the general locality from John Hardy, with whom I was at one time in correspondence; and I, knowing not then aught of a Mr. Casson, presumed Hardy to be the discoverer, as he was certainly the communicator to me of that and other facts which I duly acknowledged in the preface to "*West Yorkshire.*"

I willingly reject, as very improbable, the idea that Mr. John Hardy could have found the bog-fern in question before 1856. I received no specimen or date, which led me to search so carefully for myself. Probably Mr. Hardy himself first learnt of the fern's occurrence from Mr. Casson in some more or less indirect way, living on the spot, as it were, as the latter gentleman did. Honour, however, where honour is due! It is part of the plan of my *West Yorkshire Flora* to give *date with name* of the *earliest* notice of each constituent species; so that now, thanks to Mr. Backhouse's timely note, the record stands: "1856, Wm. Casson, Thorne."

NOTES ON THE VERTEBRATE FAUNA OF YORKSHIRE,
1881-1883.

BY WM. EAGLE CLARKE, F.L.S., AND WM. DENISON ROEBUCK.

(Continued.)

17. *Ruticilla titys* (Scop.). *Blackstart*.

Mr. Bailey's note, that he has observed this species at Flamborough, in October and November, having been doubted in high quarters, it is interesting to know that Clarke shot one at Spurn, in the last week of October, 1882, and saw another there about the same date in 1883. It is probably a regular autumn visitant.

18 or 19. *Cyanecula* (? species). *Bluethroat*.

Spurn Head, one shot in Clarke's presence on the 11th of September, 1882, and another seen the same day. The specimen procured was an immature bird, in which state of plumage the two species *C. leucocyana* and *C. suecica* are indistinguishable.

21. *Daulias luscini* (L.). *Nightingale*.

The northern range of this bird has been extended as far as Scarborough, where it undoubtedly bred in 1882 (W. Robinson). At Staveley, near Boroughbridge, two pairs nested in 1881 (Knubley), and a pair nested near Harrogate in 1883 (Inchbald).

37. *Acrocephalus streperus* (Vieill.). *Reed Warbler*.

Seebohm, in his "British Birds," remarks that it "seems very doubtful whether the Reed Warbler breeds in Great Britain north of the Humber." This surprising conjecture is of course quite erroneous, for the species is known to breed quite commonly in various localities which are not only north of the Humber, but some of them actually in the northern half of the county, as for instance Staveley near Boroughbridge, and Knaresborough, in both of which localities it nests annually. It is also a regular nesting species near Leeds, and at Hornsea Mere in the East Riding it breeds in great abundance. This is not the only instance in which we have to regret the vague and sketchy manner in which so important a subject as the distribution in Britain of British birds is treated in so valuable a work.

71a. *Lanius major* Pallas. *Pallas's Great Grey Shrike*.

This form is allowed specific rank by Mr. Seebohm in his work on British Birds. From the number of Yorkshire specimens that

have come under Clarke's notice, it is in all probability not only an annual winter visitant, but, perhaps, of much more frequent occurrence than is suspected.

93. *Linota linaria* (L.). *Mealy Redpoll*.

The year 1881 may be added to the list of seasons in which this species occurred in large flocks in the county.

96. *Linota flavirostris* (L.). *Twite*.

Mr. Allis's statement that this bird had bred on Thorne Waste is paralleled by the observations of the Rev. H. H. Slater (*Nat.*, 1882, p. 179), who found it nesting on Pilmoor, near Thirsk, a similar low-lying locality.

107. *Emberiza cirlus* L. *Cirl Bunting*.

Additional occurrence: Fen Bog, near Whitby, a female shot on the 28th of February, 1882, now in the Whitby Museum. Two others were seen at the same time and place (Stephenson).

108. *Emberiza hortulana* L. *Ortolan Bunting*.

The specimen captured off the Yorkshire coast, which served for Bewick's figure, is now, according to Seebohm's "*British Birds*" (vol. ii., p. 153) in the Newcastle Museum.

109. *Emberiza rustica* Pall. *Rustic Bunting*.

An addition to the avifauna—an accidental visitant from North Eastern Europe and Northern Asia.

Easington, a female (?), shot September 17th, 1881, (Clarke, *Zool.*, 1881, p. 465; *Nat.*, 1881, p. 57; *Ibis*, 1882, p. 181.)

133. *Cypselus melba* (L.). *Alpine Swift*.

Additional occurrence: Huddersfield, a female brought in the flesh to Mr. S. L. Mosley, on the 2nd of June, 1881, which had been found in an exhausted condition a day or two before (Mosley, MS.)

139. *Picus minor* L. *Lesser Spotted Woodpecker*.

Mr. Thomas Carter, of Masham, informs us that this species occurs about Aysgarth, in Wensleydale, and around Masham.

141. *Lynx torquilla* L. *Wryneck*.

Is an annual summer visitant to Walton Park, near Wakefield (H. B. Hewetson).

143. *Coracias garrulus* L. *Roller*.

One was seen by Mr. H. T. Archer on the banks of the Wharfe, near Ilkley, about the end of July, 1881. (Archer, *Field*, August 6th, 1881, p. 193, and MS.)

152. *Asio accipitrinus* (Pall). *Short-eared Owl*.

A specimen, shot at Spurn, by Clarke, in October, 1879, is in the Arctic form of plumage, described by Seebohm (British Birds, i. 72).

Falco sparverius L. *American Kestrel*.

In the Zoologist for 1883, p. 126, Mr. James Backhouse, Jun., records the occurrence of this species near Helmsley, in May, 1882. We have very carefully investigated the evidence adduced, and regret that we are unable to accept the bird as a member of the Yorkshire fauna, as there are certain features in the case which are in our opinion fatal to its claim for admission.

186. *Pandion haliaetus* (L.). *Osprey*.

During the autumns of 1882 and 1883 this species appears to have been much more frequently observed than it has of late years, when, indeed, it was comparatively almost unknown.

187. *Phalacrocorax carbo* (L.). *Cormorant*.

This bird ceased to breed at Huntcliffe (not Arncliffe, as stated in the Handbook), near Saltburn, some years ago, but now breeds in the cliffs near and at Kettleless (T. H. Nelson, MS.).

190. *Ardea cinerea* L. *Heron*.

Mr. H. B. Hewetson informs us that there is a Heronry at Nostell Priory, the seat of Mr. Rowland Winn, M.P.; and Mr. Backhouse, Jun., of one, numbering about fifty nests, at Moreby Park, near York.

193. *Ardea garzetta* L. *Little Egret*.

Additional occurrence: Aike [incorrectly spelt Ake] Carr, near Beverley, one obtained about 1840 (Ruskin, The Eagle's Nest, p. 170).

196. *Ardetta minuta* (L.). *Little Bittern*.

Additional occurrence: Goole, a young male obtained, September 23rd, 1881, now in the possession of W. E. Clarke (Bunker, Nat., 1881, p. 66.)

199. *Botaurus lentiginosus* (Mont.). *American Bittern*.

Additional occurrence: Harsley Castle, Welbury, near Northallerton, one shot by the Hon. W. Dawnay, October 27th, 1882, which was examined by Mr. J. Harrison, of Wilstrop.

206. *Anser segetum* (Gm.). *Bean Goose*.

Mr. Boyes is of opinion that the immense flocks noted as formerly visiting the Wolds, were not of this species, but were composed of

Pink-footed Geese. Our authority for the statement was Mr. Arthur Strickland, as quoted by Allis in his report on Yorkshire Birds, read before the British Association, in 1844.

219. *Anas boscas* L. *Mallard*.

Mr. Boyes informs us that the decoy at Meaux, in Holderness, the site of which is still to be seen, was about a quarter or half an acre in extent, with four pipes.

220. *Chaulelasmus streperus* L. *Gadwall*.

A pair, male and female, were shot on the river Hull near Beverley, in the middle of May, 1882 (Dobrée, Nat. 1882, vii. p. 185).

221. *Spatula clypeata* (L.). *Shoveller*.

This species bred in 1880 on Thorne Waste, a nest with four eggs being taken by the late Mr. Wm. Talbot of Wakefield, and others. About the year 1866 it bred near Masham, and in 1882 a pair again appeared at the same place, but owing to disturbance did not remain (T. Carter).

222. *Querquedula crocca* (L.). *Teal*.

Breeds not uncommonly on Thorne Waste (Clarke); and in the summer of 1883 a pair bred on the moors near Masham (T. Carter).

223. *Querquedula circia* (L.). *Gauganey*.

Beverley—a nest with nine eggs found by Mr. J. C. Swailes, who almost trod on the sitting female, on the 21st May, 1882 (Boyes, MS.) The first instance known of its breeding in the county, so far as we are aware.

224. *Dafla acuta* (L.). *Pintail*.

Two pairs remained on a small pond on a warren at Kilnsea, in Holderness, until late April, 1881 (P. W. Lawton).

229. *Fuligula cristata* (Leach). *Tufted Duck*.

Seen at Hornsea Mere on the 12th of June, 1883, by Mr. J. C. Swailes. Sir William Milner (Zool. 1854, p. 4441) also observed it in summer, and it doubtless breeds there.

246. *Columba livia* Bonnat. *Rock Dove*.

The statement in the Yorkshire Vertebrata that this species is *reported* to breed in inland localities has been criticised by some correspondents; but Clarke's request for specimens has never been complied with.

247. *Columba œnas* L. *Stock Dove*.

Regarding the spread of this species, Clarke contributed some Yorkshire notes to Mr. Harvie-Brown's valuable paper read before

the Royal Physical Society of Edinburgh on the 21st of February, 1883, "On the Stock-dove (*Columba cœnas*), with remarks upon its extension of range in Great Britain." From this we quote Clarke's concluding remarks, which appear as a footnote:—"Since the above was penned I have instituted further inquiries into the range and spread of the stock-dove in Yorkshire, with the chief result that I am informed, on the reliable authority of Mr. Boyes, that warreners now alive remember this bird being numerous on the Wolds *sixty years ago*, when it was their perquisite. Thus it is a most interesting fact that at a period when the stock-dove was almost, if not quite, unknown elsewhere in the county, it was common on the vast wolds of the East Riding. I am inclined to think that Yorkshire and other neighbouring counties have been peopled with stock-doves from this source, for with the gradual enclosure and cultivation of these great warrens we find a simultaneous and equally gradual spread of this species has taken place."

252. *Caccabis rufa* (L.). *Red-legged Partridge*.

Mr. C. Fullerton Smith (Field, Feb. 10, 1883, p. 184) gives notes on the introduction of this species into Yorkshire. At Hornby Castle they were turned down in 1846-7, but afterwards shot off. The same thing took place at Swinton, near Masham. At Ingleby, in the North Riding, some twenty years ago, about fifty brace were turned down by Lord de L'Isle, and now, on the neighbouring manors of Ormsby and Deighton a few brace are shot every season. This information is interesting, and supplies material upon the subject of the introduction of this species into the county, which we were unable to obtain in 1881.

253. *Caccabis petrosa* (Gm.). *Barbary Partridge*.

Mr. Boyes informs us that the Beverley specimen was an escape; he had an opportunity of examining the bird, and found it to be *pinioned*. This species must therefore be eliminated from the county list.

264. *Porzana bailloni* (Vieill.) *Baillon's Crake*.

The Goole specimen proved on examination to be an immature example of *C. maruetta*, the spotted crake (Clarke). Additional occurrence: Holmpton, in Holderness, one shot in 1880, now in the collection of the Rev. H. H. Slater (Slater, MS.).

272. *Otis tarda*, L. *Great Bustard*.

Additional information has been obtained on the former occurrence of this fine species, which it is proposed to reserve for a future article

on this species in Yorkshire. We would remark, that in his admirable continuation of Newton's Yarrell, Saunders has reproduced the old mis-statement as to Hawold being in Lincolnshire, whereas, as we have already indicated, it is in Yorkshire.

275. *Ædicnemus crepitans*, Gm. *Stone Curlew*.

A pair of this species, which is now becoming very rare in the Southern Wolds, bred near Market Weighton in 1881.

299. *Tringa minuta* Leisl. *Little Stint*.

302. *Tringa subarquata* (Güld). *Curlew Sandpiper*.

Both species were particularly numerous on the coast in late August and early September, 1881; and in the early autumn of 1883 the Little Stint was again numerous (Clarke).

310. *Totanus macularius* (L.). *Spotted Sandpiper*.

The specimen recorded from the Tees proved to be a Green Sandpiper (J. H. Gurney, Junr., *Rambles of a Naturalist*, p. 255.)

311. *Totanus glareola* (L.). *Wood Sandpiper*.

Additional occurrences: Coatham Marsh, adult shot, August 6th, 1881 (T. H. Nelson, *Zool.*, 1882, p. 91); Beverley, one shot in the spring of 1882, in the collection of Mr. F. Boyes (Boyes, MS.); Bridlington Quay, one shot mid-August, 1883 (Clarke); Easington, Holderness, one shot early autumn, 1883 (Clarke).

314. *Totanus calidris* (L.). *Redshank*.

Bred on Skipwith (Riccall) Common, in 1882, and at Masham in 1883.

316. *Totanus fuscus* (L.). *Spotted Redshank*.

Additional occurrence: Tees mouth, an adult shot on the 15th September, 1881. (Nelson, *Zool.*, 1882, p. 93.)

323. *Numenius arquata* (L.). *Curlew*.

Breeds commonly on Thorne Waste, a vast tract of heatherland on the Lincolnshire border of the county, and very little above sea-level.

326. *Sterna dougalli* Mont. *Roseate Tern*.

Mr. T. H. Nelson informs us that the five recorded for Tees Bay by "Argus" were Common Terns, and not this species.

332. *Sterna fuliginosa* Gm. *Sooty Tern*.

As suspected (*Handbook*, p. xxxvii,) this specimen has proved to be a Black Tern.

342. *Larus ridibundus* L. *Brown-headed Gull*.

A few pairs bred in 1881 and 1882, in a marshy field by the River Aire, just outside the Leeds borough boundary, and in 1883 they bred in some numbers on Strensall Common, but their eggs, about forty in number, were taken. The discussion in various numbers of the "Field" for February and March, 1884, has added nothing to the information which was in our possession at the time of framing our original account.

352. *Larus leucopterus*, Faber. *Iceland Gull*.

Additional occurrence: Spurn, a mature female and a bird of the year, shot December, 1882, now in Clarke's possession.

359. *Procellaria leucorrhoa*, Vieill. *Leach's Petrel*.

Additional occurrences: Riplingham, near Beverley, one in December, 1881, (Dobrée, Nat., 1882, p. 100); Whitby, one obtained near, in the possession of Mr. C. Bagnall (Stephenson).

362. *Puffinus griseus* (Gm.) *Sooty Shearwater*.

At the time of publishing the Handbook, we were unable to discriminate between the records of *P. griseus* and *P. major*. We can now give the following occurrences of this species:—Whitby, one shot in September, 1870, now in the museum (Stephenson). One shot in Bridlington Bay, 1872, by Mr. Elton, is referred to this species (Macpherson, Zool., 1883, p. 121). Clarke examined a fine pair in September last, which had been shot at Flamborough. Redcar, one shot September 17th, 1883 (Nelson, Zool., April, 1884, p. 147.) This species is not, however, new to the Yorkshire fauna, as Mr. Nelson supposes (see Handbook, p. 85).

FISHES.

5. *Lamna cornubica* (Gm.). *Porbeagle*.

In August, 1883, four were captured alive in Bridlington Bay, one of which, examined by Clarke, was eight feet long.

6. *Alopias vulpes* (Gm.). *Fox Shark. Thrasher*.

One captured on the 19th Sept., 1883, at Hornsea, eleven feet in length (Dobrée, Naturalist, 1883, ix. 69).

13. *Læmargus borealis* (Scoresby). *Greenland Shark*.

Whitby, one caught by Thomas Langley and brought into the port, Feb. 7, 1882 (T. Stephenson, MS.).

16. *Torpedo hebetans* Lowe. *Cramp-ray. Torpedo*.

Additional to the Yorkshire fauna: Easington, one captured on the 14th of April, 1882 (Clarke, Zool., 1882, p. 193); Bridlington,

one washed ashore and captured alive in the spring of 1883 (Thos. Boynton).

18. *Raja maculata* L. *Homelyn Ray*.

Additional to the fauna : Mr. Winson, the coxswain of the Spurn lifeboat, who is a practical fisherman and a careful observer, on being shown the plate of this species in Couch's "British Fishes," recognised it as one which he has caught commonly at 'California,' a fishing-ground ten miles off the coast between Flamborough and Withernsea.

20. *Raja circularis* Couch. *Sandy Ray*.

The cuckoo ray (*Raja miraletus*) of Couch, which is a variety of this species, has been observed by Mr. Winson as taken in 'California.'

32. *Labrax lupus* (Lacép.). *Basse*.

A specimen of this fish, weighing eleven pounds, which was caught at Whitby on the 22nd November, 1883, is noteworthy on account of the date. It contained a quantity of spawn (T. Stephenson, MS.).

58. *Zeus faber* L. *Doree*. *John Doree*.

At Bridlington this appears to be a not uncommon fish, occurring regularly every summer.

61. *Brama Raii* Bl. *Ray's Sea-bream*.

On Whitby Sands, a very fine specimen was found alive on the 2nd of November, 1882; it measured 24 inches in length, 19½ in girth, and weighed six pounds. It is now in the Whitby Museum (Thos. Stephenson, MS.)

62. *Lampris luna* (Gm.). *Opah*. *Kingfish*.

Spurn, one occurred a few years ago (Clarke, MS.).

70. *Auxis Rochei* (Risso). *Plain Bonito*.

An addition to the fauna; off Whitby, two occurrences in 1882. The first specimen was captured on the 9th September; it measured two feet four inches in length, and is now in the Museum. The other, which was two feet in length and 6¾ lbs in weight, was captured on the 18th of the same month (Thos. Stephenson, MS.).

85. *Agonus cataphractus* (L.). *Pogge*. *Armed Bullhead*.

When we wrote in the Handbook of these being taken in lobster-pots at Spurn, we were under a misapprehension. They are taken within the Humber estuary, by means of the seine-net, which is used for the purpose of obtaining bait for the lobster-pots.

106. *Atherina presbyter* Cuv. *Atherine*. *Sand-smelt*.

Additional evidence of the occurrence of this fish is to be found

in a note in *Science Gossip* for 1866, p. 254, wherein Commander Knocker, R.N., states that he had obtained many specimens, especially out of a dam erected for the pier-works, at Bridlington.

111. *Mugil septentrionalis* Günth. *Lesser Grey Mullet.*

We are able to confirm, on unexceptionable authority, the occurrence of this fish. Specimens taken by Clarke at Spurn Point, just within the estuary of the Humber, on the 31st May, 1882, submitted to Dr. Günther, were pronounced by him to be unquestionably of this species.

115. *Gasterosteus pungitius* L. *Ten-spined Stickleback.*

Occurs at Hobmoor and Bootham Stray, near York (E. J. Gibbins, MS.).

121. *Trachypterus arcticus* (Brünn.). *Deal Fish. Vaagmaer.*

An addition to the fauna : Flamborough, one was captured alive in perfect condition on the rocks near the Head, on the 17th April, 1882 (Boynton, Field, April 22nd, 1882, p. 535; *Naturalist*, 1882, vii. 185).

122. *Regalecus banksii* (C. and V.) *Banks' Oar Fish.*

Bridlington Quay, one washed ashore on the 7th of April, 1882. It measured 19 feet in length, and 21 inches in depth, and thus appears to be the largest specimen on record (Boynton, MS.; Dobrée, *Naturalist*, 1882, vii. 185.)

123. *Regalecus grillii* (Linds.) *Sild-Kung.*

The specimen which in our Handbook is recorded under *R. banksii* as taken at Staithes, in January, 1880, is considered by Dr. Day, in his *Fishes of Great Britain and Ireland*, as being probably—from the dimensions given—referable to this form, which, however, he regards as merely a variety of *R. banksii*.

127. *Ctenolabrus rupestris* (L.). *Jago's Goldsinny.*

Whitby, March 8th, 1883, a large number, variously estimated at from 40 to 100, were washed ashore. One brought alive to Mr. Thomas Stephenson was compared by him with Dr. Day's plates, and the description of it which he communicated to us affords no reason to doubt the accuracy of his diagnosis.

134. *Leuciscus erythrophthalmus* (L.). *Rudd.*

Mr. Clifton R. Garwood, of Acomb, near York (writing in the *Field*, June 9, 1883, p. 765) noted having seen the Azurine, or Blue Roach (a variety of the Rudd) in the river Ouse, amongst a shoal of roach, bleak, and dace.

201. *Salmo fario* L. "*Var. g.—Swaledale Trout*" of Dr. Day.

Under this name Dr. Day (Fishes of Great Britain and Ireland, ii. 100) describes and figures a variety which is comparatively rather broad, and in colour the most beautifully tinted form he has seen. The specimens were sent to him by Mr. George Brook, ter., by whom they were taken in the Oxnop Beck, Upper Swaledale.

223. *Engraulis encrasicolus* (L.). *Anchovy*.

An addition to the fauna, previously overlooked by us.

Bridlington, two specimens caught on the 17th Oct., 1866 (H. H. Knocker, Science Gossip, Nov. 1866, p. 254).

236. *Nerophis æquoreus* (L.). *Æquoreal Pipe-fish*.

Whitby, one washed ashore in March, 1883, had 44 rays in the dorsal fin, and measured $15\frac{1}{4}$ inches in length (Stephenson, MS.).

241. *Balistes capriscus* Gm. *File-fish*.

Dr. Day, at p. 269 of his work, cites from the Zoologist for 1868, p. 1027, a record of the occurrence of this species at Flamborough. Of this we were fully cognizant at the time of writing the Handbook, the result of our enquiries being that Mr. Bailey assured us that the specimen was an Opah, or King-fish.

243. *Orthogoriscus mola* (L.). *Short Sunfish*.

Bridlington, five in August, 1866, mostly of small size (H. H. Knocker, Science Gossip, 1866, p. 254). Bridlington, one which weighed nearly 250 lbs. was shot on the 16th of August, 1882 (Bridlington Quay Gazette, August 19th, 1882.)

244. *Orthogoriscus truncatus* (Retz.) *Oblong Sunfish*.

Additional to the fauna: Mr. Stephenson has sent us an extract from the Whitby Repository for December, 1867, recording the capture of an "*Orthogoriscus oblongus*, oblong sunfish," at Whitby, in the November of that year, which measured five feet across the fins, and five feet from head to tail. It was sold to Mr. Grier for the museum at Huddersfield.

In conclusion, we have to acknowledge our indebtedness to numerous correspondents, whose notes are acknowledged in the text, and it is our duty to record our special obligation to Mr. Thomas Stephenson, of Whitby, for the number and value of the notes he has sent us from time to time; we have also to thank Mr. George Roberts for drawing our attention to a few published records which had escaped our attention, and Messrs. Geo. Brook, ter., Thos. Carter, and E. J. Gibbins, for their response to our note inviting co-operation.

Rainfall for March.

	Height of gauge above sea level.	Rain- fall.	No. of Days	TOTAL FALL TO DATE.		Date of heaviest Fall.	Amount of heaviest Fall.
				1884.	1883.		
	Ft.	In.					
HUDDERSFIELD (Dalton) ... (J. W. Robson)	350	1·67	13	8·99	*7·90	4	0·41
LEEDS ... (Alfred Denny)...	183	1·45	15	7·42	4·93 †	4	0·40
HORSFORTH ... (James Fox)	350	1·79	14	7·86	6·90 ‡	4	0·67
HALIFAX... (F. G. S. Rawson)	365	2·82	16	12·75	13·28	4	0·97
BARNSELY ... (Dr. Sadler)...	350	1·78	17	7·24	7·09	3 & 4	0·41
INGBIRCHWORTH (Mr. Taylor)	853	2·21	17	12·45	11·36	4	0·47
WENTWORTH CASTLE (Mr. Fisher)	520	1·95	10	8·11	8·92	4	0·49
GOOLE (J. Harrison)...	25	1·60	8	6·42	5·66	9	·36
HULL (Derringham) (Wm. Lawton)	10	1·67	16	5·93	4·40 §	8	·33
SCARBORO' (A. Rowntree)...	130	2·16	17	6·90	5·39 ||	31	·39
THIRSK (Baldersby) (W. Gregson)	100	2·44	11	8·38	...	4	0·76
MASHAM (Thos. Carter) ...	269	2·90	15	10·56	...	4	1·07
SHADWELL (Geo. Paul) ...	500	1·78	12	...	...	4	...

* Average to date for 17 years, 1866-83.

† Average of 30 years, 1853-62, & 1865-84. ‡ Average of 15 years, 1870-84.

§ Average of 34 years, 1850-83. || Average fall for Mar. (18 years).

Notes and Queries.

ORNITHOLOGICAL NOTES FROM BARNSELY.—March 22nd, a flock of long-tailed tits noted in a garden near Silkstone; the wheatear reported by Mr. Richardson, of Goole, as usual, “the first spring migrant”; the gold-crested wren observed at Tankersley; willow-warbler heard in the vale of Went, very early; 27th, starlings breeding about the Parish schools and in the town; white-sparrow at the Oaks Colliery, a pair near the L. and Y. Railway, Barnsley, supposed to be breeding; April 2nd, chiff-chaff heard in the vale of Went; 4th, sand martins seen at Stainborough, Wentworth Castle Park, by Rev. W. Elmhirst; also at Crane Moor, Thurgoland, on following day, and also a pair at the same place by Rev. D. Johnson. April 11th, on our first local excursion to Conisborough and Edlington Wood, whitethroat, sand-martin, chiff-chaff, willow-warbler, the only migrants; reed bunting, magpies, jays in abundance; April 14th, the house martin reported by Mr. T. Ormerod, vale of Calder; April 18th, tree-pipit, and yellow or Ray’s wagtail reported by Mr. G. Roberts, near Wakefield.—T. LISTER.

NORTHERN RANGE OF THE SAND LIZARD.—As Messrs. Roebuck and Clarke are evidently under the impression that the true Sand lizard is not found so far north as Yorkshire, (Nat. ix., p. 149), they will be interested to know that it occurs abundantly on the sandhills, at Southport, in Lancashire. I have captured numbers there, and seen many more. The Natterjack toad too, is common in the same locality.—G. T. PORRITT.

EFFECTS OF THE MILD WINTER ON INSECT LIFE.—The unusual mildness of the past winter has not been without its influence on insect life. Coleoptera have turned up in abundance, and as regards the lepidoptera, the spring feeding larvæ of the Noctuidæ are in greatly increased numbers, and I think this promises well for the abundance of the late summer and early autumn moths. Hybernated larvæ have appeared early, and the same may be said of lepidopterous imagos. *Gonepteryx rhamni* was flying about Cambridge very shortly after New Year's day, and *Vanessa io* woke up the third week in February. The first specimen of *Vanessa urticae* I saw, was in the first week in March, and *Pieris rapæ* was out near the end of the month, and flying about in numbers. *Tæniocampæ* began to come out the second week in February; I specially noticed *Tæniocampa instabilis* at that time. I drove over to Kirtling, near Newmarket, a few days after the commencement of the year, and found mines of *Nepticula aurella*, with living larvæ inside very numerous; and a day or two afterwards I found them at Cambridge, although in much less abundance. — ALBERT H. WATERS, Mill Road, Cambridge. April 8th, 1884.

OBITUARY.

It is with very deep regret that we have this month to chronicle the deaths of two prominent members of our Union.

WILLIAM PREST was born at York, on May 7th, 1824, and died after a brief illness on April 7th, 1884. His loss will be severely felt by the lepidopterists, not only of his own county, but of the country generally, for he had been for probably more years than any other person now living in the county, an exceedingly diligent and energetic collector, and had consequently taken and distributed among the collections of the country scores of rarities, from localities in which many of them had scarcely been suspected of occurring. His best single take was perhaps the fine *Eubolia mæniata*, among broom, near York, on August 19th, 1866; but very many other species of almost equal interest were secured by him. His enthusiasm in his favourite study never seemed to flag, and we have, when out collecting with him, often been struck with his pleasure on the capture of beautiful and perfect specimens of comparatively common species, and species which indeed he must, one would think, have taken almost every season for years. Nor shall we soon forget the delight with which he brought to us on the ground, the specimens of *Eupithecia subciliata*, taken in the Copgrove Woods, August Bank Holiday, 1876; and those of *Acidalia straminata* (which, whilst capturing, he believed to

be *A. circellata*), on Thorne Waste, July 9th, 1881; nor the glee with which he confirmed our suspicion of "*Basistrigalis*," when we took to him the first example secured at Edlington Wood, on August 4th, 1879. He was, too, the first to bring to notice the variety *angelicata* of *Eupithecia albipunctata*, and most of the examples of this form now in British collections, were bred by him from Bishop's Wood larvæ. Since the discovery of *Scoparia conspiciualis*, he had collected great numbers of that insect, for immediately on seeing Mr. Hodgkinson's specimens, he recognized it as a species he had been taking for years in Sandburn Wood, York. During the last few years too, he had a great partiality for varieties, and the beautiful and extraordinary forms of many species he obtained, notably of *Abraxas grossulariata* and *A. ulmata*, *Cidaria russata* and *C. immanata*, *Acronycta ligustri* and *A. menyanthidis*, and very many others, were the admiration (we had almost said envy), of all who saw them. Mr. Prest was a frequent and constant contributor to entomological literature, and his notes and papers may be found almost continuously from the days of the first volume of the "Entomologists Weekly Intelligencer," in 1859, to the recent volumes of the "Entomologist", his last paper "On a form of the genus *Zygæna*," appearing in the December, 1883, number of that journal. Twenty-four years ago, on January 2nd, 1860, he was elected vice-president of the York Entomological Society, and we believe, had been in office in that and the York and District Field Naturalists' Society which followed it, almost continuously since, acting as secretary to the latter ever since its commencement about fifteen years ago, up to the present year. And on the formation of sections in connection with the Yorkshire Naturalists' Union, he was, on December 2nd, 1876, appointed first president of that for Entomology, an office which he held (though not continuously) for three years.—G. T. P.

JOSEPH WAINWRIGHT, F.L.S., died somewhat suddenly of bronchitis, accompanied by inflammation of the lungs, at his residence, Springfield House, Outwood, Wakefield, on April 10th, aged 71. He was for many years a prominent member of the Yorkshire Naturalists' Union, and was for some time, five or six years if we remember rightly, down to 1876 inclusive, its president—prior to the change of name from the West-Riding Consolidated Naturalists' Society. He took a warm and active interest in the movement for the improvement of its methods and procedure, which brought about its re-organization in 1877, and its extension to the whole county under its present name. He has also taken part in its proceedings ever since, and was present at the annual meeting at Barnsley so recently as March 4th last. The Wakefield Naturalists' Society was formed by invitation from Mr. Wainwright to about a dozen gentlemen, who met at his office in George Street, on April 21st, 1871. He was chosen first president of that Society, a position which he held continuously up to the time of his death. Mr. Wainwright was a botanist, and was especially a lover of exotic and cultivated flowers. During the summer months he frequently threw open his

grounds and conservatories, a generosity which hundreds, nay thousands, have appreciated by visiting Springfield, since Mr. Wainwright went there. He frequently officiated as judge at horticultural shows in various parts of the country, and was indeed, well known in the horticultural world. When the Wakefield Paxton Society was formed some years ago, he was elected its president, another office which he retained up to the time of his death. Mr. Wainwright was elected a Fellow of the Linnean Society, on June 17th, 1856. It may also be added, that he was for about 20 years a prominent member of the Wakefield Town Council, and occupied a seat on the Aldermanic bench for about 15 years (in 1863-64 acting as Deputy-Mayor), until 1874, when he terminated his connection with the Corporation.

Reports of Societies.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting, March 31st, the president (Mr. S. J. Capper) occupying the chair.—Mr. H. H. Corbett, Stockport, read a paper entitled “The causes producing localisation in insects, with special reference to British lepidoptera,” in which he described what he believed to be the chief causes which affected the distribution of British butterflies and moths, explaining how these causes would take effect. After the paper the compilation of the local lepidopterous fauna was discussed; and on the suggestion of the president it was decided that instead of a mere local list a work be compiled which should treat of the butterflies and moths of the two counties from which the society takes its title. The secretary (Dr. Ellis) offered to undertake this task, and information with reference to local butterflies was proceeded with.—J. W. ELLIS, Hon. Sec.

MANCHESTER CRYPTOGRAMIC SOCIETY.—Meeting, March 17th, Dr. B. Carrington, F.R.S.E., in the chair.—The hon. secretary placed upon the table a large packet of specimens of *Characeæ*, which he had received from Mr. Arthur Bennett, of Croydon, for distribution amongst the members, and to enlist their interest in the collection of specimens of this family in various parts of Britain; specimens of which he will be glad to receive or name for collectors. The thanks of the Society were given to Mr. Bennett for his presentation. Mr. J. R. Byrom, of Droylsden, exhibited a number of lichens which he had collected last summer in the Dovrefeld, Norway, and made some remarks thereon. The specimens were very fine examples, and mounted unpressed, and in the form of their growing condition. Mr. W. H. Pearson exhibited a large number of French hepatics which he had received from our French corresponding member, Mons. R. du Buysson; he also brought before the notice of the society Professor Lindberg's latest monograph on two new genera of hepatics. Mr. Cash read some chapters from the compiled letters and correspondence of Edward Hobson, in continuation of the completed series in hand.—THOS. ROGERS, Hon. Sec.

Fig. 1.

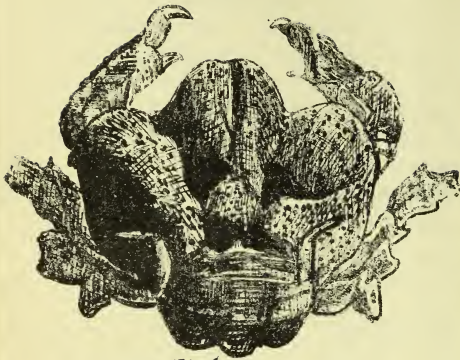


Fig. 1A.



Fig. 1B.



Fig. 1C.

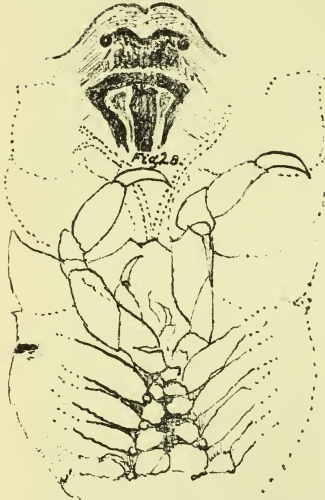


Fig. 2A.

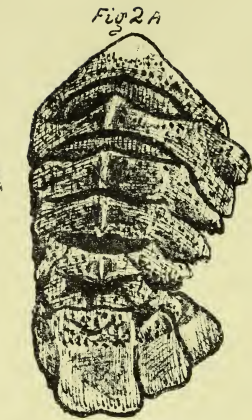
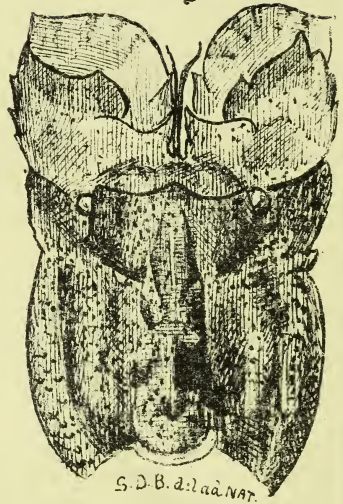


Fig. 2A.

Fig. 2



S. D. B. del. a. NAT.

Original Articles.

DARWINISM AND BEAUTY.

BY HENRY CAPPER.

Read before the Lancashire and Cheshire Entomological Society, Oct. 29, 1883.

It is strange and interesting to observe how a great discovery in any department of thought will make its influence felt in other and apparently dissimilar departments; and perhaps no better illustration of this tendency could be advanced than the great discovery of our age—the theory of Evolution. Originally framed to explain facts of natural history, its influence has been felt not only in religious and philosophical thought, but in material science, notably in chemistry. I allude to the hypothesis which, though its truth is so difficult to demonstrate, seems so likely to be true if we may judge, from analogy, that the so-called elements may not be elements after all, but, like ammonium, merely compound radicals, there being in reality not more than two or three true elements. But this is a digression.

Whilst in no way under-rating the immense importance of Darwin's discovery, is it not interesting to speculate upon how far its influence in thought may be limited, say one hundred years hence? We are at present, as it were, dazzled by its virgin brilliancy, and wherever we turn our eyes all things seem coloured by it. Bye-and-bye, when the first glare has passed away, we shall probably see that, after all, we have sometimes been deceived. Meanwhile it may be profitable to occasionally rub our eyes a little to try and see more clearly, for though the theory of evolution is the truth, and possibly nothing but the truth, even its great discoverer would never have claimed it as the whole truth. I purpose, in the following paper, first to notice what Darwin has to say on the subject of beauty, and afterwards to bring forward a few independent considerations.

Anyone who has read Darwin's works will doubtless remember the charming chapter in the "Descent of Man," devoted to the consideration of the origin of beauty in the butterfly. As this subject is likely to be especially interesting to this Society, and as it contains the key to all Darwin has to say upon the subject of beauty, I shall endeavour to give a brief summary of his argument. In a former chapter he has proved that the sense of beauty is not peculiar to man, but that he has it in common with the lower animals. This is shown to be the case when the males display their charms of colour or of voice before the females during courtship. He also gives a number of

instances of animals exhibiting a sense of pleasure in certain sounds and colours. It would be superfluous to go into details here, as doubtless you all know how completely Darwin has proved his case ; but it is essential to the due appreciation of the whole of the following argument that this should be remembered.

I cannot open the discussion better than in Darwin's own words. They are as follows:—"Every one must have admired the extreme beauty of many butterflies and of some moths ; and it may be asked, are their colours and diversified patterns the result of the direct action of the physical conditions to which these insects have been exposed, without any benefit being thus derived ? Or have successive variations been accumulated and determined as a protection, or for some unknown purpose, or that one sex may be attractive to the other ? And again, what is the meaning of the colours being widely different in the males and females of certain species, and alike in the two sexes of other species, of the same genus ?"

Darwin next mentions, on the authority of Mr. Bates, that in the South American genus *Epicallia* there are twelve species the sexes of which haunt the same stations, of which nine species have males which rank amongst the most brilliant of all butterflies, and are so different from the comparatively plain females that they were formerly ranked in different genera. The females of these nine species resemble one another, and also resemble those of allied genera found in various parts of the world. He argues from this that the nine species are descended from an ancestral form coloured in nearly the same manner, and that the males alone have been changed ; by sexual selection. In the tenth species the male resembles the female, thus strengthening this view. In the two remaining species both males and females are beautifully coloured, though the female in a somewhat less degree. Thus, out of twelve species nine have females which resemble one another and the females of allied genera much more closely than they resemble the males of their own species, in one male and female are about alike, and in the remaining two species both male and female are highly coloured. These facts clearly point to the conclusion that it is the males that have become altered by selection (in this case sexual), and that in the two exceptional species the females have become modified through inheritance from the males.

But this is no isolated instance. Darwin gives a number of others, which I need not here repeat, and concludes his examples by remarking that even amongst our English butterflies we have a good case in point. "In *Lycæna agestis*," he says, "both sexes have a

brown colour, bordered with small ocellated orange spots, and are thus alike. In *L. Ægon* the wings of the male are of a fine blue, bordered with black, whilst those of the female are brown, with a similar border closely resembling the wings of *L. agestis*. Lastly, in *L. Arion* both sexes are of a blue colour and are very like, though in the female the edges of the wing are somewhat duskier, with the black spots plainer; and in a bright blue Indian species both sexes are much more alike."

The only explanation of these facts he considers to be the action of sexual selection. Natural selection would necessarily affect both sexes alike, and therefore some other agency must have been at work. Darwin shows that even female butterflies are particular with regard to their mates, and argues that therefore the more beautiful males being chosen by the stronger, and consequently more prolific, females, would, on an average, leave a larger number of progeny to inherit their beauty than the less brightly coloured, which would have to pair with older, and consequently weaker females, or not at all. As we have seen in the majority of cases, this beauty seems to have been inherited by the males alone, but in some instances the females have been affected in a secondary manner.

All who have read what Darwin has to say on this subject will, I think, agree that his conclusions are sound. The same law has been at work amongst birds and many animals, indeed it seems to have acted powerfully upon man himself, with this important distinction—that both sexes have been affected, whereas in the case of animals, as a rule the males alone are modified, for amongst them the females are the only choosers.

It is scarcely necessary, except for the sake of completeness, to mention Darwin's explanation of the development of the gay and striking colours of most flowers, for it is now so universally known and understood—namely, that they serve to attract insects for purposes of fertilization. When Darwin discusses beauty, it is usually in connection with one of the above-mentioned ideas.

He is an opponent of the theory, which probably few now hold, that beauty has been created solely for man's enjoyment, and in one place he discusses in a most interesting manner the strange variations in the idea of beauty exhibited by different races of mankind. These subjects, which I intend presently to consider further, lead us up to our second division.

We have seen that Mr. Darwin's researches greatly increase our knowledge of the manner in which beauty has been developed in animate nature. We have next to consider the vast amount of beauty

that exists entirely beyond the scope of his theories, and to enquire the meaning of its presence.

It is remarkable how man finds everywhere where his hand has not marred Nature's fair work, numberless objects which appeal to his sense of beauty infinitely more completely than the greatest triumphs of human art; and even when his ruthless hand has for a while destroyed this beauty, if he leaves her undisturbed to work, with invisible fingers she will restore it again. Everywhere around us it is found. Beneath our feet is spread a gay carpet of green, above we are encircled with a firmament filled with ever-changing glows. Now it glows a brilliant mass of richest blue, and again it is filled with fantastic clouds; they grow darker and darker, and as night closes upon us the lightning plays amidst their frowning forms, and yet again the clouds are gone, the sound of the trumpet is hushed, and we stand beneath the sparkling splendour of the stars. Alike where meadow on meadow stretches out as far as the eye reaches, decked with fair trees, and filled with dancing corn, and where amidst barren mountains and grim peaks, that seem the thunder's home, the cataract holds carnival, there is something that fills man's soul with inexpressible delight. Thus we see that even the part of nature that is independent of any theory of selection teems with beauty, and it is found in many instances amongst living organisms under circumstances which entirely exclude any such theory as an explanation. The rich colour of the blood, as Darwin himself points out, is a good exemplary case; and though the bright colours of flowers seem to have been developed by sexual selection, the lovely green of chlorophyll, the splendid tints of the dying leaves in autumn (another of Darwin's own instances), and the graceful forms of trees and other plants, cannot have been thus developed. What, then, is the meaning of the existence of all this beauty? Why should we admire Nature's works more than the products of our own art, and indeed esteem him the greatest artist who best interprets her? Much of his own work man admits to be positively repulsive to his own æsthetic taste. He has to search far and wide to find such an object in nature. As a rule, when natural objects are repulsive they are so from unpleasant associations, and not from any inherent ugliness. I am of course always assuming that they are viewed in their ordinary place in nature. The caged lion's roar is deafening and profoundly unpleasant; in its native wilds it is said to be imposing in the extreme.

Our natural repugnance to rats, beetles, and spiders probably arises from their frequent intrusion in our habitations and amongst our food

To illustrate how liable we are to err on such a point, I may mention the case of a lady, who declared that she could not bear to see beetles of any kind; and when I protested that many beetles are beautifully decorated, she said she detested their very form. She nevertheless wore as a brooch an imitation of a red beetle, but a poor reproduction of the original type. This repulsion to beetles in this case was obviously due to association. At the same time it would be rash to assert that no truly ugly natural object exists. Darwin mentions certain sea-snakes as being such, but the very fact that he has to go so far for an instance proves how difficult it is to find one. Nor is it necessary for my argument that its non-existence should be assumed.

It is important to remember that pleasures derived from beauty are entirely different in character from those derived from any sensual source. If they be, as the pure materialists would tell us, simply and solely due to certain unknown movements of the molecules of the brain, where is the distinction from sensual pleasure which they would tell us was due to other similar movements? Can one set of molecular movements be higher or more refined than another? In our present state of knowledge it is impossible to state whether such movements do or do not occur, but this cannot be proved to be the case; and even were it proved, there remains something beyond which materialism cannot explain. The question as to whether the sense of beauty, and other similar ideas, are or are not self-existent in the human mind, is one far too wide for discussion here. There are great authorities on both sides of the question, and it is beset with many difficulties. You will remember that Professor Cayley, in that minute portion of his address before the British Association which was intelligible to ordinary mortals, gave his support to the theory of self-existence, and this after a full consideration of what Mill says in favour of the other view. You will doubtless by this time have perceived that I have assumed that his view is correct. Those who do not agree with me may be unable to agree with my conclusion, but the present is not the time to discuss the matter with them. When we consider that throughout nature we so universally find that which appeals to our sense of beauty, we are led to one of two conclusions—either beauty has been created for the purpose of gratifying this sense, or it is itself the product of an intellect having a similar sense of beauty. The former theory, once so universally accepted, is not supported by known facts.

“ Full many a gem, of purest ray serene,
 The dark, unfathomed caves of ocean bear;
 Full many a flower is born to blush unseen,
 And waste its sweetness on the desert air.”

And we all know that numberless objects exist, and have existed and perished, that never met or shall meet the eye of man. Consideration will, I think, produce the conviction that such a theory is most improbable. We are thus led to the conclusion that beauty is the result of intellect. We will next consider how this theory is strengthened by further considerations.

To return to our late subject, the development of beauty in Lepidoptera. Darwin shows that in this order brilliancy of colour not only occurs in the perfect insect, but frequently in the caterpillar. Sexual selection is of course here entirely out of the question. His explanation is that those caterpillars which exhibit these brilliant colours have a nauseous taste, and birds do not care to consume them. Their colour serves to distinguish them from other caterpillars which are more palatable to the birds, and thus acts as a protection. Now, both in the case of the butterfly and the caterpillar the colours are not only bright, but of a most refined character, and there are also shadings, lines, rings, &c., most tastefully arranged; and since it is scarcely credible that the female butterfly can appreciate such niceties, and since the caterpillars would be as well protected by any colour, however gross and glaring, whilst lines, circles, &c., seem to be absolutely useless to it, we must conclude that though the theory of selection explains much, it does not in this case cover all the facts. But indeed the theory necessarily implies that there is a constant tendency in the species affected to produce the bright colours, and that natural or sexual selection, as the case may be, merely takes advantage of this tendency. Here we see both these agencies at work, and in each case the delicate shadings and markings and refinement of colour appear. These markings are also found in some chrysalises.

Here, I think, we derive strong support for our views.

It is also well supported by analogy, for the arguments I have been using can be equally applied to such principles as order, unity in diversity, &c., which can be appreciated and admired by the human intellect, but which have been placed in nature by another agency.

Objection may be taken on the ground that man's sense of beauty is variable. As shown by Darwin, it varies widely in different individuals and different races, but as this variation can only take place within certain limits, I do not think the objection very important. No sane person would declare the star-lit sky to be repulsive, or find beauty say in an ordinary locomotive waggon.

The fact that our æsthetic taste is not fixed may account for the

existence of such objects as the sea-snakes mentioned by Darwin as being ugly products of nature. We may also argue from this fact that not only is beauty in nature produced by an intellect similar to that of man, but by one having an almost identical taste.

To sum up. I have shown that Darwin has explained in a most interesting manner the development of beauty in many animals by the theory of sexual selection, but that although this theory throws much light on the subject, it also leaves much unexplained. It does not tell us why the colours and markings produced should be of a most refined type, or give any reason why beauty should exist throughout nature. We have therefore to look for some other cause, and since the intellect of man is capable of appreciating, and to a limited extent of reproducing this beauty, and since it is highly improbable that it has been created solely for his gratification,—we are irresistibly led to the conclusion that it is the product of an intellect alike in kind but immeasurably grander than his own.

Lest anyone should think me indifferent to the higher conceptions of the Creator given us by religion, I may say that I have purposely avoided saying anything on so sacred a subject, which belongs to another sphere of thought, and about which any remarks here would be out of place.

Huyton Park,
Liverpool.

REMINISCENCES OF BURNT WOOD, STAFFORDSHIRE.

BY JOSEPH CHAPPELL.

Read before the Lancashire and Cheshire Entomological Society, February 25th, 1884.

ABOUT 1850 I was informed that there were extensive woods at or near Ashley, which have since become known as Burnt Wood. At that time I knew very little about entomology, although I ventured to explore them. My time being very limited, and Whitsuntide being the only period that I have a week to spare, I packed up my collecting apparatus and started *en route* for Burnt Wood, about fifty miles—a pleasant walk at that time. I arrived at Ashley late in the evening, in consequence of loitering to admire the scenery, and to devote a little time to entomology. Early next morning I entered Burnt Wood, where *Thecla rubi* was skipping about the banks very abundantly; *Argynnis Selene* and *Euphrosyne* were sailing about the open glades;

Gonepteryx rhamni seemed to be flying against time over bush and briar; *Ephyra pendularia* was at rest on the oaks; *Orygia pudibunda* was common on the low bushes, especially on *Vaccinium myrtillus*; *Lycæna argiolus* was flying round the holly; *L. Alexis* and *Anthocharis cardamines* were plentiful near "Four Oaks"—even these were game to me. *Bombyx rubi* was flying in profusion; of *Macaria notata* I found one at rest on a young oak (this was a rare species, and my capture of it probably induced Mr. John Blakeley to visit Burnt Wood the following season). The males of *Lampyris noctiluca* visited sugar, also *Helops caraboides* abundantly; *Silpha thoracica* was abundant on carrion; *S. quadripunctata* occurred freely on the branches of trees; *Corymbites cupreus* and *C. pectinicornis* flew very abundantly over the meadow-grass just outside the wood. I returned home after being there a week, perfectly satisfied with my visit.

The following Whit-week Mr. John Blakeley and I went to Burnt Wood, and during the week we added a few more species to my previous list; among them were the following:—*Lithosia mesomella*, *L. rubricollis*, *Platypteryx lacertula*, *P. falcata*, *Scotosia undulata*, and *Macaria notata* freely; *Campylus linearis* also occurred freely, and we obtained some nice varieties; *Sericosomus brunneus* occurred sparingly on birch, and *Cryptocephalus lineola* on low willow bushes. We had just found the larvæ of *Cleora glabraria* feeding on a long thread-like lichen growing on oak trees in Bishop's Wood, when the keeper turned us out of the Wood for not asking his permission instead of the wood-ranger's; this discouraged me from visiting the place for many years, and my success in other localities made me almost forget Burnt Wood.

In the course of a year or two we had formed a society at Manchester for sending its members to explore districts we were unable to visit individually, and about the middle or latter end of June, we sent Mr. Worthington, to Burnt Wood, where he was fortunate in capturing some very good species, viz:—*Melitæa Athalia*, *Argynnis Paphia*, *A. Adippe*, *Notodonta chaonia*, *Ellopiæ fasciaria*, *Eupithecia debiliata*, *Angerona prunaria*, *Hyppena crassalis*, and *Cleora glabraria*. The latter species was obtained, I believe, by beating the branches of oak, the perfect insect falling and simulating death; it occurred at the "Slather hills," in Burnt Wood. Many other species were obtained, and consequently other entomologists visited the district.

Some years after Mr. John Smith was sent to Burnt Wood, and was fortunate in capturing a specimen of *Notodonta bicolora*, a species with which he was previously unacquainted. I believe it was killed by tobacco-smoke, which had the effect of changing its colour. He

drew the attention of some of the keepers to his capture, probably in consequence of its being a very remarkable insect, and this specimen was eventually obtained by Mr. Carter, by purchase. About the same time, a specimen of *Sesia sphericiformis* was captured by Mr. Vincent Moss, one of the under game-keepers who collected insects; others I believe, were obtained from the wood-cutters in the larval and pupal states, some of which were reared by Mr. Moss.

In 1865 I decided to visit Burnt Wood once more in company with Mr. T. Charlton and Mr. Samuel Greenhough, during Whit-week. So much had Burnt Wood altered that I scarcely knew my way about. However, I captured a few good beetles, and one *Notodonta chaonia* by Tuesday night, when Mr. Greenhough decided to return home. I collected assiduously (coleoptera principally), until Friday, when I was rewarded by a specimen of *Notodonta bicolora*, which I knocked out of a birch bush into my umbrella while beating for beetles. The announcement rendered Mr. Charlton speechless. However, I told him to sit down and we would decide on other tactics. After I had put my specimen safely away and packed up my umbrella, we each cut a beating stick nine or ten feet long, and fell to work in earnest, and in a very short time Mr. Charlton shouted out "Hurrah!" He had beaten a pair (*in copula*) out of a birch bush. Several hours more were spent in beating and searching beneath birch, without finding any more. I shall never forget the pleasure it gave me to see *bicolora* alive, especially beautiful with the almost confluent orange marking, when the wings are folded together. They remind me of *Menthastri* when on the wing. Later on in the evening, about four or five o'clock, I captured one on the wing; before dusk, Mr Charlton took another; I then again had the pleasure of adding another. The next day was entirely devoted to searching for *bicolora*, without success. We decided to keep the females alive for the purpose of obtaining ova; they were placed in a perforated zinc box lined with newspaper, the one we obtained *in copula* loose, and the others pinned, and they were all in my care. On Sunday we set out for home, having been there a week.

Before we left on Sunday morning, the under-keeper Edwin Moss, and his brother Vincent paid us a visit, when the following conversation took place:

"Well Vin, how many *Sphlegiforme* have you taken this season?"

"None; why?"

"Oh! I only asked you the question."

"Why? have you taken it?"

“ No, I suppose there’s a knack in it.”

“ That’s all.”

“ I shall get into it.”

“ I dare say you will.”

“ I have taken *bicolora*, only six ; you know there’s only a bit of a knack in it. You had better see them.”

Which they did ; the insects at that time being all alive.

After we arrived home I transferred the unpinned female to a paper bag in which I had previously placed a few birch leaves, and I obtained 106 ova (not 186, as stated in the Ent. Mo. Mag.) the following week.

The ova are green and hemispherical, changing to almost chocolate in the centre, previous to the emergence of the larvæ. I fed the larvæ on birch ; 22 changed to pupæ, and seven perfect insects emerged the ensuing season 15 pupæ were alive until 1867, but never emerged. The larva is green, whitish on the back, with several yellow lines, the spiracular line being interrupted. My friend Mr. Sidebotham saw the larvæ several times and the late Mr. Doubleday was aware that I was feeding them. The pupæ were enclosed in cocoons among the fallen leaves, close to the surface of the peat in my breeding-cage.

The first specimen I captured is in the collection of Mr. Barrett ; one was in the collection of the late Mr. Doubleday ; two are in my own collection ; two in that of Mr. Sidebotham ; one in that of the Rev. Henry Burney ; one was in the collection of Mr. O. Hammond, near St. Alban’s ; the late Mr. Campbell, of Manchester, purchased four from Mr. Charlton and sold them to Mr. Harwood, of Colchester ; and one, or rather a portion of one—for it had lost the abdomen—was sold to Mr King, along with Mr. Charlton’s collection.

Manchester, February, 1884.

NATURAL HISTORY NOTES FROM SOUTH AFRICA.

(Concluded.)

BY S. D. BAIRSTOW, F.L.S.

A DIRTY bluish pink species of *Turritella*, whose name I do not know, is often taken alive amongst the rocks. The great object of its life consists in making a shell of irregular dimensions and shape. A perfect proportionate specimen is the rarity—an ugly one the species. *Ancillaria obesa*, *Cerithium pinguis*, and similar types of small fry go to form the grand marine graveyard of our coast, but as with most of the lesser mollusca, although their shells are procured in tolerably fair condition we do not find their living inmates. Members of the periwinkle group

struggle meritoriously to replace them, but these are usually neglected by otherwise disappointed collectors. I have taken scores of smashed *Malapium lineatum* (a lovely shell, when good) but only two really acceptable specimens. I have gathered one hundred *Mitra picta*, over fifty *Bulla aperta*, over two hundred of either *Desmolea*, but out of the whole collection to select a series for my cabinet is not a gratifying task. Judging from a congeries or mass of particles where bits of strange shells are certain to congregate, I might safely infer that undercurrents and heavy seas have imported us treasures from distant parts, or else the marine fauna of South Eastern Africa is rich in unrecorded species of inaccessible location. A fortnight ago I picked up a fine but small *Dentalium* (?) I don't think it is recorded from the Cape. I am no adept in the arrangement of mollusca according to the laws of generic or specific areas, in the art of provincialisation—if I may so coin the word—but if not a genuine native, from where has it travelled, this fragile delicate shell of an insignificant creature? Did it descend from the Red Sea and preserve animation until within reach of our raging waters? or as a friend suggests, “was it swallowed by a fish near the Indian coast, which took an excursion *down South*; got sick away from home after digesting the animal, and disgorged the shell as unpalatable in the Algoa Bay?” In either event the journey must have been long and tedious. Perhaps you can assist me in the problem.

I am now nearly at my journey's end:—first impressions, one of winding lanes and twisted alleys; and many sighs have been gulped, many regrets uttered that I am not quite at home amongst the strange forms and faces, habits and languages, of my beloved chums. I started planless, I finish planless. Much I might have said, much I might have omitted. Touching mollusca, why did I omit mention of the great African *Achatina*? or why not tell you about my prolific *Lepisma* writing desk friend, which always bids me welcome and then flees away in terror? What have I to say about our noble Crustaceans, or most curious fishes? Reply there is none. Is there one class beseeching recognition more than another? If so I give the palm to *Crustacea*, and deeply deplore my inability to treat upon them. I have, however, drawn a couple of marine examples for you. *Decapoun* (Pl. x.) to which surmise all details. The indefatigable Farquahar gathered them, and several of our Society members are now tackling the class in real earnest. This is a fitting place to state one of our little grievances. We are always pleased to give value for value, specimens (in duplicate) for information rendered, but when solitary ones are sent to be named, with accompanying request to return until duplicated; I submit the

form should be adhered to. Those at your end willing to assist are guaranteed compensation, and we are glad to exchange on such a basis. I have said that at home generalists are deficient. Here we want specialists. Still, one is apt to generalise too much, guided by misleading ambition; but as I topple over that rock fragment in the ocean, and see a living, moving mass, I long to know each creature by its name, to learn the economy of each, to acquire knowledge and hold it closely to the end. Yearning, the real struggle for existence, turns the tap of life's rough watercourse, and "Back, go back!" I am constrained, hemmed in, baffled, by the miserable peg which plugs desire with its wretched checkmate, commerce. Incapacity to achieve my soul's delight. Abortive attempt to do something; vulgar awakening—nothing done. Partial contentment must suffice: not all I would, but all I could. Need I grapple with another opposing force? Each step I take on beach or veldt, novelty meets me half-way. What is your name? I ask.

Find it!

How?

Read!

Where?

The question terminates discussion. Or put it in this fashion:

Are you known or unknown?

Find out!

How?

Write home!

Bless my heart, it takes two months for prompt correspondence to pass, and then—what then? O chaotic sequence! Why, my friend submits to a friend, and he cannot re-obtain from that friend, but will write again, which HE DOES.....NOT! Therefore we emigrant naturalists act upon Government suggestions, and feed on hope. Precious few provisions our glorious Assembly offers to hungry individuals. Give, and we'll accept to any extent. Request, leave your card, and call again when we are not at home. Real sympathy, practical assistance, emanates from members of the press. I cannot speak too highly of the Eastern Province public writers. Where magazines, social mediums, are absent; where business *is* business, and men work on common ground; where effort anticipates return, I repeat—"Honour the Press!" *Is* South Africa a century behind in art and science? Then the Press is blameless—supporters of the Press are not. Success to it, and may advertisements flourish, and be paid for in *due* season.

I now wrap up my batch of rigmarole disjointed letters, trusting they may prove slightly interesting to *some* of my dear old field-companions. Remember! impressions are subservient to alterations, more especially when first-born creations. Carp! cavil! erase! but turn over a few leaves to my inaugural project, the details of intention, and then excuse. I have written as though I were chatting in the days gone by, and to myself the gossip is pleasant. Indeed, to shut the window, to draw the curtain, and retire, is an effort, the only one I feel to be irksome, and

“ Thus—I say with Gloster—

Sometimes hath the brightest day a cloud :

And after summer evermore succeeds

Barren winter, with his wrathful nipping cold :

So cares and joys abound, as seasons fleet,—

Sir's, what's o'clock ?”

Port Elizabeth,
South Africa, Sept., 1883.

Rainfall for April.

	Height of gauge above sea level.	Rain-fall.	No. of Days	TOTAL FALL TO DATE.		Date of heaviest Fall.	Amount of heaviest Fall.
				1884.	1883.		
HUDDERSFIELD (Dalton) ... (J. W. Robson)	Ft. 350	In. 1·75	19	10·74	*10·14	4	0·27
LEEDS ... (Alfred Denny)...	183	1·82	19	9·24	6·77 †	27	0·29
HORSFORTH ... (James Fox)	350	2·21	22	10·07	9·36 †	27	0·40
HALIFAX... (F. G. S. Rawson)	365	2·09	20	14·84	16·24	27	0·37
BARNSELY ... (Dr Sadler)...	350	2·12	18	9·36	8·48	28	0·47
INGBIRCHWORTH (Mr. Taylor)	853	1·85	18	14·30	12·72	28	0·44
WENTWORTH CASTLE (Mr. Fisher)	520	2·01	18	10·12	10·51	28	0·32
GOOLE ... (J. Harrison)...	25	1·12	17	7·52	7·81	7	·20
HULL (Derringham) (Wm. Lawton)	10	1·62	21	7·55	5·78 §	12	·26
SCARBORO' (A. Rowntree)...	130	1·83	19	8·73	7·33 ||	27	·38
THIRSK (Baldersby) (W. Gregson)	100	1·91	15	10·29	...	1	0·61
MASHAM (Thos. Carter) ...	269	2·08	25	12·64	...	1	0·54
SHADWELL (Geo. Paul) ...	500	2·49	21	...	..	27	...

* Average to date for 18 years, 1866-83.

† Average of 30 years, 1853-62, & 1865-84. ‡ Average of 15 years, 1870-84.

§ Average of 34 years, 1850-83. || Average fall for April (18 years).

Notes and Queries.

NATTERER'S BAT AT PATELEY BRIDGE.—I have just received a living specimen of this bat from my correspondent, Mr. William Storey, of Pateley Bridge, who took it in that town on the evening of the 18th May. It is thus interesting to confirm its existence in that district, from which he sent it to me in June of last year, and one would think that it likewise occurs in other localities in the north of England, as bats are generally much overlooked. Its nearest allies are the whiskered and Daubenton's bats, from both of which it may be most readily distinguished by the smaller number of transverse lines which are to be counted in the interfemoral (or tail) membrane when held up to the light. There are only eight, whereas in the other two they number sixteen or more. I should be glad to hear of its occurrence in other places.—WM. DENISON ROEBUCK, Leeds, May 19th, 1884.

BIRDS NEAR HALIFAX.—The swallow arrived here (Ryburne Valley) on April 13th, the same date as last year; the martin and sand-martin not appearing before April 29th, a later date than usual for this species; Ray's wagtail was here on April 26th, and the sand-piper and cuckoo on May 1st, the latter, a few days later than generally. Owing to the mild weather, birds commenced to nest earlier than usual, and young thrushes, blackbirds, and robins were on the wing at the end of April. Resident and migratory birds are all very plentiful this spring in this district, and young birds will be numerous.—F. G. S. RAWSON, May 9th, 1884.

EGGS OF PIED WAGTAIL.—At the meeting of our society, on the 17th, at Hessle, one of the party found a pied wagtail's nest with thirteen eggs. Is this not an extraordinary number, even if the nest were tenanted by two hens? One bird was on the nest, and I saw the eggs; of their identity there can therefore be no mistake.—N. F. DOBRÉE, president of the Hull Field Naturalists' Society.

LARGE HALIBUT.—I saw to-day, on a fish-monger's slab in Hull, a halibut taken by a fishing smack off the Dogger, which I measured to be 6 feet 9 inches long, and weighing rather over 20 stones. This fish is abundant in our market, but rarely reaches anything like this size, though it is said to be common in more northern seas.—N. F. DOBRÉE, Hull, 21st May, 1884.

THE HOLLY BLUE BUTTERFLY IN NIDDERDALE.—I wish to record a fresh Yorkshire locality for *Lycæna Argiolus*, Mr. Wm. Storey having sent it to me from Guyscliffe, near Pateley Bridge, where he took it (a female specimen) on the 17th May.—WM. DENISON ROEBUCK, Leeds, May 19th, 1884.

OBITUARY.

EDWIN BIRCHALL.—By the death of Edwin Birchall, Yorkshire loses another who, in his day, proved himself to be one of its ablest and most gifted lepidopterists—a man of European repute as a student of that order, and one whose philosophical tendencies raised him so much above

the level to which many of our entomologists attain. He identified himself very closely with the lepidopterous fauna of Ireland, for which he did a great deal, as the lists which he published in the 3rd and 10th volumes of the "Entomologists' Monthly Magazine" amply shew. Whilst in Ireland too, he took and had captured for him, immense numbers of the local *Zygæna nubigena*, which he distributed most freely and generously among the cabinets throughout Britain. The genus *Dianthæcia* was also a great favourite with him, and he paid much attention to it. He was a native of Leeds, but left the town at an early age, and returned to it only after many years, when his reputation had been made, and his fame won in other districts, so that he never had the opportunity of doing much for the lepidopterous fauna of his native county. At this time, Bishop's Wood and Sherwood Forest were frequented by him in his collecting expeditions, and he was still a hard worker, and a capital correspondent, as we know from personal experience. The last few years of his life were spent in the Isle of Man, and here he was successful in obtaining its famous species, such as *Sesia philanthiformis*, *Dianthæcia cæsia*, *Polia nigrocincta*, &c. Latterly, he fell into bad health, but even when unable to collect himself, he employed the lighthouse keeper to send him such species as flew to and were captured at the lights; and a number of these captures he kindly presented to us when we called upon him last year. For some time he was a Fellow of the Linnean Society, having been elected on the 18th of June, 1874. He died at Douglas on the 2nd of May, this year, aged 65 years.

Reports of Societies.

BARNSELY NATURALISTS' SOCIETY.—Meeting May 13th, Mr. T. Lister in the chair.—A full report of the spring migrants was read. The wheat-ear and willow warbler both reported March 22nd, chiffchaff 24th, a second instance April 2nd, sand martin 4th, pair of swallows 7th, 8th, and 9th, the latter did not come again for several days to their breeding haunts. Willow warbler noted (2nd instance) 9th, another 10th, house martin 11th and 14th, whitethroat 11th, redstart 13th, cuckoo seen on 13th, had been reported singing on the 3rd; yellow or Ray's wagtail and tree pipit 18th, grasshopper warbler 21st, sedge warbler 24th, whinchat 25th, spotted flycatcher 27th, blackcap warbler 30th, wood warbler May 1st, night-jar 3rd, nightingale 5th, swift 4th, landrail 7th, garden warbler and lesser whitethroat 9th. With the exceptional cases in March and early April, the migrants have come pretty near the average time. A few rarer residents and visitors have been noted—white sparrows near the Oaks Colliery and L. and Y. Station, Barnsley; gold-crested wrens in Locke Park and other places April 5th; green and great spotted woodpeckers, Nottan Park, on the 5th; kestrel, Dodworth-road, 18th, at Silkstone 22nd; nuthatch and spotted woodpecker, Deffer Wood; black-headed gulls and flights of common gulls and wild geese, May 1st to 7th; sparrow hawks seen.—T. L.

BRADFORD NATURALISTS' SOCIETY.—Meeting, April 22nd, 1884, Mr. Soppitt, chairman.—Mr. Soppitt described a visit to Ingleton, where he found *Pupa secale*; it has only been previously recorded from Kilnsey Crag. He noted having seen *Viola hirta*, wood sanicle, *Draba verna*, &c., and on Ingleborough he found the purple saxifrage growing abundantly. He also reported a ramble up Goit Stock valley, where he saw the willow wren, swallow, sand martin, and also observed a pair of kingfishers making their nest. Mr. Carter showed a box of insects found on and about Ingleborough, among which were *Carabus arvensis*, *Nebria Gylenhallii*, *Calathus melanocephalus*, &c.; Mr. West, specimens of *Helleborus viride*, *Hutchinsea petrea*, &c., collected in a ramble near Matlock.

MEETING, May 6th, Mr. Soppitt presiding.—Mr. Bennett exhibited two starlings from Skegness, also specimens of shells, *Limnæa peregra*, *L. palustris* and *Planorbis complanatus*. Mr. Soppitt described a visit to Goit Stock, where he saw swallows, a pair of redstarts, and nest of the grey wagtail with three young ones; on returning, he saw a squirrel in Bingley Wood. Mr. Firth reported having seen a large number of yellow wagtails about Brownroyd. Mr. Barraclough reported a number of plants he had observed about the roads near Thornton, and in the neighbourhood of Cottingley. Mr. Soppitt exhibited a fungus found on the Scotch fir (*Peridermium pini*), the first stage of which is on the groundsel. Mr. Carter showed specimens of *M. Artemis* (greasy fritillary). Mr. Ward reported a ramble from Ilkley to Harewood Castle, where he observed redstarts, missel thrush, and nests of hedge-sparrow and blackbird. Mr. Carter read a paper on “Coleoptera.”

MEETING, May 20th, Mr. J. W. Carter in the chair.—Mr. Illingworth described a visit to Roche Abbey with the Y.N.U.; he also described a visit to Skegness. Mr. Soppitt exhibited *Paris quadrifolia* and *Geranium lucidum*, from Barden, and also a specimen of a fungus, *Morchella esculenta*; he also reported a ramble of the society on the 17th, from Saltaire to Bingley, which was considered one of the best the society has had. Mr. Firth reported having observed in that ramble, 36 species of birds, among the summer visitors the black-cap and garden warblers; he also noticed the dipper and snipe on Baildon Moor on the 18th. Mr. Terry exhibited a box of insects, among which was *S. dubitata*, taken near the Parish Church. Mr. Eastwood read a paper on “Nest-building Fishes.”

HECKMONDWIKE NATURALISTS' SOCIETY.—Meeting, May 17th, 1884. Dr. Stuart (the president) in the chair.—Mr. J. M. Barber gave an account of a ramble which he had taken during that afternoon with the Juvenile Mutual Improvement Association of George-street Chapel to Owllet Hurst and Finching Dyke. The party collected about sixty botanical specimens and also observed several birds. Members present had noticed the cuckoo and corncrake during the week in the neighbourhood of Heckmondwike. Mr. Barber had observed that the oak was fully a week before the ash at the present moment. The president then read his

paper, on "Air, Earth, and Water in Relation to Health"—the concluding paper of the series on "The Humble Forms of Plant Life." After a vote of thanks had been passed, a ramble was arranged to the Carlinghow Banks and Howley Ruins for May the 31st.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Monthly meeting, April 28th, the president (Mr. S. J. Capper) occupying the chair.—A paper was read entitled "Entomological Notes from Grange and Witherslack," communicated by Mr. Shuttleworth, of Preston. In this were detailed the results of a day's collecting in 1881, and a week's in 1883, in this entomologically famous neighbourhood. During the *conversatione*, Rev. Thomas J. Moore, curator of the Museum, exhibited a nest of a species of mud-wasp, which he had found in the interior of a clock brought from the West Indies to be repaired, the nest having stopped the works. The secretary (Dr. Ellis) exhibited living specimens of the water spider from Liscard, and a living *Cetonia aurata* from Leeds, where it had been hibernating in thatch.

LEEDS NATURALISTS' CLUB AND SCIENTIFIC ASSOCIATION.—Meeting May 19th, Mr. W. Denison Roebuck, F.L.S., in the chair.—There was a good muster of members, and numerous objects were on view. On behalf of Mr. W. Storey, of Pateley, were exhibited freshly gathered specimens of the adder's tongue, moonwort, bush vetch, petty whin, and field speedwell. Mr. Charles Smethurst showed a specimen of the oxlip from Crake Hall, Bedale; and larvæ of the purple barred and lemon sallow moths, recently secured at Addingham, near Ilkley. Mr. Henry Marsh brought a series of ammonites collected at Whitby, and Mr. S. S. Peat specimens of quartz containing gold, lately received from a relative at Charters Towers, Queensland. There was further shown on behalf of Mr. Storey, Natterer's bat, and several slugs, moths, beetles, and bees, and a box of miscellaneous insects captured in Nidderdale more than 20 years ago by a Mr. Hutchinson. The more interesting of these were wasp beetle, ruby-tailed fly, tiger beetle, and cardinal beetle. Mr. F. Emsley exhibited the pollen sacs of the honey bee, and Mr. Walter C. Scott a perfectly blue egg of the blackbird, taken lately at Arthington.

MANCHESTER CRYPTOGAMIC SOCIETY.—At the usual monthly meeting in April, Dr. B. Carrington, F.R.S.E., in the chair, Mr. W. H. Pearson exhibited a series of mosses and hepatics which he and Dr. Carrington had collected during the Easter holidays in the Lake District. They had been very fortunate in finding many rarities; amongst them may be mentioned the following:—*Glyphomitrium Daviesii*, the first record for England; *Orthotrichum Hutchinsiae*, *Leptodon Smithii*, and *Hypnum demissum*. Amongst hepatics the chief prize was *Lejeunia microscopica*, the only previous record being in the south of Ireland; *Adelanthus decipiens*, only previously been found in Ireland and Wales; *Lepidozia cupressina*, new to Cumberland; *Radula aquilegia*, *Radula voluta*, new to England; *Plagiochila tridenticulata*; and other rare hepatics were also

found, and specimens of the various species were distributed. Mr. W. Forster exhibited some interesting young plants of a variety of *Scolopendrium vulgare*, which he had raised from the margins of the fronds of full grown plants not producing spores. Mr. J. Cash finished the reading of his interesting compilation of the letters and correspondence of Edward Hobson. An essay on the genus *Amblystegium*, in French, was presented to the society by Mons. R. du Buysson, the author. Mr. G. A. Holt recorded the finding of *Gymnostomum tenue* and *Weissia mucronata* at Ashley, in Cheshire.

YORKSHIRE NATURALISTS' UNION.—ROCHE ABBEY, MAY 8TH, 1884.—The opening of the excursion season of 1884 was a most unqualified success. The district chosen was the very productive and picturesque magnesian limestone district surrounding Maltby Commons and Roche Abbey, with the beautiful Cistercian ruin as a rendezvous. There was a very large attendance of members and associates, not only from the neighbouring towns but from places so far distant as York, Leeds, and Hull. The arrangements had been most efficiently made by the officers of the Rotherham Society, to whom the Union stand much indebted. The majority of the members drove in waggonettes from Rotherham to Maltby. The Sheffield Naturalists' Club had made independent driving arrangements, and joined the other parties at Bramley village. The Doncaster members also drove direct to the place of meeting. Arrived at Maltby, the members divided into two parties, one of them, under the charge of the Rev. R. M. Norman, vicar of Maltby, and Mr. F. W. Dickinson, the secretary of the Rotherham Society, and numbering about a score, driving to Martin Beck, a wild jungly tract of country beyond Tickhill. The other party, at the head of which were the Rev. W. T. Travis, of Roche Abbey Mill, and Mr. S. H. Bennett, of Rotherham, continued the drive a mile or two beyond Maltby, and then alighted for the investigation of Maltby woods. Both parties subsequently made for the Abbey, as did also a smaller one of three members which walked down the valley and through Wood Lee Common to Roche Abbey, and afterwards examined the valley of the Laughton stream. About 120 sat down to tea, after which all the meetings, sectional and general, were held in the open air, the true "Union weather" which prevailed rendering this course of procedure an enjoyable one. At the general meeting the chair was occupied by a vice-president, the Rev. W. C. Hey, M.A., of York. The minutes of the Malham meeting having been taken as read, the roll was called, and twenty societies were found to be represented, viz :—Huddersfield, Heckmondwike, Barnsley, Wakefield, Elland-cum-Greetland, Liversedge, Bradford (Naturalists'), Leeds (3), York (2), Sheffield, Dewsbury, Hull, Halifax, Doncaster, Ilkley, and Rotherham. Of individual members, associates, and friends there were about 140 present during the day, including many of the more influential of the Sheffield and Rotherham societies. The Kingston Field Club, Hull (54 members), was admitted into union, on the motion of Dr. J. A. Erskine-

Stuart, of Staincliffe, seconded by Mr. Thomas Lister, of Barnsley. On introducing the subject of new members, the chairman made an effective and telling speech, in which he pointed out that the Union made excursions into different parts of the county, not only for investigation and social enjoyment, but also to draw public attention to the work which it endeavours to do, and thereby enlist support. A gratifying result of this speech, and of the personal efforts of members present, was that the list of four new members which the secretaries had brought with them was increased on the spot to twenty. The following were elected: Rev. R. M. Norman, Vicar of Maltby, Rev. W. T. Travis of Roche Abbey, Dr. W. H. Crossley of Maltby, Dr. W. J. Lancaster, president of Barnsley Nat. Society, Messrs. Thomas Carter of Masham, W. Hoffman Wood of Leeds, Edward Birks (president Sheffield Nat. Club), F. Brittain, F. H. Colley and J. W. McIntyre of Sheffield, Isaac Walker (president Rotherham Nat. Society), F. W. Dickinson, S. H. Bennett, Thomas E. Denham, James Rhodes, Geo. Eskholme, J.P., and R. Marsh, jun., of Rotherham, and H. Somerset, M. H. Stiles, and J. M. Kirk of Doncaster. Thanks were then unanimously voted, on the motion of Mr. Councillor F. Brittain of Sheffield, seconded by Dr. Burman of Wath-on-Deerne, to the Earl of Scarborough for permission to visit his estates during the day, and to the Revs. Norman and Travis, and Messrs. Bennett and Dickinson, for acting as leaders of parties. The Sectional reports were then given. Mr. James Backhouse, jun., of York, secretary, reported on behalf of the Vertebrate Section. Very little was observed excepting birds, of which an unusual number were noted. The resident species seen numbered 36, of which may be mentioned jay, creeper, nuthatch, heron, coot, great-crested grebe, and little grebe (the two latter species nesting in Sandbeck Park). The summer visitants noted were as follows: Redstart, whinchat, wheatear, chiffchaff, willow wren (abundant), wood wren, whitethroat, lesser white-throat, blackcap, sedge warbler, grasshopper warbler, yellow wagtail, tree pipit, swallow, martin, sand martin, cuckoo, swift, and corncrake. The only reptile seen worthy of note was a viper about 3ft. in length. For Conchology the Rev. W. C. Hey, M.A., of York, president of the Section, reported that not very much had been done. No water-shells had been found at all, while of land mollusca 18 species, as follows, had been collected:—*Helix aspersa*, *H. rotundata*, **H. lapicida*, *H. nemoralis*, *H. hispida*, *Zonites cellarius*, *Z. crystallinus*, **Z. purus*, *Z. nitidulus*, *Clausilia rugosa*, *Pupa umbilicata*, *Cochlicopa lubrica*, **Corychium minimum*, *Arion ater*, *A. hortensis*, *Limax agrestis*, *Bulimus obscurus*, and **Vertigo edentula*. Those marked * were additional to the list already printed in the circular. The Entomological Report was given by Mr. G. T. Porritt, F.L.S., of Huddersfield, president of the Section, who recorded that very little had been done. Among lepidoptera Messrs. George Rose and W. E. Brady had taken larvæ of *Thecla W-album*, and *Xanthia gilvago* (?), and Mr. W. Hewett of York had secured

Notodonta dodonæa in the Roche Abbey grounds. The coleoptera included *Chrysomela polita* (plentiful), *Coccinella variabilis*, *C. 14-guttata*, *C. 11-punctata*, *Silpha rugosa* and *S. thoracica*, *Phyllobius argentatus*, *Timarcha coriaria*, and *Telephorus clypeatus*. For Botany, Mr. P. F. Lee, Sec. Bot. Sect., who was absent through illness, sends the following note, from data supplied by Dr. F. Arnold Lees and Mr. W. H. Stott (Doncaster), who reported for the Section at the meeting, and also from specimens collected by the Martin Beck party:—" Altogether 117 species of flowering plants were observed either in bloom or fruit, and of these the notable ones were *Ranunculus Lenormandi*, *R. auricomus*, *Helleborus viridis*, *Viola canina* sub-sp. *sylvatica*, var. *Reichenbachiana*, *Genista anglica* (the needle furze), *Rubus fruticosus* sub-sp. *sub-erectus*, *Cratægus oxyacanthoides*, Thuill., *Chrysosplenium alternifolium*, *Valeriana dioica*, *Myosotis sylvatica*, *Daphne laureola* (the spurge laurel), *Myrica gale* (the bog myrtle), the daffodil, or Lent lily, *Narcissus pseudonarcissus*, *Paris quadrifolia* (found with five and six, as well as four leaves), *Convallaria majalis*, *Fritillaria meleagris*, *Colchicum autumnale*, and *Carex digitata*. When my notes for the circular were sent (which were cut down, as the others, for want of space), I then said with reference to *Primula elatior* reported by a local collector, that perhaps on close examination it would prove to be one of the hybrids of the Lond. Cat. the true *P. elatior* of the South of England having acuminate calyx-teeth, and no folds at the mouth of the corolla. Mr. Lees says, after seeing the plant in question, that the *Primula elatior* (oxlip) gathered at Roche Abbey is not the true oxlip to which that name alone belongs, but is the cowslip-primrose hybrid—the *Primula variabilis* of Goupil, and the *P. vulgaris* var. *C. intermedia* of the Lond. Cat. The *Fritillaria meleagris* is not accepted as anything but undoubtedly introduced in England north of Staffordshire and Warwick by the late H. C. Watson, the safest of all authorities on plant-distribution, in his "Topographical Botany" and other works. The lily looks native enough to uncritical observation, in the pasture land of Sandbeck Park; but against the probability of its indigenuity are the facts that its locality is very near to the Hall parterres, and that it does not grow scattered all over the open ground like the other bulbous rooted liliaceous plant of the park—the *Colchicum*. The very circumscribed area over which it grows (and there thickly) must be taken into consideration too; as well as the further fact that the kind of station in which it is found in Sandbeck Park is not like those in the Thames valley and elsewhere in the South, in which it occurs undoubtedly in an indigenous state." Mr. Edward Birks, president of the Sheffield Naturalists' Club, made some observations on the flora of the district and the operations of the day. There was no report given for the Geological Section, as none of the sectional officers were present. The proceedings closed by a hearty vote of thanks to the chairman, proposed by the Rev. R. M. Norman, seconded by the Rev. W. T. Travis.—W. D. R. and W. E. C.

“TO OUR READERS.”

“*Pour prendre congé.*”

IT is now nine years since, at the request of the Yorkshire Naturalists' Union (then the West-Riding Consolidated Naturalists' Society), we undertook to edit and publish this Journal. It has appeared regularly ever since, indeed we believe we are correct in saying it has never been a day late, but has always been in our subscribers' hands by the first of the month during the whole of that period. Financially, it has always been satisfactory, there having been at the end of every year a small balance in hand. Of its utility we must leave others to judge. Many of the articles have been of great value; the discovery of species new to the county or to Britain, in nearly all branches of Natural Science has been promptly recorded, and many have been described for the first time in this Journal. The Notes, &c., have kept the naturalists of this large county thoroughly informed as to what was being done by their brethren in the various branches of Natural Science; and, consequently, cannot fail to have advanced the knowledge of the natural history of our county very materially.

To all our contributors we offer our warmest thanks for the hearty co-operation they have always accorded to us. Personally we have made many friends among them, through our little Journal, and our labours in connection with it have always been so great a pleasure, that it is only other and urgent duties which have induced us to resign the position entrusted to us. Even this we did not carry out until we had secured the promises of Messrs. W. D. ROEBUCK and W. E. CLARKE that they would, if appointed, undertake the editing in future; but, knowing it is to be in the hands of such competent, enthusiastic, and conscientious naturalists, we have no hesitation or misgiving in handing it over to them, and we trust more support will be accorded to them even than has been to us.

C. P. HOBKIRK.

G. T. PORRITT.

THE LATE MR. WILLIAM WILSON:
NOTES ON HIS EARLY BRYOLOGICAL WORK.

BY J. CASH.

(Read before the Manchester Cryptogamic Society.)

UNTIL Mr. Wilson, when quite young, became interested in the botany of his native county, the cryptogamia, both of Lancashire and Cheshire, had been (except by one or two humble botanists in the neighbourhood of Manchester) comparatively neglected. George Caley was one of the first to pay attention to the bryology of these parts, and, as the discoverer of at least one interesting species originally classed with the *Weissia*, but now known under the familiar name of *Disclium nudum*, his name is not likely to be forgotten in bryological history. Contemporary with him, and even more distinguished as a bryologist, was Edward Hobson, to whose zeal and attainments testimony is borne by Sir William Jackson Hooker in the pages of the *Muscologia*. Hobson's career was almost ended when that of Wilson began. If the latter proved the more successful bryologist of the two, it was owing, no doubt, to his superior educational advantages, and to his greater leisure for study both at home and in the field.

Wilson had, from the first, an innate love of nature. Possessing a weakly constitution he was precluded from following the profession his parents had marked out for him, and as a means of recruiting his health much of his time, at suitable seasons, was spent out of doors. What more natural than that he should turn his attention to the flowers and mosses which grew in his path? The study of these yielded him mental occupation that was most acceptable and enjoyable, just as their collection afforded him the requisite inducement to take the exercise which was necessary for his physical strength. If Mr. Wilson had not botanised in his younger days he would never in all probability have reached the age of three score years and ten.

It was about the year 1826—possibly a little earlier—that Mr. Wilson began his bryological studies. I have seen a little portfolio of selected specimens, representing probably thirty species, gathered by him about that time in the vicinity of Over, in Cheshire. They were mostly common species. Amongst them was *Aulacomnium androgynum*, a moss which may still be found growing luxuriantly, but always barren, on the sandy hedge banks about Over and Delamere. Another was *Bartramia pomiformis*, which also is still to be found there. At first Mr. Wilson studied phænogamous plants, and this study he continued

for some time with much success, but after his intimacy began with Sir Wm. Jackson Hooker he devoted closer attention to the Musci, which eventually, as we all know, became his specialty. In a former paper read to this society some particulars were given of Mr. Wilson's journeys to the Highlands, on the invitation of, and in company with, the distinguished Glasgow Professor. Their meetings in after life were not frequent, but the correspondence which passed between them covers a period of nearly fifty years, and a perusal of it throws much interesting light upon the history of many now familiar species.

I propose in this communication to give some account of Mr. Wilson's early explorations in his own immediate neighbourhood. I am indebted much for information to my late lamented friend, Dr. Kendrick, of Warrington, who obligingly placed in my hands a good deal of Mr. Wilson's botanical correspondence and private memoranda.

For an enthusiastic bryologist some forty or fifty years ago, Lancashire and Cheshire were by no means barren ground. I have already mentioned one locality, viz., Over, on the border of Delamere Forest, which Mr. Wilson frequently visited. His family was interested in property there, hence his intimacy with the place. In February, 1828, on the road side between Over and Delamere he found upon the hedge bank a moss resembling *Pottia truncata*, but presenting certain peculiar features which in his judgment removed it from that species. He named it provisionally *Gymnostomum affine*, MSS., and sent specimens to Sir Wm. Hooker, along with *Pottia truncata*, var. β , which grew associated with it. Sir William replied in a letter dated Glasgow, April 5th, 1828, as follows:—

“ The arrival of your letter and your parcel gave me very much pleasure, and not myself only but my boy Joseph,* who is highly gratified by the valuable proof you have given him of your recollection of him. * * You have given me, too, some interesting employment in the examination of your beautiful botanical specimens. I have devoted no little attention also to the *Gymnostoma*, and you will, I fear, think me very unreasonable in not being entirely of your opinion with regard to the two being distinct species. I see, indeed, all the characters you point out, and your sketch is entirely faithful. Amongst such minute objects as mosses and other cryptogamia, it is very difficult to say what constitutes a species and what a variety; and, perhaps, had I seen only your *Gymnostomum truncatulum*, var. β , and your *G. affine*, MSS., I should have agreed with you in thinking them distinct.

* Now Sir J. D. Hooker, of Kew, for whom Mr. Wilson had sent a present of mineralogical specimens.

But I find in looking into my herbarium and to published specimens and figures such a gradation between the common *truncatulum*, with its turbinate capsules, and your *affine*, with its ovato-cylindrical ones, contracted at the mouth, that I know not where the line is to be drawn. If *Gymnostomum affine* be reckoned a species, then the *G. intermedium* of authors must be so too. But I confess I had, unless your further observations should confirm your present opinion (and I will be very open to conviction) rather, at present, keep them as varieties—*G. truncatulum*, $\beta = G. intermedium$; $\gamma = G. affine$. The leaves, I think, afford no character. The asperity of the upper part of the calyptra is so excessively minute that, without the other characters of the plant were paramount, I would not lay much stress upon it. I had the same plant in view in making variety β of *truncatulum*, and mentioned the characters as varying from ovate to oblong.”*

Passing from this subject, the writer compliments Mr. Wilson upon the beauty and accuracy of his sketches. This habit of sketching minute plants was, he said, the best way to understand them thoroughly. “Your MS. observations upon those little favourites of mine, the *Jungermanniæ*,” Sir William wrote: “are admirable, I shall take the liberty of putting them into my own copy of the ‘British *Jungermanniæ*’; those on the mosses I shall keep for my ‘Muscologia.’ * * I am glad I directed your attention in the ‘Muscologia Britannica’ to *Bryum [Mnium] affine*, for I have compared your plant with figures and find it to be the true one. I hope you will find it more advanced as to its capsules; the leaves are quite satisfactory.”

Mr. Wilson, notwithstanding the great authority of his correspondent, maintained his ground with regard to *Gymnostomum affine*, and Sir Wm. Hooker at length admitted its specific claims. Writing on the 23rd June, 1828, he said:

“Before setting out on my Highland excursion on Wednesday next—when I shall miss your company—I have many letter debts to pay, and amongst them one to you, for from you I have received a very long and very interesting communication. To this communication I have one, and only one objection, namely, that you should have paid a very heavy postage upon it, which entirely belongs to me, and which I should most cheerfully have paid had it amounted to twice as much and contained only half the information that it does. Pray bear this in mind in your future letters. I have already, I think I may say

* See “Mus. Brit., Ed. II.”

entirely, come over to your mind on the subject of your *Gymnostomum*—not *affine*, for that name is pre-occupied, but *Wilsoni*, MSS.; and you will think me unreasonable in requiring the testimony of another botanist before I could satisfy myself on the subject. Scarcely two days after I sent you my last letter, Drummond* came to me from Forfar, and told me that he had found a new *Gymnostomum* allied to *truncatulum*. I told him I knew what it was, and would show it to him. We then compared his species and yours, which exactly agree; and he (Drummond) declares he could find no specimen to vary from these which were before us. I shall, with your permission, publish figures in my 'Botanical Miscellany'—probably in the next."

In the same letter Sir William speaks of the fruit of *Mnium affine*, which Mr. Wilson had gathered in perfection shortly before, near Over, as "an excellent discovery." It would appear that fruiting specimens of this moss had not previously been observed in Britain.

The letters, of which abstracts are given above, constitute a pleasing addition to our knowledge of the history of *Pottia Wilsoni*, Hook. Mr. Wilson gathered the moss in subsequent years in the same locality; and in March, 1831 (as appears by a memorandum he made at that time) it was very fine and abundant in the original station. I regret not to be able to report that it grows there still. In the spring of this year I searched long and carefully for it, but failed to discover any trace of its existence. It is, however, recorded from several other localities in Britain, and quite recently I have had a specimen sent to me from Minehead, in Somersetshire. On the continent it is reported as occurring in France and Sardinia.†

It may be fitting here, as the species has been mentioned, to say a little more about *Mnium affine*. About the same time that he found the *Pottia* which bears his name, Mr. Wilson was fortunate enough to observe this species with young fruit. The locality, I have reason to believe, was Paper Mill Wood, where, three years later (March, 1831), he sought it again without success. On the 11th April, 1831, however, he came upon fruiting specimens at a place called Dale Ford, the fruit being nearly ripe; but being unable to make further search at the time, he determined to devote a day specially to it. Accordingly on the 15th of April he set out for Sandiway Head, and by nine o'clock in the morning he was on the ground. At the end of the day he had the satisfaction of recording that he had found *Mnium affine* in

* Thomas Drummond, the distinguished botanist and traveller.

† Schimper, "Synopsis," p. 152.

fruit, in four stations previously unknown to him—a fact of which he apprised Sir Wm. Hooker in a letter dated April 18th, adding that he had gathered above thirty specimens. In April of the following year, the moss was again found fertile, but not so plentifully except in one station; and on a visit to Knutsford Moor, Mr. Wilson, strange to say, found it there also—and that, too, on the day of his discovery on the same ground of *Paludella squarrosa*.

On March 24th, 1831, Mr. Wilson records the finding of various mosses and *Jungermannia* at Over: *Blazia pusilla*, was seen with perfect fruit; he also gathered *Jungermannia obtusifolia*. At Newchurch Bog he observed *Climacium dendroides* with over-ripe capsules. On April 11th, at Pettypool, he gathered *Jungermannia trichomanes*, *J. connivens*, and *J. polyanthos*, in fruit; he also observed *Tetraphis pellucida* on a bank on the margin of Newchurch Bog, with fruit; in the same neighbourhood *Phascum alternifolium*; in Paper Mill Wood *Orthotrichum pulchellum*, and near Grange Wood *Hypnum polymorphum*. *Hypnum filicinum* was observed at “Wade’s Sand hole,” but much too unripe to gather. Another station for fruiting *Hypnum filicinum* was found on a subsequent visit, near Hartford Bridge. On the 4th of May Mr. Wilson, who had shortly before made the acquaintance of Mr. J. E. Bowman, went with him to Delamere specially to gather fruiting *Mnium affine*. The journey was a successful one; they found in addition to fruiting specimens of that moss, *Jungermannia obtusifolia*, in spots “not far from the brook below Dale Ford”; also *J. Francisci* and *J. exsecta* “by the roadside as you go down to Dale Ford—perhaps fertile.” I find memoranda with regard to various other mosses and hepatics. One moss which Mr. Wilson met with puzzled him greatly. He thought it was a species of *Dicranum* (*Dicranella*) and a new one. He first observed it on the 24th of March, 1831, “whilst rapidly crossing a field below Mr. Little’s garden at Over,” and picked up a large tuft. “It may,” he wrote, “prove to be a *Gymnostomum*. I compared it with *Weissia controversa*, and was confirmed in my opinion of their being quite distinct.” The fruit was not quite ripe, and Mr. Wilson confessed that for the time he could make nothing of it. He gathered it on subsequent visits, examined it and re-examined it, but to no purpose. At length he sent it Sir Wm. Hooker, who replied as follows (April 21st, 1831):—

“Your supposed *Dicranum* is the veritable *Gymnostomum microstomum*. Upon this I will stake all my little knowledge of mosses. I almost recognised it with the naked eye, and I felt quite sure of it with the aid of a single lens. Would that I had as little difficulty with many

mosses, which others seem to have no difficulty whatever in determining. In *Gymnostomum microstomum* the capsule does exhibit generally, if not an inclination in the capsule, at least an obliquity, and that pretty little mouth never can be furnished with sixteen cleft teeth. The jaw would not contain them."

On the 10th of May Mr. Wilson, again visiting Over, gathered a good stock of the moss, which was to him at the time an interesting novelty. Subsequently he corresponded with Mr. Bowman respecting it, and received from that gentleman specimens from Derbyshire, which proved to be identical with his own Cheshire specimens.

Mr. Wilson's most notable discoveries at Knutsford in 1831-32 (*i.e.* *Paludella squarrosa* and fertile *Hypnum Blandovii*) were described in a previous paper; there is, therefore, no necessity to refer to them in detail here; but there remain one or two interesting facts to mention in connection with his journeys to Knutsford, Baguley Moor, Castle Mill, and other places in that part of Cheshire. On the 19th of April, 1831, he visited the Bollin Valley, and in Butts Clough gathered *Mnium undulatum* "in a good state;" also fruiting *Jungermannia trichomanes*. At Castle Mill he saw "*Hypnum salebrosum*, with old fruit, on the slope in the corner of the field." The moss referred to is not the *Hypnum salebrosum* of Hoffman, but *H. glareosum*, Br. and Sch. (Bry. Eur.). Edward Hobson was the first to detect it as a British moss, and this spot near Castle Mill was where he found it.

The following memorandum by Mr. Wilson referring to the same visit is interesting:—"In Cotteral Clough most of the trees were cut down, and I could not find *Jungermannia tomentella* in fruit. Gathered *Neckera pumila* with over-ripe fruit on several trees near that on which I used to gather it. It ripens about November. Could not see any *Hypnum splendens* in fruit." Mr. Wilson crossed over from Ringway towards Baguley Moor, and in the fields observed *Hypnum polymorphum* with nearly ripe fruit. "On Baguley Moor," he wrote, "I gathered plenty of *Hypnum aduncum*, fr., nearly ripe; *Jungermannia crenulata* with fruit; and in the splash of water a large thick *Chara* (new to me) along with *Chara vulgaris*, small var. Gathered also *Jungermannia inflata*, var. a. N.B.—*Hypnum scorpioides* is plentiful in the same swampy spot with *H. aduncum*, but always barren. I observed *H. fluitans* barren on one part of the moor. On returning by the hollow way, near Bollin Bridge, I gathered some very fine *Hypnum filicinum* in a good state."

The moss referred to in the above extract as *Hypnum aduncum* is our *H. exannulatum*, and is mentioned by Mr. Wilson in a communication which appeared in the *Naturalist* (1st series, vol. ii.) where he enters into a critical examination of *Hypnum aduncum* and its allies. "This moss," he says (referring to *Hypnum exannulatum*) "described in 'Bryologia Britannica' under the name of *Hypnum aduncum*, was first found with ripe fruit on Baguley Moor, in April, 1831, and was then, and at the time of the publication of 'Bryologia Britannica,' the only known moss which could be well referred to Hedwig's *Hypnum aduncum*, and there was the great authority of Dr. Swartz for so naming it." Mr. Wilson shows that the *H. aduncum* of Hedwig is identical with *H. vernicosum*, Lindberg (= *H. aduncum* var. *tenuis*, Bry. Eur.), the *H. aduncum* of Bry. Eur. being our *H. Wilsoni*, formerly found fruiting at Ainsdale. With regard to *H. exannulatum*, Mr. Wilson says in the article cited: "In Bry. Eur. the leaves are unhappily described as '*haud plicata*,' for if not actually plicate as in *H. uncinatum*—with which it is contrasted, they are remarkably striate, and by this obvious mark the moss may always in the field be easily recognised."

On the 30th January, 1833, Mr. Wilson again visited Ringway, and procured a good stock of *Hypnum glareosum*, with perfect fruit. He also gathered *Tortula rigida* and *Jungermannia turbinata*. *Neckera pumila* in Cotteral Clough, was "over-ripe and very scarce." It is not clear what species is referred to in the following memorandum which Mr. Wilson made in his journal:—"At the fork in Cotteral Clough grows a hypnum, now with young setæ, which I take to be *Hypnum fluviatile*, Brid., having the leaves entire. It may prove to be a variety of *H. filicinum*." Again, on Feb. 6 Mr. Wilson rode to Cotteral Clough for more *Hypnum glareosum*, and took the opportunity of exploring other woods up the Bollin. He writes: "Observed as I went along *Daltonia* [*Cryphæa*] *heteromalla*, *Anomodon viticulosus*, *Hypnum* [*Leskea*] *sericeum*, *Leucodon sciuroides*, and *Orthotrichum pulchellum*. *Hypnum salebrosum* is fertile at the entrance of the lane near the bottom of Cotteral Clough, on the west side near the gate, under a tree, and likely to be abundant. A large dense patch of the barren plant is just by, nearer to the gate: this I partly transplanted to the fertile spot."

Mr. Wilson's first visit to Mere Mere was made, I believe, in 1832. He went, apparently for its rare phænogamous plants, *Limosella aquatica* and *Elatine hexandra*—which, together with *Scirpus acicularis*, he records having then gathered—but no mention is made of the bryological rarities which have contributed to make the place famous.

It was in the autumn of 1834 that Mr. Wilson first collected *Physcomitrium sphaericum* in that which is still the only known station for it in Britain. His botanical journal in the latter half of that year was, owing to private circumstances, not kept with the care he had previously bestowed upon it, and the only entry I can find bearing upon the bryology of Mere is the following, which is without specific date :—“ Made discoveries of several new mosses at Mere, in Cheshire, Irlam, &c.”

The most notable of these discoveries was that of the rare *Physcomitrium*; but Mr. Wilson also found some rare phasca, including *Phascum stenophyllum* (*Phascum sessile*, var. β Bry. Brit.), and the rare *Archidium phascoides*. Fruit of *Riccia fluitans*, for the first time in Britain, was on this occasion discovered. The Irlam discovery was fertile *Dicranella Schreberi*. Mr. Wilson communicated these facts to his friend Sir Wm. Hooker, who wrote as follows :—

“ Glasgow, November 28th, 1834.

Dear Sir,—I am much obliged to you for your letter of the 31st of October, and would not have suffered a month to have elapsed without answering it had I been master of my own time. I have wished particularly to congratulate you on your most extraordinary and interesting recent cryptogamic discoveries. To say nothing of *Gymnostomum* [*Physcomitrium*] *sphaericum* and other good mosses, I do think your having found the fruit of *Riccia fluitans* a circumstance on which you deserve to be congratulated by all lovers of botany. Hundreds have searched for it, but no one ever saw it before in that state. I wish you would make a drawing of it on a small size such as the space included within this pencil line [about 5in. by 2½in.], and write a description, and let me publish it—if I am mad enough to go on with the ‘ Botanical Journal.’ I am a very great loser by the four numbers I have already published; yet I am very desirous to continue it, for it is a means of giving much botanical information to the public which would otherwise be entirely lost. I should not be so much a loser if the publisher could afford to pay me what I expend upon it, and as he is bound to do. But as the sale has not covered the expenses of advertising, and as the man is poor, I have not the heart to ask him for the money. Your *Dicranum Schreberianum* looks like what Greville and I found on Ben-y-Gloe some years ago, and which I suppose is what Bridel makes var. β . *Grevilleanum*. I cannot lay my hands on my own specimens now, and my second edition of ‘ Muscologia Britannica,’ where I have figured it, is gone to the binding. But in some continental specimens given in Mougeot and Nestler I find the beak of the

lid varying in length; never, however, I allow, so long as in Greville's figure. In regard to size I have seen German specimens almost twice the size of yours, and with a very indistinct struma. * * *

Most faithfully yours,

W. J. HOOKER"

On May 6th, 1835, Mr. Wilson again visited Mere. The water was very high, and there was no access to any of the mosses seen in the previous year. A subsequent visit in the autumn was attended with better success. He gathered *Phascum stenophyllum* more plentifully than in 1834. *Physcomitrium sphaericum* was, however, very scarce, and *Archidium phascoides* scarcely visible where in the preceding autumn it had been abundant. The station for these mosses described by Mr. Wilson will, I suppose, be that now so well known. "It is," he says, "found by going from the outlet up the west shore until you reach a creek. It is between the last willow bush and this creek, on the steep face of the ground, in yellowish clayey soil."

There is one British moss—essentially British, for I believe it has not up to the present time been discovered anywhere on the Continent—with which Mr. Wilson's name will ever be associated; it is, moreover, one of the rarities occurring within the limits of the Manchester flora. I refer to *Orthodontium gracile*. It was first observed on the 25th of March, 1833, growing on rocks at Helsby. In his journal of that date, Mr. Wilson records having gathered *Schistostega pennata*, and "a new moss—*Bryum (Pohlia) acuminata*?" Next day he examined the moss, and wrote to Sir Wm. Hooker about it, with drawings and specimens. On the 27th he again visited Helsby, and gathered "a large stock"; and two days later he made a coloured drawing of what he called "the new *Pohlia*," devoting nearly the whole day to the work. This drawing, it is not improbable, was the one subsequently published along with Mr. Wilson's description of the moss (under the name of *Bryum gracile*) in the Supplement to English Botany.

In 1831 Mr. Wilson determined the connection between *Schistostega pennata* and the "shining moss," which, it had previously been maintained, was an independent growth, and respecting which Mr. J. E. Bowman had written an elaborate memoir in the Magazine of Natural History. The appearance of the young confervoid shoots of *Schistostega*, shining with a metallic green lustre, under favourable conditions as to the light, will not be unfamiliar to those who have seen this beautiful moss in its favourite abodes. I have never seen it so brilliant as it is at Rowter Rocks, in Derbyshire, where it first excited

Mr. Bowman's attention. The moss was considered very rare at the time of which I write. Only a few stations for it had been discovered. In one of his letters to Mr. Bowman, Mr. Wilson enclosed a specimen of the rare *Daltonia splachnoides*; Mr. Bowman, in return, sent his friend a specimen of what he described as "the not less rare" *Schistostega pennata*.

But, with regard to the "shining moss," so called; on the 21st of May, 1831, Mr. Wilson made an examination of specimens sent him by Mr. Bowman, and saw reason to suspect their true nature. On the 23rd he made this entry in his journal: "Examined the shining moss of Rowter Cavern, and fully satisfied myself of its being a confervoid state of *Schistostega pennata*, of which I detected an example in a state of transition from one to the other; and made drawings." He wrote Mr. Bowman an account of what he had seen, enclosing the specimen between talcs, displayed for his examination, and also with drawings copied from his (Mr. Wilson's) own sketches. Again, on the 24th of May, he observed several other instances of young *Schistostega* plants with confervoid shoots from the base of the stem. He prepared a drawing of this, at Mr. Bowman's request, for the Magazine of Nat. History.

There had been a controversy as to the splitting of the lid in *Schistostega*; Mr. Wilson had made it a matter of careful investigation, and his conclusions are stated at length in "Bryologia Britannica." It may not be uninteresting to quote the following extract from a letter addressed to him by Sir Wm. Hooker, and dated June 5th, 1831:—

"Your account of the examination of *Schistostega* has gratified me very much. It has proved the fallacy of Hedwig's character of the operculum most satisfactorily. Now, must this genus be restored to *Gymnostomum*? Assuredly, as genera are at present defined—derived wholly from the fructification, it cannot be separated; yet, if foliage and habit be taken into account, and the nature, too, of the operculum, *Schistostega* may well be distinguished from every other moss, and I should wish to keep it separate, though with another name; so I should like to have *Fissidens* distinguished from *Dicranum*."

In closing this communication I will only mention a few other mosses and hepatics which Mr. Wilson records having gathered in Cheshire, between the years 1831 and 1836.

In July, 1831, he visited a place called Sinks Moss, near Knutsford, in order to gather *Malaxis paludosa*, but returned home unsuccessful. The place was partly enclosed and cultivated. He, however, gathered *Splachnum ampullaceum*, a moss which seems to have been more common

in those days than it is now, on the Lancashire and Cheshire bogs. Sinks Moss is now all under cultivation, but the locality retains some remnants of its former cryptogamic flora, for I have within the last few years gathered *Dicranella cerviculata* on the peaty ditch bank thereabout.

Hypnum nitens and *H. stellatum* were gathered in fruit at Knutsford May, 1832, about the time when Mr. Wilson made his more important discoveries of *Hypnum Blandovii* and *Paludella squarrosa*. *H. stellatum*, fertile, I have myself gathered at Knutsford recently; *H. nitens*, however, has not been found with fruit for many years. I believe the fertile plants were destroyed by the drainage which destroyed *Paludella squarrosa*.

In April, 1834, Mr. Wilson gathered *Phascum alternifolium*, "in excellent state," at Grappenhall; and *Gymnostomum tenue* at Lymm, the latter being one of the stations recorded in Bry. Brit.

Pottia Heimii was gathered in April, 1835, at Norton Marsh, and also at Gate Wharf, near Warrington.

Tetradontium Brownianum, barren, was, in May of the same year, observed by Mr. Wilson growing abundantly on the roof of a small cave near the highest part of Helsby Hill.

On June 17th, 1833, Mr. Wilson gathered, on Congleton Cloud, *Dicranum Scottianum* in fruit—(I may say that I visited this hill last spring, but could not then find the moss). On the banks of the Dane, near Bosley, Mr. Wilson found *Orthotrichum rivulare* and *Leskea polycarpa*. The latter species he also gathered about the same time at Rosthern Mere, where I understand it still grows.

On the 16th March, 1836, Mr. Wilson found *Phascum crispum* at Appleton, growing associated with *Gymnostomum microstomum*; and on Stretton Moss *Splachnum ampullaceum*. *Tortula revoluta* he gathered at Appleton in the following month.

Other mosses recorded from Cheshire by Mr. Wilson at various times are—

Dicranum Schraderi, Oakmere; Wybunbury Bog (c. fr.)

Hypnum cæspitosum, Frodsham.

Bryum roseum, c. fr., Near Over.—(First found by Mr. Wilson's brother.)

Fissidens exilis, Butts Clough, 1834.

Leskea latebricola, Paper Mill Wood, near Over, with fr., Feb., 1828.

Hypnum chrysophyllum, at Grappenhall, and also near Over.

Hypnum giganteum, c. fr., Wybunbury Bog.

Manchester, 1884.

Notes and Queries.

POLECAT, &c. — Can any reader of the *Naturalist* give instances of the recent occurrences of the polecat or martin, or mention localities for the blind worm or glowworm in Yorkshire?—G. ROBERTS, Lofthouse, Wakefield.

Laverna phragmitella IN YORKSHIRE.—As will be seen from the report of the Yorkshire Naturalists' Union excursion on Whit-Monday, this interesting species, hitherto unrecorded for the county, was collected by Lord Walsingham, at Sherburn. The larvæ were detected feeding in the *Typha* heads growing near the railway station, and several heads exhibited at the meeting of the Entomological Section seemed to be full of them. His lordship says the insect "is usually regarded as a fen species, but is in fact, very widely distributed, occurring probably almost everywhere where *Typha latifolia* and *T. angustifolia* abound." He has "found it certainly from Cannes, in the south of France to Yorkshire, throughout the whole distance. The effect it produces when feeding makes the seed heads of *Typha* very conspicuous at a distance. Unaffected heads appear solid or burst at one side and fall away; affected heads are swollen and matted together by the larvæ, which attack the downy seed and bind it together by their galleries and cocoons, preventing it from falling to the ground when it becomes detached from the stem, and thus preserving it as a conspicuous object after the unaffected heads have become mere naked stems."—G. T. PORRITT.

INSECTS AT CAMBRIDGE.—Mr. Mosley asked the question last March, "Where are the Insects?" I might repeat the query now, and echo would answer, where? Some of them are common enough in all conscience, *Hyalopterus pruni* is swarming on our plum trees, and *Myzus ribis* disfigures the red currant bushes; but, of course, by "insects" we mean Lepidoptera, and where are they? Most species worth mentioning are, as far as Cambridge is concerned, conspicuous by their absence. White butterflies are common enough; I scarcely remember seeing them more so; but as for the moths, with the exception of such species as *Sesia tipuliformis*, *Acronycta psi*, *Plusia chrysitis*, *Gonoptera libatrix*, *Pionea forficalis*, and *Spilonota suffusana* (all of which are abundant enough), they are scarce. I have sugared again and again, this spring and summer, but the moths seem to have joined a lepidopterous "blue ribbon army;" for sugar, beer, and rum, have proved the reverse of attraction to them. I notice the absence of many species I have been accustomed to see, all the more, because I am making out a list of the lepidoptera occurring in the neighbourhood of Cambridge, and so I am carefully investigating the subject, and am constantly on the look-out for specimens. *Eudorea pyralalis* swarms about our strawberry beds, but it does not abound anywhere else. What does the larva feed on? There is no moss anywhere near, nor yet lichen in any great plenty.—A. H. WATERS, Cambridge.

Rainfall for May.

	Height of gauge above sea level.	Rain-fall.	No. of Days	TOTAL FALL TO DATE.		Date of heaviest Fall.	Amount of heaviest Fall.
				1884.	1883.		
HUDDERSFIELD (Dalton) ... (J. W. Robson)	Ft. 350	In. 1·69	11	12·43	*12·14	3	0·67
LEEDS ... (Alfred Denny)...	183	1·12	11	10·36	8·41 †	3	0·32
HORSFORTH ... (James Fox)	350	1·01	12	11·08	11·18 ‡	12	0·25
HALIFAX... (F. G. S. Rawson)	365	2·50	13	17·34	17·33	1	0·85
BARNSELY ... (Dr Sadler)...	350	0·86	10	10·22	9·66	3	0·27
INGBIRCHWORTH (Mr. Taylor)	853	2·52	12	16·82	14·30	3	0·50
WENTWORTH CASTLE (Mr. Fisher)	520	1·27	11	11·39	11·76	3	0·32
GOOLE ... (J. Harrison)...	25	0·72	9	8·24	9·67	6	·15
HULL (Derringham) (Wm. Lawton)	10	0·64	11	8·19	7·27 §	6	·12
SCARBORO' (A. Rowntree)...	130	0·71	14	9·44	9·21 ||	12	·15
THIRSK (Baldersby) (W. Gregson)	100	1·09	9	11·38	...	19	0·21
SHADWELL (Geo. Paul) ...	500	1·15	11	...	..	...	...

* Average to date for 18 years, 1866-83.

† Average of 30 years, 1853-62, & 1865-84. ‡ Average of 15 years, 1870-84.

§ Average of 34 years, 1850-83. || Average fall for April (18 years).

Reports of Societies.

BARNSELY NATURALISTS' SOCIETY.—Meeting June 10th, Mr. T. Lister in the chair.—A box of coleoptera found at Bishop's Wood on the Sherburn Excursion was exhibited. The local Excursion for this month was fixed to Ryhill and Hiendley Dam on the 26th. The bird report is brief—all the warblers were reported as arrived by May 9th—the last were, Apr. 21st grasshopper warbler, 24th sedge-warbler, 25th whinchat, 27th spotted fly-catcher, 30th sedge-warbler, black-cap, May 1st wood-warbler, 2nd night-jar, 4th swift, 5th nightingale, singing until first week of June to the delight of many, six miles from Barnsley; a second, two miles from the town, which being disturbed, disappeared; a third is also reported; 7th land-rail, 9th garden warbler, lesser whitethroat. Most of these came near the average time, those reported in March and first week in April were very early—as the wheat ear and willow-warbler 22nd, chaff-chaff Mar. 2nd, sand-martin Apr. 11. Nineteen gulls (*L. canis*) were seen flying over Langsett, May 26th. Mr. Hailstone writes of eight black-headed gulls, and a tern at Walton Lake, June 1st, staying only one hour, and on the 13th June, a pair of terns.—T. LISTER.

BRADFORD NATURALISTS' SOCIETY.—Meeting, June 4th, 1884. Mr. J. W. Carter presided. Mr. Illingworth reported a visit to Grange, where he found *L. Argyolus*, *A. Euphrosyne*, and *N. Lucina*; he also

exhibited eggs of three species of sea-birds. Mr. Soppitt reported a visit to Windermere and Grange, where he found *Cochlearia anglica*, *Vicia sativa*, &c. ; he also described a visit to Goit Stock. Mr. Carter described a visit to Grange, where he found *Geranium sanguineum*, the rock rose, common barberry, *Sphagnum papillosum*, *S. acutifolium*, &c. Mr. Beauland showed a number of plants from Goole, among which were *Allium scorodoprasum*, *Carex vulpina*, *C. riparia*, *Comarum palustre*, &c. Mr. Spencer exhibited *Orchis Morio* from Grange. Mr. West reported a visit to Scawfell, where he observed *Thalictrum minus*, *Trollius Europæus*, *Saxifraga stellaris*, *Plantago lacustris*, *Salix herbacea*, *Carex rigida*, &c. Mr. Eastwood exhibited *Saxifraga granulata*, &c., from Holden Wood.

MEETING, June 17th, 1884, Mr. Soppitt in the chair.—Mr. Carter reported a ramble to Holden Wood, Mr. Bennett reported a visit to Broughton Woods, Lincs., where he found the lily of the valley abundant. Mr. Soppitt exhibited, on behalf of Mr. Hebden, *Æcidium convallariæ*, growing on the lily of the valley ; Mr. B. Spencer, a monstrous form of *Geum rivale*, in which one flower, instead of stamens has another flower growing from the centre, and a daisy, with small flowers growing out of one large one ; Mr. Barraclough exhibited *Cardamine pratensis* with twelve petals, and described a number of plants he had observed about Bolton Woods ; Mr. Carter, *Carabus glabratus*, collected by Mr. West on Helvellyn, *C. violaceus*, *C. nitens*, and *Harpalus protens* from Rombald's Moor ; Mr. Terry, a number of moths from Witherslack ; *L. marginata* and *V. cambricaria* from Holden Wood. Mr. B. Spencer read a paper on "Plant Lore," in which he gave an account of the origin of the wearing of flowers as emblems, &c.,—especially the rose, thistle, shamrock, and leek,—in the British Isles, and the various flowers used as emblems by other nations of Europe. Mr. Illingworth described a visit to Grange, and exhibited a number of plants collected there, including *Orchis maculata*, *Osmunda regalis*, &c.

HULL FIELD NATURALISTS' SOCIETY.—On June 14th the third excursion of this society took place, when upwards of sixty members and friends proceeded by road and rail to Hornsea. The party assembled at Hornsea Bridge Station, on arrival of the train leaving Hull at 2.5, and after short preliminary addresses on the chief characteristics of the locality and the species which might be expected to be found, three divisions were formed for investigating different portions of the ground. The geological party proceeded to the beach, and inspected the sections formed by the washing away of the cliffs, observing in one place the remains of an old lake basin. A number of striated and polished boulders characteristic of the boulder clay of the neighbourhood were also seen. The botanical and zoological sections visited the neighbourhood of the Mere. The botanists observed 157 species of plants, amongst the most interesting of which may be named two orchids, *O. ustulata* and *O. incarnata* and the adder's tongue fern, *Ophioglossum vulgatum*. The entomologists met with moderate success, specimens of twelve species being taken. The

ornithologists reported the occurrence of 43 species of birds, including great-crested grebe, mallard, coot, water-hen, teal, kestrel, sparrow-hawk, carrion-crow, gold-crested wren, &c. The heron was found breeding, and there was a concurrence of opinion that this bird has increased in the district in the last two or three years. Several nests of the reed-warbler were taken, and a number of eggs of coot, water-hen, sedge warbler, reed-warbler, garden-warbler, black-headed bunting, white-throat, bullfinch, spotted fly-catcher, &c.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting, May 26th, the president (Mr. S. J. Capper) occupying the chair.—A paper communicated by Mr. S. L. Mosley, of Huddersfield, on “Bird Protection in its Relation to Insect Life,” was read. The author blamed the action of the Wild Birds Protection Act for much of the scarcity of insects of all orders during the last few years—an opinion, however, which most of those present did not entirely endorse. A conversazione followed, during which Mr. Pierce and Dr. Ellis exhibited recent additions to their collections.—J. W. ELLIS, Hon. Sec.

OVENDEN NATURALISTS’ SOCIETY.—Monthly meeting, May 31st, Mr. T. Scott in the chair.—The following botanical specimens collected during the day, were exhibited by Messrs. Sheard and Bullock:—*Cardamine pratensis*, *Lotus corniculatus*, *Viola canina*, *Tormentilla officinalis*, *Pedicularis palustris*, *Ajuga reptans*, *Stellaria Holostea*, *Polygala vulgaris*, *Geranium Robertianum*, *Lactuca virosa*, *Hyacinthus nonscriptus*, *Ranunculus aquatilis*, *Alchemilla vulgaris*, *Vicia sativa*, *Oxalis acetosella*, *Cherophyllum sativum*, and *Vinca minor*.—J. OGDEN, Sec.

YORK FIELD NATURALISTS’ AND SCIENTIFIC SOCIETY.—Monthly meeting, June 11th, the chair being occupied by Mr. Geo. Benson.—Mr. H. J. Wilkinson (hon. sec.) exhibited a fresh specimen of the rare and local *Carex paradoxa*, also the following rare British plants:—*Trinia vulgaris*, *Gentiana verna*, and *Alchemilla conjuncta*. On behalf of Mr. Thomas Watson, specimens of the Moorgrass (*Sesleria cœrulea*) and *Bartsia alpina*. Mr. Dutton exhibited a fine series of *Hydrelia unca* and *Phibalapteryx lignata*; also the following fresh-water shells:—*Anodonta anatina*, *Unio tumidus*, *U. pictorum*, *Paludina vivipara*, and *Sphœrium rivicola*; as well as eggs of the snipe (*Scolopax gallinago*) and bullfinch (*Pyrrhula vulgaris*.)

YORKSHIRE NATURALISTS’ UNION.—SHERBURN, JUNE 2ND.—This year’s Whit-Monday meeting was highly successful, and is especially noteworthy as being the first occasion on which the new president, Lord Walsingham, occupied the chair. To do this he travelled specially from Merton Hall, Norfolk, and arrived at Sherburn in the course of the afternoon. In addition to providing for the entomologists access to Bishop’s Wood, two parties had been arranged for, one to Scarthingwell and Towton, the other to Ledsham and Ledstone. The attendance for the first-named of these parties was very large, the rendezvous being Church Fenton Station,

which was left about a quarter before ten. Arrived at Scarthingwell Park, the members were met by the Hon. H. C. Maxwell-Stuart, J.P., and two of his sons, who spared nothing that lay in their power to promote the enjoyment of the members. Some of the party elected to take an extended route northwards, under charge of Major Thompson, and left the Park for Saxton Carr and the woods about Towton Spring. Most of the work done on this route was botanical. From Towton Spring the route lay through the wood known as Renshaw, and up the valley of the River Cock, which is here a clear and winding and very swift stream. On Towton Battle-field the remainder of the party were met; they had spent a most profitable hour in examining the superb collections of foreign lepidoptera and birdskins, as well as of minerals, agates, &c., which had been collected and brought home by the Hons. Herbert and Arthur Maxwell-Stuart. After this they had investigated the lake by means of boats, and thence—under the able guidance of Mr. B. Saynor—proceeded to the battlefield of Towton, to rejoin Major Thompson's contingent, afterwards making their way to Sherburn village. The Ledsham party, which had Mr. George Roberts for leader, assembled at Micklefield Station in the forenoon, and included several naturalists from Leeds, Wakefield, &c. After examining an extensive limestone quarry near the Station the members struck into a footpath and entered the Ledsham estates, permission to explore which had been granted by Mr. C. W. Wheler, J.P. In the woods the blackcap, garden-warbler, sedge-warbler, wood warbler, chiff-chaff, thrush, blackbird, wren, chaffinch, oxeye tit, and robin were all in song. One nest with young (blackcap) was found. Search for shells was not productive, the soil and vegetation being too dry. The site of the "Beacon" was passed, also the lodge mentioned by Thoresby as having been built about 1680. Passing across the park and the great beech avenue which Lord Strafford is said to have planted about 1620, the lane was then followed to Ledsham, and the woods were again entered. At Ledsham was found a new station for *Clematis vitalba*, and *Rosa pimpinellifolia* was observed growing in the Park. In the wood was found a wild gooseberry growing on the top of an isolated rock. Here were also found *Clausilia rugosa*, *Bulimus obscurus*, *Helix rufescens*, and *H. rotundata*. The Beacon was again approached, and after a parting look at the glorious sylvan scenery of Ledsham, the party crossed the Selby road and made towards Sherburn. Near Sherburn many large specimens of the spindle-tree were noticed in flower, and *Erigeron acris* was picked up. At Newthorpe was found a new station for the deadly nightshade (*Atropa Belladonna*). At Ledsham swallows and martins were flying about the Church, and about a score swifts were flying about Sherburn Church. *Helix aspersa* was found in the latter churchyard, and it was noticed that some of the ash trees were scarcely in leaf. The lepidopterists were in great force, most of them spending the day in Bishop's Wood. The tea and meetings were all held in the old Court House, adjoining the Red Bear Inn, Sherburn. The

chair at the general meeting was occupied by the president, the Right Hon. Lord Walsingham, and the Union was honoured by the presence of the Hons. H. C., Herbert, and Arthur Maxwell-Stuart. The minutes of the Roche Abbey meeting having been read and confirmed, the roll of societies was called. It was found that 21 societies were represented, viz :—Huddersfield, Heckmondwike, Barnsley, Wakefield, Elland-cum-Greetland, Leeds (3), Liversedge, Goole, York (2), Selby, Hull (2). Dewsbury, Malton, Doncaster (2), Scarborough, and Bradford (Microscopical Society). The attendance of individual members was considerably over a hundred. The president, in his opening remarks, after thanking the Union for his election, observed that it was difficult to exaggerate the amount of good which such associations are capable of effecting. Not only do they afford to those who live in towns the much-needed means of becoming acquainted with those delights which are especially associated with country life—too often hidden from many throughout the greater part of their lives by a veil of smoke—but they contribute greatly to the cultivation of scientific tastes and enlist numerous workers, whose united exertions in the field of science cannot fail to throw at least occasional gleams of light upon some of the many interesting problems connected with natural history which are perpetually presenting themselves for solution. He then said that everything connected with the county possessed the utmost interest for him, and he rejoiced to be able to share with his Yorkshire neighbours those healthful pursuits and interests which afford so large a measure of contentment and happiness to all who know their value ; and which at the same time are by no means wasted if they contribute ever so little to that great structure of knowledge which inch by inch and atom by atom scientific research throughout the world is continually engaged in strengthening and enlarging, undeterred by the reflection that to finish and complete it must be through all time a task beyond the range of human powers. His lordship concluded by urging the claims of the Union to further support, especially from the associates. The following new members were then elected :—Misses Frances A. and Mary A. B. Crossley of Maltby ; Miss Edith Milner of Bishopthorpe, near York ; Messrs. T. Carter Mitchell of Topcliffe, Robt. Peach of Harrogate, Richard Thompson of York, W. H. Hudleston, M.A., J.P., F.R.S., &c., of Weybridge, J. Lee Cover of Sherburn, Philip Sewell of Whitby, and Major B. B. Thompson of Harrogate. It was unanimously and heartily resolved, on the motion of Dr. H. F. Parsons, F.G.S. (an old member whom all were pleased again to see), seconded by Mr. C. P. Hobkirk, F.L.S., of Dewsbury, that the best thanks of the Union be voted to the Hon. H. C. Maxwell-Stuart, J.P., of Scarthingwell, to Mr. C. W. Wheler, J.P., of Ledstone Park, and to the Ecclesiastical Commissioners, for the permission so readily accorded to the members to visit their respective estates. Mr. Maxwell-Stuart replied, after which thanks were voted to Major Thompson, Mr. B. Saylor and Mr. Geo. Roberts for placing their extensive knowledge of

the country at the disposal of their fellow-members by acting as leaders of parties. The sectional reports were then given. For the Conchological Section its president, the Rev. W. C. Hey, M.A., of York, in a much-appreciated speech, stated that although not very much had been done, yet three species additional to the previously recorded fauna had turned up, viz., *Zonites nitidus*, *Pisidium pusillum*, and *P. fontinale*. Including these, the total number of species observed was 29. The streams near the station had produced *Physa fontinalis*, *Limnæa palustris*, *L. peregra* and var. *ovata*, *Planorbis carinatus* and *P. complanatus*. Some of the *Planorbis* showed a tendency to interesting distortions. *Valvata cristata* and *V. piscinalis* also occurred. Of land shells were noted *Helix arbustorum*, *H. nemoralis*, *H. aspersa*, *H. cantiana*, *H. rufescens*, *H. hispida*, *H. rotundata*, *Clausilia laminata* (Bishop's Wood), *Cochlicopa lubrica*, *Zonites cellarius*, *Z. nitidulus*, and *Succinea elegans*. The Entomological Section reported, through its president, Mr. Geo. T. Porritt, F.L.S., Huddersfield:—Most of the collecting had been done in Bishop's Wood, but the most interesting species, *Laverna phragmitella*, new to the county, was taken by Lord Walsingham at Sherburn. His lordship also noticed *Laverna epilobiella*, and the larva of *Nonagria typhæ*. The large party working Bishop's Wood were led by Messrs. G. C. Dennis and R. Dutton of York. Larvæ of *Tæniocampa populeti* were taken in profusion (two trees alone yielding over 100), along with a sprinkling of those of *Tethea subtusa* from the poplars; and other species taken as larvæ or imagos included *Argynnis Euphrosyne*, common, *Arctia mendica*, *Orgyia pudibunda*, *Phigalia pilosaria*, *Himera pennaria*, abundant, *Ephyra punctaria*, *Asthena candidata*, *Eupisteria heparata*, *Agriopsis Aprilina*, *Phoxopteryx Lundana* abundant, *Ephippiphora Brunichiana*, *E. phlugiana* common, and others, including several micros new to the district, but of which a complete list is not yet made out. The botanists mustered in greatest numbers, and were well pleased with the day's work. 266 flowering plants and ferns were observed, the following being worthy of special mention:—*Phanerogams*: *Clematis vitalba*, *Actæa spicata*, *Barbarea stricta*, *Polygala depressa*, *Galium Mollugo*, *Sium latifolium*, *Valeriana dioica*, *Atropa Belladonna*, *Antirrhinum Orontium*, *Veronica montana*, *Acorus Calamus*, *Potamogeton densus*, *Cephalanthera ensifolia*, and *Ophrys apifera*. All the three officers of the section were present, and the president, Mr. Thomas Hick, B.A., B.Sc., of Harrogate, gave the report at the general meeting. The weather was too dry for cryptogams. Two were found in Bishop's Wood by Mr. J. Harrison of Goole—*Æcidium violæ* and *Peridermium pini*. In the absence of the officers of the Geological Section, Mr. B. Holgate, F.G.S., reported. Two parties worked over the magnesian limestone and marl, which present many features not by any means thoroughly understood, concerning which various theories have been advanced, and consequently about which there is much to note and learn. The first place visited by the party (which met at Church Fenton Park)

was Scarthingwell Park, the distance from Church Fenton Station to Scarthingwell being along a level road upon clay. It is only at the Lake at Scarthingwell that the limestone passes upwards in a gentle slope from under the drift, the luxuriance of the wych elm, the red colour of the soil, and other features of the country showing this. The Messrs. Maxwell-Stuart very kindly conducted the party by a short road through the Park to the Dinton Dale quarry, about which there is much that is interesting to students of this system, the beds being numerous and diversified, with partings of marl between them. Some of these were flaggy dolomites nearly approaching lithographic stone, whilst others contained numerous cavities lined with crystallised carbonate of lime similar to that which is so common in the neighbourhood of Pontefract. In a quarry near to the place marked on the map as the Towton Battle-field, on the right-hand of the road between Saxton and Towton, a good many of the pieces were found to resemble, on a rough examination, the rocks of the oolitic system, being formed in numerous small pellicles like the roe of a fish, but on closer examination many were found to be hollow, and it does not appear to have been formed in the same way as the true oolites have been. The Huddlestone quarries are so well known, that the specimens from them scarcely require description. It forms a good building stone (which the stone from the other two quarries do not), and presents a good appearance. The other party started from Micklefield and worked by way of Ledstone and Ledsham. They were successful in finding several fossils which, excepting the *Axinus*, are not common in the district. They found an internal cast of a *Rhynchonella*, a specimen of *Littorinella*, and a piece of flint in a bed of limestone six inches thick, near to Ledsham Church. For the Vertebrate Section its secretary, Mr. James Backhouse, jun., York, reported that 26 resident birds were observed, and 18 migrants, whilst 22 species were found nesting. The Scarthingwell Park pond forms a great attraction for wild birds, of which were noticed herons, coots, and water-hens in fair abundance. The reed-warbler breeds annually in the reeds by the water's edge, but no birds could be identified. This is probably (with one exception) the most northerly limit of its breeding range in England. Amongst the migrant birds noted were two not seen on the last excursion—the garden warbler and spotted flycatcher. A very curious nesting-place was discovered for the song-thrush: growing against the trunk of a tree was a huge fungus, forming a solid ledge, and upon this the nest was placed; whilst immediately above was another fungoid growth which served as a dome or roof. The nest being empty, was conveyed to Sherburn, and shown at the evening meeting. Amongst the fishes, pike, roach, and trout were noticed; and water shrew, common shrew, squirrel, and hedgehog amongst the mammals.—The meeting closed with a vote of thanks to the president for his services in the chair, proposed in a humorous speech from Mr. Barwell Turner, F.C.S., Leeds, and seconded by Major Thompson.

— W.D.R., W.E.C.



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