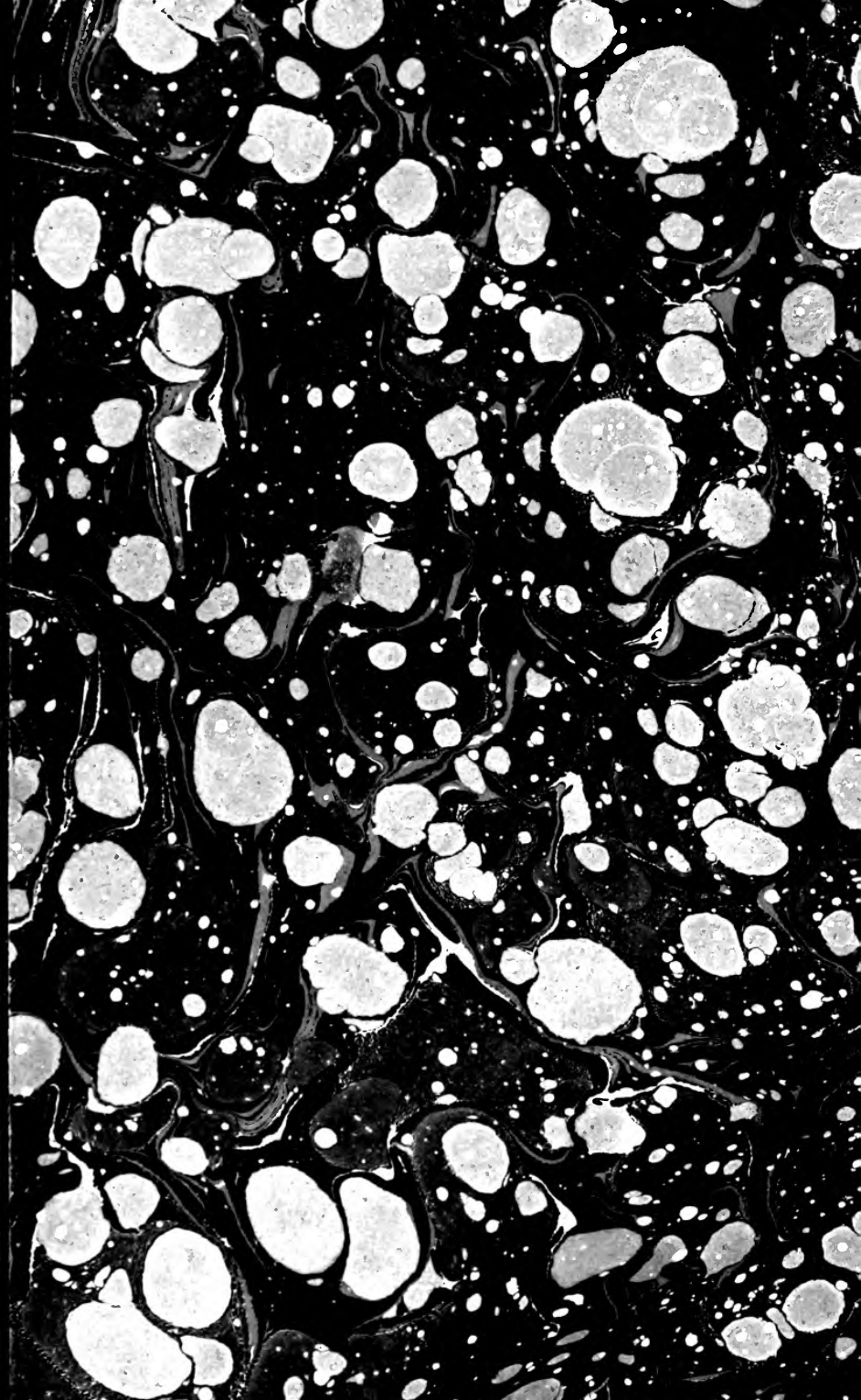
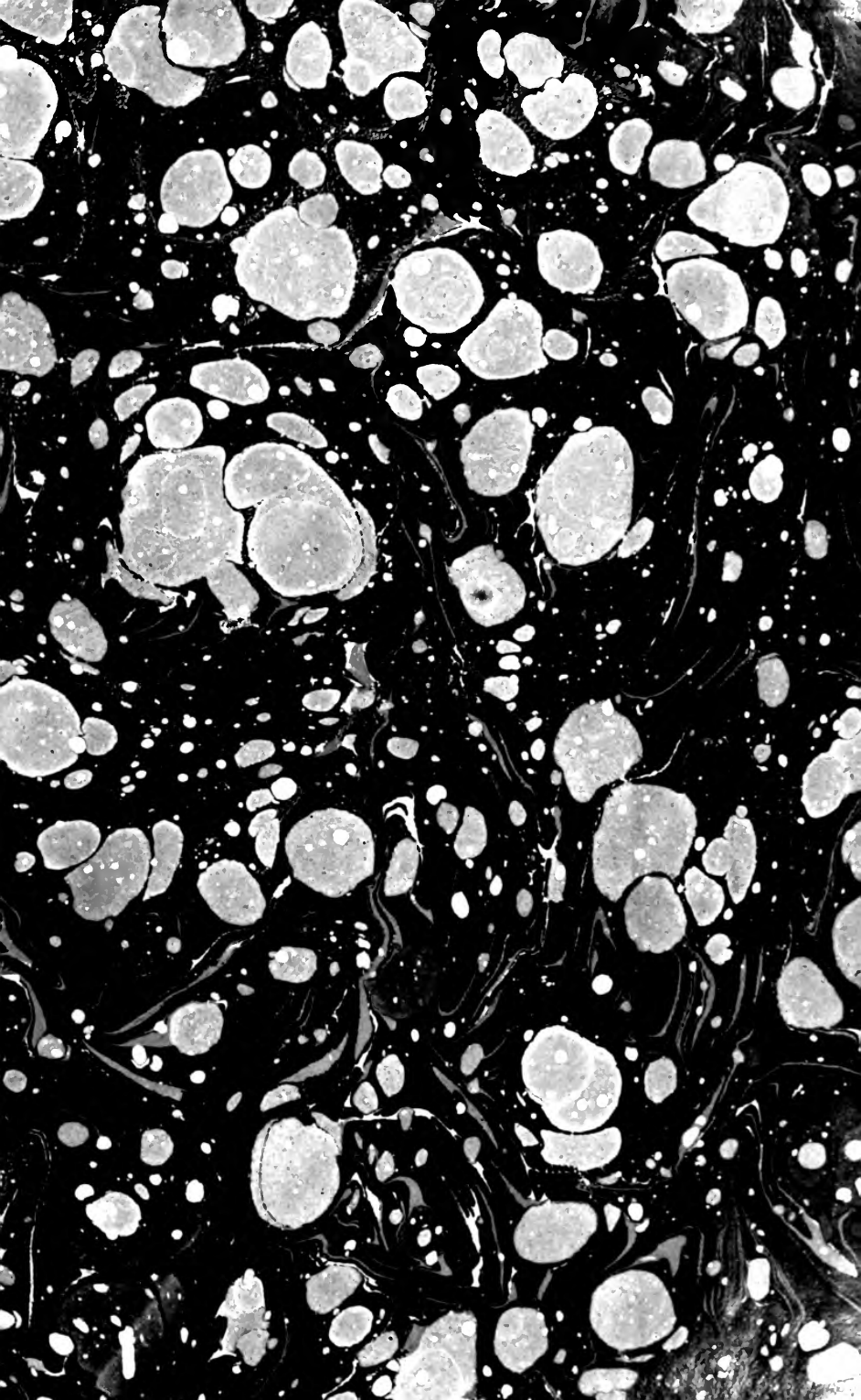




See note to vol. 1.

S.16.A2

10.	1 – 40	1843
11.	– 80	4
12.	– 116	5
13.	– 164	6
14	– 196	7
5 ⁂	– 260	8
6 ⁂	– 316 [317–348]	9
7 ⁂	– 378	1850.

⁂ should have been numbered 6, 7 & 8.

cpr?

HISTORY

OF THE

BERWICKSHIRE NATURALISTS' CLUB.

INSTITUTED SEPTEMBER 23, 1831.

——"MARE ET TELLUS, ET, QUOD TEGIT OMNIA, CŒLUM."

1842-1849.

BERWICK-UPON-TWEED:
PRINTED FOR THE CLUB, AT THE WARDER OFFICE.
MDCCCXLIX.

MEMBERS.

	Date of Admission.
1. George Johnston, M.D., Berwick-upon-Tweed,	Sept. 22, 1831.
2. Rev. John Baird, of Yetholm,	....
3. William Baird, M.D., British Museum, London,	....
4. Robert Dundas Thomson, M.D., Lecturer on Chemistry in the University of Glasgow,	....
5. Mr. Robert Embleton, Surgeon, Embleton,	....
6. Prideaux J. Selby, Esq., of Twizell House, by Belford,	April 20, 1832.
7. Rev. Joseph U. Barnes, Vicar of Kendal,	June 18, ...
8. Sir William Jardine, Bart., of Jardine Hall, Dumfriesshire,	Sept. 19, ...
9. George C. Carpenter, Esq., The Cottage, Ford,	April 16, 1838.
10. Rev. Thomas Knight, The Rectory, Ford,	....
11. Henry Geo. C. Clarke, M.D., Berwick-upon-Tweed,	....
12. George Darling, Esq., of Fowberry, by Wooler,	June 18, 1834.
13. Francis Douglas, M.D., East Indies,	July 30, ...
14. Admiral Mitford, of Hunmanby, Scarborough,	Sept. 17, ...
15. Rev. I. Parker, of Ilderton, by Wooler,	....
16. J. S. Donaldson Selby, Esq., of Cheswick,	May 6, 1835.
17. Rev. W. S. Gilly, D.D., Vicar of Norham,	May 4, 1836.
18. Rev. Thomas Riddell, Vicar of Masham, Bedale,	May 1, 1838.
19. Frederick J. W. Collingwood, Esq., of Glanton Pyke, by Whittingham,	May 6, 1840.
20. Mr. Jonathan Melrose, Coldstream,	....
21. Rev. J. Dixon Clark, The Hall, Belford,	Dec. 16, ...
22. Mr. David Macbeath, Berwick-upon-Tweed,	....
23. Mr. Rowe, Surgeon, Coldstream,	Sept. 15, 1841.
24. John Boyd, Esq., Cherry-Trees, Yetholm,	....
25. Robert Home, Esq., Berwick-upon-Tweed,	June 15, 1842.
26. Sir Thomas Tancred, Bart.,	Sept. 28, 1842.
27. William Murray, Esq., of Marshall Meadows,	Dec. 15, 1842.
28. Charles Wilson, M.D., Kelso,	July 26, 1843.
29. James Tait, Esq., Edenside, Kelso,	... ...
30. Mr. James Douglas, Commercial Bank, Kelso,	....

		Date of Admission.
31.	William Dickson, Esq., of Amisfield, Alnwick,	Sept. 20, 1843.
32.	William Broderick, Esq., Belford,	....
33.	John Turnbull, Esq., 16, Thistle Street, Edinburgh,	....
34.	Rev. George Walker, Belford,	....
35.	Ralph Carr, Esq., Dunstan Hill, Gateshead,	Oct. 18, ...
36.	Rev. J. C. Atkinson, Danby, Gisborough, Yorkshire,	May 1, 1844.
37.	Rev. Dr. Thomson, 32, Danube Street, Edinburgh,	Oct. 30, ...
38.	Rev. Thomas Witham, of Lartington, Barnard Castle,	May 7, 1845.
39.	Rev. William Ritchie, Berwick-upon-Tweed,	....
40.	Mr. William Dunlop, Mayfield, Reston,	....
41.	Colonel Younghusband, Belford,	Sept. 3, ...
42.	Rev. Matthew Burrell, of Chatton, by Belford,	....
43.	Rev. George Rooke, of Embleton, by Alnwick,	....
44.	Charles Selby, Esq., of Earle, by Wooler,	....
45.	Archibald Jerdan, Esq., Mossburnford, Jedburgh,	Oct. 3, ...
46.	Henry Gregson, Esq., of Lowlinn,	May 3, 1846.
47.	Rev. Hugh Evans, Ford,	....
48.	Rev. William Lamb, of Ednam, by Kelso,	June 3, ...
49.	William Stevenson, Esq., Berwick-upon-Tweed,	....
50.	Major Elliott, Berwick-upon-Tweed,	May 5, 1847.
51.	Mr. Archibald Hepburn, Whittingham, Prestonkirk,	....
52.	Patrick Clay, Esq., New-water Haugh,	....
53.	Rev. John Ayton Wood, of Beadnell, Alnwick,	June 16, 1847.
54.	Mr. George Tate, Alnwick,	....
55.	The Right Hon. the Earl of Home, Hirsel, Coldstream,	Oct. 20, ...
56.	David Milne, Esq., of Milne Graden, Coldstream,	....
57.	Rev. L. Shafto Orde, of Shoreston, Bamburgh,	....
58.	Rev. Mr. Carr, Norham,	....
59.	George Turnbull, Esq., of Abbey St. Bathans,	....
60.	James Renton, Esq., of Highlaws, Eyemouth,	....
61.	A. Hood, M.D., Amisfield, Coldingham,	May 3, 1848.
62.	Rev. Christopher Robinson, Kirknewton, Ford,	June 21, ...
63.	Rev. Hamlet Clarke, Sheep Street, Northampton,	July 26, ...
64.	J. Campbell Renton, Esq., M.P., of Mordington,	... .
65.	Mr. George Carpenter, The Cottage, Ford,	....
66.	Rev. Samuel Fyler, Cornhill,	June 25, 1849.
67.	Rev. W. Darnell, Bamburgh,	July 25, ..
68.	Mr. Alex. Douglas, Surgeon, Belford,	....
69.	Henry Stephens, Esq., Redbraes Cottage, Bonnington, Edinburgh,	Sept. 12, ...
70.	Francis S. Cahill, M.D., Berwick-upon-Tweed,	Oct. 18, ..

The Address delivered to the Berwickshire Naturalists' Club, at its Anniversary Meeting held at Lowick, September 28. 1842. By GEORGE DARLING, Esq., President.

GENTLEMEN,

Again the Anniversary Meeting of our Club has summoned its members to commemorate its institution, and to hear the result of the labours, or, I should rather say, the harvest reaped, not by bodily fatigue, but yielded to the agreeable recreation and innocent pastime of men happy to escape from the monotonous toil of their necessary occupations, to revel in all the beauty of Nature's loveliest scenes, and the thousand charms of her ever-changing aspects, and to have their feelings elevated, and their minds improved, by the calm contemplation of the wonderful works of God.

The past year has been one peculiar in the recollection of all, and will live in our memories while our lives and our faculties remain. Soon after our last Anniversary Meeting, rain fell in prodigious quantities, and we witnessed floods almost unparalleled in the annals of our times. To these succeeded a winter of moderate severity; the mercury occasionally dropping within a few degrees of zero. Spring set in earlier than usual, and with a degree of warmth seldom felt in this district. On the 4th of March, a steady course of dry weather commenced, which, almost without intermission, continued until the 10th of August, when a severe thunder-storm passed over the whole land, and rain fell in considerable quantities; but a day sufficed to restore the lovely weather, and for three weeks longer the heat vied with that of India; the thermometer frequently standing so high as 80° and 85° in the shade, and once so high as 95°. This was again followed by the escape of an immense quantity of the electric fluid; so rapid were the discharges, that we counted twenty-seven flashes in five minutes' space, and the thunder seemed one continuous roll. This second storm produced no heavy rain in our immediate vicinity, but effectually changed the character of the weather, which has continued showery up to this time; and the parched and cracked earth is again beginning to be clothed with green, where, for months, the brown hue of sterility every where met the eye, and made the heart ache for the famishing flocks, whose protruding ribs were so many solid voices bespeaking the extent of their privations. The very trees shed their leaves untimely, and

the wells were dried up; yet sickness has not prevailed, to add horror to suffering: and now it has pleased an allwise Providence to send his refreshing rains, and plenty will again smile over the length and breadth of our beloved island.

The Anniversary Meeting of 1841 was held at Kelso; the members present being—Dr F. Douglas, President, Dr Johnston, Dr Clarke, Rev. Geo. Cunningham, Rev. John Baird, Rev. Andrew Baird, Messrs Geo. Darling, and Jonathan Melrose. The Meeting was favoured by the company of Dr Douglas, Dr Wilson, and Mr John Boyd.

Not having been in time to join the Members in their agreeable ramble, I am indebted to the pen of Dr F. Douglas for the notice of this Meeting.

"The members of the Club having breakfasted with Dr Douglas, set out on their walk, which first took them to the Chalk Heugh, an eminence overhanging the Tweed, which commands one of the finest panoramic views in the south of Scotland. Thence the eye ranges as far as the "Eildon three," and the Waterloo column, surmounting Pinnacle Heugh, a monument of Britain's glory. Nearer are beheld the mounds of Roxburgh's ruined pile; and, as if in contrast, the stately palace of Floors, bosomed in the richest woods, already shewing the many coloured tints of autumn, and the "silver tide" of Teviot mingling with "Tweed's pellucid stream;" while almost beneath our feet the "copse clad isles amid the waters rise." After feasting our eyes on this enchanting spot, rendered doubly beautiful by the brightness of the sun, and the clearness and buoyancy of the atmosphere, the party visited the Museum of the Tweedside Physical and Antiquarian Society, and spent some time in examining its various contents; then, by the kind permission of the Duke of Roxburghe, the members walked through his Grace's park, and inspected the very extensive and magnificent improvements carrying on at Floors Castle. The walk was then directed through the woods along the bank of the Tweed, to Trow's Crags, where the river is curbed with a bridle of stone, which tradition ascribes to the wondrous wizard Michael Scott. From Trows the party proceeded to Makerstone, where they were politely shewn the different observatories erected by Sir Thomas Makdougal Brisbane. A new observatory, for magnetic observations, attracted considerable attention. The Tweed was crossed below Makerstone House, and the party returned to Kelso, and had barely time to spend five minutes in visiting a fine horticultural exhibition, before they were called to the necessary and agreeable business of dinner, in the Cross Keys' Hotel. After dinner the Presi-

dent read the usual annual Address. Mr George Darling was elected President, and Dr Johnston, Secretary, for the ensuing year. Mr William Rowe of Coldstream, and Mr John Boyd of Cherrytrees, were proposed and admitted members of the Club. No papers were read, nor any communications of importance made to the Meeting.

During the walk, nothing new was observed. Several plants, however, were noticed which are of rare occurrence within the limits of the Club, such as Viola hirta, Thalictrum majus, Clinopodium vulgare, Epipactis latifolia, Listera cordata; and Dr F. Douglas pointed out the habitat of a beautiful coral-like fungus, Clavaria rosea, which has not been discovered in any other locality in Great Britain. Some small specimens were gathered, but they were not in perfection, and their beauty was nearly gone.

The December Meeting was appointed for the 15th December, at Berwick, but, from the extreme severity of the day, the members from the country were prevented attending, and little beyond fixing places of meeting for the ensuing summer, and passing the Secretary's accounts, was done. A continuation of Dr Johnston's catalogue of the Molluscous Animals of Berwickshire, and an extensive catalogue of the Coleopterous Insects of the district, which forms the Club's park, by Mr George Dunlop, were laid before the Members; and, as Mr Dunlop is not a member of the Club, its thanks were cordially voted to him, for a communication so much in accordance with its professed object.

1842.—The first Meeting of the year was held at Coldstream, on the 4th of May. The members present were—Mr Darling, President, Mr Selby, Dr Johnston, Dr Clarke, Rev. Mr Barnes, Mr F. Collingwood, Mr W. Rowe, Mr Melrose, Rev. Dixon Clarke, and Dr F. Douglas. Mr Tancred and Mr G. Carr favoured the Club as visitors.

The "merrie month of May" commenced—as the lads and lasses who, in the more southern counties, dance round the may-pole, and crown their rustic queen with Nature's freshest garlands, would wish to see it ever—bright, warm, and joyous; but on the morning of the 4th, a hazy appearance made each husbandman rejoice in the hope of a soft and refreshing rain, nor were they altogether disappointed. Towards ten o'clock, a warm drizzling rain bedewed the hot earth, and the fields, when the sun again broke forth in his glory, had that heated smoking appearance so congenial to the growth of the young crops. The Club, after a breakfast at Mr Mauchlin's, which required the appetite of long travel to make it tolerable, divided in search of the day's

amusements. The President and Mr Carr wended their way to the streams of Tweed, passing the beautiful seat of the Marjoribanks, and crossing the verdant meads which lie between Lees and the river, rejoicing in the soft rain, and prepared to do their devoir upon the multitudes of trout with which the waters abound; but "the best laid schemes of men and mice gang aft aglee;" and ere the creel was half stocked, the bright god of day poured his radiance over stream and hill, and the shy habitants of the Tweed would no longer spring at the tempting fly, but sported themselves amid the rippling shallows revelling in the sunshine. However, the President captured several of the different fry of the sea-going fish, which of late have given so much labour to many careful naturalists. He took Smelts of the salmon with their silvery sides, dark purply fins, and swallow-tail. The same in the stage when called Parr; and specimens of the fry of both Bull-trout, and apparently another variety, which is probably the sea or salmon-trout, caught in great abundance by the nets of the fishermen, and sometimes running to the weight of sixteen and even eighteen pounds,—in a few instances even exceeding that. The most remarkable circumstance connected with this smelt is, that although the parent is generally smaller than the salmon, the smelt is invariably larger, longer, and thicker than the salmon Smelt, having, instead of the dark pectoral fin of the salmon smelt, a bright golden tint ornamenting these parts, and which has obtained for it the appellation, among the fishermen, of Yellow-fin.

The Rev. Mr Barnes also took his way to the River, and succeeded with his rod somewhat after the same fate as his "brother of the angle." A pair of the pretty little Ring-plover were observed by the President flitting about the shore of the river, and, from time to time, emitting their plaintive cry.

The rest of the members took a delightful walk down the banks of the Tweed by Lennel to Milnegraden, where the lovely scenery, rendered doubly alluring by the now bursting foliage of the woods spangled with heaven's own diamonds, and offering to the eye all the varied tints of "many greens," and the promise of future luxuriance, amply repaid all who enjoyed this walk, for the disappointment attending their search for a piece of water which was expected to afford a rich harvest of aquatic plants and insects in its ample bosom, to "the careful and scientific explorers of its hidden treasures;" but which the fairies or good people had either spirited away or rendered invisible to the eyes of the expectant naturalists. Be this as it may, no lake could be found, but many other very interesting objects were seen, and duly appreciated. The

humidity of the morning had tempted from their lurking-places several varieties of snail, and a few were gathered. The hawthorn, with its beautiful white blossoms and rich scent perfuming the air, was gathered in full blow in several situations—a proof of the forwardness of the season. The sand-martin was seen in great plenty, skimming over the waters, and excavating its simple habitation in the banks which overhang the Tweed; and the varied sweetness of the thousand warblers trilling their songs of love, added a charm to the morning's ramble, which the denizens of our crowded and bustling towns can but rarely taste; and if this Club had no other or higher object than occasionally to give such a delightful change and peaceful recreation to those whose occupation confines them to the desk, or the close and uninteresting monotony of a town life, that object alone would render it a blessing to the neighbourhood. The Club dined at the usual hour, and, despite a very so-so entertainment, the evening was passed in the enjoyment of much delightful and improving converse, each member willing to impart the knowledge he possessed, and all rising from the board better and happier than before.

A paper by Mr Hardy on the Waste of the Sea-Banks between Redheugh and Dowlaw, was read.

I am indebted to Dr F. Douglas for the following minutes of the Gordon meeting:—

Berwickshire Naturalists' Club. Gordon, June 15. 1842.—Present.—Dr Johnston, Mr Collingwood, Dr Clarke, Dr F. Douglas. Mr Home, solicitor, Berwick, visitor.

The chief object of the Club's meeting at Gordon was to gather the *Linnæa borealis* in the fir-woods of Lightfield, upon the Mellerstain estate; and thither, by a circuitous route over moss and muir, the eager party bent their steps. The first object which attracted special attention was an ancient and ruinous tower, situated to the west of the village, and formerly occupied by the powerful family of Setons, who were allied to the noble house of Gordon, formerly the proprietors of that district of country. Near the old ruin *Chelidonium majus* was found, furnishing another illustration to the opinion, that this plant was introduced into horticulture at an early era. In the peaty muir on the farm of Greenknow, were gathered *Stellaria glauca* and *Myosotis palustris*, while in the nearly stagnant waters of the Eden, was observed another plant of rare occurrence in Berwickshire, viz., *Sparganium natans*. After leaving the moss, every fir wood, and thicket for

miles around were penetrated and carefully searched for the humble little flower bearing the name of the immortal Swede. The search was, alas! in vain; and after continuing it for fully three hours, the spirits of the party flagged, and they returned disappointed to the inn, where a good dinner and excellent liquors soon dispelled any portion of vexation which might still be felt at the want of success attending the expedition. One of the members of the Club, however, nothing daunted by a single failure, and anticipating better fortune in a second attempt, did not allow many days to elapse, until he was again in the woods, in the hope of securing the prized Linnæa, and most fully and amply was he rewarded by beholding a large space of ground covered with the delicate shining leaves of the trailing little plant, with here and there a short flower-stalk, ascending and bearing a pair of beautiful pinkish bell-shaped flowers, bending gracefully downwards: innumerable specimens of the finest description were obtained.

It seemed remarkable, that, on the first search for it, all the members had passed within five yards of the spot where the Linnæa grew. *Listera cordata*, *Trollius europæus*, *Pyrola minor*, were found in the woods during the course of the forenoon's walk, and a new fungus, *Æcidium pini*, was added to the cryptogamic flora of the county, the bark of the fir-tree on which it grew being totally destroyed by its ravages.

A paper by Mr Hardy was read, entitled "Butter-cups and Daisies."

The Minutes of our Meeting at Abbey St Bathans were furnished me by our Secretary, and the Club will excuse my adopting them without change.

ABBEY ST BATHANS, *August* 3. 1842.

In obedience to the mandate of the Club, nine of its members mustered on this morning in this oasis of the Lammermuirs, viz. Geo. Darling, Esq., President; Dr Johnston, Rev. A. Baird, P. J. Selby, Esq., Rev. Geo. Cunynghame, Rev. J. Wallace, J. S. Donaldson Selby, Esq., Rev. J. D. Clarke, and Mr Robt. Home; and Mr Tancred joined the meeting, as much we presume for the enjoyment of a day's good fellowship as from a wish to see the capabilities of our county.

The Club, led to the Abbey by its retired position and celebrity for natural beauty, were fortunate in the day of their meeting, which was equal in mildness to the best days of a clime of myrtles and vines. It

was a luxury to be in the open air; and a stroll by the clear waters with the angling rod, was the principal occupation of the members, and enough for enjoyment. The fish, which, with a large measure of patience, were captured, furnished a dish for the dinner-table—spread out for us on the green by the side of a trotting burn nigh to the alehouse—our rendezvous—a very homely, artless, and yet a picturesque scene, and where the honest angler, who may chance to wander hither, in the pursuit of his avocation, will fare well if he meets with such liberal entertainment as was our share this day.

In such a locality as Abbey St Bathans, the Club finds the material for forming a correct idea of the nature, extent, and composition of the ancient forests in which their forefathers may, perchance, have hunted the deer, with hound and horn, in the gallant company of a Douglas or a Percy. There was around them a large extent of hilly moors covered with brown heath, relieved, at intervals, with wide streams of green rushy ground. In the many ravines which descended from the moor above, and in whose bottoms a runlet had cut its way amid shelving rocks, we found many springy spots occupied principally with some shrubby willows (*Salix aurita* and *cinerea*), intermingled with arching briars and wild roses. In others the alder grew predominant, while rushes and meadow-sweet and marsh thistles filled up the under ground, leaving often a middle space carpetted with mosses of yellow-green, and too moist for the growth of other plants than the willow-herbs, the forget-me-not, the ranunculus, and other semi-aquatic herblets. But the drier ground was mainly occupied with the birch, rising up from amid a bed of tall heather or of blaeberries; while a tree of oak, of the mountain-ash, and of the tree willow (*Salix caprea*) grew up among the birches, marked, each of them, by its peculiar shade of green. Where, again, the streamlet had cut its channel deeper, and at a lower level, the vegetation became more free and various; the alder was more common and luxuriant; the rose and brier arched their bows with greater freedom; the rowan-tree assumed a taller habit, and by its side the hagberry grew, as if conscious Nature had pleasure in the augmented beauty which each derived from the contrast between their intermingled foliage, flowers, and fruit. Here all the underground was occupied by luxuriant ferns, bending in graceful plumes over the shelving edges of the banks, with tall nodding rushes and grasses, wild geraniums, hypericums, and willow-herbs, and various umbelliferous and compound syngenesious plants. Every spot is a picture, and every one so fertile in flowers, that the botanist may cull there alone a richly varied herbarium,—from the green moss, through whose dense mass the spring filters

its waters, to the hazel and the oak that shelter the pool beneath their shade from the too hot influence of the sun.

How different again is the wood that hangs on the sides of the hills rising from the valley on each side of the principal stream or river! It consists principally of oak, of moderate size at the base of the hill, gradually diminishing in stature as we ascend, until we find it at the summit nearly level with the surface of the ground, spreading in low circular leafy bushes. This troop of oaks is intermingled with a considerable quantity of birch, as various as the oak itself in size and appearance, while an ash tree rises tall above them both at distant intervals. The "bonnie broom" is frequent and tall on the lower line of this wood, while the whin occupies the line above with a denser growth than usual. The intermediate ground under and amidst the trees is full sometimes of a coarser herbage, rich in fungous growths, and where lichens make the trunks all leprous; sometimes moss predominates, and this is the habitat too for the *Melampyrum sylvaticum;* in other places are long streams of stones and gravel covered partially with briars, trailing roses, and with green patches of the wild sage *(Teucrium scorodonia),* or of the herb Mercury *(Mercurialis perennis.)*

Such fancy paints our ancient border forests to have been, and probably there is much of reality and truth in the picture. A wide mountainous and barren tract, intersected by a principal devious stream, having, on each side of it, an alluvial plain of some breadth that afforded good and abundant pasture for the horses, herds, and flocks of the rude inhabitants. On each side there run up ravines of greater or lesser depths, every one with a burn or rivulet in its bottom; some rocky and clean—others with plashy places,—while the hills are occupied with woods such as we have attempted to describe, and the plains above are brown barren moors, varied with peat-hags and covers of whins and of broom, as the depth of the soil afforded a locality for their growth. Through these forests herds of red and fallow deer were wont to roam at freedom, and were the chase which our forefathers pursued with almost savage raptures—while now the ground is occupied with new and foreign plantations, with corn, with artificial pastures, and the hills are covered with flocks of sheep, obedient to the call of the shepherd, and browsing watchless, because they know no danger.

"The sheep are on the slopes around,
The cattle in the meadows feed,
And labourers turn the crumbling ground,
Or drop the yellow seed;
And prancing steeds, in trappings gay,
Whirl the bright chariot o'er the way.

"Methinks it were a nobler sight
To see these vales in woods arrayed—
Their summits in the golden light,
Their trunks in grateful shade;
And herds of deer that bounding go,
O'er rills and prostrate trees below."

While following their "contemplative recreation," the members of the gentle craft could scarcely fail to recreate another scene of former times—affording not a less interesting contrast nor a less instructive moral—

"It taught me well, all earthly thinges be borne
To dye the death, for nought long time may last."

How easy was it to bring into the landscape the stately priory, with its rich church and chapel, which stood where now stands the humble and unpretending kirk—the once glowing orchards—the rich cultivated fields—the scattered hamlets teeming with a redundant and happy population! How easy to imagine that on such a day as ours was—tempted by its sunshine and its fairness—the proud abbot of Coldingham had chosen it whereon to visit the sister abbey of St Bathans, and was now descending, in all the state and company and panoply of his order, the height that overhung the hidden retreat about us!

One or two members only betook themselves to seek out the vegetable rarities which grew in this locality, and they were few and possessed of comparatively little interest. Indeed all that are worth particular notice were two or three species of Hieracium, viz. *H. palustre*, *H. boreale*, of Koch, and the *H. sylvaticum*. These were found in tolerable abundance in the rocky bed of Monnie-nut burn, below Godscroft, a place remarkable as the birth-place and residence of one of the most distinguished scholars of the sixteenth century. The *H. boreale* is a fine ornamental species. The *Melampyrum sylvaticum* was abundant in the oak woods. The species of oak was principally *Q. Robur*, but many specimens approached *Q. sessiliflora* in its peculiarities. A pubescent variety of *Epilobium palustre* was common in marshy spots on the hill sides. After dinner a paper was read by the President, detailing some experiments made with the Honey-bee, with a view to establish some new facts in the history of their internal economy, and which he proposes to carry out next season, "Deo cedente."

It remains for me now to say but a few words on vacating the President's chair, which was conferred on me at the last Anniversary, and

which I am sorry to have filled so inadequately, but beg to assure you it is my misfortune, not my intentional fault; and although not equal to any of our scientific members in knowledge of the delightful subjects which form the great attractions of this Society, yet I am not wanting in zeal for its interests, and admiration of its objects. In reviewing the past year, it must be evident, that but few additions to our knowledge of the botany of our district have been obtained; nor is this strange; when so much had been accomplished, less and less must annually be expected. This year has, however, been favourable to the botanist, in as much as the long course of fine weather has brought to perfection many of the little, modest flowers of our woods and dells, which, in wet and ungenial seasons, scarce raise their sickly heads. It might, too, have been expected, that it would have afforded the entomologist very many interesting additions to his collection of insects; but other causes have prevented this. The severe winters which, for three years, have visited our district, and the tremendous flood of last autumn, combined to destroy the embryo of what this hot summer would have brought to life and beauty; and instead of the season being rife with the rare and lovely specimens of our butterflies, moths, and beetles, this summer has been extremely deficient in these productions. Yet not altogether blank. Mr Selby has added a very rare and beautiful moth to his collection, captured on the lawn at Twizell by his daughter Mrs Tancred. This specimen, taken on the 14th August, is the *Catocula Fraxini*, one of the rarest of the genus. Mr Selby also has communicated to me the following notice: On the 23d July 1842, when walking through a straggling whin covert, on the edge of the moor to the west of Twizell, Mr Selby was surprised by flushing a woodcock from a small patch of ferns, within a yard or two of his feet; and scarcely had he satisfied himself that he was correct in the bird, when another rose from the same place, which he shot, and which proved to be the male in tolerable feather and condition. No nest or young were discovered, though they might easily have been overlooked on the rough ground where the old birds were disturbed, and no doubt they had remained in the locality for the purposes of nidification, the habitat being peculiarly favourable for such purposes, dry ground for roosting and abundance of springy places at hand. Mr Selby states, that this is the first instance of woodcocks remaining over summer in his immediate neighbourhood.

Although the finer kinds of our insects have been so rare, no scarcity of some of the most destructive sort has been felt. Wasps have abounded in prodigious numbers, and the turnip crop has been injured

to a frightful extent by the aphis, which in some places arrived in such quantities as to deserve the name of clouds. At Milfield the harvesters had to hide their heads before the sheaves to protect them from the myriads which were alighting all round, and which so covered the corn as to make it necessary in a day or two to re-open the sheaves and expose them to the sun and air. When opened they had the appearance of being covered with glue, and emitted a strong and disagreeable smell. This pest has in many places destroyed whole fields of turnips, and in a few, the entire crop is gone. For some time after their first attack, I could discover none of the parasites that feed on them; but, in a few days, they began to appear, both the lady-birds of two varieties, and several of the dipterous flies, whose larvæ live on the aphides; and, by-and-bye, thousands of a small sort of ichneumon-fly appeared among the little wretches. It is a beautiful provision of an all-wise Creator, that, whenever any destructive insect makes its appearance, other insects which prey upon it soon shew themselves, checking its increase, and preventing the total destruction which otherwise would inevitably follow, if no such stop were put to the natural increase, which, in the case of the aphis, is all but miraculous. There is no space in this Address to go into the history of the different parasites, but I trust some of our very careful investigators will furnish a paper on the subject.

I have received another notice from a person in the town of Wooler, who observed a large eagle, seemingly the Sea-eagle, last month, upon the line of the Till, near Doddington; it settled within a few yards of him; and, when pestered as it was by some smaller birds, crows, &c., took short flights, always again resting on the banks of the river. He did not observe it strike any fish, but had no doubt it was on the watch for some monarch of the brook to satisfy its craving appetite.*

Having been more lengthy than I fear the patience of the Club will admire, however their kindness may tolerate, I must now say adieu, and resign my post to one who will, I am sure, be more deserving the honour which awaits him; and, in doing so, express my warm thanks for the indulgent forbearance shewn to me by the members of the Club.

* This bird has been twice seen by other persons,—once by Mr Cully of Fowberry, and once on the banks of the Till, near Hetton House.

Buttercups and Daisies. By Mr James Hardy.

" We perceive numbers of individual substances so like in their obvious qualities, that the most unimproved tribes of men consider them as of one species, and give them one common name."

Reid's Essays on the Powers of the Human Mind, Essay 5, Chap. iv.

The terms goulon, goulion, goulans, gülans, gowlons, gollande, guild, gild, gules, and gowan, as applied to plants, are obviously related, and appear to derive their origin from the Anglo-Saxon *gold,* or, if we wish to consult a more remote parentage from the Suio-Gothic, *gul, gol,* yellow.* " In the south," [of England] says Ray, " we usually call

* Dr Jamieson, Etymological Dictionary of the Scottish Language. From the same root seems to proceed the heraldic colour, gules, red. However differently the two colours, red and yellow, impress the visual nerve, the ideas respecting them appear once to have been nearly allied. There is in perception, as well as in nature, an intermediate colour, in which both are blended, viz. orange. The heraldic colour *or* is " yellow as gold." Forster, in an etymological account of colours, in the Perennial Calender, p. 432, *suspects* that yellow and red spring from synonymous roots. The former he derives from the A. S. geaelgan, to inflame, and it signifies the colour of flame; the latter he *suspects* to have some connection with the word *ray,* as applied to the bright light of the sunbeams. In confirmation of this conjecture, it may be observed, that, in Dr Turner's Herbal, Part 2d, fol. 49, it is said that, of the flower of the wild pomegranate, " there are diverse kyndes." " Som white, som *red like golde,* some of ye color of a rose." The word yellow (A. S. gelew), is obviously connected with *gul* or *gol,* whatever be the ultimate root of these terms. " The Italian giallo, and the French jaune, allowing for the discrepances of dialect, bear similar relations. Hence also the gules-ought, or guelsought (similar to the " long sought," or inflammation of the lungs), occurring in Turner's Herbal, as a name for the jaundice. The Welsh, at the present day, observing a similar analogy, denominate the Barberry bush, from the reputed virtues of the inner bark in curing the yellow jaundice, the *prin clevot millin,* signifying the yellow disease tree.† (Farmers' Mag., Aug. 1809). Gall, the bile, is not unlikely from the same root as—

" That colour which on gold we think so fair,
That hue which most adorns the tressed hair;

† The repute of this shrub extends also to Berwickshire, and has perhaps procured it the place which it frequently occupies in the corner of the cottage garden, but I am disposed to believe, that the credit it has obtained is not native. In an old work, in black letter, entitled, " A most excellent and perfecte homish apothecarye, or homely physick booke, for all the grefes and diseases of the bodye. Translated out of the Almaine speeche into English, by Jhon Hollybush. Imprinted at Collen, 1561," there is given the following " true medicine for the jaundis." " Take the wood of Berberis, pyll the upper shell wyth the leaves

Marygolds simply golds, from the colour of the flower."* In the vicinity of Newcastle this plant is entitled the Marygowlon, and in other parts of Northumberland the gowlon, which appears to be the plural of the word gold or gol in the Saxon or German form. Ray further informs us that goulans is the name of the corn-marigold; and as such, it is a very apt translation of the Greek term Chrysanthemum, "golde-floure," applied by modern botanists to this plant. Buchanan, in the Statistical Account of Scotland introductory to his History, alludes to the corn-marigold under the term guild while mentioning one of the western isles, called "Tyan, from an herb, which is prejudicial to fruit, not unlike guild or loosestrife, but that it is of a more dilute colour."† Under this celebrated name, it gave occasion to acts of the Scottish Legislature, not only inflicting heavy penalties upon the farmer in whose land a single stalk of "guilde" should be found, but denouncing him as "ane traitour, quha leades and convoyes an hoist of enemies in the Kingis lands or the Barones."‡ This was not, however, the only instance in which this "splendid weed" disturbed the serenity and peace of a kingdom. The lawgivers and landholders of Denmark were likewise, from its noxious prevalence in the corn-fields,

as derangements of the biliary system produce "that false gold, the *jaundice*." In a similar manner, obstructions of the bile give origin in horses to what is called the *yellows*. The bile has hence been pleonastically styled the "yellow gall." Gaule (the Myrica Gale), though not confined to Britain, is perhaps, from a secondary meaning of the last term, as being as "bitter as the ga'." In some parts of Dumfriesshire, this plant is reckoned by the shepherds to be the gall of Scripture.

* A collection of English words not generally used, &c.

† History of Scotland, Book I.

‡ Stat. Alex. 2. c. 18. Hailes' Ann. Scot., *apud* Dr Jamieson.

from it, and take the seconde shell *that is yelowe*: putte thereof as much as a walnut in a cloth, and seth it wyth a pinte of water, that it be well boyled, and let it coole, and then drink it. This hath been experimented, put thereof also in thy drinke." This author incidentally admits us to what were the probable grounds of the efficacy of this "simple," while mentioning the colour of the inner rind. To its hue, probably, and the yellow dye it is capable of affording, was it that with "gilt arms at his own weapons," it could overcome jaundice. And could it have found words, as Cowley has given to another herb with similar character, to assert its claims, doubtless they would have been backed by some such testimony as the following:—

"Nature's own patent gives me my command;
See, here's her own sign-manual, here's her hand:"—
"Whoever me dissects, would think, nay swear,
O'erflown with gall, I sick o' the jaundice were."

constrained to issue stringent decrees for its extirpation.* Turner, the father of English botany, who, as being a native of Morpeth, is the oldest authority for the Northumbrian names of plants, gives "a gallande" as the common name for the crowfoot or kingcup.† Ray mentions it under the form gülan, as in Northumberland, appropriate to the buttercup; and at the present day, in the northern parts of that shire, the "yellow gowlon" is the term by which the various tribe of crowfoots that "gild the plain" is designated. Passing the Tweed, we find the appellation still retained, but altered by the omission of a letter. In some parts of Berwickshire, the yellow gowan yet recalls the memory of what is more popularly known as the buttercup (*Ranunculus repens, acris, bulbosus, &c.*) In Lanarkshire, however, the phrase, yellow gowans, yet flourishes as the common name of the creeping meadow crowfoot (*Ranunculus repens.*) Hamilton of Bangour, in his ballad of the Braes of Yarrow, thus alludes to it by this familiar term—

> "Sweet smells the birk, green grows, green grows the grass,
> Yellow on Yarrow's bank the gowan,
> Fair hangs the apple frae the rock,
> Sweet the wave of Yarrow flowan.
> Flows Yarrow sweet? as sweet, as sweet flows Tweed,
> Its grass as green, its gowan as yellow,
> As sweet, smells on its braes the birk,
> The apple frae its rock as mellow."

Turner, in his Herbal, under the head "Lukken Gollande," as Mr Hodgson, in his History of Northumberland, remarks, and as may be seen from the subjoined description,‡ pourtrays the *Caltha palustris.* "Turner's Lucken Golland," says Mr Hodgson, who, from passages in his History, appears to be a native of Westmoreland, "we called *water golland*," and as appropriate to it, he quotes what Allan Ram-

* Lightfoot, Flora Scotica, vol. i. p. 490, borrowed from Linnæus according to Jamieson.

† The Seconde Parte of William Turner's Herball, &c. &c. Imprinted at Collen, 1562; blackletter, fol. 114.

‡ Thys herbe useth to growe comonly about water sydes, and in watery meadowes, the proporcion of the leffe is much like unto a water rose, otherwyse called nunefar, but the lefe is sharper and many partes lesse, and there grow many leves on one stalke, and in the toppe of the stalke is a yelow flowre like unto the kyngcuppe called ranunculus; but the leaves of the floures turne inwarde agayne, in the manner of a knoppe or lyttell belle." A new Herball, &c. &c., by Wylliam Turner, Physicion unto the Duke of Somersettes Grace. Lond. 1551. Fol. k. v.

say says of the Lucken gowan, though this passage is more usually referred to the *Trollius europæus*—

> " We'll pou the daises on the green,
> The lucken-gowans frae the bog."

" The plant, says Mr Hodgson, " which, as a boy, I was taught to call locken-gowen, or goudy-locks, is the *Trolius europea (sic)* of botanists."* In Wilson's Synopsis of British Plants in Ray's Method,† we have " *Ranunculus globosus*, the globe flower, or locker gowlons." In Wallis, this name is repeated.‡ This is nothing but the " locket" or " closed goulions" of some of the old herbalists.§ Lightfoot's explanation of

> " Lukin gowans, of the medoes green,"

by cabbage daisy, is singularly apt; and it is somewhat remarkable that the Berwickshire name for this plant, viz. Stocks, should justify its propriety, the flower being an admirable miniature of a " closed cabbage-stock."

In the instances above enumerated, under various forms of spelling, the word gold appears to perform the part of a genuine term, of which there are, in popular estimation, various species: the Marigold, the flower of the Virgin, so specified in Roman Catholic times " from a fancied resemblance of the florets of its disk to the rays of glory round the Virgin's head;"‖ the guild, gule, or gowlon, pre-eminent as the purest metal, not requiring heightening epithet; the yellow gowlon, or gowan, which is a gilding of the " refined gold;" the water goland, equally happy as the marsh Marigold; and the locket or lucken a *closed* gowan.

What ideas suggested by the word gowan or gowlon made it be extended and transferred from the " cuckoo buds of yellow hue," and the " constant" marigold " that goes to bed with the sun,"¶ to the daisy

* Hodgson's History of Northumberland, Part 2, vol. 2. Mr Hodgson quotes from the edition 1548.

† Newcastle-upon-Tyne, 1744.

‡ Natural History and Antiquities of Northumberland, London, 1769, vol. i. p. 201.

§ Nicholas Culpeper, M. D., who, in his usual whimsical way, remarks of Crowfoot,—" Many are the names this furious biting herb has obtained, almost enough to make up a Welshman's pedigree, if he fetch no farther than John of Gaunt, or William the Conqueror."

‖ Forster, Perennial Calendar, Introduction, p. xxii.

¶ " Summe," says Dr Turner, writing about threehundred years ago, " use

(*Bellis perennis*), to which, in the northern part of the island, the name is almost universally appropriated, it is not so easy to ascertain. Perhaps the correspondence of form was the medium of connection. Everywhere in the fields, associated with the corn-marigold, or goulans (*Chrysanthemum segetum*), the corn-feverfew (*C. inodorum*) the great ox-eye (*C. Leucanthemum*), and the corn-chamomile (*Anthemis arvensis*), have been, in Berwickshire, denominated horse-gowans, and in Northumberland white-gowlons, in the same manner as some naturalists, "taking no note" of colour, have united three of those plants under a general term of Chrysanthemum. As these, in the common parlance of the north of England, are termed "big daisies," so from considerations of superiority of size, and similarity of form, they may have given occasion to the imposing of their own name upon the smaller plant, *Bellis perennis*, which in so many aspects may be regarded as their miniature. Obvious external appearances, often seized on at random, and not particularly examined, form the leading features of popular generalization. Sometimes one class of attributes will be fixed upon as characteristic, and as suitable to be distinguished by a general name; but before the chain of comparison, which this process supposes, has been completed, some other prominent property of verisimilitude obtrudes itself, misleads the mind from the primary elements of its consideration, and, in the confusion which ensues, becomes comprehended under a common term, to which it has no natural claim. Of this the application of the word buttercup is an instance. Regarded as a general term, it is not restricted to plants of a yellow hue, but, all notions of colour being abstracted, and those of identity of form alone kept in view, it is given, by the common people, to *Parnassia palustris*, which is considered as the white buttercup. But the instances wherein, "for the convenience of language or dispatch," from application after the original meaning of a term has been forgotten, or from other "accidents of time and chance," words have lost their original meaning, are too obvious to be insisted on. Words, regarded originally as the representatives of the varied ideas present to the mind of him who imposed them, their origin being veiled in obscurity, become used only after the manner of coins, which, from the series of years that have elapsed since their invention, no longer recall the quantity of stock, or weight of rude metal, of which they were primarily the conventional symbols. And the analogy is still further retained in the purposes to which, in the necessities of so-

to make thyr here yelow with the floure of this herbe, not beyng content with the natural colour which God hath geven them."

ciety, they are respectively put. As the value of the one will fluctuate with changes in the economy of states, the rate of exchange, and gradations of skill in bargain-making, so the other will be used, with more or less variable signification, at different periods, according to the revolutions they have undergone, or the degree of enlightenment and sense of propriety, possessed by those who employ them. And so great sometimes will the aberration from original signification, produced by these means, have become, that words in every respect resembling each other, will be applied to objects, in which the finest ingenuity will scarcely detect any one thing in common. This being the case, we can scarcely expect much precision in the name of an object, so trivial and so unimportant to the necessities of humanity, as a gowan or daisy is usually considered. Indeed, "buttercups and daisies,"

> "Coming ere the springtide
> Of sunny hours to tell,"

are so naturally associated with each other, that a community of name might take place, without exciting much notice in an unobservant state of society; and to one who has a taste for rural pleasures, it is almost as great a source of satisfaction, at seeing them placed so "amicably close," as at beholding them "marshalled into bands, under distinct names or ensigns." That, however, the word gowan, thus by two different chains of ideas, brought to apply to objects so familiarly connected, was considered generic, is obvious from the terms, ewe, white, and yellow, being found necessary to be annexed, to obviate the confusion that would result from things inherently so distinct, bearing the same appellation. This is evident in the following passage: "We saw the pleasantest mixture of gowans, so commonly called, or daisies white and yellow, on every side of the way, growing very thick, and covering a considerable piece of the ground, that we ever had occasion to see."*

Under the family of white gowans or gowlons, there are, as with those that still answer to the primitive meaning of the word, several species. The horse gowan, the Berwickshire name for *Pyrethrum inodorum*, *Chrysanthemum Leucanthemum*, and *Anthemis arvensis*, in other parts of Scotland united as the white gowan, and in north Northumberland as the white gowlon; and the *Bellis perennis*, the gowan of the Scotch, and the gowlon of Derbyshire, if not of other parts of England. The latter plant, under this term, stands at the head of its class,

* Brand's Orkney, p. 31, *apud* Dr Jamieson.

without a peer, the type, as it were, in which all the superior properties of the other species are blended, giving occasion to the common proverb as applicable to any thing particularly excelling, "That cowes, or keels, the gowan." In some districts we have this dignity somewhat curtailed by the application of additional epithets. Hogg somewhere speaks of "some bit waefu' love story, eneugh to make the pinks (*Cardamine pratensis*) an' the ewe-gowans blush to the very lips;"* and some nameless bard, in yearning for green pastures, has also sung of "the bonny ewe-gowans that shed their sweets around."† As the "May gowan,"‡ this plant is associated with one of the most delightful periods of the year, and deservedly so, for then the daisy, with a robe of purity, begins to invest the fresh green fields with a galaxy, that rivals in intensity and in beauty, the clustered host of stars that girdle the midnight heavens. As appearing in this month, it has, in the popular mind, become linked with the salubrious influences which the pure and balmy air, and the "vernal spirit" diffused and quickening in all animate existences, are estimated to impart to the infirm and the sick

> ——"who long have tossed
> On the thorny bed of pain."

The languid pulse is enlivened, the feverish brow freshened, the wasted frame invigorated, and the flickering flame of life re-illumed, as the invalid, half assured of convalescence, again treads the verdant carpet, in which the daisy is interwoven—a woof of unsullied purity. "It is a happiness but to breathe and move; and not every limb merely, but almost every fibre of every limb has its separate sense of enjoyment."§ And relatives and friends who experience "those ties which bind our race in gentleness together," now that spring and its train of promised blessings have once more revisited the plain, with the fears and anxieties of many a watchful night allayed, feel, at its approach, as if the oft reiterated hope were almost already realized; that when once again the object of their solicitude had trod the fresh May gowan, the vital powers of nature would refit the frail tabernacle, and all would yet be

* Tales by the Ettrick Shepherd.

† In Tait's Edinburgh Magazine.

‡ The "mary-gowlon"—the common name of this plant in the vicinity of Wooler, is perhaps a corrupt substitution for may-gowan.

§ Dr Thomas Brown, Lectures on the Philosophy of the Human Mind, sect. 17.

well.* The good taste by which this general favourite has been connected with the season of its first appearance has not been wanting to other nations. The French, by their common name *Marguerite Paquerette*, have associated it with the festival of Easter, with which in France its flowering is synchronous. It is pleasing to those who love to appreciate the ameliorating influences of natural scenery, and of the prosecution of physical research upon the mind, to note the preservation of those modes of thinking, by which the operations and festivities of the season become linked with the most prominent natural objects at the period of their occurrence or commemoration. To the clasical student they recall the memories of those primitive times in the world's history when, to the patriarchal labourer, the revolutions of seasons and proverbial wisdom, deduced from a thousand experiences of nature's doings, formed a calendar truly natural.†

The instances remaining in which the word gowlon or gowan has not yet been discussed, are in such cases where it occurs connected with the names of places. The foregoing remarks will convey some idea of the plants that were in view in such topographical nomenclature. In Hodgson's Northumberland,‡ there is mentioned a locality in the parish of Haltwhistle called the Gowan Syke. This, to all appearance, derives its prænomen from the prevalence in the half-stagnant marsh or syke of *Caltha palustris*. Among the lands which in 1603 George, Earl of Dunbar, had conferred upon him, by the favour of James VI. on his accession to the English throne, along with several places in the vicinity of Berwick, he had "the meadow called the *Yellow Gowland*, near Leatham, and extending to East and West Mordington."§ In the charter of the same Sovereign to the town of Berwick-upon-Tweed, of date 30th April of the same year, this meadow, "vulgariter" termed "*Le Yellowe Gowland*," occurs as being, under the obligations of the grant just cited, exempted from the jurisdiction of that borough.‖ This was a large piece of ground, and is still well remembered though

* In Berwickshire, the common expression is, "Ye'll get round again, if ye had your fit (foot) on the May gowan."

†No change of consuls marks to him the year;
The change of seasons is his calendar:
The cold and heat, winter and summer shows,
Autumn by fruits, and spring by flow'rs he knows.
Claudian's Old Man of Verona, by Cowley.

‡ Part II. vol. iii. p. 352.

§ Raine, History of North Durham, p. 32.

‖ Ib. Appendix, p. clii.

now divided into three or four farms. It appears to have derived its name from the abundance of its natural productions while in an uncultivated state. These seem to have been the various species of crowfoot which, in the border counties of England and Scotland, are named the yellow gowan, gowlon, or gollande. That the gowan and gowlon are convertible terms, will appear from the preceding observations. The use of the English mode of spelling the word may be accounted for from the political relations of the town of Berwick and its dependent demesnes, having for the last three hundred and sixty years been more closely allied with England than with the northern division of the island, of which it once formed the principal port. And that a large extent of ground, uncultivated for a series of years, should, by the abundance and peculiarities of its native vegetation, give occasion for popular notice, will not appear wonderful if we consider how attractive old pastures, at different periods of the season, are with those plants to which such a descriptive and appropriate term as the yellow gowlon has been assigned. First, the dandelion,* with its bright epaulettes; then the various buttercups in succession, the bulbosus, the acris, and the repens; and, finally, the corn-marigold with "targe of gold," fraught with the richest hues of light, and, by the sun's bright influence, tinted with colours almost as gorgeous as those lighted up by his own setting beams, glowing through the clouds that canopy his setting —enliven all the fields—inspiring in the lover of nature, awake to every genial impulse, sentiments vivid as their own bright woof, and fresh and fascinating as the fancies of life's "young dream."

J. H.

List of Berwickshire Coleoptera. By Mr GEORGE DUNLOP.†

Cecindela campestris.
Dromius agilis.
4-maculatus.
linearis.
Dromius fasciatus.
Lamprias chlorocephalus.
Clivina fossor.
collaris.

* The Leontodon is one of various similar syngenesious plants, to which Dr Jamieson states the term gowan is applied in some parts of Scotland.

† This list embraces only such species as could be named with certainty; and is therefore confessedly incomplete.

Dyschirius gibbus.
Cychrus rostratus.
Carabus catenulatus.
granulatus.
arvensis.
violaceus.
hortensis.
nitens.
Helobia brevicollis.
nivalis.
Marshallana.
Leistus fulvibarbis.
rufescens.
Loricera pilicornis.
Bidister bipustulatus.
Anchomenus prasinus.
albipes.
Platinus angusticollis.
Sphodrus leucopthalmus.
Pristonychus terricola.
Agonum parumpunctatum.
moestum.
picipes.
Olistophus rotundatus.
Synuchus rivalis.
Calathus cisteloides.
melanocephalus.
rufangulus.
mollis.
Argutor interstinctus.
erythropus.
Pœcilus cupreus.
versicolor.
rufifemoratus.
Omaseus nigrita.
melanarius.
Steropus madidus.
Broscus cephalotes.
Stomis pumicatus.
Patrobus rufipes.
Platysma niger.
Abax striola.
Amara eurynota.
similata.
lævis.
communis.
familiaris.
trivialis.
lata.
Bradytus ferrugineus.
consularis.
apricarius.
Curtonotus aulicus.
Harpalus æneus.
ruficornis.
limbatus.
rufimanus.
Ophonus puncticollis.
pubescens.
Aepus fulvescens.
Trechus collaris.
dorsalis.
minutus.
parvulus.
brunnipes.
tristis.
Tachys immunis.
pusillus.
binotatus.
Philochthus biguttatus.
Peryphus littoralis.
agilis.
tibialis.
femoratus.
saxatilis.
lunatus.
cnemerythrus.
atrocœruleus.
Lopha 4-guttata.
Tachypus properans.
var. acutus.
striatus.

Tachypus bipunctatus.
Bembidium paludosum.
flavipes.
Notiophalus aquaticus.
biguttatus.
striatus.
tibialis.
rufipes.
Elaphrus cupreus.
Haliplus ferrugineus.
obliquus.
ruficollis.
Hygrotus inæqualis.
scitulus.
Hydroporus depressus.
12-punctatus.
alpinus.
6-pustulatus.
proximus.
nigrita.
jugularis.
ovalis.
erythrocephalus.
flavipes.
pubescens.
Laccophilus minutus.
interruptus.
Colymbetes fuscus.
notatus.
guttatus.
fontinalis.
uliginosus.
maculatus.
nebulosus.
Sturmii.
bipustulatus.
fuliginosus.
ater.
Dytiscus marginalis.
punctulatus.
Acilius sulcatus.
Gyrinus natator.
elongatus.
Potamobius villosus.
Parnus prolefericornis.
Georyssus pygmæus.
Elmis Volkmari.
variabilis.
lacustris.
rugosus.
æneus.
Helophorus aquaticus.
granularis.
griseus.
fennicus.
nubilus.
Enicocerus viridiæneus.
tristis.
Gibsoni.
Hydrobius fuscipes.
bipunctatus
minutus.
Cercyon littorale.
obsoletum.
laterale.
melanocephalum.
quisquilium.
Sphæridium 4-maculatum.
marginatum.
Phalacrus corruscans.
Ptomaphagus truncatus.
Catops fornicatus.
Choleva angustata.
Necrophorus humator.
vestigator.
mortuorum.
vespillo.
Necrodes littoralis.
Oiceoptoma thoracica.
rugosa.
dispar.
Silpha obscura.

Silpha opaca.
Phosphuga atrata.
Nitidula grisea.
colon.
discoidea.
bipustulata.
obsoleta.
impressa.
Strongylus ferrugineus.
Meligethes viridescens.
cœruleus.
pedicularius.
Carpophilus flexuosus.*
Cateretes urticæ.
Micropeplus porcatus.
Trichopteryx minima.
Mycetæa hirta?
Cryptophagus lycoperdi.
cellaris.
Byturus tomentosus.
Ips ferruginea.
Latridius lardarius.
porcatus.
transversus.
Dermestes lardarius.
murinus.
Attagenus pellio.
Byrrhus pilula.
fasciatus.
sericeus.
dorsalis.
Simplocaria semistriata.
Hister unicolor.
cadaverinus.
carbonarius.
purpurascens.
æneus.
Geotrupes sylvaticus.
Geotrupes stercorarius.
Aphodius fossor.
scrutator.
fimetarius.
scybalarius.
sordidus.
terrestris.
melanopus.
inquinatus.
rufipes.
luridus.
contaminatus.
prodromus.
sphacelatus.
marginalis.
merdarius.
nigripes.
Ægialia globosa.
Melolontha vulgaris.
Serica brunnea.
Adrastus limbatus.
Dalopius marginatus.
Agriotes sputator.
obscurus.
lineatus.
Limonius minutus.
nigroæneus.
Elater balteatus.
Hypolithus riparius.
4-pustulatus.
Ctenicerus pectinicornis.
cupreus.
Selatosomus æneus.
Aplotarsus testaceus.
rufipes.
quercus.
Athous hæmorrhoidalis.
vittatus.

* I took a *dead* specimen near Berwick, but the wood in which it was may have been foreign.

Campylus linearis.
Atopa cervina.
Cyphon melanurus.
marginatus.
pubescens.
Telephorus flavilabris.
testaceus.
pallidus.
melanurus.
dispar.
nigricans.
cyaneus.
pellucidus.
fuscus.
rusticus.
lividus.
bicolor.
Malthinus sanguinicollis.
biguttulus.
Necrobia quadra.
ruficollis.
violacea.
Ptinus 6-punctatus.
germanus.
crenatus.
Anobium striatum.
Cis boleti.
Hylurgus piniperda.
angustatus.
Mecinus semicylindricus.
Ceutorhynchus quercus.
didymus.
sulcicollis.
Nedyus assimilis.
contractus.
pollinarius.
troglodytes.
Cryptorhynchus lapathi.
Orchestes quercus.
Tachyerges salicis.
Anthonomus fasciatus.
Anthonomus ulmi.
Grypidius equiseti.
Notaris acridulus.
bimaculatus.
Dorytomus tortrix.
Hypera punctata.
polygoni.
murina.
nigrirostris.
Leiosoma punctata.
Helobius abietis.
Alophus triguttatus.
Barynotus mercurialis.
Merionus obscurus.
elevatus.
Leiophlæus nubilus.
Otiorhynchus notatus.
ovatus.
tenebricosus.
ater.
lævigatus.
piceus.
scabrosus.
scabridus.
Strophosomus coryli.
Sitona ulicis.
spartii.
canina.
lineata.
grisea.
tibialis.
Polydrusus undatus.
micans.
Nemoicus oblongus.
Phyllobius pyri.
cæsius.
alneti.
argentatus.
mali.
uniformis.
viridicollis.

Cleonus sulcirostris.
Apion violaceum.
hæmatodes.
radiolus.
æneum.
carduorum.
flavipes.
apricans.
viciæ.
ononis.
subsulcatum.
Oxystoma ulicis.
Deporäus betulæ.
Attelabus curculionoides.
Apoderus avellanæ.
Brachytarsus scabrosus.
Pogonocherus nebulosus.
Clytus arietis.
Rhagium indigator.
bifasciatum.
Donacia cincta.
sagittariæ.
proteus.
menyanthidis.
linearis.
hydrochæridis.
Leptura melanura.
Pachyta livida.
Crioceris cyanella.
melanopa.
asparagi.
Adimonia halensis.
Galeruca tanaceti.
capreæ.
saturata.
lineola.
Luperus flavipes.
Haltica nemorum.
rufipes.
ferruginea.
flava.
Haltica helixines.
Thyamis tabida.
atricilla.
femoralis.
confinis.
pallens.
lurida.
Macrocnema napi.
Mantura semiænea.
Chætocnema concinna.
Sphæroderma testacea.
cardui.
Phædon betulæ.
concinna.
tumidula.
marginella.
vitellinæ.
polygoni.
fastuosa.
raphani.
Chrysomela 10-punctata.
litura.
lamina.
staphylæa.
polita.
varians.
hæmoptera.
Helodes phellandrii.
beccabungæ.
Clythra 4-punctata.
Cassida rubiginosa.
equestris.
Chilocorus 4-verrucatus.
Coccinella 14-guttata.
oblongo-guttata.
7-punctata.
5-punctata.
variabilis.
humeralis.
dispar.
11-punctata.

Coccinella 13-punctata.
globosa.
Rhyzobius litura.
Endomychus coccineus.
Blaps mortisaga.
Helops striatus.
Lagria hirta?
Meloe proscarabæus.
Anthicus fuscus.
Astilbus canaliculatus.
Tachyporus testaceus.
chrysomelinus.
obtusus.
marginatus.
analis.
Tachinus marginellus.
apicalis.
rufipes.
subterraneus.
pallens.
Creophilus maxillosus.
Trichodermus pubescens.
Staphylinus castanopterus.
stercorarius.
brunnipes.
æneocephalus.
pubescens.
Goerius olens.
Goerius fuscatus.
Ocypus similis.
Quedius tristis.
picicornis.
Philonthus laminatus.
splendens.
politus.
marginatus.
rubripennis.
Cafius fucicola.
Gabrius pallipes.
Othius fulgidus.
Gyrohypnus rufipennis.
Lathrobium elongatum.
rufipenne.
lineare.
Rugilus immunis.
Stenus oculatus.
lævis.
pusillus.
bimaculatus.
Oxytelus opacus.
Anthobium sorbi.
piceum.
Lesteva caraboides.
obscura.
Micralymma Johnstonæ.

Notice of the Smilacina bifolia (Convallaria bifolia), a British Plant.
By R. Embleton, Surgeon.

For my knowledge of this interesting addition to the British Flora, I am indebted to my friend, the Rev. Osd. Head, of Howick, who discovered it growing, rather sparingly, "under the shade of a wide spreading beech," in one of the woods at Howick. It has hitherto been found in France, Germany, and other parts of the Continent; and I possess a specimen in my herbarium from Norway, collected by my friend Mr R. B. Bowman, of Leadenhall Street, London. It is

a graceful and beautiful plant, and well deserves a share of the admiration which is so universally given to the other members of the natural family, (the lily of the valley tribe) to which it belongs. It is easily recognised by its creeping roots, from which arises a delicate stem from five to seven inches in height, with two alternate ovate leaves, and terminated by a spike of small, delicate white flowers. It flowers in July.

Since its discovery in the woods of Howick, I am informed by Mr Duncan, Earl Grey's gardener, that it is found in the woods at Kenwood, the seat, I believe, of the Earl of Mansfield, and from which place, through the kindness of the same individual, I possess specimens, which do not shew any difference from those gathered at Howick, with the exception of their being a little more succulent. It is there found in similar situations, namely, under the shade of beech and fir trees. It may, probably, hereafter be found in many other quiet, shady spots of our native woods, and will well repay the wandering botanist for his labour of love in its search.

EMBLETON, *Sept.* 21. 1842.

A Descriptive Catalogue of the GASTEROPODOUS MOLLUSCA of Berwickshire. By GEORGE JOHNSTON, M.D., F.R.C.S.E.

PART III.

ORDER—PLEUROBRANCHIATA.

21. PLEUROBRANCHUS. *Cuvier.*

Animal naked, gasteropodous; cloak and foot expanded, the former strengthened by a thin expanded subspiral shell; tentacula two, with an eye at the base of each; vaginal orifice anterior to, the anal posterior to, the branchia, which is dextral, lateral, and pectinated.—Phytophagous?

1. *Pl. plumula*, "cloak broad, reticulated; foot pointed."—*Flem.* Brit. Anim. 291. Bulla plumula, *Mont.* Test. Brit. 214, tab. 15, fig. 9. (the shell.) *Turt.* Brit. Faun. 168. *Turt.* Conch. Dict. 25. Berthella porosa, *Blainv.* Malacolog. 470. pl. 43. fig. 1. Pleurobranchus plumula, *Johnston* in Mag. Nat. Hist. vii. p. 348, fig. 46.

Hab. Between tide marks in Berwick Bay, not common.

Body oval, convex dorsally, of a uniform cream-yellow colour. Cloak smooth, reticulated with minute clear spots, so as to appear almost porous like a piece of fine sponge; the margin thickish, plain, undulate, free, and sufficiently broad to conceal the foot when at rest. Tentacula arising between the cloak and veil, superior, cylindrical, short, formed of a membrane folded into a tube slit along one side. Eyes small, black, one at the superior base of each tentaculum. Veil above the mouth broad, somewhat triangular, produced at the upper and outer angles, which are folded. Mouth shortly proboscidiform. Space between the cloak and foot smooth, deep. Orifice of the generative organs on the right side, placed very forward, tubercle-like. Branchia arising immediately behind it, single, naked, plume-like, and pectinated; the posterior half free. Foot oval, tapering posteriorly when in a state of extension, and projecting beyond the cloak; the margins undulate, plain. Shell concealed in the substance of the cloak, dorsal, ovate-oblong, depressed, with a minute spire at one end; brownish, thin, pellucid, strongly wrinkled concentrically, and marked with a slight fossa from the apex to the opposite angle. Length 6 lines, breadth 3½ lines.

I am unable to describe the internal organisation of this interesting mollusc; but it may be permitted me to direct attention to the wonderful structure of its oral organs, which I could not (although not unfamiliar with analogous structures in congenerous species) view without a feeling of indescribable pleasure and amazement: and, to the lovers of the microscope, I am satisfied that few objects can afford a more gratifying display. Within the soft parts of the mouth there lie two thin oval plates, one on each side, reticulated in an inconceivably minute and regular manner, after the fashion of the compound eyes of many insects; the meshes being diamond-shaped, and set with a small obtuse process at each angle. Between these plates (which, I presume, are a modification of the maxillæ or jaws) the tongue is situated: a broad membrane, folded at the sides, and armed with innumerable little spines or teeth, arranged in close-set transverse series, parting from a longitudinal medial line. The tongue is of a square shape, rounded at the lower end; to which is appended an inversely heart-shaped piece of similar structure and appearance: the whole fitted to rasp down the vegetable matter on which the animal feeds.

The cloak is fleshy, but not fibrous; and, in its composition, includes many small crystalline spicula of carbonate of lime, which are also to be found in the foot and branchia. These spicula are colourless, short, cylindrical, and rounded at both ends; and they seem to have no determinate arrangement. I have found similar spicula, but larger and more abundantly, in the tegumentary system of the Doris.

Like the land slug, the Pleurobranchus progresses by obscure undulatory motions of the foot; but it justly claims the "bad pre-eminence" of being superior in sluggishness and tardiness.

The specific name of Blainville is unjustifiable; and no authority can warrant our adoption of it. Montagu (the discoverer of the species) called it Bulla plumula;* and, although the generic name must be altered to suit the progress of science, his specific name is sacred, and beyond the changeful caprice of any systematist. Blainville has done some further wrong to Montagu, in ascribing even the discovery of the mollusc to Donovan; whose name, I may observe, is often substituted

* He subsequently constituted with it a new genus, which he called Lamellaria, a name preoccupied in botany.

for that of the former naturalist by foreign authors, and by some careless translators in our own country.

22. Aplysia. *Linnæus.*

Animal naked, gasteropodous, hunchbacked, winged on the sides; the folds partially concealing the shell, which forms a horny patelloid shield over the branchiæ; tentacula four, ear-shaped; eyes two, sessile; sexual orifices on the right side; anus placed at the end of a syphon.—Phytophagous.

1. *A. mustelina*, body snail-like, gibbous on the back, of a uniform purplish-red or brown colour, closely speckled with short wavy and inosculating black lines. Length 3-4 inc. Ap. depilans, *Penn.* Brit. Zool. iv. 78. *Flem.* Brit. Anim. 290. Ap. mustelina, *H. Davies* in Penn. Brit. Zool. iv. 79. tab. 22. Ap. hybrida, *Sowerby*, Brit. Misc. 111. tab. 53.

Hab. Berwick Bay, near low water mark, not common.

Head truncate; mouth inferior, covered by a veil; anterior tentacula marginal, folded, ear-like; posterior small, tubular at the base, folded above; eyes two, very small, black, encircled by a white halo, placed in front and at the external base of the posterior tentacula; back gibbous, encircled with a fin-like expansion of the cloak, the margin undulate, separate before, but continuous behind; tail depressed, obtuse; foot concave, plane, wavy or even according to the position of the animal. On one side there is a furrow which runs obliquely backwards from the anterior tentaculum, and terminates under the branchial covers. Shell horny, ovate, narrowest behind, where the apex is oblique and produced into a small mucro, convex dorsally, smooth or very faintly marked with a few lines radiating longitudinally, the margin entire, with a membranous border that becomes broad on the wide and rounded front. It resembles pretty closely that of the *Aplysia brasiliana*, as figured by Sowerby in his "Genera of Recent and Fossil Shells." The Aplysia often adheres by the posterior part of the foot, which it can contract into a kind of circular sucker; and it frequently swims, in a reversed position, along the surface of the water. It feeds on sea-weed, particularly on *Fucus palmatus* and *crispus*. When alarmed, it pours out, in great abundance, from under the branchial lid, a beautiful purple-coloured liquor, which has a very slight sickening smell, but too faint to occasion any unpleasant sensations, nor does it possess any acrid property. This innocuous character of the British species proves it to be distinct from the *Aplysia depilans* of Linnæus, who, epitomising the history of Bohadtch, says—"Habitat, in M. mediterraneo; sanie depilans tactu, fœtidissima ad nauseam usque."* There is a nearer relationship apparently of *Ap. mustelina* with the *Ap. fasciata* of Poiret, and I have seen a specimen of the former, in which the wings were bordered with a line of bright blue; but the figure given of *Ap. fasciata* by Risso does not represent

* We may add, that the figure given of Ap. depilans (or as he calls it, *Ap. leporina*) by Delle Chiaje, leaves no doubt of the species being altogether different from the British one.

our species. It may assist the solution of the question to add the specific character which Delle Chiaje gives of A. FASCIATA, "*tubulo in dorso, brevissimo; branchiis paullum longis, integris; alis amplissimis, liberis; syphone laterali, extenso.*"—Anim. senza Vert. Napol. i. 69.

23. BULLA. *Linnæus.*

Animal gasteropod, destitute of tentacula; "body in front with a fleshy expansion or tentacular disc, behind with a membranaceous appendage or lid. Shell convoluted; aperture the whole length of the shell."—*Fleming.*

1. *B. Cranchii*, shell oblong-oval, opaque, white, marked with numerous close transverse punctured striæ. *Flem.* Br. Anim. 292. B. cornea, *Lamarck*, Anim. s. Vert. vi. ii. 36. B. punctura, *Johnston* in Edin. New Phil. Journ. April 1828, p. 79.

Hab. Berwick Bay, very rare.

Shell 4 lines long, thickish; apex with a very narrow perforation. It resembles the *B. ampulla* of Montagu in shape; but is distinguished by having the whole surface punctured, and these punctures are arranged in regular striæ. Only one specimen has occurred, and a part of the outer lip appears to have been broken off during the animal's life, and again renewed; this portion is smooth. This description differs in some material points from that of *B. Cranchii*, given by Lamarck and Fleming; but I have the high authority of J. E. Gray, Esq., to whom my specimen was presented, for stating that it and my *B. punctura* are the same shell. The specific name commemorates a very remarkable man, and enthusiastic naturalist, of whom there is an interesting life in the Annals of Philosophy, vol. xi. p. 326.

2. *B. umbilicata*, shell cylindraceous, rounded at both ends, smooth, white, pellucid; spire none; aperture linear and narrow above, widening below, entire; the pillar with an oblique obsolete plait; the outer lip thin and rounded. Length $\frac{1}{8}$th; breadth less than the half. *Mont.* Test. Brit. 222, pl. 7, fig. 4. *Flem.* Brit. Anim. 293.

Hab. Berwick Bay, in sand, very rare.

From its pellucidity, the pillar is visible within the shell. There is no spire, nor is the apex umbilicate.

3. *B. cylindracea*, shell cylindrical, white or greyish, smooth; aperture linear, widened at the base; apex umbilicate; pillar with a single fold. Length 5 lines; breadth not 2. *Pen.* Brit. Zool. iv. 259, tab. 73, lower fig. *Mont.* Test. Brit. 221, tab. 7, fig. 2. *Flem.* Br. Anim. 293.

Hab. Berwick Bay, rare.

The shell is covered with a distinct epidermis, and is very faintly striated spirally at the base. The following description of the animal is from a dead specimen :—Snail completely retractile within the shell, gasteropodous, white; the foot short and broad, with plain margins; collar narrow, plain. Belongs apparently to the same genus as *Bulla truncata.*

4. *B. truncata*, shell subcylindrical, white, smooth, the upper half obsoletely plaited; apex truncate, umbilicate, the whorls visible in the umbilicus; aperture narrow-linear above, widened at the base, entire, the margins somewhat thickened, slightly everted, with a plait on the pillar at the base. Length 1 line. *Mont.* Test. Brit. 223, pl. 7, fig. 5. *Flem.* Brit. Anim. 293. B. retusa, *Wood*, Ind. Test. pl. 48, f. 59.

Hab. Berwick Bay, in sand, very rare.

The animal is entirely retractile within the shell, and is gasteropodous; it is of a pure white colour, short, and of a subquadrangular or oblong figure; the back covered with a sort of cloak, free on the sides, while the foot extends the whole length of the body. Front wide and truncate, sinuated in the middle; eyes two, dorsal, placed at the base of a sort of auricle formed by a fold of the cloak, and reflected backwards; foot entire, truncate anteriorly, rounded behind. Slow in its motions, and issuing from the wide part of the shell.

5. *B. catena*, shell oblong, very thin, pellucid, white, striated with chain-like transverse striæ; aperture ampullaceous, effuse above, the pillar arcuated, plain; outer lip thin and even; spire obsolete, consisting of a single involution. Length $\frac{1}{8}$th; breadth $\frac{1}{10}$th. *Mont.* Test. Brit. 215, pl. 7, fig. 7. *Fleming* in Brewster's Edin. Encyclop. vii. 84. *Laskey* in Wern. Mem. i. 396. *Turt.* Brit. Faun. 168. *Dillw.* Rec. Sh. 478. *Wood* Ind. Test. pl. 18, fig. 15. *Turt.* Conch. Dict. 24. *Brown*, Conch. Illustr. pl. 38, figs. 33, 34. Bulla punctata, *Flem.* Brit. Anim. 294. Bullæa catena, *Clarke* in Zool. Journ. iii. 337.

Hab. In shell-sand occasionally.

The striæ are only visible under a good magnifier, when they "appear interwoven or formed into links like a chain." Mr Clarke has given a description of the animal.

6. *B. pectinata*, shell oblong, somewhat widest at the base, milk-white, pellucid, marked with moniliform transverse lines; aperture ampullaceous, widening below, where it is remarkably pectinated, effuse at the upper end, the pillar arcuate with a narrow fold; outer lip thin; the spire truncate, depressed. Length 2 or 3 lines; breadth more than half the length. Bulla scabra, *Mull.*

Zool. Dan. ii. p. 41, pl. 71, fig. 10–12. B. pectinata, *Dillw.* Rec. Sh. 481. *Wood*, Ind. Test. pl. 18, fig. 21.

Hab. Found in shell-sand, and almost always imperfect, from having the pectinated series of spines at the base rubbed off. Mr Alder has found it entire in the stomach of a haddock. Muller procured his specimen from the stomach of a flounder.

This shell, well described and figured by Muller, is larger than *Bulla catena*, and not so broad in proportion to the length; the aperture is less patulous, and the spire more complete. The clear spots or beads of the transverse lines are much larger, oval, and, though often in apparent contact, they are yet separate from one another, and not linked. When recent it appears to be of a yellowish colour.

"Muller and Chemnitz, in the same year, described two very different shells with the name of *B. scabra*, and as neither has the preference on the score of priority, I have changed the name of the present species, because it offers another which is peculiarly applicable."—*Dillwyn.*

24. Diaphana. *Thos. Brown.*

Obs.—This genus is indicated by Captain Thomas Brown in his "Illustrations of the Conchology of Great Britain and Ireland," Edin. 1827; but I am not aware that he has anywhere given a definition of it. This is, perhaps, fortunate, for the name, being a *comparative* and an *adjective* one, is peculiarly objectionable. I adopt it provisionally, because to do otherwise would necessitate the reduction of Brown's names to synonymes, and might add to an overburdened nomenclature; for, as the animals of the shells are unknown, we want the grounds for referring them to their true genus. They will probably prove to be members of the genus *Akera* of Muller.

1. *D. pellucida*, shell ovato-ventricose, pellucid, clear-white, smooth, the apex truncate, flat, spiral but not umbilicate; aperture the length of the shell, entire, contracted above, widening below, the pillar with a thin fold and a minute perforation behind it; outer lip thin and even. Length $\frac{1}{10}$th, the breadth about a third less. *Brown*, Illust. pl. 38. fig. 10, 11.

Hab. In shell-sand.

The shell, when large and full grown, is milk-white, but smaller specimens are perfectly diaphanous, exhibiting the axis or columella very clearly. The wide part of the aperture occupies about three-fourths of its whole length, and the back of the shell is a little humped. It seems to be identical with a shell figured by Muller in Zool. Dan. tab. 71, fig. 6—9, and described as very like the *Akera bullata.*

2. *D. candida*, shell ovato-globose, milk-white, pellucid, smooth; the spire small, very slightly raised, obtuse, of two whorls; aperture longer than wide, entire, the pillar arcuate, with a narrow

fold, the outer lip thin, semicircular. Length not a line, and about one-third less in breadth. *Brown*, Illust. pl. 38. fig. 13. 14.

Hab. In shell sand, rare.

Order—CERVICOBRANCHIATA.

25. Capulus, *Montfort.*

"Shell obliquely conical, recurved behind, with an uncinate rather spiral apex; aperture large, elliptical; muscular impressions two, lateral, joined together at the back, each rounded in front; epidermis horny, thick, somewhat velvety."—*Sowerby.*

1. *C. hungaricus*, shell longitudinally striate, thickish; the apex spiral, greatly recurved, acute; aperture roundish, the margin uneven, plain. Diam. about 1 inch. *Flem.* Br. Anim. 363. *Sowerby*, Gen. c. fig. Patella ungarica, *Dillw.* Rec. Sh. 1034. Pileopsis ungarica, *Lam.* Anim. s. Vert. vi. ii. 17; 2d Edit. vii. 609.

Hab. Adhering to shells and stones in deep water, rare. Small and bleached specimens frequently occur in shell-sand.

"In a live, or recent, state, it is covered with a rough pilous epidermis, of a brown colour; beneath which the shell is of a deep flesh-colour, inclining to carnation, finely striated longitudinally, and frequently wrinkled transversely. Inside extremely smooth and glossy, generally of the same colour, but brighter, sometimes white; margin of the aperture nearly round, more or less undulated or indented, and crenated. The epidermis, which projects beyond the margin, forms a ciliated border."—*Montagu.*

26. Emarginula. *Lamarck.*

"Shell clypeiform or depressedly conical, more or less oblong, hollow beneath; vertex turned backwards; anterior margin slit or notched. Anterior sides of the muscular impression interrupted, expanded, not continued across the front."—*Sowerby.*

1. *E. fissura*, "shell conical, cancellated, with a deep and narrow marginal fissure, and the summit recurved;" margin crenulate. Diam. of the base 3–5 lines. *Lam.* Anim. s. Vert. 2d Edit. vii. 582. Patella fissura, *Dillw.* Rec. Sh. 1054. *Mull.* Zool. Dan. i. p. 25. tab. 24. fig. 7–9.

Hab. On shells from deep water, rare. In pools between tide-marks on Eyemouth shore, *R. Maclaurin.*

27. Lottia. *Gray.*

Shell patelliform, generally depressed, with the vertex inclined to the anterior margin, and sometimes nearly marginal: muscular impression non-symmetrical, being rather wider on the right side near the head than on the left: internal central disk generally of a dark or varied colour. The branchial plume is contained in a cavity over the neck of the animal, and is only occasionally protruded.—See *Sowerby's* Genera of Rec. and Fossil Shells.

1. *L. virginea*, shell oval, with the apex towards the anterior side, greyish or pale-flesh colour, rayed with lines of a deeper red, even, very obscurely striated; the margin smooth, coloured and spotted; interior white or tinted with red. Diam. 5 or 6 lines. Patella virginea, *Mull.* Zool. Dan. i. p. 13. tab. 12. fig. 4. 5. *Dillw.* Rec. Sh. 1052. *Flem.* Brit. Anim. 287. Lottia virginea, *Alder*, in Ann. and Mag. Nat. Hist. viii. p. 403.

Hab. Near low-water mark under stones, and in the roots of Laminaria digitata, not uncommon.

Head towards the narrow end of the shell. Tentacula white, awl-shaped; foot oval, with a plain margin, white; cloak with a filamentous fringe all round and about half a line within the margin, the filaments short, equal, obtuse and white, while the margin itself is plain and marked with purplish bands corresponding to those on the shell. The filaments do not point outwards like the marginal filaments of the cloak of Patella vulgata, but are all directed inwards and towards the body, so that they are apparently more analogous to the branchial circle than to tentacular filaments. The tongue is very long and ribbon-shaped, rough, with the spinous teeth arranged quincuncially in five series, and those in the middle series are much larger than those of the sides.

In opposition to an opinion which I gave in the Magazine of Zoology and Botany, vol. ii. p. 365, Mr Alder has very satisfactorily proved that this pretty limpet is a Lottia, and to him we are indebted for an excellent description of the branchial organ. I am not, however, equally convinced that our species is the *Patella virginea* of Muller, although, in deference to Mr Alder's authority, I have here also followed him; for on examining Muller's excellent figures, I can see no trace of a ciliated fringe anywhere; which, on the contrary, is shewn, just as it has appeared to me, in the figure 6 of *Patella tessulata.*

"In tracing this species through all its stages, I find that in its very young state, the red markings of the shell are not in regular lines, but have a tessellated or chained appearance, exactly similar to those of Mr Forbes's *Lottia pulchella;* in fact, I cannot perceive any difference between my shells and specimens of *Lottia pulchella*, kindly presented to me by Mr Forbes."—J. Alder.

Order.—CYCLOBRANCHIATA.

28. Patella. *Linnæus.*

Shell generally ovate, sometimes oblong, more or less depressedly conical, rarely of a pyramidal form, concave beneath in proportion as the vertex is convex; apex always more or less anterior, sometimes very nearly central; muscular impression elliptical, interrupted in front where the head of the animal is placed.—See *Sowerby's* Genera.

1. *P. vulgata*, shell cinereous, bluish or greenish-grey, often rayed with red or yellow bands, more or less distinctly ribbed and striated longitudinally; apex obtuse, sub-central; base ovate, the margin plain; interior margaritaceous. Diam. from 1 to 2 inches. *Dillw.* Rec. Sh. 1032.

Hab. Between tide marks abundant.

This common shell is subject to considerable variation in colour and shape: sometimes it is extremely conic, often much depressed; sometimes strongly ribbed and crossed with fine striæ, and often nearly smooth; of an uniform cinereous or greenish colour, or rayed with coloured bands and streaks.

The Limpet has two awl-shaped tentacula bulged at the base, where the small sessile eyes are situated: mouth proboscidiform, armed with two pairs of cartilaginous jaws of very unequal sizes, and with a tongue of surprising length; it is a narrow ribbon-like body fully 3 inches long, of nearly equal breadth throughout excepting at the apex, where it is somewhat dilated, the surface roughened with 3 rows of teeth; the side rows alternating with the middle one, which is quadrifid, while the side teeth are divided only into two points: there is also placed along each side of this remarkable organ a double row of cylindrical tubes whose apertures look towards the base. The tongue is never projected outwardly, but is kept folded back, lying in the gullet and intestinal canal, and used probably as a rasp to grate down its fibrous food. Foot plane, with an even margin: circumference of the cloak dusky or specked with dusky spots and furnished with numerous tentacular filaments of unequal sizes; and between the cloak and foot the naked branchiæ are visible. These form a thick delicate fringe around the body between the foot and the ciliated margin of the cloak, and are uninterrupted excepting on one side of the head or neck where there is a channel that breaks the continuity, and leads obliquely to a large cavity over the back, which has a wide and free communication with the external atmosphere. The animal is usually stated to be monœcious, and certainly there is no external difference among the individuals; but the observations of Mr J. E. Gray prove them to be really bisexual. The females spawn in autumn or in the "back end," when young and old,—the small and full grown,—are found pregnant with numerous round eggs swimming in a transparent viscid fluid. See Ann. Nat. Hist. vol. i. p. 482.

The walk of the Limpet is very slow and limited, and as they increase in age and size, the unwillingness to move appears often to grow upon

them, for many of the larger Limpets form for themselves a hollow place in our sandstone and limestone rocks, to live in apparently for life, secure from the tempest of waves that twice a day lashes over them. These hollow places are common on our coast: they are a few lines in depth, of the size and shape of the rim of the shell, and are excavated, perhaps, by long maceration of the soft muciferous foot upon the rock, assisted by partial rotatory and vermicular motions of the same organ. That it secretes any solvent has not been proved.

Our fishermen distinguish three kinds of Limpets: viz.

(1) YAWDS, which have a tough leathery foot of a cream-yellow colour, and tentacula of the same colour but a shade lighter. The shell is coarsely ribbed, often marked with coloured rays, the rim of the aperture uneven, unequally crenulate, and marked with dark and white alternating spots or bands of very unequal sizes, but the white marks are always opposite to or correspond with the ribs or elevated ridges on the outside. (*Brown's* Illustr. pl. 37, fig. 12, and 14.) The Yawds are found near low water-mark, and are said to be less common than the other varieties. They are almost worthless as a bait.

(2) SCROOFS, which for bait are as little valued as the preceding. The foot is soft, greenish-grey, or olive-coloured and streaked, encircled with a paler margin; the sides of the snail bluish-grey; the snout cream-yellow, with olivaceous tentacula often dusky about the tips. The shell is strongly ribbed and rather vividly streaked in general with yellow or red, appearing especially on the inner side. (*Brown's* Illustr. pl. 37, fig. 15.) This variety is found mostly on the dry rocks covered with Balani, and in the shallow pools amidst these rocks, where it is often covered with a forest of Corallina officinalis.

(3) The LIMPET or LEMPECKS. These have a rather thin shell of a greenish colour, the external surface even and obsoletely ribbed or merely striated. (*Brown's* Illustr. pl. 37, fig. 17.) The foot of the snail is a wine-yellow, or approaching that colour, with a yellowish edge; the sides very light blueish grey; the snout of the same colour as the edge of the foot; and the tentacula have dusky tips. This variety affords the bait so extensively gathered for the capture of all white fish. From constant warfare, their numbers have of late years greatly decreased; there is not now one out of ten that there were 20 years ago, and the collecting of them has become consequently tedious enough. The bait-gatherer, for picking them from the rocks and preparing them for the line, has 8d per day, but very few fishermen need to hire, there being hands enow in general out of his own "sma' family." The number taken during the year is prodigious. Each boat requires, I am told, for the baiting of its lines fully 360 scores. From Berwick alone, there are 11 boats daily occupied in the white fishery, and consequently 79,200 limpets are daily needed for their supply. Now, suppose that the lines are baited only 150 days in the year with them, and we have an annual consumption of 11,880,000! This I am given to understand is a low calculation of the real destruction; and how amazing must be the productiveness of a creature that, unprotected (unlike the oyster), affords such a supply! And to get at the full extent of this from our coast there is to be taken into the calculation the boats furnished with it from Holy-Island, Spittal, Ross, Burnmouth, Eyemouth, Coldingham, Redheugh, and Cockburn'spath, amounting in all probably to not less than 50.

The Limpet is happily never used as food with us. The shell is often used to apply Fuller's earth, and similar remedies, to the sore nipples of nurses; hence probably the origin of "Pap-shell," which Lister tells us is one of its English names.

2. *P. pellucida*, shell corneous, pellucid, smooth, rayed with interrupted azure blue lines from the vertex to the broad end; apex black, lateral, leaning; base ovate, the margin thin and smooth. Length $\frac{8}{10}$ths; breadth $\frac{5}{10}$ths. *Flem.* Brit. Anim. 287.

Hab. On Laminaria digitata, common.

When young, the vertex touches the marginal line, but in full grown specimens it is considerably raised.

3. *P. lævis*, shell depressed, conical, thickish, corneous, subpellucid, rayed with brown and interrupted blue lines diverging from the apex, smooth; apex lateral, inclined, resembling a small shell placed on a larger one; margin smooth; interior iridescent. Length $\frac{8}{10}$ths; breadth $\frac{6}{10}$ths. *Flem.* Brit. Anim. 287. P. cærulea, *Mont.* Test. Br. Sup. 152.

Hab. About the roots of Laminaria digitata, common.

Animal white, with continuous branchiæ. Dr Fleming considers this distinct from the preceding, and it is not very easy to find intermediate specimens, to prove that they are not so; yet I cannot but agree with those naturalists who consider the differences between them to depend entirely on differences in their locality. "The Patella pellucida of Montagu is synonymous with the P. cærulea of the same author, the former having been founded on specimens taken from the stalk, and the latter on individuals obtained from the flattened frond of the Fucus, on which the species usually takes up its abode: it is indeed by no means rare to find specimens in which the animal has moved from one of these positions to the other; and, in such cases, the apex of the shell represents P. cærulea and the base P. pellucida, or *vice versâ*."—*J. E. Gray*, in Phil. Trans. for 1833, p. 782. The very reverse of what is here stated, relative to the habits of these supposed species, is the fact, as Mr Gray subsequently ascertained; but his conclusion appears, nevertheless, to be correct. P. lævis lives ensconced snugly in holes, which it has eaten out of the under side of the root of the tangle; and it is interesting to see them instinctively select a site, so secure from foe and storm, and at the same time where food is ever at hand. The holes are often an inch or rather more in depth, and the convex form of the face of the shell may arise from the animal living in an almost hemispherical cavity. Ann. Nat. Hist. vol. i. p. 483.

Chiton. *Linnæus.*

"Shell oval, consisting of eight arched pieces arranged across the body of the animal in a series overlapping each other, their ends set in the skin, which forms a rim around them." *Gould.*

1. *C. fascicularis*, shell oval, dusky or cinereous; valves raised and striated down the middle, coarsely granular, the granules flattish; marginal band armed with tufts of short spines, and fringed. Length from 6 to 10 lines. *Flem.* Brit. Anim. 288. *Lowe*, in Zool. Journ. ii. 96. *Sowerby's* Gen. fig. 3. *Brown's* Illust. pl. 35, figs. 5, 8.

Hab. On old shells from deep water, rare.

The shell is often prettily variegated and streaked with brown, green, and white. There are 18 tufts around the sides, the hairs short, rigid, asbestine, and often spread out stellate-wise. The edge of the band is also fringed with cilia. Mouth with a puckered rim and a narrow veil. The *Chiton fascicularis* of Linnæus is surely distinct from our European species.

2. *C. marginatus*, shell oval, variously coloured and spotted, commonly cinereous; valves finely shagreened, the medial line obtuse; marginal band spotted, pulverulent, ciliated on the edge; interior greenish. Length $\frac{8}{10}$ths. *Flem.* Brit. Anim. 289. Ch. cinereus, *Lowe*, in Zool. Journ. ii. 99.

Hab. Under stones between tide-marks, very common.

The marginal cilia are very short, and scarcely appear in cabinet specimens unless these have been carefully dried.

3. *C. ruber*, shell oval, reddish, mottled; valves obtusely carinate, smooth, glossy, marked with striæ of growth; border pulverulent, spotted with red and white. Length $\frac{7}{10}$ ths. *Flem.* Brit. Anim. 289. *Lowe*, in Zool. Journ. ii. 101. tab. 5. fig. 2.

Hab. At low water-mark, rare.

4. *C. cinereus*, shell oval, blackish or ash-grey; valves scarcely beaked, rough with small granules closely arranged in lines; border granular. Length $\frac{4}{10}$ths. *Flem.* Brit. Anim. 289. Ch. asellus, *Lowe*, in Zool. Journ. ii. 101. tab. 5. fig. 3.

Hab. On shells and stones from deep water, frequent.

The granules of the border are sometimes rubbed off; they correspond in colour with the general colour of the shell. The ciliated fringe of the marginal band is very short.

The *Chiton asellus* of Captain Brown (Illustr. pl. 35, fig. 14.) is undoubtedly distinct from our Ch. cinereus; and Brown's *Ch. fuscatus* (pl. 35, fig. 17.) is probably identical with it.

Order—CIRRHOBRANCHIATA.

Dentalium. *Linnæus.*

Shell simply tubular, slightly arched, tapered posteriorly, and open at both ends.

1. *D. entalis*, shell white, strong, smooth, and even. Length, $1\frac{4}{10}$ths. Diam. of the mouth $\frac{2}{10}$ths. *Dillw.* Rec. Sh. 1065.

Hab. Deep water, frequent.

The posterior aperture of the shell forms a perpendicular slit, emarginate on the dorsal side, and furnished with two small testaceous convex plates.

The form of the animal is, like that of the shell, round, and tapering gra-

dually to the posterior extremity; it is smooth, whitish, and closely invested with a thin pellucid membrane, beneath which two strong satiny ligamentous muscles are seen lying along the ventral surface, adhering closely, and each of them divided into a broad and a narrow slip. These arise near the base of the foot, and they extend to within a line or so of the anus, forming there a circular band with a laciniated margin; and the office of the ligaments is, doubtless, to draw the snail within the shell, or push it outwards, according as the one or the other end is made the fixed point. The collar is very thick and fleshy, and makes a complete circle, through which the foot can be pushed at pleasure. The foot forms the anterior portion of the body; it is cylindrical, thick, fleshy, pointed with a conical process and cleft below; and in the groove we see the mouth in the shape of a compressed process, projecting forwards, and with its edge fringed with short tentacular papillæ. At the root of this process the branchiæ originate, forming two bundles of numerous clavate filaments. The mouth is furnished with a ribbon-like tongue, armed with cartilaginous or horny blunt denticles, set in two rows. Anus posterior and terminal, opening by a wide slit directed to the dorsal aspect.

2. *D. striatum*, Brown, Illust. pl. 1, fig. 8. "Found by me at Holy Island, coast of Northumberland." *Capt. Brown.*

A Supplement to Dr Johnston's Catalogue of the Berwickshire Mollusca. By Robert Maclaurin, Coldingham.

Pleurotoma. *Lamarck.*

"Shell fusiform, turrited, aperture oval, with a more or less elongated canal at the base; outer lip with a notch near the suture; operculum horny, acuminated, and having its nucleus at the lower end."—*Sowerby.*

1. *P. gracilis. Flem.* Brit. Anim. 354.

Hab. Coldingham Bay, rare.

Although I have met with several examples of this shell, they have all been more or less worn. Shell turrited, with 12 whorls tapering gradually; whorls crossed by seventeen bent obtuse ribs, obsolete at the suture, which is distinctly marked with an impressed and minutely ribbed line. Two elevated lines around the base of the body-whorl. Aperture oval, white; pillar rounded; canal short. Epidermis dark-brown, beneath which the surface is seen to be spirally striated. Length $1\frac{3}{10}$ths; breadth $\frac{1}{4}$ inch.

Trichotropis. *Broderip and Sowerby.*

Shell turbinated and carinated externally; the aperture wide but longitudinal, rather longer than the spire, effuse or obscurely chan-

neled at the base; epidermis spinous or ragged; operculum horny, small, elliptical, with a lateral nucleus.

1. *T. borealis.*

Hab. Coldingham Bay, in deep water, rare. The Rev. D. M. Inglis has also found it at the Cove, Cockburn'spath.

Shell ovato-conical, white, covered with a pale-yellow hairy epidermis, strongly striated spirally. Two or three striæ, much larger than the rest, encircle the top of each whorl. Whorls 7, much rounded, tapering to a fine point. Aperture blueish-white, very glossy, somewhat triangular; pillar flattened, oblique: behind it there is a small groove. Length $\frac{1}{2}$ inch; breadth $\frac{3}{10}$ths.

Scalaria *Trevelyana*, i. p. 263.

Hab. Coldingham Bay, in deep water, rare.

Shell pale-rose coloured, elongated, with 12 rounded finely tapering whorls, crossed by 17 ribs varying in thickness; ribs interrupted by a separating line; intermediate spaces very glossy, distinctly striated transversely and indistinctly in a spiral direction. Aperture white, nearly round. Length $1\frac{1}{4}$th; diameter of the base $\frac{4}{10}$ths.

I have again described this shell, for Dr Johnston's description has been founded on young and worn specimens. When young it is of a uniform cream-colour, with the ribs so thin as to look like some other species. The only British Scalaria with which the shell is likely to be confounded is *Sc. Turtoni*, from which, however, it may be distinguished by the number of its ribs, by having as many whorls when it is an inch shorter, and by the peculiar marking of the spaces between the ribs.

Rissoa *semicostata*, shell white, glossy; ribs abbreviated on the body-whorl, on the under part of which there are strong spiral striæ. Length 1 line. Cingula semicostata, *Flem.* Brit. Anim. 307.

Hab. Coldingham Bay, rare.

Odostomia *unidentata*, shell white, smooth, glossy, strong; whorls 5, rounded, the apex blunt. Length 1 line. *Flem.* Brit. Anim. 310.

Hab. Lumsdain shore, in shell-sand, not uncommon.

Capulus *militaris*, shell reticulated by longitudinal and transverse striæ. Diam. $\frac{5}{8}$ths. *Flem.* Brit. Anim. 364.

Hab. Coldingham Bay, adhering to shells and other marine bodies in deep water.

Capulus *antiquatus*, shell covered with concentric ascle-like wrinkles, formed by the layers of growth. Length $\frac{4}{10}$ths; breadth $\frac{3}{10}$ths. *Flem.* Brit. Anim. 364.

Hab. Coldingham Bay, very rare. I have seen only one example which was cast ashore after a storm.

An Address to the Members of the Berwickshire Naturalists' Club, delivered at the Anniversary Meeting held at Ford, September 20. 1843. By GEORGE JOHNSTON, M.D., President.

GENTLEMEN,

Eleven years have elapsed since I had the honour of addressing you from this chair. Few of us were then sanguine enough to believe that the Club could ever sustain such a lengthened existence, while, in fact, it shews yet no evidence of decay, for the meetings of the past session have been more numerously attended than those of any previous year, and no later than at our last meeting, three Members were added to our list.* It is not difficult to account for our permanency. Attendance is not enforced upon us; and when we do meet, there is a certainty in us that the disposition to society and socialness, innate to humanity, and ever influencing its conduct, will have fair play; for while there is nothing in our rules to restrict or restrain freedom of conversation or debate, yet the professed object of our meeting together operates, unseen and unfelt, to guard us against the introduction of unpleasant topics, and to win us to subjects that move the heart and its affections, and so to place us in pleasant harmony with ourselves and with each other. Our association affords us, moreover, the stated means of indulging another principle bound up with our frame and constitution, for He who made nature all beauty to the eye, implanted, at the same time, in his rational creatures, an instinctive perception of that beauty, and with it joined indissolubly, a balm and virtue that operates through life. You have the proof of this

* The Members admitted in the course of the year, are :—

Sept. 28. 1842, Thomas Tancred, Esq., Twizel-House.
Dec. 15. —— William Murray, Esq., of Marshall-Meadows.
July 26. 1843, Charles Wilson, M.D., Kelso.
James Tait, Esq. jun., Edenside, Kelso.
Mr James Douglas, Commercial Bank, Kelso.
Sept. 20. —— Rev. Edward Bigge, Archdeacon of Lindisfarne, Egglingham.
William Dickson, Esq. of Amisfield, Alnwick.
William Broderick, Esq., Belford.
John Turnbull, Esq., 49 George Square, Edinburgh.
Rev. George Walker, Belford.

in the gaiety of the infant swayed only by external influences,—in the child's love of the daisy and the enamelled fields,—in the girl's haunt by the primrose bank or rushy brook,—in the school-boy's truant steps by briery brake or flowery shaw, by trouting streams or nutting wood,—in the trysting tree and green lanes of love's age,—in the restless activity that sends us adrift in search of the picturesque,—in the "London-pride" of the citizen,—in the garden of retired leisure,—in the prize-flower that lends its pride and interest to old age! Yes, there is a preordained and beneficial influence of external nature over the constitution and mind of man which this Club fosters and encourages, and therein lies its usefulness. After the walk of this day you will all, I feel assured, be willing to assent to my conclusion; for let us have come in whatever mood the mind can assume,—grave or gay,—disposed for good or evil,—I do not doubt the result—we have found good in every thing. The landscape before and around us has been our teacher, and from the lesson there was no escape; for, doubtless, no cultivated mind could persevere in its moodiness when for hours it has felt the impress of that beauty which wooed it to peace, of that gratification and pleasure that entered in through every sense and through the air we breathed and walked in. Oh no! we are all the better of these excursions,—they soothe or soften or exhilarate the man, and raise him in his own estimation by keeping awake his best feelings and laying asleep for a season those that are of earth, earthy. May the Club live for ever! and it seems to me a matter of very little importance, whether we ever add a single item to the account of Science. We are not regular dealers with her; and any dues she may claim for our birth and institution, we have hitherto annually discharged as honest servitors. This year our gift is a good one, for we have added to her Flora of our Island another beautiful plant, the Maianthemum bifolium; and to her Fauna, the finest species of Star-fish that lives in our seas.

Our last Anniversary Meeting was held at Lowick, September 28, 1842, and was thinly attended on account of some untoward events that otherwise engaged the Members who were nearest the rendezvous; and this was much to be regretted; for the address of the President was really a good one, and, I am happy to state, has been favourably mentioned in those Journals which honour our proceedings with their notice. In the "Phytologist," in particular, large extracts from it have been given; and I have reason to know that these extracts have raised a wish in other quarters to have clubs similar to our own in object and conduct. The Members present at Lowick were—your President George

Darling, Esq., P. J. Selby, Esq., and Mr Embleton; and Mr Tancred, who was present, was elected a Member before the meeting separated. The majority of the Members visited the limestone quarries near Lowick, which were known to be rich in organic remains, and from which the Reverend Mr Jenkinson has procured his extensive and beautiful collection, the examination of his fine specimens occupying the forenoon in a very interesting manner. Mr Embleton made alone an excursion across the Lowick moors as far as Kyloe Crags, but found nothing new to the district to reward his toil. Dinner having been discussed, Dr Johnston was elected President, and Mr Embleton, Secretary, for the ensuing session. Mr Selby exhibited a remarkably fine specimen of the *Catocala Fraxini*,—the largest and amongst the rarest and most beautiful of British moths—which had been a short time previously captured at Twizell House by Mrs Tancred. And a collection of the radiated animals found in the sea near Embleton was shewn by Mr Embleton, amongst which was a fine specimen of *Goniaster equestris*,—another of *Ophiocoma Goodsirii*,—and another of *Spatangus purpureus*, all new to our coast, and the only ones which had come under his notice, although his attention had been directed to these animals for several years past.

At our December meeting, held, as usual, at Berwick, the Club breakfasted with Dr Clarke, whose guests were Dr Johnston, Captain Carpenter, Mr M'Beath, Mr Home, and Mr Robert Maclaurin,—a company by much too small for the liberality which had furnished the table. After some routine business, William Murray, Esq. of Marshall-Meadows, was elected a Member; and a paper, communicated by Mr James Hardy, "on Bowling as an extinct Berwickshire sport," was hailed as the first contribution to our annual publication. But what most interested the meeting was the exhibition of a large and very splendid species of starfish, which was at once perceived to be new to our Fauna; and the belief expressed that it was unknown to zoologists, has been confirmed by Professor Edward Forbes, who has since described and figured our specimen, under the name of *Goniaster abbensis*, in the 11th vol. of the Annals and Magazine of Natural History. For this addition to our Fauna, naturalists are indebted to Mr Robert Maclaurin, a zealous coadjutor of the Club. The specimen, now in the possession of Professor Forbes, was found between St Abb's Head and the Isle of May, and was brought up on the lines of the fishermen from a depth of about 30 fathoms.

The village of Horcliffe or Horckley, was the scene of our Meeting in May, and had we been bound on a border raid, we could not have

more astonished the natives of this rude hamlet, which, I may remind you, is the birth-place of one of our members, who, I dare say, blushed when he told the secret, not because it revealed the tale of 50 years that were gone, but it is sad to find no cause of boast or pride in our native home. The meeting was a good one, and the weather propi tious. There were present Dr Johnston, P. J. Selby, Esq., Dr Clarke, Dr Douglas, Rev. Dr Gilly, Mr Melrose, Rev. J. D. Clarke, Mr Macbeath, Mr Home, Thomas Tancred, Esq. and Wm. Murray, Esq. The business of the forenoon was a stroll down the steep banks of the Tweed, which here makes many a sinuous bend, and is the principal feature in some fine landscape; then up Horcliff deane to renew our acquaintance with its ruined cottages and their umbrageous elms, its most picturesque mill, the little burn, the overhanging rocks topped with trees and sloethorn, and hung with tracery of honeysuckle and ivy on one side, and with a dense moss on the other, through which the cool waters trickled in a sparkling shower. There was a strong wish expressed to have a sketch made of the scene to adorn the Club's Transactions, and the Rev. Dr Gilly afterwards kindly undertook to have one made for this purpose. The party now returned to the banks of the Tweed, along which they sauntered, surrounded with beauty, and wading in the balmiest atmosphere, as far as Norham Castle, the ruins of which were examined. During this walk the *Ranunculus auricomus* was gathered on the wooded banks below the Castle, growing with *Viola hirta* and other more common plants. Several insects were captured from amidst the myriads that were flitting around; and an orange-tipped butterfly *(Pontia cardamines)* was seen for the first time in the season. A white-throat *(Carruca cinerea)* was heard amid a thicket of sloes covered with a white sheet of blossoms, and which had undoubtedly newly arrived from its winter quarters, for it was the first that Mr Selby had heard. A vast number of minute beetles of several species were observed on our return from Norham Castle, clustered on sticks, straws, and stems and leaves of plants, growing at the water's edge—forced up to the parts projecting out of the water by the upward flow of the tide, and giving a useful hint to the collector of the times when his hunt would be most successful.

The whole party reassembled at half-past 3 o'clock to a neat and substantial dinner, that laid a pleasant foundation on which to raise the afternoon's talk, which every one seemed to enjoy and partake of. After the minutes of the previous meeting had been read and corrected, Mr Selby exhibited two specimens of the Scotch Fir, which illustrated, in a very striking and beautiful manner, the mutation of the leaves into cones,

and the gradual growth of the latter. Etchings from these specimens were promised by our zealous member to adorn the present No. of the Club's Proceedings. Mr Selby next laid before the meeting a table of the first appearance of our Migratory Birds at Twizel for about twenty years, accompanied with remarks; and this valuable table will form a prominent article in our Proceedings.

The station of our meeting in June afforded a strong contrast with that of May. Horckley stands on the verge of a steep precipice, and overhangs the Tweed where the noble river has reached its full breadth and depth, and where it winds

> "Through woods and meads, in shade and sun,
> "Sometimes swift, sometimes slow,"

forming ever the main object in a prospect which the verses of Dyer not inaptly describe:—

"Old castles on the cliffs arise,	Norham, Twizell, Home.
Proudly towering in the skies!	
Rushing from the woods, the spires	Ladykirk.
Seem from hence ascending fires!	
Half his beams Apollo sheds	
On the yellow mountain heads!	The Lammermuirs.
Gilds the fleeces of the flocks,	
And glitters on the barren rocks!"	

Greenlaw, on the contrary, is lowly placed at the head of a cultivated and corn-clad vale, margined with dark plantations, and intersected with a subsidiary burn, while it opens westwards and to the north in a wide common and barren muir, which no poetry can elevate into beauty. It was across this common and muir that our morning walk lay, travelling intent, like pilgrims to their shrine, to the habitat of the *Linnæa borealis*, the ever-green memorial of our great master. In our progress a few plants were picked that are worthy of notice. The pretty *Sedum villosum* drew occasional attention; a *Pyrola* was examined, and was considered to be the *P. media*, but the unexpanded state of the blossoms forbad more than a conjecture; the *Potamogeton oblongum* occurred in almost every shallow ditch, flowering freely; and in a ditch near the Eden, which was crossed in our walk, there grew in profusion *Potamogeton prælongum*, and, in smaller quantity, the *P. pusillum*. Dr Douglas was fortunate in finding the *Peplis portula*, a plant that had not

previously been known to grow in the western parts of the county—but sure I am that this discovery gave us less pleasure than the sight, the welcome sight, of many a common, albeit beautiful, floweret of old and familiar acquaintance, that every where courted our admiration, and filled the heart with sweet memories and associations!

> "Beautiful objects of the wild-bee's love!
> The wild-bird joys your opening blooms to see,
> And in your native woods and wilds to be.
> All hearts, to Nature true, ye strangely move;
> Ye are so passing fair—so passing free—
> I love ye all!"

It was really vexatious and hard to have the feelings—the boy-like feelings—which the contemplation of these wild-flowers awoke and set to sport, arrested in their course and effect by the wisdom and heartlessness with which a learned gentleman maintained that the said muirs might be made to bear turnips in their peat-bogs, and yellow corn on their russet heaths, by the aid of modern chemistry—I wean, a reckless enterprise. The advocate of this nefarious scheme is, I regret to say, an old and esteemed member of the Club, but truly a renegade brother. Why, our Club has ever entertained a bitter enmity against all such ugly and utilitarian inroads on the primitive condition and naked beauty of Nature, which threaten to curtail, or, it may be, to annihilate the field of our operations. There is the consolation that these so called improvements are in the distant prospect, and, in the meantime, let us gratefully join the poet—

> "Thanks be to Nature, some green spots remain
> Free from the tread and stain of that gross world
> Whose god is commerce, and religion gain—
> Its altars furnaces, whose smoke is curled
> Around the very clouds! Be praise agen
> To Nature and her God!
> There still are flowery meadows, pathless woods,
> Groves, hills, and vales, forests and solitudes!"

And so may it ever be! The Linnæa was reached about noon, but, on account of the backwardness of the season, it was not in flower, and the buds that were shewing themselves might not be full-blown for ten or fourteen days to come. From this sacred spot the party directed their weary steps to the village of Gordon, to partake of some refreshment, and to examine the spirited improvements in husbandry effected and in

progress about that ancient village.* Thence they returned in almost a straight line to Greenlaw, where dinner awaited them. The party consisted of Dr Johnston, Dr R. D. Thomson, P. J. Selby, Esq., Dr Clarke, Dr F. Douglas, Mr J. Boyd, and Thomas Tancred, Esq., who were honoured with the company of Mr Gourlay, a well known botanist resident in Glasgow.

The good weather that had favoured our previous meetings did not forsake us on the 26th of July, when the Club assembled at the pleasant and pretty town of Yetholm, the metropolis of the gypsies of this district, and of a parish fortunate in having a fellow-member for its minister. You would scarcely excuse me, I am sure, did I fail just to remind you of the unwearied exertions of that reverend gentleman towards the amelioration of the condition of the gypsies, and of his services in general towards his people, especially in regard of the education of the young. The manse, embowered in trees planted with his own hand, and gladdened with a garden laid out by his own taste, received a large party to breakfast, amongst whom were the following members of the Club, viz :— Dr Johnston, Rev. J. Baird, P. J. Selby, Esq., Captain Carpenter, Geo. Darling, Esq., Dr F. Douglas, Mr Melrose, Mr Rowe, Mr John Boyd, and Mr Home. Having, with our characteristic humanity, speedily eased the table from the burden under which it groaned oppressively, the party, with that feeling of self-satisfaction which the performance of a good deed imparts, began a laborious walk of alternate ascent and descent amid the lower range of Cheviot Hills—a part of the once great forest that was the hunting-ground of the Douglas and Percy, —but hills now covered with a close green sward, nibbled by flocks of stupid sheep—it would not do,—imagination nor heard nor saw nor hound nor horn ; and so we travelled on under a sudorific sun, and apparently under disfavour, for neither Fauna nor Flora proffered to us a single new gift.† To such hot wooers this was cool treatment; but we were not cooled, and I find myself as warm an admirer as ever of these silvan sirens, and mean to continue faithful—

> " How gladly I recall your well known haunts,
> Beloved of old, and that delightful time,
> When, all alone, for many a summer's day,
> I wandered through your calm recesses, led
> In silence by some powerful hand unseen.

* See the New Stat. Account of Berwickshire, p. 38.

† Mr Hislop has favoured me with the names of the few Beetles that he picked up, viz :—1. Patrobus rufipes ; 2. Harpalus limbatus ; 3. Calathus piceus ; 4. Aphodius rufescens ; 5. Necrobia violacea ; 6. Otiorhynchus ovatus ; 7. Cataphagus obscurus.

> Nor will I e'er forget you, nor shall e'er
> The graver tasks of manhood, or th' advice
> Of vulgar wisdom, move me to disclaim
> Those studies which possessed me in the dawn
> Of life, and fixed the colour of my mind
> For every future year."

Our perseverance was partially rewarded even on this day; for, having reached the deep and rocky gully in the side of the great Cheviot, named Dunsdale, some plants of rare occurrence in the district gladdened us with their beauty. I, for one, had not previously gathered the *Saxifraga hypnoides* in its wild and native habitat; and were it my lot ever to woo a fairy—and fairies have been often wooed by mortals in this district, unless legends lie—it should be on the mossy cushion, and under the canopy of the white blossoms, of this pretty flower. The *Rubus saxatilis* trailed its "innocent" shoots amidst the heathery rocks, and ripened its berries in vain, awearying for the roe-buck, which in days of yore came every autumnal eve to taste their sweetness.* What a fine and sweetly wild picture was the herd browsing amidst the crags of that dark and silent ravine! But civilization and man spoil all. The deer are gone; the solitude is disturbed by the giggle of pic-nic parties; and the very flowers, happy to have been born to blush unseen, are rudely torn up by the botanical idler, whose play is very death to them. The plant which, on this occasion, most engaged his cruel attentions, was a *Hieracium*, of which many fine specimens were sacrificed to gratify his prying curiosity. I have since examined these, and it seems scarcely possible to resist the conclusion, that what have been called H. sylvaticum, murorum, and pulmonarium, are merely states of one species.

The walk homewards was hurried and fruitless; but if there was any disappointment felt at the result of the day's excursion, it disappeared before the gladsomeness that sprung up out of a good dinner and a temperate cheerer. Dr Wilson, Mr James Tait, and Mr Jas. Douglas, were thus enticed to enrol their names in our list of Members, and the addition was hailed as an augury of the Club's perpetuity. After dinner, Dr F. Douglas read a minute description of the skeleton of a child which had been found in a stone coffin on the farm of Edenmouth, near Kelso; and Dr Wilson gave verbally a history of the discovery of the skeleton of a beaver, made when digging in the moss at Linton Lough, in Rox-

* The Scotch name for the fruit is "Roebuck-berries." "The young shoots are very long, trailing, hairy, and furnished with innocent prickles."—*Lightfoot.*

burghshire. Mr Selby then favoured the Club with some account of an interesting collection of insects, made in the neighbourhood of the Pease Bridge, by Mr James Hardy, to whom a letter of thanks was unanimously voted, not only for this communication, but for the cordial interest he has taken in the prosperity of the Club. Mr Darling then read a short account of his success in planting potatoes in autumn—a novel practice which some other members had tried with success—and the conversation which this led to continued to engross the Club until the approaching twilight warned the members to bethink of the homeward road, and left me without a theme for further talk.

A List of Echinodermata found on the coast at Embleton, Northumberland. By R. EMBLETON, Surgeon.

In enumerating the following species, I have followed the arrangement and nomenclature of Professor Forbes, in his interesting work on the British Star-Fishes; a work not less valuable for the faithfulness of the descriptions than for the beauty and correctness of the illustrations, and which must have proved of infinite advantage to every one engaged in the study of this curious and beautiful class of animated beings.

CRINOIDEÆ.

Genus COMATULA.

C. ROSACEA.—*Rosy Feather Star.* During the summer of 1842 I obtained a single specimen of this highly curious and interesting species from deep water in Embleton Bay; and is, as far as I know, the only specimen that has been taken on the east coast of our island. I must refer to the above named work for a full account of its curious transformations; "its history is one of the little romances in which natural history abounds, one of those narrations which, while believing, we almost doubt, and yet which, doubting, must believe."

OPHIURIDÆ.

Genus OPHIURA.

O. TEXURATA.—*Common Sand Star.* Not unfrequent.

O. ALBIDA.—*Lesser Sand Star.* Not rare.

Genus. OPHIOCOMA.

O. NEGLECTA.—*Grey Brittle Star.* Frequent.

O. GRANULATA.—*Granulated Brittle Star.* Common.

O. BELLIS.—*Daisy Brittle Star.* Frequent.

O. GOODSIRII.—*Goodsir's Brittle Star.* In examining a large piece

of limestone drawn from the depth of about 30 fathoms, and which contained several specimens of the *Arca fusca*, I was fortunate to meet with a single specimen of this recently added species to the British Fauna.

O. ROSULA.—*Common Brittle Star.* Frequent.

ASTERIADÆ.—URASTERIÆ.

Genus URASTER.

U. RUBENS.—*Common Cross Fish.* Not very common.

U. VIOLACEUS.—*Violet Cross Fish.* Frequent.

SOLASTERIÆ.

Genus CRIBELLA.

C. OCULATA.—*Eyed Cribella.* Not uncommon.

Genus SOLASTER.

S. ENDECA.—*Purple Sun Star.* Frequent in deep water.

S. PAPPOSA.—*Common Sun Star.* Very common.

GONIASTERIÆ.

Genus GONIASTER.

G. EQUESTRIS.—*Knotty Cushion Star.* I had the good fortune to add a beautiful specimen of this very rare species to my collection in 1842. It was obtained from deep water in Alemouth Bay, about 8 miles to the South. It agrees both as to size and markings so exactly with the specimen described by Mr Forbes, that it might well be taken for the identical specimen. Both were taken on the coast of Northumberland.

ASTERIÆ.

Genus ASTERIAS.

A. AURANTIACA.—*The Butthorn.* This beautiful species is obtained in our bay, on what the fishermen call soft ground. It is by no means a very common species.

Genus LUIDIA.

L. FRAGILISSIMA.—*The Lingthorn.* Rare in Embleton Bay; and almost impossible to obtain a perfect specimen.

ECHINIDÆ. CIDARITES.

Genus ECHINUS.

E. SPHÆRA.—*Common Egg Urchin.* Plentiful in Newton Bay on the rocks called the Little Fills.

E. MILIARIS.—*Purple-tipped Egg Urchin.* Rare with the preceding.

CLYPEASTERIÆ.

Genus ECHINOCYAMUS.

E. PUSILLUS.—*Green Pea Urchin.* Found occasionally in shell-sand denuded of its spines.

SPATANGACEÆ.

Genus SPATANGUS.

S. PURPUREUS.—*Purple Heart Urchin.* Two specimens of this pretty but uncommon species have occurred to me this summer.

Genus. AMPHIDOTUS.

A. CORDATUS.—*Common Heart Urchin.* Very plentiful at low-water mark in Newton Bay.

On Bowling as an extinct Berwickshire Game. By JAMES HARDY.

Ὅλμον δ' ὡς, ἔστιν κυλινδέσθαι δι' ὁμίλου.

HOM. IL. λ. 147.

And roll'd it like a mortar through the ranks.

COWPER.

In the year 1841, a considerable number of stone-balls were, in the course of tillage, met with scattered over a field, on the farm of Penmanshiel, in the parish of Cockburnspath. The whole came into my possession, and as they appear to be connected with an antiquated Berwickshire game, and with a state of manners somewhat different from the present, I felt justified in making inquiries as to their nature. And though this does not appear of the most exalted character, yet as a single feature in the somewhat shadowy and indistinct notion we have of the former customs of the county, it may not be altogether destitute of interest. The balls are from the size of a large marble to that of a cricket-ball: some are as shapely as if turned in a lathe; others are of very indifferent symmetry, and yet bear the marks of the rude instru-

ments with which they have been fabricated. They appear to have been manufactured near the place of their discovery, by means of a hammer, a chisel, or a knife. They are formed out of the greywackè, so prevalent in the district. In one instance the material is a hard variety of basalt, not unfrequent in the state of boulders, distinguished by a pitted or variolar aspect, which it assumes from the disintegrating action of the weather on the olivine and augite disseminated through the firmer texture of its basis.*

To assign the purposes to which these balls might have been put by the rural forefathers of the place was at first sufficiently puzzling, as no recollection could be elicited of objects in any respects resembling them having occurred any where in the neighbourhood. However, from having witnessed in the north of England, the country sport of bowling, I was led to conjecture that these balls might have been subservient to a somewhat similar design. Some of the balls commonly used in this game being procured and compared with those discovered in Berwickshire, were, with the exception of a small difference of size in favour of the former,† found exactly to correspond not only in appearance, but likewise in the mode of their formation. These balls in the vicinity of Newcastle consist of a very hard stone got from ballast, apparently greenstone, and are exceedingly globular, although modelled by only a hammer or a chisel, and finished by a large file or risp. The stone is held in the hollow of the hand, and is gradually rounded by the application of the one or other of these instruments until it becomes—

> "teres atque rotundus,
> Externi ne quid valeat per læve morari."‡

Sometimes the whole operation will be performed with an old file. Several of the Berwickshire balls yet bear the traces of a knife upon their surface. The establishment of identity appeared complete. A fossil shell could not better develope the history of the deposite of which it formed an inherent portion, than did those balls afford indications respecting one of the almost forgotten recreations of the people of Berwickshire. Upon further inquiry, I learned that bowling was a pastime that *had*

* Such a stone about a century and a half ago, would have been regarded as an excellent remedy for the small-pox. "Quidam," says Sir Robert Sibbald, treating of a stone characterized by similar scars and depressions, "ad Variolarum affectum eum commendant de collo suspensum!" Scotia Illustrata, Pars II. B. 4, p. 49, Edin. 1684.

† In 1843, a ball was found in the same locality 9½ inches in circumference, and fully equal in size to those used near Newcastle.

‡ Horat. Sat. II. 7. 60.

existed in Berwickshire within the memory of the present generation. Then it was played with the cast-metal balls, nearly four times larger than the balls now under consideration. There is, however, every reason to believe, that stones were the original projectiles with which the game was practised. Cast-metal balls are comparatively of recent invention, to the huge mortars of the hardest granite, with which the ungainly field-pieces of other times were supplied. In Northumberland and Durham we find bowls of stone still employed, in conjunction with those of the more solid material, which the advancement of art has introduced. Bowls of stone are commonly used by boys, into whose hands have degenerated many of those sports and pastimes once honoured with the sanction and participation of royalty. This opinion may be farther strengthened from the equally rude state in which the analogous instruments employed in the elegant recreation of the bowling-green formerly existed. What these once were, may be learned from the following passage, written by Lord Shaftesbury, descriptive of an old English sportsman: "In the year 1638, lived Mr Hastings at Woodlands, in the county of Southampton. By his quality, son, brother, and uncle of the Earl of Huntingdon, he was peradventure an original in our age, or rather the copy of our ancient nobility in hunting, not in warlike times. He was very low, strong, and active, with reddish flaxen hair. His clothes, which, when new, were never worth five pounds, were of green cloth. His house was perfectly old fashioned, in the midst of a huge park, well stocked with deer and rabbits, many fish ponds, a great store of wood and timber, a bowling-green in it, long but narrow, full of high ridges, never having been levelled since it was ploughed; *round sand bowls were used*, and it had a banqueting house like a stand, built in a tree."*

Such being the grounds upon which I infer the identity of the Berwickshire and Northumbrian bowls, an outline of the mode in which the sport is generally practised, may serve to convey an idea of its character. In the vicinity of Newcastle bowling is confined chiefly to colliers. To this, their favourite recreation, they are accustomed to devote the Saturday afternoons, and the Monday forenoons, being at leisure from their work at those times.† The ground on which it is performed is

* Memoirs of the Honourable William Hastings; quoted by Daniel, Rural Sports, vol. i. 456.

† The reason of Monday's being so distinguished, as well as the familiar hallowing of the Saturday afternoon, is owing to religious grounds. An old rhyme ridiculing the prodigal expenditure of time in the Roman Catholic ceremonial, designates Monday as "Sundayes brother." The practice once existed in Scotland. "On the 26

usually the highway, which is preferred for its smoothness. At other times recourse is had to moors and commons, or the gently undulating sands by the sea-shore. The bowls used are almost invariably of stone, being manufactured during their vacancies from labour, of which they have no lack. Frequently the large bowls have a hole grooved in the side, for the insertion of the thumb, to facilitate throwing. The highest weight used is forty ounces. Such a ball is as much as a man can conveniently grasp and hurl. If a bet is to be decided, the balls are scrupulously weighed, the weight being reckoned by the amount of ounces they contain. The grocer who must attend to the wants of his customers in a variety of respects generally performs this good office. When one challenges another the weight is always predetermined. Only two individuals play, but they can have an indefinite number of *marrows* or sidesmen. The merit of the game depends either upon a single throw of the bowl to a surpassing distance, launched in the manner which in Scotland is called a *hainsh*, being precisely the fashion after which the Greek Δισκος was impelled;* or, as is more frequent, a determinate number of "jaculations" are appointed, and victory is the reward of him who "measures out the greatest length of ground."† A coat, hat, or stick, is put down at the place where the bowl rests, and from this as a starting point, with the prefatory ceremony of a race of long steps to give increased impulse, the next throw has to be taken. One of the sidesmen runs before, and lays himself down at the spot most suitable for the ball striking, in order that his marrow may direct his aim thither. Here he will squat till the bowl be close upon him, though at the impetus with which it is moving, it would be sufficient not only to stun him with its stroke, but even to kill him outright. Were it not for the path being pointed out, the bowl might be diverted from the track by a stone, or might be plunged in a mossy soil or ditch. Parties to whom such unpleasant mishaps have befallen, may at times be observed standing with the greatest unconcern, tossing the ball from the middle of a pool of water. The art of the game consists in sending the bowl straight and low at setting off, so as to strike the place where the sidesman indicates, it may have free course to roll onwards unobstructed. If cast at too great an elevation, it rebounds, and coming a second time

of Junii [1598], ane conventioun held [at Edinburgh] at q^lk^ ther wes maid certaine actis." * * * "4. Y^t^ the Monday sould be a day of absteining from work."—*Birrel's Diarey*, p. 46.

* Potter's Greek Antiquities, by Prof. Dunbar, vol. i. p. 502.

† Mackenzie's View of Northumberland, vol. i. p. 210.

in contact with the ground, the impulse is deadened, and much force lost. If properly managed it will roll to a distance as great as that to which it has been thrown. Large sums of money, by that pernicious love of gambling so grateful to a degraded taste, are staked upon these contests, the amount being sometimes from forty to fifty pounds a-side. The stakes are raised by a number clubbing together. "Some of the bowlers," says Mackenzie, "can throw to an incredible distance. Many of them will venture the full amount of their fortnight's earnings on a cock-fight or a bowling match, and often to the great embarrassment of their family affairs."*

Among the same classes of the community in North Durham, and the bordering districts of Northumberland, this game is also a great favourite. In that detached portion of the County Palatine, as well as throughout Northumberland, there exist certain relics of antiquity, known by the name of Feasts, each of which has a pastime, or series of pastimes, which it is requisite to connect with the celebration of the rural festival.† Bowling is the pastime of Lowick Feast, the married

* Mackenzie's View of Northumberland, vol. i. p. 210.

† These feasts, or as they are called elsewhere in Northumberland, hoppings, are held on the festival day of the patron Saint to whom the Church of the place is dedicated. They appear still to have many of the buffooneries of ancient heathenism intermingled with their festivities. Bede relates the circumstances under which they were introduced into the Saxon Church. The pagan paganalia seemed to offer a considerable barrier to the success of the early missionaries. To obviate this, Pope Gregory the Great, in a letter to Mellitus, a companion of Augustine, directed that they should be retained, under proper restrictions. "Whereas," says Gregory, "the people were accustomed to sacrifice many oxen in honour of demons, let them celebrate a religious and solemn festival, and not slay the animals, *diabolo*, to the devil, but to be eaten by themselves, *ad laudem Dei*, to the praise of God" (Bede, Eccl. Hist. lib. 1. cap. 30). To this equivocal policy country wakes owe their institution.—One side of their character has been darkly delineated, and fatally uniform throughout.

"Many to the taverne goe, and drinke for companie,
Whereas they foolish songs do sing, and noyses great do make."

BARNABE GOOGE.

Their picturesque accompaniments are much more fascinating, and in the view of fancy partially relieve their characteristic indiscretions.

"Come, Anthea, let us two
Go to feast, as others do.
Tarts and custards, creams and cakes,
Are the junketts still at wakes.
Morris-dancers thou shalt see,
Marian too in pagentrie;
And a mimick to devise,
Many grinning properties." HERRICK.

One of the earliest accounts of the circumstances with which they were attended.

men being matched against the bachelors. Sometimes it happens that one township will challenge a rival to a trial of skill. The sum depending on the combatants of each side will be between fourteen or fifteen pounds. Two of the most noted bowlers are selected to decide the superiority. A certain distance of from two to three miles is marked out on the public thoroughfare, and whoever first, by alternate throws, attains the goal, is acknowledged as conqueror. Four individuals who have acquired a competent knowledge of the game, two on each side, are chosen umpires, and determine all controversies. The two opponents, mutually confident as to the issue, stand forth, and an introductory race being premised, give forth the bowl from the same barrier. The rule of the game is, that where the bowl settles, thence the next throw must commence. At this point a straw is laid down, and two men, named triggers, must see that when the race for the succeeding cast of the bowl has concluded, the straw is exactly between the feet of the party whose turn it is to dismiss the bowl. If this be not the case, and any dispute arise, the bowl is recalled, and the throw is renewed. If the bowl rolls into a ditch, thence it must be thrown. On one occasion near the village of Etal, an awkward player dashed his bowl through the roof of a house, and by this means two throws were lost,

when little removed from their original condition, is the following. Sometime after the year 667, Wilfred Bishop of York "built a new church at Ripon, of smoothed stone, adorned with various columns and porticoes, which excited the admiration of his contemporaries; and at its dedication, the brother Kings Ecgfrid, and Aelwin, of Northumbria and Mercia, with the principal nobles of the kingdom, held a riotous and continuous feast, during three days and three nights, a custom which was borrowed from the older observances of paganism." Wright's Biog. Brit. Literaria, p. 174; who cites Eddius Vit. Wilf. c. 17. Excepting Paxton feast, unless "house-heating" be regarded as their illegitimate progeny, I have found no traces of these "merry wakes" in Berwickshire, though doubtless such occasions of good fellowship would not be neglected, as their occurrence is noticed in various parts of Scotland. "Peblis to the play," attributed to James I., is descriptive of the scenes of fun and frolic witnessed at such jocular convocations.

> "For it wes thair feist-day thay said
> Of Peblis to the play."

"Chrystes Kirk on the grene," another regal production, is a still more vivid portraiture of the obstreperous and unlicensed "deray" of a village revel. Another old poem, "The piper of Kilbarchan," said to have been composed by Sir Robert Sempill of Beltries, mentions St Barchan's feast. Kilbarchan is in Renfrewshire. To these feasts we probably owe the institution of several of our village fairs. This is the opinion of Sir Henry Spelman; and Dr Burns terms it "just and rational." (Burns' Ecclesiastical Law, vol. i. p. 310.)

as it had to be tossed out at the breach it had made. Such was the nice construction of the law on the point. It has been remarked, that the strongest person is not always successful at this game, as excellence depends upon the poising, levelling, and dexterous projection of the bowl, rather than upon the amount of corporal might exerted. Sometimes the loser will be a quarter of a mile in the rear, at other times the victory will be closely contested. One hundred yards is reckoned a good distance in casting a bowl, though expert bowlers often surpass it.

There is considerable danger attending the practice of this sport on the public roads. There have been instances of death resulting from the blow of a bowl carelessly directed. To a stranger, the animated concourse on the occasion of a bowling match, presents a scene at once alarming and picturesque. The excited movements of a large body of men, as if on the eve of an outbreak, the vehement gesticulations and discordant acclaim of encouragement and applause, the succession of stones, volley after volley, and the disorderly tumult that accompanies the players to the goal, give it the appearance of a straggling fight, rather than of an association of peaceable rustics for holiday recreation.

Such are the scattered hints I have been able to glean respecting the mode in which this game is pursued. It remains that I add a few particulars connected with its history. Fitzstephens, in his History of London, mentions casting of stones as one of the amusements of the young Londoners in the twelfth century. It was one of the sports prohibited by edict in the 39th year of Edward the III. (1339) as engrossing too much the public attention, to the neglect of the long bow and other martial exercises, which that politic monarch wished to encourage. Barclay's Eclogues, 1508, includes among the "featis of maistries," "on which it not refuseth any prince or kinge" to "bestowe some diligence," the casting

> "——by violence,
> Stone, barre, or plummett, or suche other thinge."

It is one of the many complaints, and in this instance justly, of Barnabe Googe, in his translation of the Pope's Kingdom, from the Latin of Tho. Neogeorgius, 1570,

> "Now, when their dinner once is done, and that they have well fed,
> To play they go, to casting of the stone, to runne or shoote on Sunday afternoone."

It is to be borne in mind that this is not the sport interdicted by the infamous proclamations of James I. and Charles I. respecting games that may be practised on Sundays;—"at all times in the meaner sort

of people by law prohibited, *bowling*,"*—this being directed against the injurious and gambling practices in bowling-greens and bowling-alleys, which had at that period become the common resort of the dissolute and idle.† Casting of stones, says Brand, "is a Welsh custom, practised as they throw the blacksmith's stone in some parts of England. There is a similar game in the north of England called *long-bullets*. The prize is to him who throws the ball farthest at the fewest throws."‡ In the west of Scotland, bowling with cast-iron bowls, was a very common exercise, till the increased traffic on the roads, and the insinuation of a new tone of manners, made it necessary to relinquish it. In the eastern district of Berwickshire the game was called *bowls* or *bullets*, and the parties who kept it up were chiefly the farmers. The principal games took place when amateurs from one part of the county, such as Coldingham, by challenging or *bragging* those of the vicinity of Cockburnspath, provoked a vigorous competition. A set of bowls consisted of four, made of cast-iron, four parties being engaged on one side to throw in turn, while an equal number opposed. The bowls were sometimes thrown by raising the arm as a stone is cast, but more frequently they were propelled in the *hainshing* mode. The *hails*, or boundaries of the game, were the now obsolete fishing hamlet of Head-

* Here I have only supposed a case. I have since met with almost precisely the mistake which I imagined ought to be guarded against. It occurs in the Parochial History and Antiquities of Stockton-upon-Tees, by the Rev. John Brewster, M. A. 2d ed. Stockton, 1829.—The common within the township of Stockton was divided according to an award decreed in the Court of Chancery at Durham, Sept. 8, 1662. The Saltholme was appointed to be equally parted between John Jesson, Esq., and Thomas Harperly, excepting one acre of land, with Mr Jesson's consent, more to the share of the latter, "in consideration that the said Thomas Harperly and his heirs and assigns, shall for ever thereafter permit any that hath a mind *to bowl* on the usual accustomed place in the Saltholme within the said Thomas Harperly's allotment there." Upon this the historian of Stockton remarks, "I am sorry that I cannot, in justice to Mr Jesson's good intentions, point out the spot where the *bowling-green* formerly was. No traces of it are known at present, nor is there any tradition that I can discover which retains the least remembrance that such a place ever existed." There can, I think, be little doubt that it *never did exist*, and that the hitherto almost unnoticed pastime of long-bullets, as Brand terms it, is referred to here, on which the circumstance of the common's becoming private property, was almost certain to lay an embargo.

† This information is derived from Strutt's Sports and Pastimes of the people of England.

‡ Brand's Popular Antiquities, vol. ii. p. 286, 4to.

chesters as one terminus, and the conical height of Hoggeslaw, or Woodend, still more remote, on the old post road, as the other. The side that outstripped their rivals by the fewest throws, or what was equivalent, first reached the goal, were declared victorious. The success of a throw depended on the setting away, as if the bowl came in contact with a stone, and the roads then were any thing but free from obstructions, it would start aside, or even recoil on the thrower. The prize was something substantial—a supper provided by the vanquished party, consisting, like that in a curling match, of beef and greens. A great *bet*, as a game was termed, came off on Cockburnspath Green in 1807 or 1808. It was a well-contested struggle, and it was the last.

The age of the balls which have given occasion to this paper, it is now impossible to ascertain. The field in which they occurred is called the Crofts,—a name assigned in the early stages of cultivation to those portions of arable land, which industry had reclaimed from the barren and unprofitable waste. In it the old onstead of Penmanshiel stood, and probably it was the first-fruits—the "immetata jugera"—won from the brown solitude of heath, with which the whole place was once covered.* The original period of its occupation is involved in obscurity, but if we assume a series of aged ash-trees now fast verging to decay, like the steading they sheltered and its forgotten inhabitants, as coeval with its settlement, it is not altogether of modern date.† From these

* I suppose the name Penmanshiel, Penmashiel, or Penmorshiel, may signify the *high moor shieling*, in the same manner as Penshiel in the Lammermuirs may be the *high shieling*. A *shiel* or *shieling* is a shepherd's summer hut, as well as a summer pasturage for flocks,—equivalent to the *scalinga* of ancient charters. Though sufficiently lowly in "days of yore," it has not been unhallowed by the footsteps of merit. It was here a talented professor of humanity (Prof. Christison) in his boyhood tended "the homely slighted shepherd's trade." Even then, perchance, that generous ambition might have fixed its determinate hold on his character, which after years of strenuous exertion, placed him in one of the most honourable positions the cultivation of literature can confer; while many a compeer less enthusiastically inspired, left in his native seclusion,—"and with low-thoughted cares confined," toiled on hopelessly and ingloriously in the strife,

> "——to keep up a frail and feverish being,
> Unmindful of the crown that virtue gives."
>
> MILTON'S *Comus*.

† Generations pass while some trees stand, and old families last not three oaks.
SIR THOMAS BROWNE.

crofts being free from obstructions, and within the view of their dwellings, they might be preferred by the gamesome youth to celebrate their festivities—

> "To chase the rolling circle's speed,
> Or urge the flying ball."

Loiterers too, and shepherds from the neighbouring Coldingham common, might stroll in, and the keen spirit of rivalry which the presence of strangers prompted might give rise to a contest, in which each combatant might consider himself honoured in bearing an active part,—and gainer or loser,—might signalize the time spent there, by some feat of merit, which in future years the garrulity of age would complacently recount,—

> "——and still be proud
> To find the triumphs of its youth allowed.—CRABBE.*

It is not unworthy of remark, that a British camp existed in the same field, which probably furnished part of the materials, out of which

* Since writing the above, I have met with two passages cited in Ellis's Specimens, illustrative of the conjecture here thrown out. The first is from Wace, one of the early romance writers, who, about 1160, in the reign of Henry II., wrote in French *Le Brut D'Angleterre*. This was a translation of Geoffrey of Monmouth's History of Britain, which, again, is supposed to be derived from Tyssilio, a Welsh bard of a more remote period. (Turner's Hist. of the Anglo-Saxons, vol. i.) In this work, he is describing the sports that attended the coronation of King Arthur. After mentioning various games as being celebrated, he says,

> "Li autre alerent e cremir,
> *Ou pierres getier*, ou saillir."

Layamon, a Saxon ecclesiastic, made a vernacular version of this poem, about 1180. In rendering this passage, he amplifies it in such a manner as to leave no doubt, that the "pierres getier" (stone-throwing) of Wace was the game now called bowling.

> "Summe heo driven balles
> Wide geond the feldes."

(Some they drove balls, wide over the fields.) Besides the antiquity these passages assign to the game, they unfold the estimation in which this now degraded sport was held in former times. Then it was ranked indiscriminately with archery, running, leaping, dart-throwing, wrestling, jousting, sword-game, and other honourable recreations. And the spectators, besides the many-voiced multitude, were kings, with their liege-men of every grade, "bothe least and maist," "biscopes, clarckes, eorles, beornes, theines, and sweines;" while, to enhance the festive mirth, the eye of beauty "shed its selectest influence," as the queens present, and all the ladies, leaned over the walls to view the assembled nobles, "and that folk play." And when victory was achieved, it was royalty itself that distributed the prizes.

> "And wha swa mihte iwenne
> Wurthscipe of his gomene,

the steading was originally constructed. A primitive hand-mill,— an uncouth specimen of "the science of a martial race,"—dug from amidst the ancient entrenchments, shewed that it had been occupied by a corn-consuming population. Their supplies of grain, however, must have been derived from some more fertile glebe than the bleak territory, on which, as a post of observation, for it affords a "prospect into regions far away," rather than as in a land of desirable abode, they cast up their heterogeneous defences. As the balls were considerably removed from this encampment, they appear to have no other connection with those "rude tenants of rude dwellings" than coincidence of place.

To what extent, in past times, this game may have occupied the attention of the Berwickshire people, I have not learned, but probably it was not confined to the eastern district, in which its remains have been disinterred. As a manly exercise, it had many attractions for a rude and half-civilized people, and, doubtless, conjoined with other athletic games, and the warlike taste of the age, it contributed to that ardour for excitement, expertness in the use of weapons, and resolution in surmounting obstacles, which inflamed the passion for martial enterprise in the breast of many a stalwart borderer, and ensured to his undertakings a prosperous development.

The causes of its abolition and disuse as a game are much more apparent. The dangers arising from its practice on the public roads, together with the growth of more refined notions of public conveniency, may have exercised a certain share in this result. But these appear to be but a portion of a revolution in manners and customs more deeply influential, which brought increased civilization and improved ideas of decorum in its train, effected during the latter part of the preceding century, and the commencement of the present, by the introduction of new modes of husbandry, and a distribution of country labour, incon sistent with the desultory, idle, and half-leisurely habits, that afforded intervals and occasions for the long revels and holiday seasons of days gone by. Previous to that event, the turnip husbandry had not rendered it urgent for the farmer to turn over his stubbles to be mellowed and pulverized in winter, by the certainty, in consequence of neglect, of a lost crop; and wheat then, unless on the most productive soils, rarely

> Hine me ladde mide songe
> At foren than leode kinge;
> And the king, for his gomene,
> Gaf him geven gode."

(And whoso might win worthiness of his gaming, him they led with songs before the people's king, and the king, for his gaming, gave him gifts good.)

entered into the routine of cropping.* Barley and oats were then the staple products of the district, and they demanded no pressing or en-

* There is a tradition which curiously illustrates the scarcity of wheaten bread in Berwickshire in former times. It is said, that a King Alexander, who, it appears, like Nero in the days of his distress (Scutonius relates the tale), and despite the encomiums of national song, had no relish for the unleavened fare of his subjects, was, during a peregrination through the Merse, assailed with the qualms of hunger, which there offered no means of satisfying, till the royal party reached the town of Dunse. A loaf of white bread being there procured, and it was the only town in the shire that could afford such a luxury, the hungry monarch's appetite was at length appeased with its appropriate aliment. The testimony of ancient records does not belie the story. It is in the demesnes of the great monasteries that we find the cultivation of wheat first alluded to; and that in insignificant measure compared with oats or barley. Wheat was prepared at the mills of Roxburgh in 1124, when David I. granted the charter to Kelso Abbey. Its relative proportion to other grains is afforded by the returns of the old religious houses. The revenue of the priory of Coldingham at the Reformation, as respects grain, amounted to :—"Wheat, 6 chalders, 7 bolls, 3 firlots, 2 pecks; bear, 19 chalders, 12 bolls, 1 firlot, 2 pecks; oats, 56 chalders, 8 bolls, 2 firlots; pease, 3 chalders, 13 bolls, 3 firlots, 2 pecks." (Chalmers' Caledonia, II., p. 334.) On the opposite side of the Borders, little difference existed. The monks of Holy Island grew wheat on their territory on the mainland; but in all georgical affairs they were on the foreground of improvement. In 1339–40, they had at Fenham, "48 acres sown with wheat, 19 with barley, and 50 with oats." (Raine's North Durham, p. 48., and *passim*.) This creditable example seems, however, to have flourished in an oasis, while negligence and sterility gathered around. When Æneas Sylvius, the papal legate, crossed the borders into England in 1448, he found the inhabitants in a "deplorable state." They stared on him, as we would do at an Ethiop, and even doubted if he were a Christian. "Æneas, understanding the difficulties he must expect on his journey, had taken care to provide himself, at a certain monastery, with some loaves, and a measure of red wine, at sight of which they were seized with the greater astonishment, having never seen wine or white bread." (Sir W. Scott's Essay on Border Antiquities, p. 18, compared with Dalyell's Fragments of Scot. Hist., p. 18.) This is not incredible, considering the class among whom he had fallen. As early, however, as 1255, when Henry III. met Alexander III. and his Queen at Wark Castle, the provisions of wine and wheat were amply liberal. (Magnus Rot. Pipae, 40 Hen. III.) In the reign of the latter monarch, as the oldest monument of Scottish song testifies, there was no destitution throughout his realm of "ale and brede," and "wyne and wax." But Wyntoun was a monk. When Patten, in the train of Somerset's disastrous inroad in 1547, visited Berwickshire, the diet of the inhabitants had somewhat improved on that of the Alexander of tradition. Previous to their blowing up Dunglas Castle (which, from the description and the ruins of walls, for which the oldest inhabitant can assign no origin, seems to have reared its sinewy strength between the present village of Billsdean and the sea), the soldiers had leisure to ascertain that it contained, "of white bread, oten cakes, and Scottish ale," "indifferent good store." (Patten's Expedicion into Scotlande, p. 35.) What were the prevalent grains in the North of England at the same time? The Corn-poppy (*Papaver rhœas*) and the Blue-bottle (*Centaurea cyanus*), as is well known, are most frequent in fields of wheat. Turner, however, a native of Morpeth, in his Herball, dedicated to the Duke of Somerset in 1548, indicating the localities of these plants, does not mention it, which, it may be inferred, he would have done had it abounded. Of "Blew-bottell or Blew-blaw," he says :—

grossing preparations. The ground for the barley crop, indeed, required to be twice, or, at the utmost, thrice ploughed;* once in the *back end*, and again in spring,—the latter process being termed "steering the barley seed." But the farms at that period were of insignificant size,—and even though tillage, effected by the unnecessary encumbrance of two oxen and two horses yoked to a single plough, was slow, clumsy, and protracted,—yet the crop not being sown till the beginning of June,† a large interval at the end of the year could, without inconvenience, be assigned to the cultivation of the sports of the field. So much were the labourers, on some occasions during the months succeeding the harvest, unengaged with out-door occupations, that, according to an informant, the ploughs have been laid up from that period, till the near approach of spring gave the signal for renewed exertion.‡

"It groweth muche among rye; wherefore, I thynke, that good ry, in an euill and vnseasonable yere doth go out of kynde into thys wede." And of the fourth kind of Poppy or Chesboule, he says, "Thys kynde is called in English, corn-rose or red corn-rose, and with us it groweth much amongest the rye and barley." At that time "bigge barley" grew "muche in the north country." He also speaks of rye bread, called by the "Northerne men" "aussem brede," as a familiar thing. Intermediate between this period and that alluded to above, John Ray, the naturalist, in 1660, took his simpling itinerary along the eastern coasts. His observations, made with philosophic deliberation, attest, likewise, the scarcity of wheat. "The ground in the valleys and plains bears very good corn, but especially bear-barley, or bigge, and oats, but rarely wheat and rye." (Select Remains.)

* It was generally remarked, that it was the worse of the third ploughing, for by loosening and breaking the roots of the quicken-grass (and probably also of *Holcus mollis* confounded with it under the name of *wrack*), with which the grounds at that period of careless husbandry were replete to an excessive degree; in a moist season it became so luxuriant as to shock the crop, and usurp the mastery of the field. When this circumstance happened, Nature was allowed to "play her virgin fancies," as by that means the expense of buying grass seeds was obviated.

† Linnæus makes the patriotic boast, that in Sweden, "grain of all sorts is observed to spring forth sooner, grow quicker, and ripen in less time than in any other part of the world." (Oration concerning Travelling in one's own country, 1741.) In the Flora Lapponica, he says, "that at Purkyaur, in Lapland, anno 1732, barley sown May 31, was ripe July 28, *i. e.* in 58 days." (Stillingfleet's Miscell. Tracts, p. 13.) In the champaign of Scania, whether the spring be early or not, the barley is sown about May the 29th. It would appear that our old people in the eastern part of the shire, while they observed the period of sowing, both expected and enjoyed the precocity of the sudden and ardent summer of Sweden and Lapland. We cannot readily contradict statements derived from single instances of very forward seasons, that make a deep impression, are long remembered, and, in the decay of intellect, are apt to be cited as general facts. They affirm that a *little* after the barley was under the *clod*, the dew was standing upon the tender blade, and that it was reckoned a common thing for only six weeks to intervene between the grain's being out of the bag, and its waving yellow, ready for the sickle.

‡ A similar custom prevailed in the Orkney Islands in the 16th century. "They

This was the genial time in which masters and servants, then little restricted from intermingling by scruples as to rank or station, gave themselves up to relaxation,—"when toil remitting lent its turn to play:"—

> "Condita post frumenta, levantes tempore festo
> Corpus."

The cattle were turned out to moors and commons, where the horses often sojourned till about New Year tide.* In most instances the farms were so small, that the farmer and his family, after the fashion of the primitive ages,† managed their limited mailings, without extrinsic aid. Being their own masters,—satisfied with "what life required,"—and paying but a pittance of rent; a life partly divided between festivity and half-indolent labour, would to such minds offer more attractive inducements, than the self-denying diligence that accumulates a competency. And even the possessor of broader acres and of ampler means, was actuated by no bolder ambition than the partners of his toils; could devise no mode of signalizing himself superior to the sports which were the mutual heritage of high and low. The produce of the fields being secured—with mind relaxed from the cares of office—consigning to the men within the house, for hinds were then seldom heard of, the autumnal and winter task of thrashing the corn with the flail, the charge of tending the cattle, or the brief details of the short winter's yoking; he sought recreation in the violent agitation of the chase, or the boisterous excitement of bowling, curling, skaiting, and football, afforded a ready and grateful employment for a vacant but ardent mind.

While such was the condition of the agricultural population, that of the rest of the community was scarcely less favourable to an observance and retention of rites and customs, enforced by the sanction of ages. The farmer employed no out-door labourers, excepting in spring and

teill not whill ye spring of the zeir, and as they teill, so they saw ther aittes; ther plouche is drawen be foure beastis going syde for syde; the caller gangis backward with a whipe." (Descriptio insularum Orchadiarum, per me, Jo. Ben., ibidem colentem, in anno 1529. MS. Adv. Libr. Dalyell's Fragments, p. 21.) The monks of Kelso were wiser in their day and generation. About 1241, "they laboured their grange of Colpenhopes *in winter*, with two ploughs." (Morton's Monast. Hist. of Teviotdale, p. 117.)

* Hence the repeated mention in writings of the periods of Charles II. and James II., of horses being taken out to the commons, or running loose there. For illustration I may refer to Veitch's Memoirs, p. 46 (Nov. 28. 1666.), and Simpson's Traditions of the Covenanters, 1st Series, p. 173.

† "Ut prisca gens mortalium
Paterna rura bobus exercet suis."—HORAT. *Epod. Od.* ii. 23.

autumn. In the former season, engaged in weeding at sixpence or eightpence per day, they were little encouraged, in a state of husbandry, where nature still retained the sovereignty, and the farmer seized a crop only where she would permit.* The superfluous hands were necessarily driven to other means of subsistence. The females in winter plied the distaff, prepared the hemp, flax, and wool;† and in summer bleached their long webs, in the bright sunshine, on the unstained grassy mead, by the banks of a sparkling stream. The cottages in rural villages had

* This was less for the purpose of checking the weeds than of procuring the thistles (*Cnicus arvensis*), as provender for the horses; in hard years, and in the want of artificial grasses, accustomed in the summer season to little better. The same thing happened in Forfarshire under the old *regime*. "In the field below, a man appears to be very busy weeding corn; but observe he pulls no weeds except thistles, and these he lays on the side of the field, till their prickles are softened by the sunbeams, afterwards they were carried home and distributed among the horses for supper. (Edinburgh Magazine, Aug. 1818, vol. iii. p. 126.) The monks, as far as we have information, were the earliest patrons of weeding on the borders. At Clarilaw, in Roxburghsire, the gift of David I., the monks of Kelso had twenty-one cottages, to each of which was attached three acres, minus a rood, and pasturage for two cows. For these they rendered annually two bolls of meal, and *weeded* the corn on the Abbot's grange at Newton (et serclabunt totum bladum grangie de Neuton.) The grange of Newton was cultivated with seven ploughs. (Rotal. Redit. Monast. de Kalcow, written before 1316, *apud* Morton's Teviotdale, p. 166. 167.) In 1346-7 there is an entry in one of those Account-Rolls of Holy Island, that in such an interesting manner connect the manners of former times with the present. "To two women weeding corn, [wheat] (mundantibus frument'), at Corpus Christi (about the middle or end of June),—4d." (Raine's North Durham, p. 89.) Rather curiously the weeds seem to have been thistles. In 1416 among the farm utensils at Fenham, occur "4 weed hokys" [weed hooks.] (Ib. p. 128.) Their tenants had scandalously thistly corn. 1344-5. "Gloves for 14 servants, when they gathered the tithe corn, 2s. 8d." (p. 87.)

† In Patten's Expedition of the Duke of Somerset, it is mentioned that the party detached to receive the surrender of Dunglass Castle, found stowed up in it, by "y^e^ wyves of y^e^ toune," for security, "yarne, lynnen, hempe, and heaps of such baggage beside." These were "very liberally let alone;" (p. 35.) Turner (1562) says, flax, "called of the Northern men lynt," "groweth very plenteously in the north parte of England." (Herb. part ii.) Almost contemporaneously in the rent-rolls of Holy Island there is in 1501-2, "tithes of hay, lint, and hemp, 28 shillings." There is, however, an entry more than a century prior to this, "hay, flax, and garden herbs (porrecti) 24sh;" (Raine, p. 117.) In the reign of William the Lion there was a place called "Lintedikes," near Lilliesleaf, in Roxburghshire; (Morton's Teviotdale p. 271.) In Cromwell's invasion in 1650, the Scotch women of Ayton and other places passed through in the march from Mordington to "Coppersmith," were "clothed in white flannel, in a very homely manner." (Relation of the fight at Leith, &c. 1650.) This was doubtless *home* made, for even the thrifty dames of last century confess they could not proficiently tint their woollen cloth, but sent it to the dyer, who, for the process, charged the extravagant price, in their estimation, of two shillings per yard.

generally attached to them a garden and an acre of land, a palliative of idleness, rather than an incentive to industry, the possessors being, from their two exclusive dependence on the bounty of Nature, as it is emphatically expressed, "always in misery." Most of the occupiers, to some homely craft or calling, added a cart and the appropriate beast of burden—a horse or an ass*—with which they were accustomed, at certain seasons, to convey green fish to Fisherrow market, or to the inland parts of the country for sale. Many were deeply involved in smuggling, and in the defective state of the revenue laws at that period, and the prevalent tone of opinion on the subject, under the name of cadgers, carried on with little secrecy or restraint their contraband commerce. Aldcambus, and several other rural hamlets, now, save in the groupes and straggling lines of forlorn plane-trees and ashes, obliterated from the landscape, were tenanted by some twenty or thirty families of such individuals, in a condition little removed from absolute idleness—eager to concur in whatever scheme of revelry and uproar, would preclude the necessity of thought, absorb care, or "give time a shove." In such a society, cock-fighting, badger-baiting, and similar inhuman devices, were relished with intense avidity; and as these could not at all times be in-

* These horses when yoked were distinguished, as those of carriers are still, by the high capes attached to their collars. Asses were particularly numerous. There was a certain part of the common now included in Penmanshiel farm, in which they were accustomed to leave or *stele* these animals at night, in the expectation of finding them in the morning; called, from the circumstance, the Cuddies' stele. A *stele* (pr. stale) is described as a place where cattle can be put for shelter and security during the evening, so that they will not wander. It differs from a *fauld* in not being enclosed. The Cuddies' stele, as seen in the hand of Nature, previous to being cultivated, was a wilderness of ferns *(Pteris aquilina)*, dense whins that overtopped a man, and a sprinkling of scroggy birches. This very insignificant corner is remarkable for appearing to have retained its name for nearly six hundred years. About the year 1259, David the son of Ernald de Quichesyd (Quixwood) gave to his brother Adam along with other acres within the territory of Aldecambus, an acre and a half above "stele" (sup. stele) which appears to have been the place in question. At the period of its improvement, there was bordering upon it, "a piece of auld gaun land," answerable to the description. It is also curious, as serving to mark the wide prevalence in former times of terms now disused—terms perhaps conferred previous to the disruption of the border districts, into rival and hostile frontiers. The monks of Hexham held, according to an account of their revenues, July 7. 1297 (25 Edward I.), amongst their extensive domains, "the church of Slealy * * * and a common of pasture in *Le stele*, for 260 sheep, the gift of Gilbert de Slealy. (Wallis's Northumberland, vol. ii. p. 80.) From the chartulary of the monastery being burnt shortly before that period by the Scots under Sir William Wallace, the date of the benefaction is unknown, but it went back beyond the memory of man. In the charters of the Abbeys of Kelso and Melrose, we have also, Mollestele in Teviotdale, and Witelawstele in Northumberland.

dulged in, the sole remaining available resource, so that mirth might have no pause, and conscience no throb, was with rural games to "play down the setting sun."

There was, however, "a change, an evil time was come." The division of the commons deprived their animals of provender, the establishment of a coast-guard extirpated their traffic, while the extension of the farms engulfed their little all. They were thus compelled, in the destruction of all that fostered them, and in the decay of all that inveterate usage had endeared, to forego the idle habits of their prime, and to adopt modes of support more consonant to a regular calling. Some by a silent acquiescence participated in the movement by which society was impelled forward; and the steady demands for labour rendered their co-operation necessary; others disturbed from their "old hereditary nooks," by the prying and unwelcome intrusion of innovation, removed to more congenial localities, where yet lingered vestiges of

"Auburn, loveliest village of the plain."

In a similar manner, but in a degree still more intense, the change affected the agricultural population, among whom it originated, shattering the bonds of old habits, and quickening the springs of activity and energy anew. The apathy and indolence which at former times nullified and impeded attempts at advancement, were shaken off, and a course of severer, but not unmitigated toil, adopted, even in its urgency auspicious to the higher interests of humanity; and though not productive of the amount of festivity enjoyed by primeval tillers of the soil, rewarded in numerous instances with comforts and conveniences to them unknown. The mind of the master too is on the stretch from the beginning of the year to its end, and the intervals of repose glimmering dim and distant, like the straggling stars of the twilight, are more frequently spent in the bosom of his family, or with not abated cheerfulness, in the pursuit of gratifications of a more refined and intellectual character, than in the rough, rustic strifes and feats of his progenitors. The public mind, borne on by the current of innovation and improvement, has rapidly resigned and left behind, whatever of futile or trivial importance, in its former state, might shackle the exercise of its faculties, in circumstances hitherto inexperienced. Such, in particular, has been the fate of the holiday frolics, merry-makings and sports, with which, in former times, the swain endeavoured to "lighten every task." In some instances, as cock-fighting and bull-baiting, they have fallen under the ban of outraged humanity. Others have violated en-

lightened opinion by the mixture of dross that debases their more generous qualities. Others, again, however important in the estimation of the "rude forefathers of the hamlet," have been regarded as trifling, degrading, and destitute of intrinsic worth, by their censorious or better informed posterity. The sports of childhood are no longer relished; the vigour and bolder impulses of maturing manhood are beginning to be experienced.

"Nimirum sapere est, abjectis utile nugis,
Et tempestivum pueris concedere ludum."

From these combined influences it has resulted, that such a depreciation has befallen all robust exercises, that they lie very much under the danger of indiscriminate proscription by the sober part of the community, as nuisances to society. It is principally owing to the operation of this spirit, that beyond the games of foot-ball and curling,* and an occasional exhibition of strength, Berwickshire can at present boast few relics of the gymnastic feats of antiquity. To the rapidity with which the customs and sports of a date by no means distant are hastening into oblivion, it is, that witnessing the few faint vestiges one of them has left, I have been led to inquire, how came these things here?

And in the dim outline and indistinct picture of the past, trace we no heralds of admonition, as to the vanity of earthly ambitions, and the fleeting destiny of aims directed to matters of brief moment? The existence of the generation gone by, slumbers in the memory of their successors, in a forgetfulness as dark and undefined as do the filmy uncertain records of their deeds and most vaunted exploits. A few transitory lineaments, and a track of shivered fragments, alone survive the wreck of an age. The rest are "tossed upon the waves of time."† "Our fathers find their graves in our short memories, and sadly tell us how we may be buried in our survivors."‡ "Nihil rerum mortalium tam instabile ac fluxum est, quam fama——non sua vi nixa."—TACITI *Annal. Lib.* xiii. 19.

* This, "auld Scotia's manly game," has now, as far as Berwickshire is concerned, met the fate of all perishable things. The last contest, attended with all the ancient ceremonial, took place in 1810. Several attempts have been since made to revive it by those who have joined the "roaring play," while "warmed with youth's blood in their swelling veins"—but with ineffectual effort. The lapse of time had impaired many of its venerable usages, and the light of other days had vanished never more to burn.

† Lord Bacon.

‡ Sir Thomas Browne.

Notice of a curious and anomalous production of Cones upon the Pinus sylvestris, Scotch Fir. By P. J. Selby, Esq. of Twizell House.

In the course of thinning a plantation of about twelve years' growth, I met with the anomalous production now submitted to the inspection of the Club, and which I thought might be acceptable to our Botanical Members, as being a striking and interesting illustration of that general law, admitted and believed by all the eminent botanists of the present age, viz., that the various parts of which flowers, seed-vessels, and fruits are composed, are only modifications of the leaves, more especially, as I am inclined to suppose, such a *lusus* of rare occurrence, the present being the only instance I have ever yet met with in thinning any plantation, an operation in which I have been more or less engaged during the last thirty years.

The tree from which the specimens were taken, was a common Scotch fir, *Pinus sylvestris*, of the age above mentioned, and about thirteen feet high. It grew, surrounded by three or four stout larches, but was vigorous and apparently in excellent health, as the strength and the length of the shoots of the last and former years plainly indicated. Two of the three shoots now exhibited, it will be observed, are those of the last season, one shewing the embryo cones surrounding the whole circumference of the shoot for the greater part of its length, occupying the exact places which, under common circumstances, would have emitted fascicles of leaves, a few of which, it may be observed, are interspersed among the young cones where they do not cover the whole circumference; the second (Plate I.) shews the cones mostly confined to one side of the shoot, where they represent the leaves, the other side being clothed with its due portion of true leaves or spicula. The third is a shoot of the previous year, and the first, it would appear, in which the tree shewed any symptoms of this anomalous growth, as none of the shoots of preceding years were found to be similarly affected. Upon this shoot the cones, like those ordinarily produced by the species, have attained a considerable size by the additional year's growth (Plate II. half the nat. size), shewing them to be true cones, and in all probability, if they had been allowed to proceed to maturity, capable of producing perfect seeds. The present instance, I may add, is at variance with what usually takes place in regard to the common pine, *P. sylvestris*, and other species of the genus *Pinus* and genus *Abies*, in cases where cones are produced at any early age, inasmuch as this occurs to the greatest extent when the plants are

checked in growth, or have become sickly in constitution, the cones on such occasions occupying invariably the usual situation, that is, close by, or around the diverging shoots of the year, whereas, in this instance, we have them occupying the greater part of the shoot, and upon a tree of vigorous growth and healthy appearance.

Table shewing the period of Arrival of several Summer Birds of Passage, in the neighbourhood of Twizell-House, for the last twenty years. By P. J. SELBY, Esq. of Twizell-House.

The annexed table, shewing the period of arrival of several of our summer birds of passage, in the immediate neighbourhood of Twizell, for upwards of twenty years, is taken from such entries as I had made each year, as the various species came under my personal observation. Imperfect as this table may probably appear to the members of the Club, I may be allowed to remark, that in many cases where the entries seem to be the most deficient, this has not always arisen from neglecting to record or watch the first appearance of a species, but from other and various causes. Thus, the non-appearance of a particular bird for one or more seasons within the limits of my observations, prevented an entry, as did also the absence of any species from the precincts of Twizell, till a period considerably posterior to its known presence in other localities, within a short distance, or in the same parallel of latitude. Absence from home at the time of arrival also occasionally prevented the registration of some of the birds enumerated. As examples of birds which seem to have deserted the district, or which are now but rarely met with, are the *Locustella avicula*, grasshopper-warbler, the *Hirundo urbica*, window-swallow or martlet, and the *Saxicola rubetra*, whin-chat. The first, some twenty-five years ago, used to be common, I may almost say plentiful, about Twizell. This was when the plantations were young, with an abundance of thick herbage and an undergrowth of whin, broom, &c., a cover congenial to the retired habits of this curious little bird. As this undergrowth died out and gave way to the growth of the forest trees, the grass-hopper-warbler gradually forsook the locality, and it is now a bird of very rare occurrence, and for the last few years has only been heard occasionally at a distance on the verge of the moors to the west of Twizell, where the ground still remains favourable to its habits. The martlet is also now rarely seen at Twizell on its first arrival, or during the breeding season, though it formerly had its clay-built tene-

ments in the angle of almost every window of the house, and beneath the eaves of the stables and other out-houses. Its desertion I also attribute to the change produced by the growth of the large body of plantation around the house, for open districts are the favourite resort of this species, as is shewn by the multitudes which select, as breeding places, the eaves and windows of houses in open exposed districts, the rocky precipices of the sea-coast, as about St Abb's Head, or those of the interior, as I observed to be the case in Sutherland, where the limestone or marble cliffs near Inch-na-Damff are annually visited by large colonies of martlets.

To the whin-chat, *Saxicola rubetra*, which is annually becoming less frequent in this neighbourhood, I may add the sedge-warbler, *Locustella phragmitis*, the white-throat, *Sylvia cinerea*, and the cuckoo, *Cuculus canorus*. The gradual desertion of this species, I think may chiefly be attributed to the great change that has taken place in the features of this northern district within the last twenty or thirty years, in consequence of the improved system of agriculture that has been pursued, and under which the draining and reclaiming of marshy and waste pieces of ground has been so generally effected. Many of our members can no doubt recollect when bogs of greater or less extent, and pieces of ground covered with natural herbage and low brushwood, were to be seen in almost every direction, I might say in almost every field; these, however, have now vanished under the spirit of improvement, and their loss, though no doubt considered a gain by the agriculturist, is, I believe, not unfrequently regretted by the botanist and the ornithologist, as it was in these favoured spots that the one was wont to pull the rarest gifts of Flora, and the other to listen to the various notes, or watch the habits of some of the most interesting of our feathered visitants.

An inspection of the table will shew that a considerable difference takes place in the period of arrival of the various species, in different years; this, however, may always be traced to the advanced or retarded state of the season, as the migratory flight seems in a great measure regulated by the state of vegetation; thus I have observed that the arrival of the willow-wren and blackcap may be expected with the first southerly wind, as soon as the larch becomes visibly green, and that of the wood-wren with the first bursting of the buds of the oak and beech. In some seasons the arrival of the earlier visitants is found to be at the usual or average period, whilst that of the later comers is postponed considerably beyond it; this always happens when the spring has been favourable to the first, but has been succeeded by cold and ungenial weather about the time the flight of the latter should have taken place.

TABLE shewing the Period of the Arrival of several of our Summer Birds of Passage, as observed in the immediate neighbourhood of Twizell House.

Years.	Saxicola œnanthe, Wheatear.	Phylloppneuste, rufa, Chiff-Chaff.	Phyll. trochilus, Willow-Wren.	Phyll. sibilatrix, Wood-Wren.	Sylvia melanocephala, Black-Cap.	Adornis hortensis, Petty Chaps.	Curruca cinorea, White Throat	Salicaria phragmitis, Sedge Warbler.	Locustella avicula, Grasshopper Warbler.	Saxicola rubetra, Whin-Chat.	Hirundo rustica, Swallow.	Hirundo urbica, White-rumped S. or martlet	Hirundo riparia, Bank Swallow.	Cypselus apus, Martin.	Cuculus canorus, Cuckoo.	Anthus arboreus, Tree Pipit.	Motacilla alba, Pied Wagtail.	Motacilla boarula, Grey Wagtail.	Totanus hypoleucos, Sand-Piper.
1816		April 19.	April 24.							May 2.	April 15.	May 16.	April 18.		April 27.				
1817	April 8.		April 28.						May 5.		April 21.					May 5.			
*1819	April 1.	April 11.	April 18.						April 24.										
1823		April 13.	April 21.	May 2.			May 6.	May 6.		April 29.	April 28.	May 2.	April 25.	May 8.		April 27.			
†1824		April 18.										April 20.							
1825	April 5.	April 8.	April 13.	April 29.	April 26.		April 30.	April 29.			April 15.		April 30.			April 28.	Mar. 8.	Mar. 10.	April 30.
‡1828	April 1.		April 13.			The other visitants all earlier in their arrivals by a week or ten days.													
§1831			April 11.		April 10.		All early this year.									April 18.	Mar. 8.	Mar. 13.	
1837			April 30.	May 8.	May 6.		May 16.	May 16.			April 27.				May 3.	April 27.	Late in March.	Late and very few.	April 28.
1838	April 15.		May 1.	May 8.	May 4.	May 25.	May 10.	May 10.			May 3.		April 19.	May 4.	May 2.	May 5.	Few Wagtails this year, and late in arriving.		
1839	Mar. 31.		April 22.	May 7.	April 22.	May 17.	May 5.	May 17.		May 1.	April 22.			May 3.		April 26.			
1840	April 5.	April 23.	April 23.	April 28.	April 25.		May 6.			April 26.	April 21.				April 27.	April 25.	Mar. 12.	Mar. 12.	
1841	Mar. 28.	Mar. 28.	April 23.	May 1.	April 26.	May 16.	May 11.	May 15.			April 26.				April 30.	May 11.	April 25.	April 26.	April 30.
1842		April 20.	April 26.	April 29.	April 23.		May 3.	May 5.			April 31.				April 26.	April 28.	About middle of March.		
1843		Mar. 31.	April 19.	May 1.	May 1.												Mar. 18.	Mar. 21.	

* Entries for 1820, 1821, 1822, lost.

† Between the 20th of April and 1st May, all the other visitants, with the exception of the Swift, Flycatcher, and Goatsucker, had been observed.

‡ No returns to be found for 1826 and 1827.

§ Note-Book from 1832 to 1837 mislaid. Since found, and added on the following half-sheet.

TABLE shewing the Period of the Arrival of several of our Summer Birds of Passage—Continued.

Years.	Wheat-ear, Sax. œnanthe.	Lesser Willow-Wren, Phyll. rufa.	Willow-Wren, Phyll. trochilus.	Wood-Wren, Phyll. sibilatrix.	Black-Cap, Syl. atri-capilla.	Greater Petty-Chaps, Adornis hortensis.	White-Throat, Syl. cinerea.	Sedge-Warbler, Salicaria phrag-mitis.	Grass-hopper Warbler, Locus-tella avicula.	Whin-Chat, Saxicola rubetra.	Swallow, Hirundo rustica.	Martlet, Hirundo urbica.	Sand Swallow, Hirundo riparia.	Swift, Cypselus apus.	Cuckoo, Cuculus canorus.	Tree Pipit, Anthus arboreus.	Pied Wagtail, Motacilla alba.	Grey Wagtail, Motacilla boarula.	Common Sand-piper, Totanus hypo-leucos.	Fly-catcher, Musicapa grisola.
1832		April 6.	April 18.																	
1833			April 23.		April 25.	May 15.			April 27, or never.		April 22.								April 18.	
1834	April 8.		April 18.	May 2.	April 18.	May 10.	April 27.	May 7.	May 4.		April 27.				April 26.	April 24.				
1835			April 20.	May 7.	April 18.		May 16.	May 16.		May 18.	April 27.				May 4.	May 7.				May 25.
1836	Mar. 31.		April 24.	May 15.	May 6.						May 7.					May 3.				

Notice of the Discovery of an Ancient Sarcophagus containing a Human Skeleton and an Urn. By Francis Douglas, M.D. Kelso.

At a late meeting of this Club, I happened, in the course of our forenoon ramble, to mention the discovery, on the banks of the Tweed, of a skeleton enclosed in a rudely formed sarcophagus, and accompanied with an urn, evidently of very ancient date. At the request of the Members then present, I have made minute inquiries regarding all the circumstances connected with the discovery of these ancient relics, and I now offer the result of my investigation.

In the month of March last (1843), some workmen were employed on the farm of Edenmouth, two and a half miles below Kelso, to level a small tumulus immediately overhanging a precipitous bank of the Tweed, at a spot familiarly known to lovers of the "gentle craft" as Sprouston Dub. The object which the farmer had in view, was to level the tumulus for the purpose of filling up a small ravine which intersected one of his fields. The barrow or tumulus itself had originally been circular, and probably about twenty feet in diameter at its base, but a segment had been removed, during the lapse of years, by successive portions of the precipice, on which it was raised, falling over into the river beneath, by the gradual undermining of the bank, and the friable nature of the limestone and shales which compose it. On the top of the bank generally the soil is shallow, and covers a substratum of gravel; but the mound itself was of several feet elevation, and consisted entirely of pure earth, thereby indicating its artificial structure. The whole tumulus did not exceed seven or eight feet in height, and it was at the depth of six feet from its apex that the coffin enclosing the skeleton was discovered.

The sarcophagus, if such a rude attempt to separate human remains from parent earth can be so termed, consisted of five flat stones of various sizes. The sides were composed of two flat stones kept apart at either end by two smaller ones, and the whole was covered by a triangular slab, which overlapped at several points the parallelogram containing the bones. The whole did not exceed two feet in length, and fifteen inches in breadth and depth. The stones had never been hewn, and consisted of the limestone rocks which abound in the bank and in the bed of the river near the spot.

The skeleton which was discovered in this tomb was evidently that of a child about seven or eight years of age, judging from its size, from the growth of the teeth, and from the want of osseous union which ex-

ists in adult skeletons. The epiphyses, at the extremities of the long bones, were detached from their shafts, owing to the removal of the connecting cartilage; and from the same cause the bones of the pelvis were all separate. The appearance of the upper and lower jaws indicated that the period of second dentition had only nearly commenced. The first molars remained, and the four anterior permanent molars were the only teeth of the second series which had risen from the jaw, the other molars, together with the incisor teeth, remaining imbedded within the alveolar processes. With the exception of a few of the small carpal and tarsal bones with the phalanges, which were awanting, the skeleton was tolerably entire, and in excellent preservation, which latter circumstance is to be ascribed to the dryness of the situation in which the coffin was deposited.

In the sarcophagus, along with the bones, was likewise found an urn similar to those used by the ancient Britons. The urn contained some earth, according to the description of the workmen; but as no earth was elsewhere observed in the coffin, it is probable that the contents of the urn were in reality the ashes of the viscera of the body. The urn was chipped at the edges; it was about six inches in height, and varied from three to five inches in diameter. In thickness, it did not exceed a quarter of an inch. The material of which it was composed was coarse earthenware of a yellowish brick colour, and it was rudely ornamented with circular and diagonal lines.

The mode of sepulture adopted in the present instance at once fixes the era of the mound or barrow at a very remote period. The Romans did not in general bury under tumuli: when such are found of Roman formation, they are considered by antiquarians to have been extraordinary memorials of honour, and, in all probability, confined to distinguished military characters: that these reasons could not have operated in the present instance, is apparent from the small size of the barrow, and of the skeleton contained within the sarcophagus.* The urn likewise is evidently of ancient British manufacture, and closely resembles those found some years ago at Murton and Chirnside, and described and figured in the first and second Numbers of the Transactions of this Club.†

* It is remarked by Sir Richard Hoare, a distinguished British antiquarian, that "barrow burial is said to have lasted till the eighth century. In all the numerous barrows explored, not a single one contained even a fragment of Roman pottery."

† In the Transactions, however, the urns are erroneously ascribed to Roman manufacture.

The practice of cremation was, although common among the Britons of the South, rarely or never adopted by the Caledonians. The skeleton, in the present instance, had never undergone incineration; but it is probable, from the co-existence of the urn in the sarcophagus, that partial cremation had taken place, that the body had been disembowelled, and the ashes of the viscera deposited in the urn.

Such tumuli as I have described, but on a much larger scale, are found in several places in Roxburghshire and Berwickshire, and probably cover the remains of the illustrious or noble men who inhabited Britain previous to the Roman invasion. That the tumulus was small in the present instance may probably be accounted for by the youth of the individual to whom such honour had been paid.*

On planting the Potato in Autumn. By GEORGE DARLING, Esq. Hetton-House.

Having been requested by the Club to give some notice of my experiments on the autumnal sowing of potatoes, I beg to offer the following short statement on the subject. About 1836, my attention was first called to the failures which every where began to prevail more or less in the crops of this most invaluable esculent. Patches would be seen with three or four drills entirely blank, whilst those on either side were good, their leaves and stems strong and vigorous, and tubers plentiful. Various opinions were hazarded as to the cause of this partial failure, one attributing it to their being planted too dry, another too wet, a third to electrical influence; and many other imaginary reasons were freely thrown at random. Knowing that seed grown on the same piece of land, but preserved by different individuals and in different pits, vegetated unequally, some being perfectly healthy, whilst others were more or less tainted with disease, it naturally struck me that it must depend much on the harvesting and subsequent treatment of the seed. Again, I had seen that a very material influence was exerted on the same seed by different qualities in the manure with which they were planted; and I observed also that in gardens all the plants which vegetated where the old beds were, came up strong, healthy, and full of vigour. This led me to the conclusion that the natural bed of the seed must be the best to keep it in during winter, and that the manure suited it best when in a forward

* The skeleton and the urn are now deposited in the Museum of the Tweedside Physical Society in Kelso.

state of decomposition; and I saw that, by planting the sets whole in the autumn immediately after they are taken from the ground, we should attain both objects, the manure, being in the earth all the winter, would, at the time for the potatoes' demands upon it, be in a state of decomposition well adapted to yield its nutritive powers, and assist in developing and bringing to maturity a healthy plant. At the same time the tuber remains in its natural bed, its mother earth, and is subjected to no unnatural treatment, nor is it exposed to be heated in pits or chilled by sudden changes of temperature, the cold earth preventing any violent transitions, and the natural properties of the soil keeping it in the state best adapted for reproduction at the proper time. Again, another advantage I saw would be, that the first and consequently best bud would spring when the genial warmth of the early year should quicken it into life, instead of being forced to an attenuated and sickly length in some cellar or pit, then rubbed off to make way for a second, perhaps a third, and weakly scion. For these reasons I was induced to adopt the plan of winter or autumn planting, and have been, by my uniform success, fully borne out in my conclusions; and I can with perfect confidence recommend its adoption upon dry soils, for when wet stands at any time during the season, the tubers will inevitably decay, and the expectations of the planter be doomed to disappointment.

A few days ago a gentleman told me that he had tried the plan on a small scale in his garden for this year's crop, and with the delicate early ash-leaved kidney. The produce was from a drill of autumn planted seed 8½ lb. from a spring sown drill contiguous, and both fully at maturity, 5½, giving a per-centage in favour of the autumn sowing of about 40. It is supposed by many that frost may injure the sets. I have had them in the ground in all the severe frosts of our late winters, and never when they were covered properly saw a single tuber injured. I have at this moment more than an acre, and by their present appearance I should say the produce will be more than 30 per cent. above that of spring sown ones adjoining.

MISCELLANEA.

1. Sorex tetragonurus, *Jenyns* in Ann. Nat. Hist. i. 423; and ii. 43. During the present summer, I have taken two specimens of this Shrew in the plantations and garden at New-Waterhaugh, where it appears to be not uncommon. *G. Johnston.*
2. Ciconia alba. A beautiful specimen of this Stork was shot at Newton-by-the-sea, about the latter end of March, by Mr Wm. Forster. I suppose the south-east gales had driven him from Holland. He was an old bird, was swallowing a few toads for his breakfast when shot, at the side of a muddy hole not 50 yards from Mr Forster's house. *R. Embleton.*
3. Pastor roseus. A specimen of this pretty bird was shot near Newton by-the-sea, in the winter of 1842. *R. Embleton.*
4. Osmerus operlanus. *The Smelt.* Two specimens have been taken in the Tweed during the present summer, both of which came into my possession. *G. Johnston.*
5. Syngnathus ophidion, *Yarell*, Brit. Fishes, ii. 447. I obtained this species in Embleton Bay during the summer. *R. Embleton.*
6. Syngnathus anguineus, *Yarell*, Brit. Fishes, ii. 445. Two specimens were taken in Berwick Bay in October 1842; and in the same year the species occurred to Mr R. Maclaurin, at Coldingham shore. *G. Johnston.*
7. Corophium longicorne, *M. Edwards*, Hist. des Crustaces, iii. 66. This curious Crustacean abounds in the Tweed near its embouchure. In summer it crawls about the muddy shores; but in autumn and winter it lurks in cylindrical holes which it makes in the clay near high-water mark. These holes exactly resemble those that are made by a worm; they are about two inches in depth, perpendicular to the surface, and nearly parallel to each other. As great numbers are bored close together, the clay appears as thoroughly drilled as does a piece of wood that has been eaten with the maggot of the wood-beetles. *G. Johnston.*
8. Pectunculus pilosus. In Embleton Bay. The specimen is the only one I have yet procured. *R. Embleton.*
9. Lutraria vulgaris, *Flem.* Br. Anim. 464. In Embleton Bay, very rare. *R. Embleton.*

10. Lepidium latifolium. On sandstone rocks, above the Old Ford at Norham, on the N. Durham side. *F. Douglas.*
11. Senebiera coronopus. Waste ground at Haddon village, abundant; and the only station in the interior of our district where it has been observed. *F. Douglas.*
12. Bovista gigantea. A specimen was gathered this autumn in the neighbourhood of Fowberry, which measured 4 feet 9 inches in circumference. *G. Darling.*

Description of the GONIASTER ABBENSIS. By Edward Forbes, Esq., Professor of Botany in King's College, &c.

Goniaster abbensis.

G. corpore planiusculo, orbiculari, angulis in brachiis productis, infra et supra tuberculis, granulis stomatibusque vestito.

Description. *Upper surface.*—Disc round, interrupted by the bases of five short arms, each of which is as long as a third of the breadth of the disc. Surface plane, thickly covered by granules, among which are irregularly interspersed numerous mammilliform tubercles (transformed spines), and at intervals spinules in pairs forming stomata (transformed pedicellariæ ?) of an ovate form. No appearance of an anal pore. Madreporiform tubercle nearer the margin than centre large, rugose. Upper surface of arms (which are prolongations of the angles of disc) similarly covered with the centre.

Margin bordered by a double series of irregularly quadrate plates, somewhat arched at their free borders, and each edged by a single row of minute square granules. The upper series bear from one to four mammiform tubercles: when more than one, two are usually larger than the rest. On the lower series, the tubercles are usually more numerous than on the upper.

Under surface.—The triangular spaces between the avenues are granulated; among the granulations numerous large stomata, in form linear and compressed, each placed in a smooth space surrounded by a close border of flattened mammiform tubercles, those forming the lateral borders largest. The avenues are linear, contracting towards the arms. Suckers biserial. Border of avenues formed by transverse plates, each

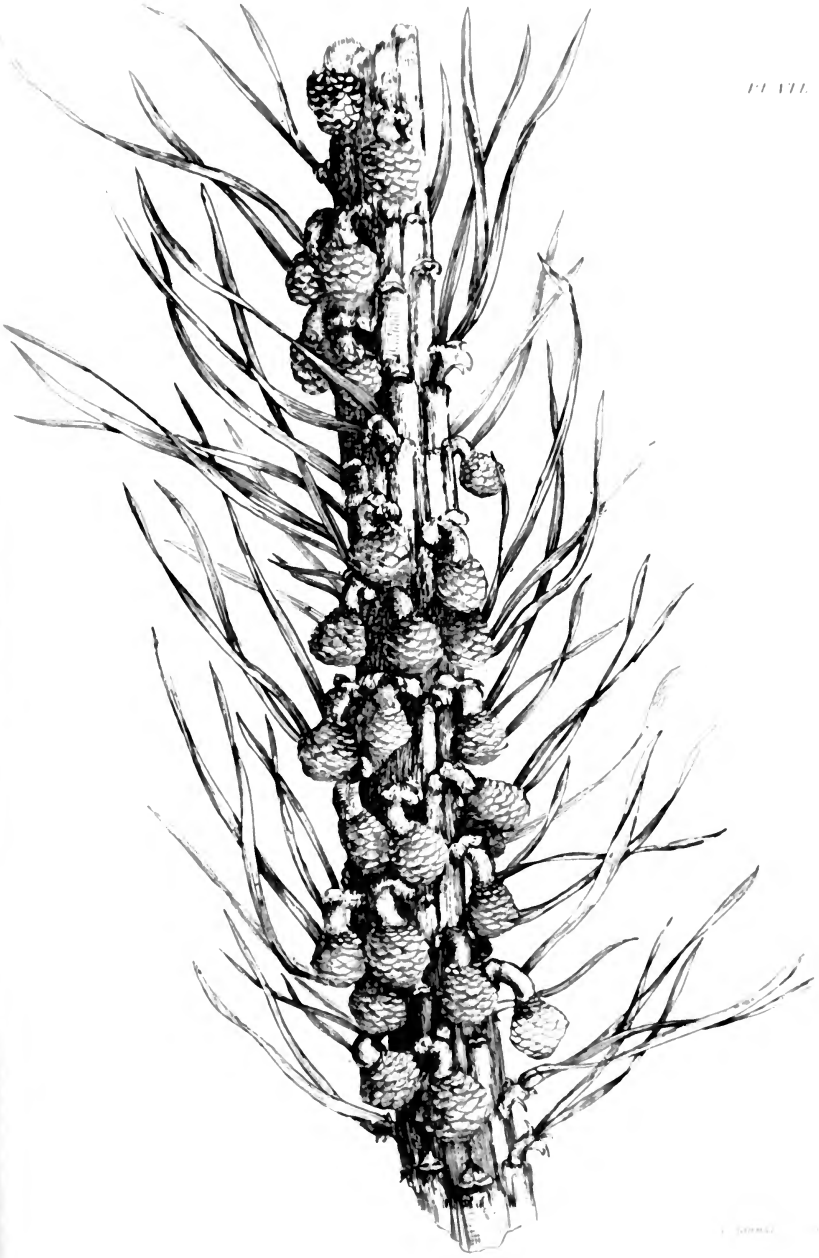
bearing four or five elongated tubercles, two of which face the avenues. These plates are each bordered by a series of granules.

Eye-cover formed of one large tranversely-ovate tubercle terminating the rays, and three or four smaller ones on each side, with a circle of minute granules immediately surrounding the (red) eye.

Dimensions.—Breadth across the disc 5½ inches; length of the arm 1¾ inch; breadth of arm at base $\frac{9}{10}$ inch.

Colour.—When fresh, Mr Maclaurin states it was of an orange-yellow, which, with crimson-red, are the usual hues of the cushion-stars. Dried, it is of a pale yellow.

The above description of this beautiful star-fish is reprinted from the "Annals and Magazine of Natural History."

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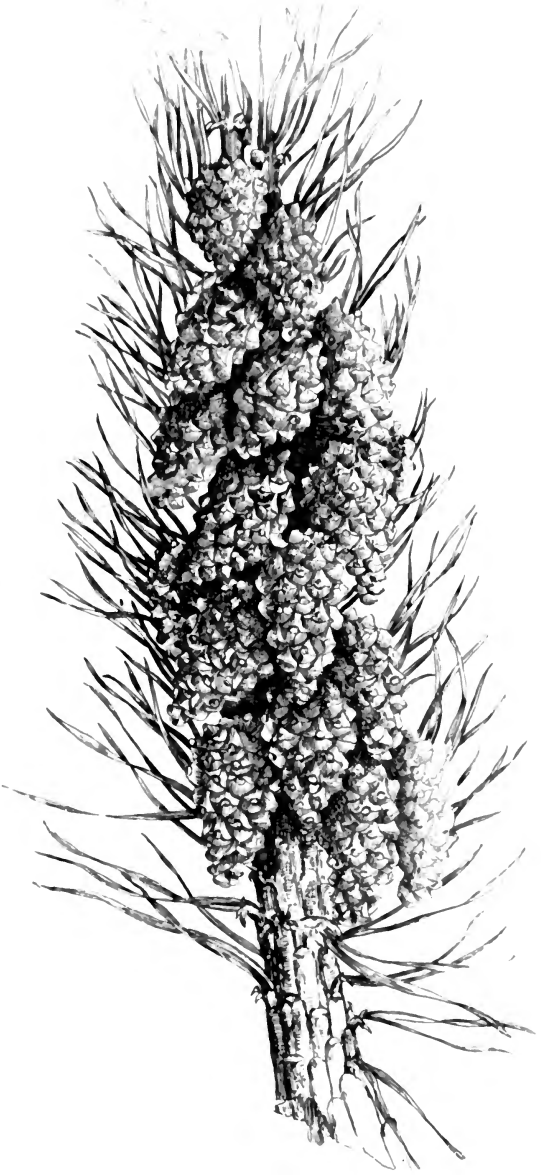



NATURAL HISTORY.

Address to the Berwickshire Naturalists' Club, read at the Anniversary Meeting, September 18. 1844. By P. J. SELBY, Esq., of Twizell House.

GENTLEMEN,

Your kind partiality having a second time placed me in the distinguished situation of President of the Club, I again, at this our Anniversary Meeting, and in conformity with established custom, find myself called upon to recapitulate the proceedings of our Society during the several Meetings of the year that has passed. Before I enter upon this detail, permit me to congratulate the now numerous members of the Club, upon its present healthy and prosperous condition, which bids fair, I think, to realize the aspiration of its esteemed founder, breathed forth in his admirable and glowing address, delivered at our last Anniversary, and responded to by all who were present, "May the Club live for ever!"—Yes, long I trust may the motives which led to its institution, and the feelings which have hitherto guided and directed it, continue to influence its members, and give a permanent support to an institution, from which, all who have attended its meetings must allow, that not only corporeal pleasure, but mental profit, has been largely derived.

For myself, I confess the days appointed for our Meeting are always anticipated with a pleasure experienced on few other occasions. I find myself, as it were, about to throw aside, for a brief period, all those cares and anxieties, which accompany and embarrass our more mundane pursuits, with a mind attuned to a higher state of feeling, anxious to participate in the

"Feast of reason, and the flow of soul."

Such a feeling, I can safely assert, has prevailed during the nine years that have now elapsed, since I last had the honour of addressing you; and I fain would believe that a similar one has not been wanting in the breasts of those Members who have been able to attend our Meetings.

But to proceed.—Our twelfth Anniversary having been appointed to be held at Ford, the Members, by special invitation, breakfasted at the delightfully situated, and tastefully ornamented cottage of Captain Carpenter. There a sumptuous and substantial repast had been prepared by the hospitality of our host, to which ample justice was done by the numerous party assembled, the appetites of the majority having received an additional whet from a long and early drive.

The morning being remarkably fine, and well adapted for a ramble in search of the rarer productions of nature, the sky being clear and cloudless, the sun shining bright and warm, but tempered at the same time with "refreshing zephyrs," the party determined to traverse Ford Moss, and the ridge of moor in the direction of the picturesque glen in which the Routing Lynn is situated, anxious to renew, in this romantic spot, a search, which, at a former meeting, had proved unsuccessful, and which had for its object the re-discovery of that most elegant of our native ferns, the *Osmunda regalis*, or Royal flowering Fern, the original discovery of which had been made some years before by Mr Mitchell, now deceased, a former Member of the Club. Leaving the cottage ornée of our hospitable host, the party passed through the court of the old baronial Castle of Ford, now the property of the Marquis of Waterford, as representative of the ancient family of Delaval, and after inspecting the extensive improvements already effected, and still in progress, in the village, by the noble owner, proceeded by way of Ford-hill farm, where the margin of a pond, bristling with a thick entanglement of Brambles, caught the keen and scrutinizing glance of the botanists, and produced a halt in that important section of the Club. Of this, advantage was taken by Captain Carpenter, who conducted others of the party to the site of one of those ancient forts or camps, so common in this district, where the mounds and fosses which defended it, are still distinctly marked. Antiquarian curiosity being satisfied, and the botanists having stored each their vasculum with specimens of the Rubi, the party again united and proceeded to the Horse Bog, a large morass, covered in drier parts with a growth of the various species of the Willow, Stunted Birch, Alder, and that sweet-scented shrub the Bog Myrtle, *Myrica gale*: there several Coleopterous Insects, and a few species of the smaller Moths, were taken by Mr Selby, and a fruitless chace was instituted by some individuals, after a specimen of the Admiral Butterfly, *Vanessa atalanta*, which has

been comparatively rare throughout the district for the last two years. Among the plants which attracted notice in the bog, were the *Typha latifolia*, and *Spergula nodosa ;* and the pretty moss *Orthotrichum pulchellum*, was gathered from the bark of some of the trees. From the Horse-bog, the rill which afterwards forms the fall of the Routing-Lynn, takes its origin ; and by its margins, which presently become steep and clothed with hazel, the party pursued their path towards the main object of the walk,—their progress at times arrested by one of Flora's beauteous gifts, the flight of a passing insect, or by the desire to pluck, as well as crack, the now embrowned nuts, which hung in clusters, most enticing, from the surrounding spray. Arrived at the important point, where the rivulet first throws itself over a ledge of rock, all doubts as to the accuracy of the first zealous discoverer of the Royal Fern were dissipated, when we beheld our worthy associate, Dr Douglas, with joyful and exulting mein, brandish aloft a frond, and, in loud Stentorian voice, exclaim *Eureka*!

The habitat of this interesting plant was at the margin of the first or small cascade, situated about fifty yards above the higher and more beautiful fall, called the Routing-Lynn. Two plants only were observed in this locality, each sending up three or four fronds about 18 or 20 inches in height ; nor could another specimen be detected in any other part of the rocky dingle below.

Another ancient fort on the left of the Dean, having arrested attention for a few minutes, the party proceeded to descend by a steep and slippery path to the bottom of the higher cascade. Here the solitude of the scene, the almost concave breast of richly coloured rock over which the streamlet fell, the tangled copse-wood which surrounded us, and hung in festoons over a portion of the basin of the fall, all conspired to render the Lynn an object of extreme beauty, and a fitting subject to embellish a future number of our transactions. Besides the *Osmunda*, several other Ferns were observed in the vicinity of the fall, viz., *Scolopendrium vulgare*, *Asplenium filix fœmina*, *Adiantum nigrum*, and *Blechnum boreale;* and a white variety of *Erica tetralix* was gathered here by one of the party. Descending the Dean, interesting from its devious windings, and the natural copse-wood which still clothes its sides, the party proceeded towards Fenton, and from thence, along the elevated ridge which reconducts to Ford. During this portion of the walk, though little occurred to interest the naturalist, attention was often arrested,

and the mind carried back to scenes of bygone days, by the view which met the eye from the elevated ground on which we stood. Beneath us lay the Till, meandering in its deep and placid course, the plain of Millfield, once a barren moor, now rich in Ceres' gifts, stretching to the south and bounded by the distant range of the Cheviots. Directly opposite, Flodden rose, in steep ascent;—its bloody field, some centuries past, so fatal and disastrous to the Scottish chivalry, now no longer an open and champaign country, from whence a monarch, seated on his royal chair, could overlook his proud array, and watch from far the approach of an advancing hostile force; but wrapped with hedge-row trees and fences, the hill itself clothed with wood, and hiding from the gaze the spot where Scotland's king once pitched his tent. From this ridge, the party diverged to the edge of Fordmoss, where the attention of Dr Johnston and Dr Douglas were again arrested by the Brambles which grow in great profusion around; and many specimens were added to those already collected, these gentlemen being anxious to determine with accuracy the species of this puzzling genus which grow within the limits of the Club.

Highly gratified with their delightful walk, and the agreeable converse in which they had been engaged, the party returned to Ford, where an excellent and substantial dinner at the Delaval Arms awaited their arrival. The repast being finished, the President Dr Johnston proceeded to deliver the annual address, the excellence of which seemed only to be duly appreciated, in the marked attention of the Members, and the reiterated plaudits with which it was received. Mr Selby was afterwards elected President for the ensuing year, and Dr Douglas, with the assistance of Dr Johnston, was requested again to accept the office of Secretary. No papers were read, nor any communications of consequence made to the Meeting.

Good fellowship, and an animated conversation, in which every one took his part, made the hours glide swiftly by; and it was not till the fast coming twilight gave notice of the coming shades of night that the party could muster resolution to say Adieu, and to break up a meeting, which all agreed had been one of the most delightful since the first establishment of the Club.

For the following account of the October Meeting held at Berwick, and which I was unable to attend, I am indebted to the Minutes furnished me by the worthy Secretary of the Club.

On the 18th of October, the following Members, viz., Dr Johnston, Mr Melrose, Captain Carpenter, Mr Collingwood, Mr Home, and Mr Murray of Marshall Meadows, met and breakfasted at Dr Clarke's. The Minutes of the Meeting at Ford having been read and approved of, Dr Johnston produced a statement of the expenditure and receipts for the past year, from which it appeared that a considerable balance was due to Neill & Co., printers. It was, therefore, resolved that the subscription for the year should be seven shillings and sixpence. It was also resolved, that the following be the places of meeting for next summer, viz.:—

First Wednesday in		May,	at Etal, Eight o'clock A. M.
Third	...	June,	... Abbey St Bathans.
Last	...	July,	... Coldingham.
Third	...	September,	... The Heather-House.

Ralph Carr, Esq. of Hedgely and Dunston Hill, Gateshead, was admitted a Member, on the nomination of Mr Collingwood, seconded by Dr Clarke.

The Members dined as usual at the Hen and Chickens, and after dinner, a paper was read by Mr Home, in which he attempted to prove that Broomridge, over which the Club walked at their Ford meeting, was the scene of the great battle of *Brunanburg;* and that the ancient forts whose ruins were traced, were probably connected with this battle. Dr Douglas sent a communication of his having found *Lepidium latifolium* on the river banks near the Boathouse, above Norham ; and *Senebieria coronopus* on some waste ground abundantly in the village of Haddon.

A bright and lively May morning ushered in the day of our meeting at Etal; and as the clock had chimed the appointed hour, the following Members, viz., Mr Selby, President, Dr Johnston, Mr Embleton, Mr Collingwood, Dr Clarke, the Rev. J. D. Clark, the Rev. Wm. Walker, Mr Broderick, Mr Melrose, and Dr Doulgas, had assembled at the village inn, from various distant points, anticipating the comforts of a substantial breakfast after their long and early drive. Many things, however, happen between the cup and lip, and so on the present occasion; for, instead of a table abundantly supplied with all the adjuncts of a morning meal, awaiting our arrival, we found, and this after a week's previous notice had been given, an ill-assorted board, with such a paucity of provisions, as visibly affected the usual stoicism of many of the assembled Members. By dint of perseverance, and a frequent application to the bell, sufficient

provender, of a homely nature, was at length procured to satisfy the cravings of the appetite ; and the equanimity of the party, which had been somewhat ruffled by this unlooked-for incident, was now restored by the loveliness of the day, and the prospect of a delightful and instructive walk. Sallying from this ill-conducted house, the party lingered for a while to view the improvements that had been effected in the village, under the direction and auspices of the noble residents at Etal House. Instead of the mean and dirty appearance the village used to exhibit within the recollection of many Members of the Club, when the Towngate was rough as well as filthy, margined by a foul and open gutter, the midden in all its magnitude and glory in front of each cottage door, it now presented a marked contrast in the extreme neatness and comfort of its dwellings ; and we could not but admire the neatly-kept and well-stocked gardens of the villagers, the taste of many of whom in laying out and filling their little plots with ornamental flowers, would not have disparaged a professed gardener, and reflected credit, no less on the industry of the villagers, than on the kind attention and watchful care of the patrons of the village, who have been the means of infusing a taste among their dependents, for a recreation at once healthy and rational.

Leaving the village, the party directed their steps to the banks, " where flows the sullen Till ;" and availing themselves of the walk tastefully laid out by Lord Frederick Fitzclarence on the eastern bank, proceeded down the stream. The interest and beauty of the scenery increased at every step, the banks of the river becoming steeper and more rugged as we advanced, in some places exhibiting a face of richly coloured rock, broken, and partially hid by patches of ivy, honeysuckle, and other climbing plants ; in others, a thick entangled brake of white-thorn, hazel, birdcherry, and the black or slow-thorn, now exhibiting a sheet of snow-white blossoms, clothed the steep acclivities. Amidst this scenery, its beauty enhanced by the loveliness of the day, while some of the party were engaged in culling Flora's lovely gifts, others were listening to the hum, or watching the flight, of the insect tribe, many of which had, no doubt, that very day been called into active life by the vivifying influence of the ardent sun. Whilst others again, with rod and fly, tempted the trout to try " the sharpness of the hook," but in vain, the brightness of the day and clearness of the streams, being decidedly adverse to Piscator's art. A few insects, but none of very rare occurrence, were taken by Mr Selby ; and Dr Johnston gathered the following species of willow upon the

brink of the river, viz., *Salix alba*, *S. viminalis*, *S. aquatica*, and *S. Lambertiana*. *Ribes nigrum* was observed in a small den about two miles below Etal, but doubts were expressed as to its claim to indigenous origin in that locality. The warble of the willow-wren, *Phyllopneuste trochilus*, whose arrival had been observed by Mr Selby at Twizell about a week before, was heard in all the wooded parts of our walk; and that of the Whitethroat, for the first time this season, in one of the thickest thorny brakes. A large specimen of the Slow or Hag-worm, *Anguis fragilis*, first discovered lurking beneath a stone, after some attempts to elude his pursuers, was captured and carried home for further observation by Mr Embleton. Pursuing our course by the side of the river, our enjoyment heightened by the continued beauty of the day, and occupied in our various pursuits, the hours flew almost unheeded by, and it was not till the watch had been consulted, and our growing appetites told us that our time was nearly up, that we thought of retracing our steps towards the village; where, on our arrival, we found a more substantial and better cooked repast prepared than we had reason to expect, considering the sample we had experienced in the morning of the internal economy of the house. After dinner, the usual routine of business commenced, and the minutes of the preceding meeting having been read over, the Rev. J. C. Atkinson of Meadow House, Hutton, was elected a Member of the Club. A number of papers and notices on different subjects connected with natural history were read—the 1*st*, a paper by Mr Carr of Hedgely, on the flight of the Peregrine Falcon in pursuit of its prey; the 2*d*, A contribution from Mr Henderson, being some additions to the popular Rhymes of Berwickshire, and a sequel to those which have already appeared in a former number of our Transactions; the 3*d*, A paper by Mr Hardy on the vegetation of Willows, which must have been inhumed for some centuries. These interesting observations were made by Mr Hardy upon the trunks of a number of Willows, which had been exhumed during the formation of the Newcastle and Carlisle railway, near the village of Dunston; the 4*th*, A paper by the same gentleman on the Solar Halo; and a list of Insects collected, in July 1843, in the neighbourhood of the Pease Bridge, amounting to the number of 333. Dr Johnston read a notice of the occurrence of the Quail at Scramerston; and a short account of James Stuart, better known throughout the district under the sobriquet of *Jamie Strength*, an old man, who died at Tweedmouth at the advanced age of 115 years.

The favourite locality of Abbey St Bathan's was the place appointed for the meeting in June; but, *proh pudor*, will it be credited by the numbers now assembled, that a retreat so interesting, the precincts of which have been described in such graphic and glowing colours in a former part of our Transactions, and which had witnessed several of our happiest meetings, remained untrodden save by the feet of the founder and master-spirit of the Club, who, nothing daunted by a threatening sky, ever punctual to the tryst, enjoyed, he tells me, amidst the sweet and peaceful scenery of St Bathan's valley, a long and pleasant day.

The July meeting was held on the 14th, at Coldingham, where the following Members were present, viz., Mr Selby, President, Dr Johnston, Mr Boyd, Sir Thomas Tancred, Rev. J. D. Clark, Rev. M. Walker, Mr Home, Rev. J. C. Atkinson; and Messrs Atherston and Lambert favoured the Club with their company, as visitors. The beautiful weather that had prevailed up to the morning of our meeting, gave flattering hopes of another auspicious day, but these were destined to be speedily destroyed; for, before we had finished breakfast, a thick haze or wet mist was observed to be rapidly advancing from the south-east. The "Head"* being the principal object of the walk, the party proceeded by way of Northfield, and along the ridge of the impending cliffs. On arriving at the "Head" itself, much of its interest and beauty was obscured by the increasing thickness of the fog; but enough of its features could still be seen to give an idea of its impressive grandeur and boldness. Of the innumerable flocks of aquatic fowl which annually breed in this locality, the greater part had already taken their departure; the Guillemot and the Kittiewake being the only species left in any considerable numbers. Upon these some of the party, armed with rifles, tried their skill, but without effect, the birds in every instance going unscathed, and, as it were, mocking each vain effort with a loud derisive cry. After crossing the "Head" the party descended to Pettycur, and thence through the fields to Coldingham Lough. Before we had reached this point a heavy rain had commenced, which forced one-half of the company to seek shelter in a cottage, while the other half turned homewards to their inn, to find comfort in a change from wet to dry. During the walk, many of the plants already recorded as growing upon the "Head" were observed in their appropriate habitats, but nothing occurred until the party reached the Lough, where a single specimen

* St Abb's Head.

of *Habenaria viridis*, a plant of very rare occurrence in Berwickshire, was found by Mr Selby.

During the vacant time before the appointed dinner hour, the Church and remains of the ancient Abbey were visited by such of the members as had not attended any of the former meetings of the Club at this place. After dinner, and the customary toasts (no minutes of the preceding meeting being forthcoming), Dr Johnston proceeded to exhibit two stone bowls, probably of British origin, lately found in Berwickshire, and sent to the Club by Mr Hardy in illustration of his paper on bowling. He also exhibited a specimen of a *Trilobite*, found in the limestone in Berwick Bay; and a fine specimen of a new British Crustacean, the *Nymphon giganteum*, distinguished from all the species hitherto described, for its great superiority in size. The specimen was described by Mr Goodsir, and discovered by Mr Embleton in Embleton Bay.

Such, gentlemen, is the imperfect sketch I have to offer, of the proceedings of the Club during the past year; and though its discoveries in a scientific point of view cannot boast of being either so numerous or so important as on several other occasions, still in a field now often trodden, and in a district of no extensive limits, we have succeeded in adding to its local Flora, as well as to the Fauna of the British Islands.

Interesting, however, as each new discovery must ever prove to those engaged in our pursuits, I wish, at the same time, to impress upon my fellow members, that the merits and usefulness of the Club are neither bounded by, nor are they to be estimated by such discoveries, however numerous or important they may chance to be. It was founded with intentions more important, and directed to objects of a higher and more praiseworthy nature; but as these have already been explained, and pointed out in many of our previous annual Addresses, in terms and language far more forcible than any I could urge, I make no apology for abruptly concluding an address which I am sure must long ago have tired my hearers, and put their patience to the proof.

On the Flight of the Peregrine Falcon in pursuit of prey.
By Ralph Carr, Esq. of Dunston Hill.

The flight of birds is something so graceful in itself, and so captivating to many lovers of natural history, that, when some of our

commonest native species glide past us in their full freedom, it is found impossible not to stop and turn to watch their movements. Such a feeling of admiration for birds upon the wing, is not uncommon in boyhood, and may be quite unconnected with any wish to capture or possess them. In my own case, it was not only strong at that age, but has remained undiminished until now, often relieving the weariness of a journey on foot or horseback, not to mention the much more wearisome penance of coach or railway. It is always some advantage if a man's thoughts can be amused, and blue demons kept at bay, by a swift, a sandpiper, a tern, or a pair of peewits; and if he can look at a flock of golden plovers, a chain of wild-geese, a company of seagulls, or a hawk of any kind, with the same sort of pleasure that is felt by every body in observing the symmetry, and fine movements of a race-horse or a red-deer.

To every one who can understand the fascination of this part of an ornithologist's pleasure, the Peregrine Falcon cannot fail to be a most interesting bird. It is not only one of the strongest and most graceful flyers among the rapacious tribes, but is second only to the Iceland Falcon in peculiar associations connected with the falconer's venerable craft, and so, even with poetical and historical lore. I cannot but hope, that the ultimate tendency of Societies like ours, for promoting and calling into action a love for natural science, in all its branches, will be to induce gentlemen to protect all our finest indigenous birds in their favourite haunts, and especially around their breeding places: that many will be led to look at the towering eyrie of a Peregrine, upon a moorland precipice or sea-beaten cliff, with more pleasure than on the brood of grouse, for the sake of which the gamekeeper would have prepared his gun and his traps against their nobler neighbours; a pastime, for which our ancestors would have condemned him to entrap mice in a prison, and for which Mr Waterton would justly "throttle him."

Prejudice, and a too scanty knowledge concerning the habits of the falcon, are the cause of this needless and utterly tasteless persecution. Grouse are undoubtedly now and then brought to the eyrie among the numbers of rooks, plovers, starlings, pigeons, "cushats," and sea-fowl, that make up the principal sustenance of the ravenous young inmates; but they are not the grouse of the adjoining moor, or of any place within three or four miles. All those in the neighbourhood must have seen the falcons a hundred times going to and from the eyrie, and it would require the gamekeeper and all his dogs

to spring them, and make them take wing while the enemy is in sight. But they are quite aware of their safety on the ground. They know well, although the gamekeeper, and his master even do not, that the long-winged hawk will never dash out her own brains by dealing her impetuous stoop upon a sitting prey. They know, moreover, that she and her keen-winged mate, the tercel, will keep far more dangerous enemies at a distance, namely the carrion crows, the hen-harrier, and even the raven. It is in crossing over the more distant moors that the falcon now and then is lucky enough to espy a grouse on the wing—flying, perhaps, to water, or sprung by the shepherd's colley—and then, certainly, woe betide it, unless it has time to throw itself down upon the heather.

Partridge and pheasants are perfectly safe, unless the falconer, with his dogs, is in the league against them. Old black-game are not much afraid of the Peregrine, which will rarely stoop at them unless specially trained, and the young birds never expose themselves, being especially addicted to the ground. For my own part, I would cherish a falcon's eyrie even in the midst of a grouse-moor of any extent, if only for the profound respect in which it would keep the whole generation of corbies, old and young; forcing them to forage in the enclosed country, and to shun the open moor. But more of this latter bird hereafter, and of its singular dealings with regard to the Peregrine.

Having hazarded these preliminary remarks, I must hasten to the subject of this paper. Avoiding all details that pertain only to falconry, I will endeavour to describe some circumstances as to the falcon's mode of flying at different kinds of prey, regarding her conduct both as a wild denizen of our free border air, and as obedient to a falconer's training. The history of rapacious birds will always be incomplete, until accumulated observations, taken in districts like our own, favourable for the purpose, shall enable us to know their habits under excitement as well as at rest. They should be especially noticed in the neighbourhood of their nests, and whilst engaged in providing for their ravenous broods; a task requiring caution, patience, and forbearance, in the observation—which some of our friends will perhaps call into use on some future occasion, and with far more benefit to the subject than is to be expected from any thing I now hope to offer.

In mentioning the falcon's mode of dealing with different birds, and their different endeavours to escape, it seems best to begin with

those objects of chase, which are the most natural to her, which she is most on the look out for when hungry, and which she flies most keenly to capture. This is the naturalist's best order of proceeding in such a matter, though, certainly, not the falconer's, who often has to contend with her troublesome predilection for pigeons and rooks.

Every year, during the autumnal months, or from about the middle of September until Christmas, our Border district is visited by peregrine falcons, on that errand of migration which has gained them their distinctive denomination of *Peregrinus*, a name that has been well conveyed into popular language by the old term, passage-hawk. At that season, the species, though never abundant here, is far from being rare. Most of the individuals seen are the yearling birds, known among falconers as "Red-hawks." Their russet-brown plumage enables us to distinguish them, in a favourable light, at a considerable distance, from an old bird, which is much lighter in colour; the whole upper plumage being ash-grey after the summer moulting. The falcons, properly so called, fly very differently from hawks of the more sluggish families, such as the kites, harriers, and buzzards. The wings, which are gracefully pointed, are moved with strong and muscular strokes, these being given with considerable rapidity, and reminding us somewhat of the common pigeon, which has the same free decided action in her wings, and probably about the same relative weight of body to support. Allowance must of course be made in such a comparison, for the hawk being so vastly larger.

In size and extent of wing, the female peregrine may be compared to the curlew, and the strokes are given with about the same rapidity as in that bird. The curlew itself may be regarded as the strongest and most perfect flier among our large birds; mounting aloft with astonishing ease, proceeding extremely fast, and, in the season of courtship, performing the finest evolutions in the air which it is possible to witness, accompanied by those thrilling characteristic notes that delight every traveller upon the moors. I may observe, in passing, that it is but rarely a falcon can succeed in killing a curlew, and that I have never witnessed even a pursuit. The tercel or male peregrine is fully one third smaller than the female.

In both sexes, all the movements bespeak strength and energy, and are, at the same time, peculiarly graceful. Hence, in contradistinction to the short-winged and more sluggish goss-hawk, the French and Norman falconers called the peregrine, *Faucon gentil*, using the

term, *gentil*, in the ordinary sense it still bears in the French language, namely, that of *graceful, elegant.*

Our attention is generally first directed to the bird's presence within sight, by signs of consternation among the pigeons, rooks, and peewits, as they take the alarm, and rise suddenly from their autumnal feeding grounds. As these birds are then generally assembled in large flocks, their movements attract the eye, and lead us to look for the cause.

If, for instance, we see the pigeons suddenly start from the roof of a dovecot in considerable alarm, but wheel close round the buildings, instead of mounting in the air, or flying boldly away, we may look overhead with a good chance of seeing the peregrine in the act of reconnoitering, by passing over the premises at a considerable height, and slowly. Her beautiful pointed wings will be finely shewn against the clear sky of an autumnal morning. So long as they keep near home, the pigeons are perfectly safe; but if any stranger belonging to another farmstead, should venture to break away, or if any of the inexperienced young should happen to fly wide on their first alarm, she will not fail to stoop, and will probably secure her prey. There is never the slightest danger to chickens or other poultry from such visits, as the invader is heedless of objects on the ground. I have seen a large brood of chicks reared from the egg to maturity, where five peregrine falcons of mine were regularly allowed, in their turns, to fly at large. They never molested the poultry, nor were at all dreaded by the parent hen as they passed over her brood, hungry and ready to pursue anything on the wing. Had we thrown a chicken into the air, its fate would have been instantaneous; and chanticleer himself would most likely receive his death-blow if thrown aloft before a falcon, or even a hungry tercel. To young poultry, the sparrow-hawk, on the other hand, is sometimes a mischievous enemy; and will frequently carry off young pigeons from the roof, or from the very threshold of the door. On *her* appearance, the pigeons act very differently, and seek refuge at once up in the air by speed of wing, for the sparrow-hawk will not follow far, nor attempt to seize a prey at any great height from the ground, although she will often soar aloft for mere amusement.

In calm weather, and if the falcon does not stoop from above, but commences the chase on a level with a flock of pigeons sprung from a stubble or field of new-sown wheat, I believe they will generally escape in safety to the dovecot, or even rise higher in the air than

their pursuer, and so set her at defiance. But even in such a chase as this the tercel would be very likely to kill his bird, as he will often mount with great spirit and success under discouraging circumstances. I am inclined to suspect that pigeons, when hard pressed by falcons, are sometimes half suffocated from having been surprised with a full crop, and so fall an easy prey where they would otherwise escape. This, however, requires confirmation; and is yet little more than conjecture. In windy weather the long-winged hawks fly with great spirit, if the day be fine and the gale not actually tempestuous. They are also invigorated by cold. At such times, I believe, they are more than usually successful in their attacks upon flights of pigeons rising from the stubbles. They fly with overwhelming speed downwind, very rapidly across the wind, and even beat up directly against it as quickly as domestic pigeons. The rising and descending of a falcon across or against a high wind is beautiful sometimes in the extreme; and her alacrity in such weather terrifies the quarry before her, and prevents it from seeking safety by mounting.

I have seen my own pigeons pursued to their dovecot from the stubbles by a young red falcon, which passed close by me, and then gracefully raised herself over the house and trees. On that occasion she was not successful, having had perhaps too short a flight; but the day before she had been seen to strike down one of the flock just as it approached the premises. This bird might have been captured, by means well known to falconers, without injuring a feather, and trained to distinguish herself in the field. It may be observed, that the chase is always terminated, if the falcon be not successful, before the flock can approach the dovecot or farm-buildings. Her stroke is always dealt with such impetuosity, that she is afraid to give it if either trees or buildings, or even a high hedge, should be immediately before her. It would endanger her own safety too much; and, by coming in contact even with the spray of a hedge, her wing-feathers, of which she has good reason to be careful, would be broken.

I may now mention how a favourite falcon of my own would pursue this quarry instinctively whenever she could find a stolen opportunity. She had never been exercised at pigeons by design, as I consider there is more cruelty than sport in turning out cowed and terrified birds from a basket, to certain destruction, if the hawk be a high flighter, and worth having. But pigeons accidentally met with on the wing are in no such woful predicament, but very competent to take care of themselves, and to amuse spectators in doing so, or

failing, as it may happen. If we may judge of quadrupeds and birds from what is known to be true with regard to human beings, we may reasonably believe that great muscular exertion during the endeavour to escape from an enemy will supersede and annihilate fear. The wonderful skill and readiness of resource which a hare displays to defeat the greyhounds, is not compatible with overwhelming dread or panic fear, as we understand those sensations. If pigeon-hawking be required, let it be followed in the open stubbles, with a cast of high-spirited tercels, and in fresh breezy weather; getting the hawks into the air well away to the windward of the quarry, or with the advantage of rising ground, or lastly, by being interposed between the flock of pigeons and the dovecot to which they are expected to return. Or another course may be followed, near any open airy farm-stead, free from trees, and having a well-stocked dovecot and a friendly owner, or one who will be so for "a consideration." Let a brisk windy day be again selected, and a cast of tercels or a falcon and a tercel. Let the hawks be unhooded, but held on the fist with their breasts to the wind, while a noise is made to alarm the pigeons slightly, and cause them to circle round in the air. When the hawks are seen to be intent on watching the flock, and eagerly extend their own wings, let a gun be discharged, and the hawks instantly cast off. The report will send the pigeons off towards the fields, or on a wider circuit, whilst the hawks will mount quickly on the wind, and will either pursue the flock, or be ready to stoop as they again approach. A flight obtained by the hawk in this way would be a dashing one requiring all her skill and speed. As she is more than likely to be defeated by the active quarry, a fresh-killed young pigeon must be ready to be thrown to her on her return to the lure. A clever tercel with a little practice of this kind near different dovecots (for such a breach of hospitality should not be repeated for long at the same), would soon enter into the plot, and perform his part to admiration; and he would learn to mount literally "on the wings of the wind," on being carried within sight of pigeons on a stubble.

Such is the course I should take, if compelled to have recourse to pigeons as a quarry, in the absence of partridge and snipes. It may be well to observe, in explanation, that the male bird or tercel is recommended to take the lead in this kind of chase, not for any superior speed (which he does not possess), but because he can get more quickly into full speed when flown from the fist, and will often

mount with great keenness and resolution. The peregrine, even in a wild state, is not much alarmed at the noise of a gun, and nothing is easier than to make hawks in training altogether indifferent to it.

This is a digression from the description of the falcon's own free mode of pursuing pigeons, and may seem to be matter only for a falconer. The object, however, was to shew how we may contrive with trained falcons to obtain a fair flight at pigeons without resorting to boxes and baskets. To see a fine headlong stoop, or to witness the hawk get the command of her game, and beat it down, ought to satisfy the true admirer of the sport. If the pigeon has dashed into a hedge there let it remain and escape. The hawk knows that she mastered it in the air, and will be very well pleased with the substitute we have got ready to offer her in a fresh killed nestling from the dovecot.

To have practised this kind of exercise with my own hawks would have been easy. They were always eager to fly at pigeons when an opportunity was offered, but as my object was to make them prefer game, and to wait in the air upon the movements of the dogs and beaters, we never designedly approached a dovecot. One very fine female falcon of the second year (having flown much at liberty during the summer), would now and then make a swoop at our pigeons, when her blood was up from a recent disappointment after partridge. One day, having driven a partridge into a hedge, not far from the farm-yard, and having thrown herself up into the air (as is always observable when the fatal stroke has been evaded), I saw her mounting up with her breast to the north-wind, instead of wheeling round, and "waiting on," until the partridge could be again started. It was evident she had something before her, for her training was excellent, and she knew her duty perfectly. She had scarcely reached a good position, when a flight of pigeons appeared, coming down the wind at great speed and making for their dovecot, just as a hare will press on towards a cover in spite of a greyhound slipped to intercept her.

The falcon hung on the wind till the flock going like lightning had passed under her, when she instantly stooped in the grandest manner, and by the impulse threw herself first in behind them, and then again up aloft, exactly over the foremost birds and completely commanding all and each. She now selected a white pigeon, and descending upon it, down it went into the rough herbage of a hedge, with merely a feather or two grazed from its back and quite unhurt;

the falcon, instead of turning round to secure her prey, as she would have done with a partridge, was content with her victory and came straight to the lure.

Another day, when we were exercising her, she flew wide and disappeared, probably to bathe. On going home, knowing that she would soon appear there, I heard her bells at a distance, but rapidly approaching with that peculiar running chime so sweet to a falconer, as shewing that the hawk is at full speed, and must have a quarry before her. The next instant she came in sight, sweeping a flock of pigeons homeward before her from the stubbles; just as they got over the plantations she stooped, when two pigeons fell down through the high trees to the ground as if shot, though both untouched. A third took refuge in a bed-room by entering at an open window. The hawk then throwing herself up to a great height and making a circuit or two, came down like a falling star on seeing the lure; and was soon receiving her reward in a good meal of beef upon her block.

But, *sat superque de Columbis*, nor would I have said so much about the peregrine's pursuit of this one bird, were it not that, in its wild state, the pigeon is so numerous a species in the south of Europe, on the cliffs both of the ocean, and of the Mediterranean Sea, with all its rocky isles and headlands.

We cannot doubt, that to prey on the rock pigeon in those regions must be pleasant pastime for the falcons bred in the Highlands of Scotland, the Hebrides, and the west coast of Norway, after they leave our Northumbrian moorsides and proceed southward. These hawks being swift enough to overtake, and strong enough to hold and quickly strangle the pigeon in question, are perhaps one of the checks ordained to keep down its numbers, and prevent infirm and weakly individuals from perishing by a slow and lingering end. We see such a beneficent provision on all sides in Nature. Rapacious qradrupeds and birds of prey are no longer supposed to be mere scourges to the creation, but one of its most merciful means for providing against protracted sufferings.

I will now close a communication so much too long for the little pith and substance imparted. Having begun the subject, and got over the prolixity, so difficult to avoid in bringing it to bear intelligibly on the natural history of the peregrine, I will hope for some future opportunity of making shorter extracts from my memoranda of the bird's prowess after other kinds of prey. She, or her helpmate, the tercel, fly keenly in pursuit of many different birds, and espe-

cially of the green plover, the rook, the carrion crow, the lesser gulls, the snipe, the teal, and all the gallinaceous game birds. With some of these I have seen the wild falcon occupied, and with them all we have had good sport with our reclaimed individuals of the species. For, to quote the words of old Belon, one of the fathers of natural history, generally, as well as of ornithology, "Le faucon pelerin est naturellement vaillant, hardy, et de bon affaire, et moult courtois à son maitre. Cest Oiseau est de sa propre nature franc à tout faire." So says Belon in his manly old French, and adds, "On le prend en la saison d'autonne; car alors il passe de païs en autre."

Note on the Glow-worm. By Mr GEORGE HENDERSON, Surgeon, Chirnside.

The *Lampyris noctiluca* seems to be a rare insect in Berwickshire, and I do not know whether it has been noticed by any member of the Club. On passing up the post-road, on the evening of the 5th of August last, between Houndwood Inn and Renton,* I observed "a modest ray" emanating from the wooded bank on the north side of the road. I was convinced that it was the lamp of the glow-worm, although I had never before seen it; but being then on a professional visit, I had no time to stop, and examine from what source the light proceeded. It was one of the mildest and most beautiful nights of the season, and, on my return, about midnight, I fondly expected again to see the object of my wishes. I was not disappointed; at the same spot, the insect was diffusing its mild radiance on the grass and bushes in its vicinity. The light appeared most beautiful, and I could not help exclaiming with the poet, surely

> "There's not a fairer beam than this
> In all the expanse of day!"

I alighted and captured the creature from the top of a long stalk of grass, on which it had taken up its station. Although I have often passed along the same road, in all seasons, and at all times of the night, I never saw one of these interesting insects, except the individual which accompanies this note; but, doubtless, the glow-worm

* Many years since, the glow-worm was noticed in this station by the late Mr A. A. CARR, author of the "History of Coldingham."

has been long an inhabitant of the woods in the vicinity of Houndwood and Renton. I have been told by an intelligent workman, who was employed in forming the post-road below the latter place, about thirty years ago, that he caught several specimens of the glow-worm there, and kept them for some time in a common drinking-glass. It is likely, I think, that the glow-worm will be found in the Pease Dean, and other sheltered places in Berwickshire.

CHIRNSIDE, *December* 12. 1843.

Addenda to the Local Proverbs, &c., of Berwickshire.
By Mr GEORGE HENDERSON, Chirnside.

1. "She comes and goes like the Coll-mill burn."

The "Coll-mill burn" flows into the sea below Coldingham. Descending from the moors, the stream is quickly increased by rain, and as quickly lessened by drought, hence the application of the proverb to a person who is well to-day and ill to-morrow. I was once asking a man how his wife was, when he replied—"She just comes and gangs like the Coll-mill burn."

2. "*Renton* is its name, and *rent* it will be."

We have here an example of an alliterative proverb, and probably it has little or no meaning; but the peasantry who are fond of tracing worldly calamities to the immediate judgment of God upon any man who has rendered himself obnoxious to them, by conduct of which they do not approve, say, that *Thomas the Rythmer* thus prophesied the downfall of the family of Renton, because of its wickedness. Sir Alexander Home of Renton, who was sheriff of Berwickshire from 1616 till 1621, was very vigorous in the discharge of his duty, and consequently incurred the hatred of many under his jurisdiction, and hence they wished that his estate would be *rent* from him or his descendants; and the country folks yet tell that the *Rythmer's* prophecy was verified upon his family,—the Homes having now not a foot of land in the place.

3. "She's like the man o' Amperley's cow; she's come hame wi' the tow about her horns."

That is, the cow came home unsold; and the proverb is applied to a young woman, who comes home from the fair or market without "a jo'," or sweetheart. *Amperley* is the name of an abrogated

farm, which lay on the south side of the Eye, opposite the modern and beautifully situated Inn of Houndwood. It now forms part of the farm of Horseley, and its onstead is long since levelled with the ground. *Amperley* was granted by the monks of Coldingham to one *Lewis de Cornoioi* in 1334.

4. "You're like Adam Weir's brood-sow, you have not a friend in the world."

Adam Weir was an eccentric farmer somewhere in the Merse, we think about its northern boundary. When men, boys, and dogs were disposed to persecute his brood-sow, for her mischievous habits, Mr W. took her under his protection, and would not allow any one to injure her, saying that "she had not a friend in the world but himsel'." And when a youngster among the peasantry is rather "hempie," and is run down by his companions for his faults, some one will befriend him, and say, "You're just like Adam," &c.

5. "You're like Adam Black's pony, nothing will tame you but marriage."

About fifty years ago, a cadger of the name of A. Black lived in the village of West Reston. He had a wild, camstary pony, that had a bad trick of shying at a whinbush, a grey stone, or any other object it thought suspicious; and, setting off at full speed, it sometimes threw the creels into the ditch; consequently, breaking the eggs and every other thing breakable which they contained. One day the beast was about to play one of her usual tricks, when Adam laid firm hold of the halter, exclaiming, "Confound you for a ————, I wish to gudeness I could get you married, for I dare say naething else on earth will tame you!" This saying came to be a proverb, and is now frequently applied to a forward, romping girl, when going on in her fun and daffing.

6. "Fair and honest John o' the Bank."

When one country man wishes to compliment another for his honesty, frankness, and independence of mind, it is often done in the words of this saying, "Ay, you're fair and honest John o' the Bank." The person who gave origin to this saying was a Mr John Richardson, tenant in Blackadder Bank, in the parish of Edrom, about fifty years since. He was a wit, and the "king of gude fellows" in his day, and was, moreover, much addicted to dancing. When staking a bargain with any person, he was wont to commend his own honesty and truthfulness, by saying that he was "fair and honest John o' the Bank." He had a neighbour Mr Thomas Black-

adder, who was a tenant in Blackadder East Side, and who is remembered for his poetical talents and country wit. "Fair and honest John's" cattle having trespassed upon his neighbour's fields, Mr B. sent him a rhyming epistle, of which the following lines are a specimen :—

> "John o' the Bank, your queys and stots
> Hae trampled a' my turnip oats;*
> But as you're a good neighbour and famous dancer,
> For queys and stots no man can answer."

* * * * * *

This same Thomas Blackadder wrote a ballad on Tam Gordon, the Spittal gipsy, who had "a lawless love of mutton." This ballad obtained considerable local fame in its day, but it is now forgotten.

7. "Go to Heckspath, and spean young deils!"

This terrible denouncement is applied on similar occasions as that of "Go to Birgham!" *Heckspath* lies on the northern confines of the parish of Gordon. *Hecks*† or *Hexe* signifies a witch or sorceress. "An old Hexe," means an old witch, and is often applied, in a bad sense, to females of the present day.

8. "The earliest ha'rst (harvest) that e'er was seen, was seen at Bentydod."

Bentydod is among the wildest and bleakest places in Lammermoor; and its harvest was *so early* that they were shearing there on a *New Year's* morning.

9. "She's as fu' o' maggots as the bride o' Preston."

We have not been able to learn who the "bride o' *Preston*" was; but we have frequently heard the proverb applied to young women who are capricious and changeable. The bride alluded to, with the bridegroom, and a gallant company besides, were on their way to Buncle, in order to have the marriage ceremony performed. But the bride "took the gee" at a place called Buncle West Mains, and would not proceed a foot further for any persuasions.

> "The bride took a maggot, it was but a maggot,
> She wadna gang by the West Mains to be married."

Whether she ever "came to, like the bride o' Winton," we will not venture to say—but it is a most likely result; and ere the sun had set, we believe the rural musicians would be heard playing after her the bridal tune—

* Oats sown after turnips.

† From *Haxa* (Saxon), a Druidess, or chief priestess.

"She's yours—she's yours—
She's nae mair ours;—
Owre the kirk-stile,
And away wi' her."

10. "You're like a Lauderdale ha'penny, not much worth."

The Duke of Lauderdale, who was at the head of affairs during the "persecuting times," had, it appears, a principal hand in some obnoxious coinage.* The *bawbees* which were issued from the mint at that time, soon became base coin; and the "Lauderdale halfpenny" was branded with infamy. Hence the application of the saying is obvious.

11. "The buttered peas of Lauderdale."

"Buttered peas" have been recommended as a specific in a certain disease; but those who wish to have some notion of this disease, had better read the graphic ballad of "The Auld Wife o' Lauderdale," in Lyle's Ancient Ballads and Songs, London 1827. The "buttered peas o' Lauderdale" are often mentioned by country folks; and natives of that district say, in the words of the song—

"Of ilka place it is the wale,
The sweet and pleasant Lauderdale,"

12. "In the howe hole o' the Merse a' the folk are bannock-fed."

The men of the Merse, have reason to be thankful for this distinction. The saying points to a period when *barley* instead of wheat was the staple grain of that fertile district; and my father remembers the time, when a cadger went once a-week from Chirnside to Berwick for *eighteenpence* worth of *wheaten* bread, and he had often much difficulty in disposing of that quantity, which served the village and neighbourhood for a whole week;—nobody then, about sixty years since, eating wheaten bread except infants and sick people. Pease-and-barley bannocks were then the staff of life;—these are now scarcely ever seen, except in the houses of the hinds and cottars.

13. "Ca' away callant, for the deil a bit o' yon man I like."

This is a very popular proverb in the east end of Berwickshire, and it had its origin in the following incident:—Many years ago, an old man lived in West Reston, who was a maker of baskets, a mender of clocks, and in short, a Jack-of-all-trades; and the word went that he was otherwise than honest, having been detected more than once making rather free with some of his neighbours' coals, corn,

* The Duke of Lauderdale was no relative of the present family.

turnips, potatoes, &c. One summer he conceived a fancy for some peats, which were dried and stacked up at the Dron moss, on Coldingham Moor; and taking advantage of *a king's fast day*, for he was not over-loyal, he took his son's cart, and a boy, and set off to bring home a load of peats. After he had packed the cart as full as it would hold, and had begun to drive homewards, he observed the owner of the peats coming across the moor; he immediately cried out to the boy who was driving—"Ca' away callant, for the deil a bit o' yon man I like!" He had truly no cause to like him;—and the *denouement* may be anticipated,—he had to leave the peats and return home empty-handed. During harvest or hay time, should the master be absent for a while from his work-people, they sometimes slacken a little in their labours—and when they see him returning, we have heard them, in a sportive manner, say to one another—"Ca' away callants," &c. in order to excite themselves to further exertion.

14. "Langton's coat," and "Bowmaker's purgative."

To be under "bowmaker's purgative," is to feign sickness for the purpose of avoiding punishment, or some disagreeable duty. And we have heard it said of an apostate, who forsakes his party in religion or politics, that he has on "Langton's coat." We have the origin of these sayings pointed out in the words of David Home of God's-Croft, in the following passage of his MS. "History of the House of Wedderburn." "In the month of June 1497, the English made an incursion into the neighbourhood of Dunse. In this incursion, two things happened," says Home, "which, though they are both very ridiculous, ought not, perhaps, to be passed over in silence. Langton (Cockburn of Langton), being alarmed, as we have already said, happened to run out unarmed. When he saw that the engagement was drawing near, he ordered his men to dismount, and he himself hastened to shew the example. Some of his vassals very unwillingly did what he commanded them; but out of care to their master, advised him to keep upon his horse, and not rashly expose himself to armed men (for he was altogether unarmed)[1]; to whom he said, that he would turn the coat he had on outside in, which, as it was white in the inside, would have the appearance of a coat of mail to the enemy; and with that he leapt from his horse into the midst of his men, and there fought so stoutly, that he deserved and obtained great praise of all. The other is surnamed Bowmaker. Having by chance, a few days after, fallen into the hands of the English, he is said, with many tears, to have be-

seeched them for mercy, telling them at the same time, that he was not present at the battle of Kelloe,* (for so the village is called, in the neighbourhood of which it was fought); nay, says he, so very innocent am I, that I was that very day confined to the house with physic, *and dined upon chickens.*† Both these stories went into proverbs, and continue so to this day."‡ They are "Langton's coat of mail," and "Bowmakers' purgative." By the one is marked a presumptuous (though brave) security; by the other cowardly innocence, or "ane innocent coward."

15. "Fast-Castle, if ye be ta'en,
Fair fa' you Johnny Robertson!"

Fast Castle was, about the year 1550, taken by stratagem from the English. Tradition avers, that a person of the name of *John Robertson* planned the process by which it was regained to the Scots. The surrounding district being under the sway of the English, while they held this stronghold by the sea, they had ordered the natives to bring in a quantity of peats for fuel, for the use of the garrison. The peats had to be carried in sacks on men's shoulders, along the narrow drawbridge which led to the gate; a considerable number of Scotsmen arriving together with their loads of peats, each one took up his sack, and proceeded to the castle. Two or three of them passed in with their loads without throwing them down, the more readily to lull suspicion—but those following threw down their sacks in the gate-way, which effectually prevented the gate from being shut, and drawing the weapons which they had concealed under their garments, they quickly overpowered the astonished garrison. When John had planned this exploit his neighbours congratulated him with the rhyme at the head of this paragraph: and no doubt when the plan was accomplished, he would be duly rewarded for the deliverance he had achieved. The rhyme is still passed from mouth to mouth, among the peasants in the neighbourhood.

CHIRNSIDE,
13*th December* 1844.

* Kelloe is beautifully situated on the northern bank of the Blackadder, in the parish of Edrom. It is now the property of George Buchan, Esq.

† It is still the custom in some parts of the country for mothers, when they put their children under physic, to give them *chicken broth*, in order to assist the operation of the medicine.

‡ Home's history was composed about the beginning of the seventeenth century.

On the Revival of Subterranean Willows (Salix aquatica.)

By Mr James Hardy.

> Nec prior mundi, Rosa morte dira
> Nostra peribit.
>
> Sir Robert Sibbald.

> Torn up by storms and placed in earth once more,
> The younger tree may sun and soil restore;
> But when the old and sapless trunk lies low,
> No care or soil can former life bestow;
> Reserved for burning is the worthless tree.
>
> Crabbe.

"Som trees grow easely and encrease with spede, as they that aryse up by rivers or waters, as the elm tree, the playn tree, the water asp, and the wylow tre." The observation is that of Theophrastus, the distinguished disciple of a still more celebrated master. Besides the exuberance of the vital principle with which these trees teem, advancing their growth beyond the slowly attained bulk and maturity of the nobler denizens of the forest, and issuing forth in prodigality of rank shoot and scion, when accident or injury endangers the existence of the parental trunk, they possess in the structure of their roots and stems, independent of their numerous fledged seeds, expedients for perpetuating the race, to an indefinite extent. In the elm, this power resides especially in the root, which, when divided or wounded, emits from the incisure, with prolific effusion, a progeny of vivacious saplings, each more prompt than its fellow to repair the threatened curtailment of Nature's fertility. In the willows and allied tribes, this office is consigned to a series of protuberant eye-like specks (*lenticellæ*) distributed at intervals over the bark, from which, when a section of the tree has been inserted beneath the soil, as from germinating seed, tender radicles protrude their rosy, sap-absorbing fibres; while, from those placed beyond the reach of the subterranean influence, a profuse array of twig and branch, edged with broad ample foliage, attests the vigorous and overmantling abundance of the procreative animus with which every slip and fragment is indued. An instance of the long continued resistance to the insidious encroachments of decay and dissolution, that, invested in this impregnate panoply, the latter tree is enabled to present, has recently been observed; which, as an addition to the curious particulars al-

ready known concerning the retention of the vegetative functions, under singularly adverse circumstances, appears well worthy of being recorded.

The Gateshead branch of the Carlisle and Newcastle Railway (commenced 1829, completed 1838), to provide against damages that might ensue from the inundations of the Tyne, is elevated on an earthen platform, at a considerable height above the level alluvial basin of the river, along which its course is directed. To raise this artificial mound a great supply of earth was requisite, a proportion of which was derived from excavations within the limits of the Railway Company's property; that flank the line on either side, like the now nearly obliterated pits of similar origin, sometimes occurring parallel to the old Roman causeways. While digging one of these trenches, in the immediate vicinity of Dunston, and to the west of that village, the workmen, at a depth of 7 or $7\frac{1}{2}$ feet, and over a space whose length is very considerable, and in breadth about 43 feet, came upon a number of willow trees of large size, lying in a variety of directions, entombed beneath a covering of mould. Several of the trees, according to the statement of an intelligent individual acquainted with the facts, exhibited few vestiges of injury they had sustained from their protracted inhumation, being in general quite hard and compact, strongly tinged with a sable hue, and resembling in various particulars those oak-trees that have been for a long period buried amid an ancient peat-moss. The soil in which they were discovered is entirely alluvial—a deep rich mould, rather moist—but if kept free from humidity, reckoned good wheat land,—containing little sand, and no traces of peat.

What became of the more solid of the trees I have not learned. They were probably removed for firewood, or some other economical purpose, as I noticed the marks of the axe on one of those remaining. The more infirm and dilapidated were at least left behind, and still retain, submerged in mud, the position they occupied, when after a repose of centuries, the light of day, and the influence of the elements were once more permitted to exert their subtle, "secret-working" agency on their feeble and shattered frames. That operation was indeed of the most wonderful and penetrative character; for in a brief space it was observed, that those black inanimate-like trunks yet retained the lingering germs of vitality, that, long repressed, and again brought into circumstances suitable to their development, with strong effort collecting the dispersed virtue, threw it forth from its

points of concentration along the stems, in a young growth of saplings, such as are produced in healthy trees of the species when pollarded, or cut over above the root, but deficient in respect of luxuriancy, vigour, and numbers.

I visited the place on the 14th of October 1843, and examined the present position of the trees. The fosse in which they occur resembles a canal or reservoir, the bottom of which is covered with water, partly from the influx of the tide, and the drainage of the soil, but principally from a stream passing along its edge having access to it. To the eye this does not appear, the surface being matted with a rush of grasses, junci, and marsh-frequenting plants, or spotted at intervals with annually widening patches of verdure, derived either from seeds mixed in unimpaired soundness with the mould, or that floated hither by the winds and currents have obtained befitting and congenial sites. The young willows are scattered along the bottom of this excavation, as if it had been the original elevation of the ground, whence they drew their pristine sustenance. I met with the remains of two trees, and the stumps and roots of three others, from which recent shoots had issued. One of them was a fragment of nigh twelve feet in length, with a diameter of one foot nine inches. One half of the trunk was corroded and gone, the remainder was exceedingly black, rotten, shivery, and, like most of bog timber when a short time exposed, crumbling into dust between the fingers, or beneath the foot, excepting at the knots, or as far as their indurating influence had reached, where the wood was yet firm and tenacious. It was from underneath one of these that a sapling had originated—not now, however, in connection with the tree. Of this the tallest wands were six feet six inches from the ground. The other tree had a diameter of one foot, and was still more ruinous, being almost a complete shell, disclosing in the interior a cankered mouldering material, that exhibited in its cracks and fissures the skeleton structure of the exanimate timber,—the rings of annual increase, and the medullary rays. It had produced young bushes at two different places along its length, and at a distance of several feet from each other. The appearances presented at one of these centres of growth were very interesting, as explaining the process by which the fresh shoots, though still preserving the position they occupied when sent off from the parent stock, were not now in union with it. At two points where, during its former growth, branches seem to have diverged, two willows had sprung, on contrary sides of the trunk. By groping

down, amongst the water, the roots could be traced, under and above the bark of the old tree, which they had ruptured, and together with the warmth of the sun, had caused to peel off. The vital ingredient had now entirely deserted the exhumed trees, having exhausted itself in giving birth to an energetic offspring, that, nourished at first from their parents' sapless trunks, ere long, finding their fellowship with rottenness and corruption unproductive of the liberty and unrestrained relaxation their budding necessities rendered urgent,—striking roots into the inviting soil, and shaking off their dependence on the meagre resources of outworn decrepitude, proceeded, in obedience to the laws of their constitution, to assert their prerogatives to a separate existence and self-maintenance. The old tree thus bereft of its few remaining drops of nutrient aliment, like a tuber that has parted with its strength and substance, in producing a race of procreant stems, rapidly resigned the frail tenure, by which as an animate object of "the olden time," it yet "shook hands with latter" days. The three other trees, whose mouldering roots and stumps were visible, had each found a representative of five or six feet in height. The rest of the young willows, to which access could be obtained, had no traceable connection with trees; the trunks whence they originated, being either deeply involved in mud, or as the place is within the reach of all that pass, and they numerous, may have offered too seducing substitutes for Christmas logs to be slightly overlooked. It was easy, however, to perceive that they had arisen from precisely the same source as their kindred; for many of them grew *in lines*, as if from the stems of trees, that once filled up the intervening vacuities. Of these young willows I enumerated forty-eight, not all, however, the products of as many trees, as three or four would sometimes occur in a linear arrangement. The species in all instances is alike,—the common "grey saugh" *(Salix aquatica)*; several of which, of small dimensions, yet flourish in the valley, and on the banks of the Tyne.

The precise period, when these trees were brought into their present situation is beyond conjecture. There are no indications, by which we can with certainty assign the date. Previous to the operation that has again laid them bare, the aspect of the surface was undistinguishable, unless in its amphibious character, and a covering of fen-grasses *(Aira aquatica, cæspitosa, &c.)*, "rashers" *(Junci)* and "risp-grass" *(Arundo phragmites)* from the flat, cultivated tracts around; and it is precisely on a level with the site of the adjacent village of Dunston. An accumulation of earth, seven feet in depth,

bearing every mark of a gradual deposition, and obviously contemporary with the general surface of the country, is a circumstance that could only be brought about in the slow evolution of undefined centuries.

A more satisfactory explanation, however, may be offered, for the occurrence of these trees, as they were found, beneath what had been originally a mass of fluviatile silt and clay. From the vestiges of roots *in situ*, there cannot be much doubt of their having formed, in the days of their primeval growth, a detached portion of a *salictum* or sallow grove, that once ruffled its dense cinereous foliage, amid the dank, quivering marshes of the Tyne, at an age when the plains of Britain lay in fen and jungle, and its heights reared their broad backs, gloomy and wild, beneath the entangled bewilderment of oak and pine, birch and hazel, and a thorny undergrowth, ere Agricola and his pioneers, or the legions of Severus, had penetrated the thickets and the wastes of woody Albion, or the axe and fire of the sacrilegious husbandmen had violated the solitary retreats of the forest. Pieces of the *Pinus sylvestris*, with the bark still adherent, disclosed in excavations along the banks of the river, of nearly the same depth as those in which the willows occur, afford support to this view of the remote period whence they derived their origin, and the nature of their associated scenery in "those prime of days." A tempest, a rush of water, or the silent overthrow induced by time, accelerated by the attacks of insect foes, may have been the causes of their downfall. Some of the neighbouring hedges, shew trees of equal magnitude, brought to the ground by these means. The *Melanotus fulvipes*, and, particularly, the *Sinodendron cylindricum*, to whose ravages the insecure stability of the gates and palings in the vicinity supply abundant testimony, spare not even living trees; and besides the damages which they, in the perfect and larvæ state occasion, in "eating to the core their eager way," and reducing to powder whatever obstructs their passage, they permit access through such of their perforations as communicate with the atmosphere to moisture, frost, fungi,—to each separate and combined mode of noxious agency. Levelled with the soil, the gradual envelopment of the trees beneath successive layers of mould was a consequence resulting from their position. Previous to the construction of the Railway, which dams back the floods, and allows of tillage being applied to what was formerly a profitless and hopeless swamp, during the Michaelmas season, when the tides are at their extreme, the waters

of the river, even without being swollen by freshes, by overflowing their banks, which are somewhat elevated above the land behind, inundated to the depth of several feet, most of the level district. The waters thus stagnating; and turbid, as those of most rivers are, with sediment, were placed in circumstances favourable to its being discharged. The amount of detrital matter was considerably increased, when the heavy rains, or the melting snow, added still ampler volume to the gaining deluge; till, as the fluid deepened and spread, field, and ditch, and hedgerow, sunk beneath the unbridled stream, and the lengthened valley assumed the aspect of a vast inland lake. Gradually, but steadily, in these periodical inundations, would gather the subsiding matter, consolidating as it augmented, over the fallen trees, hiding them from the view, and enshrining both the extinct and living in one promiscuous sepulchre. There they remained, awaiting the fate of all fossil vegetables, enclosed in like loose and shallow deposites,—the extinction of the latent seeds of life that still, with undecaying vigour, pervaded the prostrate organism, overthrown but not subdued; and at length, if petrifaction did not supervene, not only destined to the deprivation of the functions, but also of the conformation of objects animated by vital impulses; till after the lapse of ages, by unforeseen fortuity again visited, in the torpor of their faculties, by the enlivening promptings of Nature's reviving agencies, they have once more received the privilege of renewed youth;—afresh to run the course of a lengthened vegetation;—and amid a world how diverse from that of their pristine infancy!—with the delicious hues and wavy outlines of expanding foliage, they arise once more, to shed attraction and beauty, over their ancient cemetery.

List of Insects taken by Mr Hardy in June and July 1843, *in the neighbourhood of the Pease Bridge.* By P. J. Selby, Esq., of Twizell House.

LEPIDOPTERA.

1. Cucullia Tanaceti.
2. Scotophila porphyrea.
3. Orthosia gracilis.
4. Hadena adusta.
5. Hama aliena.
6. Mythimna grisea.
7. Mamæstra splendens.
8. Charadrina superstes.
9. Hadena plebeia.
10. Saturnia Pavonia minor.
11. Hepialus Humuli.
12. ——— velleda.
13. Miana literosa.
14. Acronycta Rumicis.
15. Euclidia mi.
16. Fidonia atomaria.

17. Bupalus favillacearius.
18. Alcis repandata.
19. Cabara pusaria.
20. Harpalyce tristata.
21. Cidaria montanata.
22. Harpalyce galeata.
23. Camptogramma bilineata.
24. Cidaria fluctuata.
25. Rumia Cratægata.
26. Eupithecia ?
27. Pterophorus pentadactylus.
28. Lophoderus ministranus.
29. Pontia Napi.
30. Melitæa Silene.
31. Hipparchia pamphilus.
32. Polyommatus alsus.

Coleoptera.

33. Cicindela campestris.
34. Carabus violaceus.
35. ——— catenulatus.
36. ——— arvensis.
37. Cychrus rostratus.
38. Helobia brevicollis.
39. Clivina fossor.
40. Leistus rufescens.
41. Loricera pilicornis.
42. Badister bipustulatus.
43. Agonum parumpunctatum.
43.*——— mœstum.
44. Calathus cisteloides.
45. ——— melanocephalus.
46. Argutor pullus.
47. Omaseus nigrita.
48. ——— melanarius.
49. Steropus madidus.
50. Broscus cephalotes.
51. Stomis pumicatus.
52. Patrobus rufipes.
53. Platysma niger.
54. Amara lata.
55. ——— similata.
56. Bradytus apricarius.
57. Curtonotus aulicus.
58. Harpalus limbatus.
59. ——— æneus.
60. ——— ruficornis.
61. Trechus dorsalis.
62. ——— minutus.
63. Tachys binotatus.
64. Peryphus littoralis.
65. ——— viridiæneus.
66. Notiophilus aquaticus.
67. ——— biguttatus.
68. Haliplus ferrugineus.
69. Hygrotus scitulus.
70. Hydroporus latus.
71. Hydroporus Davisii.
72. ——— nigrita.
73. Colymbetes maculatus.
74. ——— guttatus.
75. Colymees St urmii.
76. ——— fuliginosus.
77. ——— bipustulatus.
78. ——— N. S. (seems allied to Colymb. affinis, *Steph.*)
79. Parnus prolifericornis.
79.*Helophorus griseus.
80. Hydrobius fuscipes.
81. ——— minutus.
82. Cercyon obsoletum.
83. Sphæridium scarabæoides.
84. Ptomophagus truncatus.
85. ——— Watsoni ?
86. Catops fornicatus.
87. ——— clavicornis.
88. Choleva angustata.
89. Necrophorus mortuorum.
90. Oiceoptoma rugosa.
91. ——— nigrita.
92. Nitidula æstiva.
93. Byturus tomentosus.
94. Byrrhus sericeus.
95. ——— fuscus.
96. Aphodius ater.
97. ——— melanopus.
98. ——— terrestris.
99. ——— hæmorrhous.
100. ——— rufipes.
101. ——— nigripes.
102. ——— sphacelatus.
103. ——— luridus.
104. Ægialia globosa.
105. Serica brunnea.
106. Cataphagus limbatus.
107. ——— marginatus.
108. ——— obscurus.
109. Hypolithus riparius.
110. Ctenicerus cupreus.
111. Aplotarsus testaceus.
112. ——— rufipes.
113. Athous vittatus.
114. ——— hæmorrhoidalis.
115. Ctenicorus ?

116. Limonius cylindricus.
117. Campylus linearis.
118. Cyphon melanurus.
119. ——— marginatus.
120. Thelephorus pallidus.
121. ——————testaceus.
122. ——————pilosus.
123. ——————melanurus.
124. ——————bicolor.
125. ——————nigricans.
126. ——————pellucidus.
127. ——————affinis.
128. Lampyris noctiluca.
129. Cis Boleti.
130. Cœlioides Geranii.
131. Nedyus assimilis.
132. Orchestes pilosus.
133. Notaris acridulus.
134. Dorytomus tæniatus.
135. Hypera punctata.
136. Hylobius abietis.
137. Barynotus Œscidii.
138. Merionus obscurus.
139. Leiophlæus nubilus.
140. Otiorynchus notatus.
141. ——————atroapterus.
142. ——————ovatus.
143. ——————scabrosus.
144. ——————scabridus.
145. Philopedon geminatus.
146. Strophosomus Coryli.
147. ——————limbatus.
148. Sitona canina.
149. ———hispidula.
150. ———grisea.
151. Polydrusus cervinus.
152. ——————undatus.
153. ——————flavipes.
154. ——————amaurus.
155. Nemoicus oblongus.
156. Phyllobius cæsius.
157. ——————argentatus.
158. ——————Mali.
159. ——————Pomonæ.
160. ——————var. *uniformis.*
161. ——————minutus.
162. ——————viridicollis.
163. Cleonus sulcirostris
164. Apion ?
165. Oxystoma Ulicis.
166. Deporaus Betulæ.
167. Rhagium Inquisitor.
168. Leptura ruficornis.
169. Donacia Proteus, aut Nymphæa.
170. ——————linearis.
171. Crioceris cyanella.
172. Luperus flavipes.
173. Haltica flava.
174. ——— rufipes.
175. ——— nemorum.
176. ——— helxines.
177. ——— Oleracea.
178. ——— indigacea.
179. Phædon tumidula.
180. ——————marginella.
181. ——————aucta.
182. ——————Vitellina.
183. ——————Polygoni.
184. ——————fastuosa.
185. Chrysomela Hyperici.
186. ——————Staphylæa.
187. ——————litura.
188. Helodes Phellandrii.
189. Cassida obsoleta.
190. Chilocorus bipustulatus.
191. Coccinella variabilis.
192. Cistela murina.
193. Simplocaria semistriata.
194. Creophilus maxillosus.
195. Creophilus ciliaris, (*rare.*)
196. Tasgius rufipes.
197. Quedius picicornis.
198. Philonthus æratus.
199. Quedius picipennis.
200. Gœrius olens.
201. Philonthus microcephalus.
202. Quedius rufitarsus.
203. Tachinus pullus.
204. Othius fulgidus.
205. Lathrobium brunnipes.
206. ——————fulvipenne.
207. ——————elongatum.
208. Oxytelus rugosus.
209. Dianoüs rugulosus.
210. Lesteva caraboides.

Panorpidæ.

211. Panorpa affinis.

Ephemeridæ.

212. Ephemera ?
213. Baëtis stricta.
214. Ephemera talcosa.

PERLIDÆ.

215. Perla marginata.
216. Sialis lutarius.
217. Chloroperla lateralis.
218. ——— fuscipennis.

TENTHREDINIDÆ, &c.

219. Trichiosoma tibiale.
220. Hylotoma Klugii.
221. Dosythus fuscipennis.
222. ——— lateritius.
223. Allantus aterrimus.
224. ———lividus.
225. ———velox.
226. ———scalaris.
227. ———cingulata.
228. ——lividus, mas.
229. ———rufiventris.
230. ———spreta.
231. Lyda sylvatica.
232. Tenthredo nassata.
233. ——— Rapæ.
234. Crœsus, N. Sp.
235. Pristophora ?
236. Athalia Rosæ.
237. Selandria ferruginea.
238. Tenthredo simulans.
239. Messa hortulana.
240. Ichneumon fasciatorius.
241. Odynerus pictus.
242. Gorytes mystaceus.
243. Epipone spinipes.
244. Vespa britannica.
245. Bombus terrestris.
246. ——— subinterruptus.
247. Megachile circumcincta.

DIPTERA.

248. Chironomus ?
249. Tanypus culiciformis.
250. Tipula gigantea.
251. ——— oleracea.
252. ——— hortensis.
253. ——— clandestina.
254. Tipula histrio.
255. ——— maculosa.
256. Limnobia tripunctata.
257. ——— littoralis.
258. ——— longirostris.
259. ——— fimbriata.
260. Gnoriste apicalis.
261. Macrocera phalerata.
262. ———lutea.
263. Bibio Marci.
264. —— leucopterus.
265. —— clavipes.
266. Dilophus vulgaris.
267. Beris obscura.
268. —— chalybeata
269. Hæmatopota pluvialis.
270. Sargus politus.
271. ——— cuprarius.
272. Thereva nobilitata. ?
273. ——— annulata.
274. Porphyrops diaphanus.
275. Dolichopus nitidus.
276. Leptis scolopacea.
277. ———nigra.
278. ———aurata.
279. Dioctria longicornis.
280. Empis tessalata.
281. ———opaca.
282. ———stercorea.
283. ———meridionalis.
284. Ramphomyia ?
285. Hilara nigrina.
286. ———
287. Empis Bistortæ.
288. ——— testacea.
289. Rhingia campestris.
290. Leptis aurata. ?
291. Syrphus chloris.
292. ——— ?
293. ——— variabilis.
294. ——— lucorum.
295. ——— Œstraceus.
296. ——— topiarius.
297. ——— lacerus ?
298. ——— umbellatarius.
299. Cheilosia Melissæ.
300. Syrphus hyalinitus.
301. Xylota pipiens.
302. Sphegina clunipes.
303. Cheilosia ?
304. ——— ?
305. Helophilus trivittatus.
306. Eristalis horticola.
307. ———nemorum.
308. Serecomyia borealis.
309. Volucella bombylans.
310. ——— plumata.
311. Sarcophaga carnaria.

312. Sarcophaga intricaria ?
313. Musca illustris.
314. Musca vomitoria.
315. Anthomyia ranuncularia.
316. Tachina ?
317. Pipunculus ruralis.
318. Atherix crassicornis.
319. Scatophaga stercoraria.
320. ——— lateralis.
321. ——— littorea.
322. Dryomyza flaveola.

Description of a New Species of Nymphon. By H. D. Goodsir, Esq.

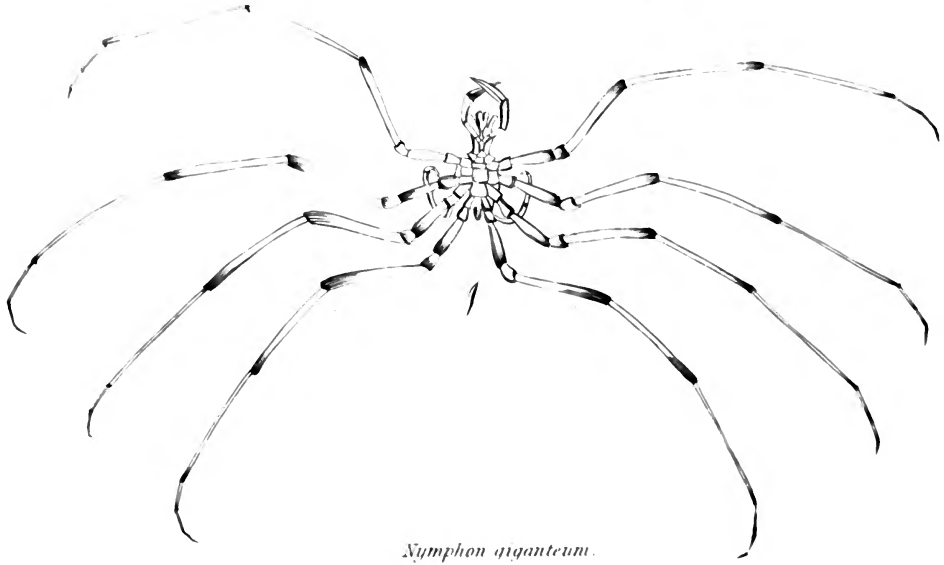
Nymphon Giganteum.—With the palpi twice as long as the rostrum, and the two last joints of equal length; with the pincers of the mandibles very long, slender, and linear; and with the oviferous legs longer than the first four joints of the ambulatory legs.

Description.—The whole animal of a straw-colour, except the proximal extremities of the joints of the legs, which are pink-coloured. Two joints of the mandibles somewhat long and rather powerful: the pincers are weak, slender, and almost linear. The palpi are larger than the mandibles, five-jointed, slender, and the first or proximal joint is about one-sixth the length of the second; the second rather longer than the third, and clavate; the fourth and fifth equal, which last is ovate and slender. The rostrum is hardly so long as the first joint of the mandibles, and is almost linear, having a very slight dilatation about the middle. It is concealed altogether on each side, by the mandibles and palpi, and very slightly superiorly, by the mandibles alone. The first segment of the body is much larger than any of the following, and is very much dilated anteriorly, for the attachment of the organs just described; posteriorly, it is also dilated, and gives attachment on either side to the oviferous legs, and dorsally to the occeliferous tubercle, which is erect and truncated. The oviferous legs are very strong, and have the two middle joints robust and short; the distal joints are hispid. The ambulatory legs are long and slender; the two tarsal joints equal of length, claw strong. Span of the legs 6 inches.

The above described Nymphon is very similar in its characters to Nymphon Johnstoni. The forms, however, of the mandibles, palpi and oviferous legs, are very different and sufficiently strong to justify the formation of a new species.

Taken in the sea at Embleton.

Plate III. Fig. 1. N. giganteum of the natural size. Fig. 2. The rostrum, palpus, and mandible magnified. Fig. 3. An oviferous leg.



Nymphon giganteum.

P.J.S. sculpt


BRITISH MUSEUM

The Battle of Brunanburg. By Robert Home, Esq.

The place where the last meeting was held (in September 1843), besides being favourable to the usual pursuits of the Club, is remarkable as the scene of events which both history and poetry have loved to deal with. There are considerable pickings, also, for the mere antiquary; and though destitute equally of taste and qualifications for antiquarian researches, it is to a theme of that sort I presume, for a few moments, to call your attention.

Bromeridge (a hill opposite to Flodden, on the other side of the Till), over which our party walked, is supposed to be near the field of the great Battle of Brunanburg. Though little is known about it (the place and precise date being both controverted), it may, in one respect, be ranked with the Platæa's, Arbela's, Zama's, Tours', and Hastings's, for it decided an important issue, *i. e.*, whether the Anglo-Saxons or Celts and Cymry were to be the prevailing race in Britain. And an Anglo-Saxon ode, one of the very earliest original poems in that language which have come down to us, still remains to celebrate the victory, which, according to the best accounts, took place A. D. 934.

Athelstan, the grandson of Alfred, was the leader on one side; Anlaf, the Dane (with a mixture of Celtish, Cumbrian, and Danish warriors), and Constantine of Scotland, were the opposite leaders. It was a fierce and obstinate struggle, beginning at sunrise, and not ending till sunset. "And never," says the Saxon ode by a cotemporary poet, "had there been a greater slaughter by the edges of swords, since the Angles and Saxons from the East, over the broad waves, sought Britain."

The actual scene of conflict cannot now be fixed. Turner, a great authority in Anglo-Saxon matters, says, "It is singular that the position of this famous battle cannot be ascertained,"—2 Ang.-Sax. 337; and I am not so presumptuous as to attempt what he was not equal to. All I mean is, to endeavour to shew that Bromeridge, near Ford, has as fair a pretence to the honour of being the bloody spot, as any of the other places to which it has been assigned. As none has any strong claims, I cannot be said to have undertaken a difficult task. I am quite aware that it is not a useful one.

The greatest objection made to Bromeridge arises from an assertion in Florence of Worcester, that Anlaf made the invasion by entering the Humber with 615 ships; and, therefore, say the objectors, the battle must have been fought near the Humber; but Florence was, by no means, a contemporary writer (he lived in the 12th century), and may have confounded this with a subsequent invasion of the same Anlaf, when unquestionably, he did enter the Humber; 2 Turn. A. S., 367. But though he had disembarked at the Humber, it by no means follows that the battle was fought near that river; for many things were done after he

landed, and before the battle. He first made war upon and overpowered the two governors of Northumbria, one of whom fled to Athelstan with the tidings. Anlaf most probably marched northward to repossess Northumbria, his expulsion from which had caused the war. His fleet would follow him to Holy Island or Berwick; there he would be joined by the Scottish king, and, turning back, would confront Athelstan, who, by that time, would have gathered his forces, and marched to meet the invader; and Bromeridge, in that case, was a very likely place for the meeting.

The author of the Saxon ode, Ethelwerd, and perhaps Egel's Saga, are the only contemporary writers about the battle. The ode calls the place "Brunanburh;" Ethelwerd calls it "Brunandune;" I know not whether Egel's Saga names it, but, at all events, he does not fix its position. Simeon of Durham, the next in point of date, lived 200 years after, and knew little about it; he calls the place sometimes "Weondune," then "Erthrunnanwerch," and then "Brunanbyrge;" and the chroniclers who follow, as well as the modern historians, merely copy each other, but all place the scene in Northumbria. This would cut off the places in Lincolnshire and in Cheshire, which have been named in connection with the battle.

As Northumberland is a wide word, especially as there applied, this still leaves any peculiar claims of Bromeridge without support. All I can muster for them is the following:

1*st*, There are three entrenchments, with several military lines, on Bromeridge, placed so as to protect a large army encamped on that height; and these, after an ancient tradition, are called "The Danish Forts."

2*d*, There is a slight tradition of a great battle having been fought near Bromeridge, and the farmer of it tells me, that rude implements of war, some made of stones, have formerly been ploughed up on Bromeridge farm.

3*d*, Anlaf escaped to his ships, which may have followed his progress northward, and which conveyed him back to Dublin. The king of Scotland escaped by land. Had the battle been near the Humber, he would have fled by sea also, but the nearness of his own kingdom to Bromeridge, enabled him thus to escape without the heavy ransom which some of Anlaf's followers were obliged to pay.

4*th*, Camden, the greatest authority on a point of mere antiquarianism, says, "The battle was fought near Bromeridge in Glendale in Northumberland."

The original of the Anglo-Saxon ode will be found in 1 Ellis's Specimens, 14; an excellent literal rendering in 3 Turn. A. S. 318; and in 1 Ellis, 32, a curious metrical version in imitation of the style and language of the 14th century, made by John Hookham Frere, when a schoolboy at Eton, "which," says Sir James Mackintosh, in 1 History of England, 50, "is a double imitation, unmatched in literary history, placing its author alone amongst English translators."

An Address delivered at the Anniversary Meeting of the Berwickshire Naturalist's Club, on the 3d September 1845. By the Rev. J. Dixon Clark, President.

Gentlemen,

The practice of thirteen preceding Anniversaries has, I find, prepared you to expect, on this occasion, a brief address, in which it is customary to recapitulate the transactions of the Club during the past season. Before I proceed to do so, however, I trust I may be permitted to express my acknowledgments for the unexpected honour you conferred by placing me in this chair as President for the year,—an honour I must have requested permission to decline, had I not felt assured of the able assistance of the more scientific members in matters where I should experience any difficulty. Without further preamble, then, I shall proceed to read the minutes of our Meetings at the places agreed upon in October last.

Our Anniversary in 1844 was celebrated at the Heather House, in Budle Bay, on the 18th September. The members assembled at breakfast were Mr Selby, President, Mr Embleton, Rev. J. D. Clark, Mr Darling, Rev. G. Walker, Mr Brodrick, Mr Melrose, and Mr Boyd. Mr G. C. Lambert, Mr A. Brown, and Mr Adshead, favoured the Club with their company as visitors.

After breakfast the Club commenced their walk along the shore as far as the Black Rock, where a fine view of Bamburgh Castle presents itself, as, in the position in which it meets the eye, the greater part of the building and keep is brought into a pyramidal form, giving it the appearance of high elevation. The ocean afforded a grand aspect; a strong breeze from the north-east having called up a heavy sea, which broke in huge and curling waves upon the shore, and the Farne Islands in the distance seemed surrounded with a mass of foaming breakers. The portion of the coast traversed was strewed with numerous *Medusæ*, mostly of the common species. One of very large dimensions, with long pendant tentacula, was afterwards noticed by Mr Clark and Mr Embleton upon the shore of Budle Bay. From the Black Rock

the party diverged to the right, and, passing over Bamburgh Moor, ascended the basaltic range of hill which stretches to the west, and leads to Spindlestone Crag. From the summit of this ridge a very extensive view is obtained, embracing Bamburgh Castle in another fine position, the Farne Islands, and a line of coast stretching to the south of Dunstanburgh Castle, with the whole of the rich and productive tract of Bamburghshire, covered at this time with weighty crops of grain, which, though cut, for the most part remained still uncarried. Arrived at Spindlestone Crag, where the whin presents a perpendicular shape, in many parts of great height, facing to the south-east, the party lingered for some time, admiring the almost columnar form of the rock, which, in several places, is finely broken by masses of ivy, as well as elder, and other bushes, springing from the ledges and broken parts of the precipice. Nor was the Bridle, and perhaps the *Spindle* stone, described in the old legend, and still standing uninjured, forgotten ; but the party regretted that the hole or cavity in the rock, the fancied retreat of the tortuous worm into which the beauteous princess was transformed by the envious queen, had, a few years ago, been destroyed, by quarrying that part of the cliff in which it was situated. A few of the plants usually met with in trap districts were still observed in flower, but nothing rare was procured. In a new-made plantation at the west end of the Crag, a few specimens of *Chrysomela graminis* were taken upon the *Hypericum perforatum*, which grew in great abundance, and on which Mr Selby, in previous years, had taken this, and another species, the *Chrysomela hyperici*. Several specimens of a hymenopterous insect, belonging to the family of *Andrenidæ*, were also captured, half benumbed by the coldness of the day, upon the flowers of a thistle ; and two or three specimens of a large Pentatoma, which infests the whin. From the Crag the party proceeded by way of Spindlestone Mills (where a pretty pied variety of the common sparrow was shot by Mr Brodrick), up to Loch Nairn, a large piece of water, where the little river Waren has been curbed by a dam or weir of vast strength and considerable height, and where the waste water discharges itself by a perpendicular and circular shaft of beautiful masonry. There the party made a discovery which arrested attention, and called all their energies into immediate action, for it was found that the pool immediately be-

low the weir was filled with large fish of the genus *Salmo*, which, taking advantage of the recent flood, had advanced thus far in their migration from the sea, but were prevented from getting further up the stream by the height and upright form of the tunnel or shaft. After vain attempts had been made to transfix some of them with a blunted leister, a small net was put in requisition, and, by great exertions, two fine fish were driven into it. They proved to be the *Salmo trutta*, which enters most of our small streams at this season of the year for the purpose of depositing its spawn. The near approach of the dinner hour, which had been fixed for three o'clock, in consequence of the distance some of the members had afterwards to ride, compelled the party to give up this exciting sport, and they returned, well pleased with the day's excursion, by way of Budle Bay. Mrs Mudie, the landlady of the inn, had prepared an excellent dinner, to which ample justice was done, after which Mr Selby proceeded to read the Annual Address, which was listened to with great attention. The Rev. J. D. Clark was then elected President for the ensuing year; and Dr F. Douglas and Dr Johnston were requested again to perform the duties of Joint Secretaries to the Club. No papers were read, nor any notices of consequence communicated; but an animated conversation was sustained until the separation of the party, in which the economy of the Honey-bee formed a prominent feature, and to which the observations and lucid explanations of Mr Darling gave great additional interest.

On the 30th of October the following Members assembled at Berwick:—Rev. J. D. Clark, President, Mr Selby, Sir Thomas Tancred, Dr Johnston, Mr Home, Dr Clark, Mr Murray, Mr M'Beath, and Dr F. Douglas.

The Minutes of the last Meeting at the Heather House were read and approved of, and the Subscription for the ensuing year was fixed to be seven shillings and sixpence.

The Meetings for 1845 were arranged to be held on the

First	Wednesday	in May	at Allanton.
Third	...	June	Bank House.
Last	...	July	Fenham.
First	...	Sept.	Cheviot.

After a most sumptuous breakfast in the hospitable mansion of

Mr Home, the whole party, arrayed in grey Codringtons, which would appear to have been selected as the uniform of the Club on this occasion, sallied forth on a walking expedition along the majestic sea banks as far as Marshall Meadows, to inspect the progress of the works on the line of the North British Railway, and to examine some curious sections which had taken place in that neighbourhood; the most remarkable geological appearance which presented itself being a large deposit of gravel and sand, at a height of nearly 200 feet above the level of the sea, and superimposed upon a solid sandstone rock. The roots of *Equisetum arvense* were observed to descend perpendicularly through the sand and gravel, to the depth of more than twelve feet. The beautiful coast at Marshall Meadows, and the improvements and alterations carrying on by Mr Murray and the Railway Company, attracted the attention of the Members for a considerable time. An elegant collation having been partaken of at the pressing solicitation of Mr Murray, the party, amidst a tempest of wind and occasional drifting showers, retraced their steps to Berwick, where a substantial dinner awaited them at the Hen and Chickens Inn. Dr Clarke read an elegant essay on the situation of yew trees in the vicinity of churchyards; and, after a long and interesting conversation on many subjects connected with natural history, the Members departed, to re-assemble in Mr Home's drawing-room, where the evening was spent in pleasing intercourse with the ladies of his household and the Misses Johnston. Music and dancing lent their charms; and the whole proceedings of the day were crowned by a masquerade in the lobby before the visitors took their departure.

On the 7th of May, the muster of members was unusually small for a "May meeting," which might be partly ascribed to the badness of the preceding day. Those who did attend deserved a vote of thanks; they were the Rev. J. D. Clark, President, Dr Johnston, Mr Selby, Captain Carpenter, and the Rev. G. Walker.

After breakfast, two of the party endeavoured, with partial success, to catch fish for the dinner, while the other moiety wandered up the Blackadder, contented to admire the scenery and the woods, for the unpropitious weather, the want of sun, the passing clouds, and the occasional showers of rain, rendered all insect hunting

fruitless, and there was no other game for the naturalists. The only rare plant observed was *Rumex sanguineus*, which grew in abundance about Allanbank House. Upon the whole, the walk was profitless and uncomfortable, and was not sufficiently repaid by the sight of one or two fine trees. The papers read after dinner were:—1. On the Minerals of Berwickshire, by the Rev. W. Atkinson. 2. On the History of the Wolf in Great Britain, by Mr James Hardy. 3. List of Berwickshire Insects, by the same. 4. Speculations on Organic Remains, by Dr Clark.

The Rev. Mr Witham, the Rev. Mr Ritchie, and Mr W. Dunlop, were elected members of the Club.

On the 25th of June, the place of meeting had been fixed to be at Bank House. The weather, however, for some days previous, had proved very unsettled. This, and the distance, no doubt, deterred members from proceeding thither, for I have received no intelligence of any one having been present, and must confess, that I did not attend on that occasion.

The next meeting of the Club was at Fenham, on the 30th July, when there were present Rev. J. D. Clark, President, Dr Johnston, Mr Embleton, Mr J. S. D. Selby, Mr Brodrick, and Mr Boyd; Mr H. Selby, R.N., favoured the Club with his company as a visitor. Immediately after breakfast, the members prepared for their walk, which lay along the shore that extends from Fenham to the cottage on the Old Law. In the scenery there was nothing to admire; but the peculiar nature of the ground, and its variety in respect of soil, moisture, and quality, gave promise of a good harvest to the collecting naturalist, and had any of the party been bent on collecting, there would not have been any disappointment. The muddy shore was covered with *Salicornia annua* and *Zostera marina*, both of them in flower; and about their herbage, and browsing probably on it, were myriads of *Littorina rudis*, and *Paludina ulvæ*. In several spots, at high-water mark, *Chenopodium maritimum* was picked. *Betonica officinalis* grew sparingly on the weedy bank, with the *Hypericum pulchrum*. *Sagina maritima* was observed in tolerable quantities upon Ross Links, the central parts of which were occupied, in a great measure, with heather, consisting, as usual, chiefly of ling; but our other heaths were also present, as well as abundance of rein-deer moss. A white variety of all the heaths was noticed.

The beautiful *Erythræa littoralis* grew here in profusion; and a *Salix*, at the time supposed to be the *argentea*, but which, afterwards, on examination by Mr Borrer, proved to be the *S. fusca, var. repens*, formed in many places circular patches, so dense as to exclude the growth of other herbs with it. It makes an admirable binder of the moveable sands. On its silvery leaves there were hundreds of the *Chrysomela vitellina*, in its blue and metallic varieties; and, on the *Ragwort*, the caterpillars of the *Callimorpha Jacobæ* were observed in great numbers. The party were now driven from their loitering walk to a more rapid pace by threatening rain, which fell rather heavily before they reached the cottage on the Old Law, the only place of shelter.

On its cessation, instead of retracing their steps along the winding shore to Fenham, which, it was ascertained, could not be approached nearer than half a mile, in a boat, at that time of tide, they resolved to visit "St Cuthbert's Holy Isle," and embarking in a small coble, were soon wafted across the tideway by a favourable breeze. Some French fishing-boats were at this moment entering the harbour. One of them seemed bearing down in a direction which threatened danger to the party, but casting anchor, the cheerful "bon jour" of the captain saluted them as they sailed close under her bows. On landing upon the beach, some fragments of limestone were picked up full of entrochi; these, when freed from the stone, constitute the beads which St Cuthbert is said to manufacture on a small island in the harbour during stormy weather.

> But fair Saint Hilda's Nuns would learn,
> If on a rock, by Lindisfarne,
> St Cuthbert sits, and toils to frame
> The sea-borne beads that bear his name:
> Such tales had Whitby's fishers told,
> And said they might his shape behold,
> And hear his anvil sound—
> A deadened clang—a huge dim form—
> Seen but, and heard, when gath'ring storm,
> And night were closing round.
> But this, a tale of idle fame,
> The Nuns of Lindisfarne disclaim.
>
> MARMION, Canto ii., 16.

In ascending the cliff, a single plant of *Hyoscyamus niger* was

seen with its dingy yellow flowers and purple streaks, said to be the characteristic livery of poisonous plants. The party did not enter the ruined pile of Lindisfarne, having visited it on former occasions, and of which an interesting account by Dr Clarke has been published in the Transactions of the Club. On the way to the town, they were fortunate in meeting Mr Donaldson Selby and his son, who had been prevented joining the party at breakfast. On the sandy links, *Erythræa littoralis* was again seen, and the *Trifolium scabrum*, but nothing in the Club's field of observation occurred, which they had not previously noticed. After obtaining some refreshment at the inn, a waggon, in the name of a noddy, on the recommendation of Mr Selby, who had ridden over on horseback, was now hired to convey the party across the wet sands to their rendezvous, which was reached at four o'clock, and a keen appetite, found fortunately by the way, gave a relish to the good things provided, with hospitable profusion, for their dinner. During the ramble, flocks of starlings were observed, making their circular and short flights in dense masses, which gave Mr Brodrick an opportunity of stating, that there was a light and a dark variety, constant in their markings, and not arising from any distinction of sex. The light variety he had not noticed in the north of England. Of the insects captured, none seemed to be rare, or new to the district. As the party walked along, beds of cockles and other common shells were observed on the coast to the south of Fenham, raised several feet above the present high water mark. The beds were twelve or fifteen inches in thickness, and indicated the former flow of the tide to at least that height.

The communications read to the meeting were:—1. Notice of an Egyptian goose, shot by Mr George Thompson in February last, about the Leet on the west side of the village of Swinton. 2. A letter from Sir Thomas Tancred, detailing the particulars of a swarm of worms, which were supposed to have been lifted into the air by some means, and again dropped with rain in the garden of a gentleman in a village near Cirencester. 3. Notice of *Ulva defracta*, being the spawn of a molluscous animal. 4. Notice of a paper on the Berwickshire *Entomostraca*, by Dr W. Baird.

Mr Donaldson Selby exhibited two Saxon Styca, one of Edilred

the 16th King of Northumberland; the other of Vigmund, Archbishop of York, recently found, in the course of removing some foundations of buildings near the Snook, on the north side of Holy Island. The coins, which appear to be principally composed of brass, are in fine preservation, with the letters quite perfect. What the buildings may have been there is no record; and the existence of the foundations was unknown until they were exposed to view by the heavy gales of wind having drifted away the sand, which had covered them for so many centuries. It is probable that a village had stood here, and been destroyed in some of the frequent inroads of the Danes, who laid waste the island and adjacent coast for many years.* The remains extend over more than an acre of ground. Mr Selby promised to communicate a more detailed account of this discovery. The party then dispersed, looking forward with pleasing anticipations to spending a day among the Cheviots in September; an excursion which, had it taken place in no very remote times, would have been attended with considerable personal risk to all concerned, for although their foray be not against the "redde deere and roo bukke," nor the flocks and herds of their neighbours, we read in Bishop Nicholson's Leges Marchiarum, "concordatum est quod...nullus unius partis vel alterius ingrediatur terras, boschas, forrestas, warrenas, loca, dominia quæcunque alicujus partis alterius subditi, causâ venandi, piscandi, aucupandi, disportum aut solatium in eisdem, aliâve de causâ, absque licentiâ ejus...ad quem loca...pertinent, aut de deputatis suis prius captâ et obtentâ."—*Leges Marchiarum*, 1705, 8vo, pp. 27, 51.

Such, Gentlemen, is the account I have to give you of the transactions of the Club during the past season. That nothing rare has been added to the list from the animal or vegetable world cannot be a matter of surprise, because the district has been so

* "In the year 793, being the 5th of Ethelred, the Church of Lindisfarne was almost totally destroyed. A fleet of Pagans arriving in the north, and ranging the coasts, landed the 7th of the Ides of June, and coming to this church, they miserably plundered it, defiled the holy places, overthrew the altars, and carried away the treasures of the church, taking some of the monks with them as captives; and after violently abusing others, turned them out naked."—Grose's Antiquities, vol. iv., p. 116. Again destroyed in 867, by Haldane, King of Denmark, p. 117.

closely investigated, that scarcely anything could have escaped the observations of the several members during the thirteen years in which they have pursued their pleasing labours. Perhaps, then, it may be asked, "What good have we done, or what is now the use of our meeting together?" I feel sure that I am only expressing the sentiments of the members, both present and absent, when I state, that we certainly hope that our labours are beneficial, and our meetings useful. The study of Nature affords a never-failing source of intellectual enjoyment; and "it is only by the united observations of various persons that we must expect to learn many curious facts in Natural History, of which we are still ignorant," and to correct erroneous opinions, which, having been handed down to us undisputed, we are apt sometimes to adopt without sufficient investigation. Besides, it is always a matter of satisfaction to find in their usual localities the native plants still flourishing. The hand of man is fast changing the face of Nature in various parts of our district. The plough, combined with the system of draining, now become so prevalent, is causing the disappearance of many of the marsh plants; and, among the feathered race, the snipe, the curlew, and the plover, deprived of their boggy feeding ground, are daily becoming more rarely seen. The advantage, however, derived to man, by the improvement of the soil and climate, is a matter of congratulation. That draining should have a most beneficial influence upon the atmosphere, when it is carried on to a considerable extent, is, I believe, generally admitted; and we may therefore hope, that, even in our day, we may be permitted to enjoy an improved climate. The past season has certainly been attended with an unprecedented fall of rain,—the snows of a lengthened winter, during which the thermometer frequently showed a very low degree of temperature, did not disappear until near the end of March; the vegetation in spring was late; and, from the beginning of July to the last week in August, rain fell almost daily, causing the rivers to overflow their banks to an extent not witnessed for the last thirty years, even in the floods of winter. The heavy crops of grain were in many places laid low, and the fears of the husbandmen excited for the approaching harvest. A most delightful change of weather, however, succeeded at the end of August, recalling to mind the gracious promise made to Noah, "that while the earth remaineth, seed-time and harvest, and cold

and heat, and summer and winter, and day and night, shall not cease." (Gen. viii. 22.) With what feelings of delight we wander forth amid the lovely scenery of nature, so conducive to a healthy state of mind and body; when, having laid aside the cares of the world for a season, we enjoy with congenial minds sweet converse, and contemplate the wonderful productions of the earth, and consider the admirable order and beauty which pervades the whole,—

"Not a tree,
A plant, a leaf, a blossom, but contains
A folio volume. We may read and read,
And read again, and still find something new,
Something to please, and something to instruct."

We may see, in everything, the power, the wisdom, and goodness of God. His power in the Creation, His wisdom in the arrangement, and His goodness in the continued preservation of the whole. Well might the Royal Psalmist exclaim in admiration, "O Lord, how manifold are thy works; in wisdom hast Thou made them all! the earth is full of thy riches!" When we are led to examine the structure of a simple blade of grass, we may perceive, that, with all our skill and science, we cannot create one like it. When we view, as at this season, the fields clothed with the golden corn, we must confess, that unless the Giver of all good so wills it, man may have laboured in vain. We may drain, we may plough, we may sow, we may do everything that lies in our power; but it is the Lord alone that giveth the increase, "reserving unto us the appointed weeks of the harvest." And, in the animal world, how wonderful is every creature, from the smallest insect that crawls upon the earth, to man himself.

"How wondrous is this scene! Where all is form'd,
With number, weight, and measure! All design'd
For some great end! Where not alone the plant
Of stately growth; the herb of glorious hue,
Or foodful substance; not the labouring steed,
The herd, and flock that feed us; not the mine
That yields us stores for elegance and use;
The sea that loads our table, and conveys
The wanderer man from clime to clime,—with all
Those rolling spheres, that from on high shed down

Their kindly influence; not these alone
Which strike ev'n eyes incurious; but each moss,
Each shell, each crawling insect, holds a rank
Important in the plan of Him who fram'd
This scale of beings; holds a rank, which lost
Would break the chain, and leave behind a gap
Which Nature's self would rue."

Since our last Anniversary, we have to lament the sudden death of the Rev. Andrew Baird, one of the Founders of the Club, and its President in the second year.*

We have likewise to regret the departure from among us of Dr F. Douglas, who has left our shores for India. The members of the Club, I am sure, unite with me in wishing him every success

* The Rev. Andrew Baird was the second son of the Rev. James Baird of Swinton in Berwickshire. He was born at Eccles in the same county, and received his preliminary education at the Grammar-School in Kelso. On the death of his father, the family became settled in Edinburgh, where Mr B. pursued and completed the course of study prescribed for those who enter into the Church of Scotland. While at the University, Mr B. paid much more than the usual attention of students to Natural History, and was amongst the most distinguished of Professor Jameson's pupils. He was one of the founders of the "Plinian Society," which had considerable influence in making Natural History more popular with the students than it had previously been. He was also one of the original members of this Club, and took an active part in its proceedings, until his mind and time became almost entirely occupied with the duties of the parish of Cockburnspath, of which he was the minister; and with the discussions that led to the severance of a large proportion of its clergymen from the Establishment. He was amongst those who deemed it to be their duty to secede; and, joining the "Free Church," he laboured zealously amongst the flock that followed him, and loved him, until his too early death. He died at Oldhamstocks, on the morning of Sabbath, June 22. His health, which for several months had been in a declining state, seriously gave way about three weeks before his death, which came, however, rather suddenly and unexpected.

Mr Baird was a man of retiring and unobtrusive habits, fond of society, and yet rather forming a part of the company than amalgamating with it. He took great delight in natural scenery, and was hence familiar with every grand and picturesque object and view in his parish and native county; and he drew, with admirable skill, the scenes he loved so well. He was an able and eloquent preacher. Professional avocations checked the progress he had early made in Natural History, but he advocated and loved the science to the end; and his latest effort was the delivery of some Lectures on its advantages as a study, in the Mechanics' Institute at Dunbar. He contributed much to the Geology and Botany of our district; but he was more an acute and accurate observer than an author, and published nothing with his name excepting the history of the parish of Cockburnspath, in the new Statistical Account of Scotland.

in his present scene of labour, where a fresh field for his investigation and research will be opened to him.

I have now to apologize for the length of this Address, which I much fear must have exhausted your patience, and I beg to resign the honourable position of your President to my successor.

J. D. C.

The Yew-Tree; or a Chapter on Churchyards. By Dr CLARKE.

> "Not harsh and rugged are the paths
> Of hoar antiquity, but strewn with flowers."

This tree has long been accounted the peculiar accompaniment of the churchyard, and "the Yew-tree's shade" figures, as an essential image, in every poetic description of the place of tombs. This local appropriation of the yew has, of course, given rise to various conjectures. Some have thought that its dark and gloomy hue fittingly consorted with such scenes,—a natural and expressive emblem of death and the grave; but it may be questioned whether the funereal character, with which our fancy loves to invest it, is not rather the reflective effect of its constant association with the grave and images of death. By others it has been supposed to have been planted in churchyards to supply the material for bows to the parishioners. This last notion cannot be true; for, whether its native character originally pointed it out as an appropriate and significant symbol, or that our imagination has thrown around it a deeper gloom, from its constant presence in such scenes, still, *there*, it would be regarded as a sacred tree, and to mutilate, or cut it down for secular purposes, would be deemed an act of profanation. Besides, the material for those English bows, which dealt such fatal execution, and, perhaps, more than courage or discipline, brought such signal victories to the arms of England, was not of native growth, but imported from Italy and Spain. For bows in common use, the elm and hazel, amongst our evergreens, were chiefly used. The true explanation of its appropriation to churchyards I believe to be this: The yew was a sacred tree with the Druids, and when Christianity superseded the Druid mysteries, it is most probable, after the analogy of converting the

heathen Basilicæ into Christian churches, that the edifices of the new religion were erected near to the old sacred places—in the neighbourhood of yew groves—in fact, "beneath the yew-tree's shade."* Thus both have come down to us together; and the yew, from this connection, has been invested with its peculiar character, and made suggestive of images of dool and sorrow. In depth of tint, though not in its arboreal character, the yew resembles the cypress, which was employed by the Greeks and Romans as a funereal emblem, and planted amongst tombs; from whence, doubtless, the Turks derive their practice of placing their sepulchral monuments amid groves of cypress. We can readily conceive how, under the fair climate of Italy or Greece, the "sad cypress" would wear a still more sad and melancholy hue from its contrast with the bright tints of earth and sky.

The Members of the Club will recollect the affecting allusion of Horace,—

> Neque harum, quas colis, arborum
> Te, præter invisas cupressos,
> Ulla brevem dominum sequitur.

With reference to trees, as a characteristic decoration of our last resting-place, their susceptibility of motion from every passing breeze, and their various stages of growth, maturity, and decay, preach to us silently, but significantly, of the changeful character of human life, and admonish us, by the most eloquent symbols, what shadows we are, and what shadows we pursue; that "we are such stuff as dreams are made of, and that our little life is rounded with a sleep." Trees, too, besides the natural and various beauty of their forms and foliage, subserve an admirable purpose in absorbing the mephitic gases which would otherwise pass through the porous soil, and, in how slight quantity soever, taint the purity of the vital air. No one can have compared the naked and repulsive aspect of churchyards in towns and cities, dank with rank herbage, and redolent of corruption, with the fair face of rural cemeteries, decked with trees and flowers, and associated with peaceful and pleasing images, without confessing (let reason and philosophy say

* I refer my readers with pleasure to a work with which they must be familiar, Mr Selby's charming book on the British Sylva, in which our learned colleague gives his countenance and authority to this idea.

what they will), that the thought of interment in the choked-up charnel-house of the town, throws an additional horror over death. That this is no idle fancy, let "the Minstrel" answer,—

> "Mine be the breezy hill which skirts the down,
> Where a green grassy turf is all I crave,
> With here and there a violet bestrewn,
> Fast by a brook or fountain's murmuring wave,
> And many an evening sun shine sweetly on my grave."

The poet Shelley, too, when attending the remains of his friend Keats to the Protestant cemetery at Rome, gave utterance to kindred feelings, when he said, "It is almost enough to make one in love with death, to think that one should be buried in so sweet a place." After his own untimely death—the more untimely, as his genius gave promise that its more ample scope and matured strength would, like the breath of Heaven, have dissipated the doubts and errors that clouded its dawn—his ashes, in accordance with the wish thus accidentally expressed, were also there interred.

In the olden time, ere the study of natural science had put to flight the marvels of ignorance, it was a graceful superstition which taught that flowers, emblematical of innocence and purity, sprung naturally, and with a sort of spontaneity, from the body which lay mouldering beneath. Thus, at the obsequies of poor Ophelia, Laertes exclaims,—

> "Lay her i' the earth,
> And from her fair and unpolluted flesh
> May violets spring."

Hence arose the custom, still so universal on the Continent, of planting flowers on graves, and which, though almost gone into desuetude with us, we learn from Cymbeline was formerly practised.

> "With fairest flowers,
> Whilst summer lasts, and I live here, Fidele,
> I'll sweeten thy sad grave; thou shalt not lack
> The flower, that's like thy face, pale primrose; nor
> The leaf of eglantine, whom not to slander,
> Outsweeten'd not thy breath; the redbreast would,
> With charitable bill, bring thee all this—
> Yea, and fern moss besides, when flowers are none,
> To winter-ground thy corse."

In a similar spirit, is the not unfrequent German epitaph, "Dein grab soll nicht ohre Blumen seyn wenn es auch deine Tage wären."—"Though thy path of life was strewn with thorns, thy grave shall be decked with flowers." It would be thought a kind of profanation to pluck flowers so planted and so growing. They are dedicated to the dead. "Der Schmuck eines Grabes gehürt dem Todten." Whilst on this topic I may mention an epitaph at Göttingen from Klopstock, which struck me by its originality and beauty—

"Saat gesaet von Gott
Am Tage der Garben zu reifen."

"Seed sown by God to ripen on the day of the Resurrection." But I was not a little pleased to find this idea anticipated by our own Jeremy Taylor, whose mind was so enriched with all learning, and so filled with images of beauty, that, like the householder in Scripture, he could bring out of his treasure things new and old. He describes a churchyard as "The field of God sown with the seeds of the resurrection." It is curious to observe how every nation seems to have shunned, by metaphor or circumlocution, the naked ideas of death and the grave. By the Greeks, the burial-ground was termed the place of sleep, an idea and phrase borrowed by the Romans; Sleep and Death being, in the graceful mythology of Greece, twin sisters, and daughters of Night. The Italians call it *Campo Santo*, or holy ground. The Pisan crusaders returning from Palestine, thought they could bring no more precious pledge of the Holy War than some of the earth of Calvary, in which they and their children might finally repose. This earth was deposited and enclosed at Pisa, and called the Campo Santo, and, from this original, places of sepulture are generally so termed throughout Italy. The French, after the Romans, call it *Cimetiere*. The Germans designate it *Gottes acker*, or the field of God. The English, *Churchyard*, that is, church earth, or the earth of the house of the Lord. The Americans alone, that literal and unimaginative people, who affect to despise the usages of antiquity, solely because they belong to the past, call it plainly and without disguise, *Graveyard*.

On the Minerals of Berwickshire. By the Rev. J. C. Atkinson.

I suppose few people accustomed to the collection of mineralogical specimens, though not necessarily very deeply versed in the science of mineralogy, would expect, when walking along the roads of Hutton and its vicinity, with their wayside heaps of greenstone "metal," and by the sections of the sandstone rocks afforded by the Whitadder and smaller streams, to meet with any very great variety of minerals; and after having, for between two and three years, scrutinized, tolerably closely, the said rocks and roads, and the river bed besides, I am obliged to say that the variety is not great, although quite sufficiently so to excite interest, and reward labour and search.

Without further preface, I will simply detail what I have met with, and will trust to your forbearance, as well for the meagreness of the communication, as the dryness of the subject.

And first, I will ask you to accompany me to the Whitadder. In the bed of the stream, and in the accumulation of rolled stones of various dimensions which are met with every here and there along its course, many members of the family Quartz maybe found. Common quartz is, of course, abundant; crystals of the same substance, for the most part acicular, and both yellow and colourless, from $\frac{1}{3}$ to 1 inch in length, are contained in many among these rolled blocks. Milk quartz also I have met with, but not often, and specimens of a substance which closely resembled fibrous quartz. Calcedony, both colourless or white and red, jasper, chert, hornstone, and moss agate, may be found with little trouble. The specimens of the last named pebble, though generally coarse, are often of 3 or 4 inches in diameter. Some of them are very beautiful. I have one which I picked up as I was wading through the stream, which is of the usual colour and texture, and encloses a broad red band of streaky red jasper.

There! we are now on an accumulation of rolled masses of rock of various sizes, brought down centuries since, probably, and consisting almost entirely of granite, greenstone, basalt, and greywacke, with sandstone in abundance, in close proximity to the present bed of the stream. If we break that soft, porous, cellular-looking stone, we shall find in its cavities something or other to

reward us for the trouble. See, we have specimens, small it is true, but very perfect, of mesotype. One such I have of nearly the size of a walnut. Turning a little to one side, we behold a stone which promises to be somewhat more patient of blows than the last; I fear, indeed, you will call it obstinate; but if broken, it will probably repay your labour with divers crystals of black hornblende, most of them small. But there may possibly be one among them of an inch in diameter, and that is by no means a small one. There is another piece of the same basaltic rock, which, in addition to the hornblende, contains numerous small red crystals. They are literally *red* iron ore.* I cannot name the variety; and an eminent mineralogist in Edinburgh, to whom a small specimen was forwarded, required a larger one to enable him to do so. This greenstone abounds with crystals of green feldspar, the majority of them small, as in the case of the hornblende; but, not unfrequently, some among them are of large dimensions. I found one, opposite Clarabad, of nearly two inches in length. It is in vain, however, to try to obtain them detached from their matrix. Here, besides the iron-ore and hornblende in this basalt, you see small crystals of red feldspar, and others, smaller still, of olivine. This one is almost yellow enough to be called chrysolite. This very cellular fragment of porphyritic amygdaloid may perhaps yield something worthy of notice. Ah! here is a tolerably good specimen, on a small scale, of healandite, besides many smaller crystalline almonds or *amygdala* of the same mineral; while those whitish concretions are calcareous. Here, again, is another piece of amygdaloid, containing small crystals of calc-spar and agate; while some of the cavities are empty, with the exception of a little brown dust, which appears to be oxide of iron; and others enclose imperfect concretions, accompanied by the same oxide. Very minute crystals of leucite may also, though rarely, be met with in amygdaloid of this kind; and almost as rarely, a little galena or sulphuret of lead.

With this nodule again, and this close by it, I am quite perplexed. The former breaks like calcedony; is partly of a dirty olive white, and partly red; is almost entirely composed of silica, according to the blowpipe; and is yet soft enough to yield to a pin. The latter is quartz, with an imbedded substance, having an

* The colour is almost carmine red occasionally.

imperfectly crystalline shape, and a dull green colour, with nearly the texture of a very fine sandstone. This, also, is nearly pure silica.

But what is this which looks not unlike petrified salmon? It yields readily to the nail, and is evidently gypsum. We shall find it *in situ* close by; for, unlike the other substances which have come under our observation and hammers, it is a native of the place. There, you see that white band at nearly the bottom of the bank—cliff I might almost call it; that is its native bed. On examining it closely we find a vein of white fibrous gypsum, of which the fibres run obliquely, and which, from the thickness of 1½ inch, thins out in many places to nothing. Above it is a quantity of the same mineral in layers, and more crystalline; selenite, in short, of a greenish-brown hue when split. Above that again a stratum of shale, and then we come to the petrified salmon, which occurs in lumps rather than in continued strata. Break one of these masses, and you find the structure is all crystalline, though, for the most part, the crystals are so minute, that it almost passes into granular gypsum; and most irregular, as you see, is the direction of the veins of more distinct crystals. On the outside the crystalline structure is far more apparent; and, with care, you may procure a plate of 1½ inch in diameter. Close by you see a seam of compact rock, of a dull grey colour. Massive gypsum is that. See how, in one point of view, it skimmers from the play of light upon those numerous but very small included crystals; see, too, this fallen rock, with cavities divided into cells as it were, some of them containing sand tinged with iron, and cemented by means of some other substance. That substance, too, is gypsum; and those cells not unfrequently contain specimens of red gypsum, externally set as full of sharp dog's-tooth crystals as a tipsy-cake with almonds; and here and there, in a very friable part of the rock, you may find large detached lumps of the same kind of gypsum. I have every reason to believe, that wherever a fissure in the rock permits it, the white fibrous gypsum is still in process of formation; and I cannot but think, that supposing terrestrial electricity or electromagnetism to be the active agent in causing minerals to assume their crystalline forms, careful experiments, not too few in number, made in such fissures, and accompanied by equally careful observation of the singular irregularity of the more crystalline veins

to which I drew your notice, would be rewarded with very interesting results.

And what have we here? By the dripping it would seem that the waters of a small spring are escaping; and you see the dirty white track they have left upon the rock. Up above, at the point where it issues, observe the beautiful golden and deep green moss intermixed. Look a little more closely, and you perceive a part of that moss is almost, as it were, in a state of transition, from a vegetable into a stone. Some of it has, as yet, only a very fine coating, and another part just retains the form of moss; while the deeper you penetrate in your examination, the more solid does the substance become; and how tough and hard it is, you find on essaying to break it. There are many springs of this kind on the Whitadder banks; and large quantities of this calcareous tufa, or "petrifaction," are in continual process of deposition by the evaporation of their waters. When first removed from the influence of the water, the tufa is very soft, but soon hardens. I have little doubt that, at some of the springs, casts might be taken from moulds, as at the Baths of San Filippo in Italy, though, of course, greatly inferior. This tufa, which in some places is almost compact enough to be called travertin, is by far the most plentiful variety of carbonate of lime. Calcareous spar is rare. One variety I met with near Hutton Bridge, was composed of a number of very small crystals, and had very much the appearance and structure of the horehound candy which form one of the numerous class of "sweeties." Rarely, too, may a variety be found, which, for want of another name, I shall call Botryoidal Calc-spar. These varieties are seldom pure enough to give the peculiar cleavage of calcareous spar; and the same remark may be made of a kind of stalactitic carbonate of lime, which has been deposited in the crevices of some of the sandstone rocks.

Here is a specimen, which at first greatly perplexed me. I only find it in one place, on the Foulden side, about 300 yards below Hutton Bridge. It looks not unlike a piece of burnt bone as it lies; is very heavy; is somewhat fibrous in its structure; and has a sort of silky lustre, which is not seen in the cross fracture. It more nearly resembles carbonate of lead in appearance than any other of the common minerals. Mr Tennant tells me it is celestine, or sulphate of strontian; and since I asked his opinion I have

seen a specimen in the British Museum nearly resembling mine. There is also to be observed in some of the rocks, especially when there is anything resembling a cavern, an efflorescence, whitish in colour, probably lime; and in some parts of the rock minute assemblages of slightly divergent feathery crystals, into the nature of which I have not attempted to seek. In addition to the minerals I have already enumerated, you may find rolled pieces of quartz, containing native copper, mica, a kind of copper-ore, green earth in small quantity, crystals of calc-spar, &c.; and feldspar in crystals of various sizes and hues, generally whitish, or tinged with faint red, and very easily frangible, from the numbers of cracks intersecting them, in company with a little green earth, may be met with in almost every other fragment of porphyritic amygdaloid. Small masses of rock, to appearance of recent formation, may also be occasionally picked up, coloured deep red, and of great specific gravity, from the presence of much oxide of iron, with a kind of mammillated surface, which, when broken, exhibit a pumice-like interior, set very full of minute crystals of magnesian calcareous spar. These specimens are very beautiful. I have only met with them on the accumulation of rolled stones, below Hutton Hall Mill.

And now, if you will permit me, I will take you up through these fields to the quarry at Nunlands, from which is procured the metal used on the roads in the parish of Foulden. We have left the sedimentary rocks you observe, and have got among igneous ones, the upper part of which seems to have been much disturbed. There is some variety of structure to be observed within this small space. Here, on the right of the cart-track into the pit, was a large fragment of rock intersected with numerous veins, all silica in one shape or other. Split that specimen, and you find inside of it two surfaces of crystallized quartz, which mutually fit each other. Break that one, and it proves to be common quartz slightly tinged with red; this again gives you calcedony of a blue tint, with a mark or two of crimson in it. The rock at the corner jutting out a little, and quite soft (the one we have left is hard enough), is full of white calcareous concretions, of small size, and covered with a thin coating of a light green. This—a nodule apparently, that has fallen from its matrix—how heavy it is! It is easily broken, and, I think, is celestine. And

what is this? Calcareous spar? Too heavy for that surely. Ah! I see, it is calc-spar, in a setting of heavy-spar or sulphate of baryta. Here, again, we have a curious combination. Outside is crystallized sulphate of lime or selenite; on the other side calc-spar; a vein of blue calcedony passing into quartz; next to it quartz, much impregnated with iron; and then more calc-spar. See here, too, what a quantity of carbonate of iron! in two forms, crystallized and massive, the latter with a considerable per cent. of silica. And observe how it effloresces where exposed to the atmosphere and damp. Some is quite reduced to powder, varying in colour from yellow to dark brown, and consisting almost entirely of oxide of iron.* In that bank opposite us, you see a quantity of heavy-spar. You might almost get a bushel of it. It is in small fragments or crystals, of, for the most part, modified forms of the rhomboid. Much of it has a siliceous oxide of iron adhering to it, and evidently deposited originally on some other crystallized mass,—probably, by the form of its crystals, fluor-spar. The siliceous oxide, when broken, exhibits, as you observe, cavities which contain the simple oxide in powder. A little to the right, again, we have more of the barytes, somewhat radiant in its formation, and beautifully white. It adheres to something solid, in which respect it is unlike that we have just inspected. And what is this something? A light blue mineral, in combination with a dark substance, with straight and weathered surface, the dark colour of which does not penetrate far. This is calc-spar; but what is the blue substance? Its fracture is that of serpentine, and its comportment before the blowpipe not dissimilar. But I never heard of blue serpentine, and Mr Tennant thinks it consists chiefly of carbonate of lime. This portion looks not unlike blue heavy-spar; and this curd-resembling matter, overlying some of the calc-spar,—what may it be? A combination of lime and baryta I take it. Pass on a little. It is difficult walking; but we shall not need to descend if we take care. Here, we come to a coarse easily-fissile rock, with numerous concretions of quartz, both crystallized and uncrystallized. Here is a drusy cavity, lined with pyramidal quartz crystals, most of them shewing but four

* This change of the carbonate into the oxide of iron may be well seen in many places along the coast of Eyemouth and Coldingham. The yellowish carbonate is quite brown where exposed to the atmosphere, and friable on its surface.

of the six sides; and there is some coarse calcedony or agate. But what is this? There must be iron in these veins by their colour; and how bright that colour on the fresh fracture,—not unlike that of the liver of an animal; but how rapidly it fades after the touch of our moistened fingers. At this point it passes into jasper to all appearance,—the fracture smooth, the colour red, and silica almost its sole constituent.

Truly, I should not have expected so great variety in so small a compass, and yet we have not quite exhausted it. Here is a large specimen of crystallized carbonate of lime in a setting of crystallized quartz; and there a small one of calcedony similarly set; and here the crystals of quartz alone. These frequent veins, too, some of pure quartz, and others seemingly of mixed silica and lime;—what a beautiful appearance they give to the porphyritic rock. And this thin whitish substance, forming these veins in a stone so easily frangible, is not quite unworthy of notice. I took it for soapstone (of which there is an impure kind on the rock close by) at first, but it is not; and I expect that, if such an alliance be permitted in the mineral kingdom, it contains lime, baryta, silica, and magnesia.

I will now ask you to accompany me somewhat farther, and I trust you will not be alarmed at the length of the walk, viz., to the shore between Coldingham and Eyemouth. In the trap rocks between Killiedraught Bay and Coldingham shore, many veins of deep red opaque carbonate of iron are seen. And in a large fragment of rock, about half a mile north of the bay, I found a very splendid specimen of the ore, in company with barytes, and a little calc-spar, lining a large cavity. This ore is common along all this line of red trap rocks. Steatite, white and grey, in frequent veins of no great thickness, is also very common. When first collected, it is very soft. Its behaviour, when mixed with nitrate of cobalt, and subjected to the blowpipe flame, is singular; for it not only gives the blue colour due to magnesia, but swells up into a large (compared with the actual quantity experimented on) feathery mass, which is singularly beautiful. Here and there, too, the rock has a thin coating of calc-spar, tinged green externally by the weather; and a few imperfect crystals of quartz may be occasionally met with. And what is this sparkling substance in veins, with beautiful iridescences on some of the surfaces when freshly exposed?

Specular iron-ore, both massive and crystallized; alone, and in company with the carbonate. The crystals are not large nor numerous. Half an inch in length is the measure of the largest. It is singular that, unlike the iridescent play of colours in most other minerals, this tarnish may be washed off, and it is not possible to restore it. In this cavern, beautifully decorated by the very graceful sea spleenwort, (*Asplenium marinum*), we find large quantities of impure stalactitic carbonate of lime. There is magnesia with it, doubtless;—probably other matters, iron for instance, in very small proportions; and hence the fracture does not exhibit the usual characteristics of that of carbonate of lime, crystallized or stalactitic. Not far from the "Fort," calc-spar occurs more frequently, and may be obtained in rhomboids of tolerable dimensions, though frequently enclosing foreign matter; some of them are remarkably translucent. A vein, too, of coarse calcedony, of some extent, and from one to three inches in thickness, may be seen near the same spot. The beach at Eyemouth affords various specimens of amygdaloid, enclosing crystals of calc-spar and cornelians of an inch and more in diameter. They come from St Abb's Head. Some of the specimens contain, also, small green agates. A great quantity of calc-spar lies about in all directions, red and white. The former is from the greywacké rocks, on the Gunsgreen side of the Eye. It abounds there, in innumerable veins, from half an inch to three or four inches in thickness. And in one spot, about a mile beyond the river, it occurs, both white and deep red, in conjunction with crystals of quartz. These crystals are long and thin, and vary much in size. Some are a quarter of an inch in thickness, and six or eight times that in length. Very beautiful specimens may be obtained by dissolving out the lime in muriatic acid, so as to leave the crystals of quartz standing out. I have looked in vain for the veins of iron-ore in these rocks mentioned by Mr Milne, in his Geology of Berwickshire; and I cannot but think that the occurrence of these numerous veins of carbonate of lime, in the Gunsgreen rocks, is rather at variance with his assertion, (p. 244), "It is curious that lime does not occur either in the greywacké series," &c.

I have but to mention now the occurrence of earthy green carbonate of copper in a rock near the Fort at Eyemouth; of easily decomposed copper pyrites in Mordington, and near Spittal,—on

the coast,—in small quantity; and feldspar, in great quantity, in the great porphyries; and I think I have mentioned almost every mineral which has come under my observation, with the exception of a specimen of black wad, or earthy manganese, in company with oxide of iron, which I picked up in a field near Hutton Hall.

Contributions to the Entomology of Berwickshire.
By Mr James Hardy.

COLEOPTERA.

1. Dromius agilis.
2. ——— 4-maculatus.
3. ——— fasciatus.
4. ——— linearis.
5. Lamprias chlorocephalus
6. Tarus basalis.
7. Clivina collaris.
8. Helobia nivalis.
9. Leistus fulvibarbis.
10. Agonum atratum.
11. Olistophus rotundatus.
12. Synuchus nivalis.
13. Calathus piceus.
14. ——— crocopus.
15. ——— mollis.
16. Argutor erythropus.
17. Omaseus Orinomum.
18. Steropus Æthiops.
19. Miscodera arctica.
20. Bradytus consularis.
21. Trechus ruficollis.
22. Blemus paludosus.
23. Epaphius Secalis.
24. Tachys pusillus.
25. Philocthus æneus.
26. ——— biguttatus.
27. Peryphus femoratus.
28. ——— saxatilis.
29. ——— cnemerythrus.
30. Tachypus properans.
31. Bembidium paludosum.
32. Notiophilus tibialis.
33. Elaphrus cupreus.
34. ——— riparius.
35. Haliplus elevatus.
36. Haliplus lineatocollis.
37. ——— fulvicollis.
38. Hygrotus fluviatilis.
39. ——— pictus.
40. Hydroporus Frater.
41. ——— depressus.
42. ——— 12-punctatus.
43. ——— latus.
44. ——— Davisii.
45. ——— erythocephalus.
46. Colymbetes striatus.
47. ——— exoletus.
48. ——— bistriatus.
49. ——— chalconotus.
50. ——— paludosus.
51. Dyticus punctulatus.
52. Parnus auriculatus.
53. Elmis Volkmari.
54. —— variabilis.
55. —— æneus.
56. Enicocerus viridiæneus.
57. Hydræna riparia.
58. Limnebius ater.
59. ——— affinis.
60. ——— truncatellus.
61. ——— nitidus.
62. Laccobius Marshami.
63. Cyclonotum orbiculare.
64. Cercyon littorale.
65. ——— crenatum.
66. ——— quisquilium.
67. Sphæridium marginatum.
68. Leiodes testacea.
69. ——— humeralis.
70. Agathidium atrum.

71. Agathidium nanum.
71.*Mylæchus brunneus.
72. Necrophorus humator.
72.*——— ruspator, *Erich.*
73. Oiceoptoma dispar.
74. Nitidula Colon.
75. ——— discoidea.
76. ——— bipustulata.
77. ——— oblonga.
78. ——— æstiva.
79. ——— obsoleta.
80. Micropeplus porcatus.
81. ——— Staphylinoides.
82. Trichopteryx atomaria.
83. Anisarthria ?
84. Atomaria atricapilla.
85. ——— atra.
86. ——— carbonaria.
87. ——— fuscipes.
88. Latridius lardarius.
89. ——— transversus.
90. ——— porcatus.
91. Corticaria pubescens.
92. Ips 4-pustulata.
93. — ferruginea.
94. Cryptophagus Typhæ.
95. Antherophagus pallens.
96. ——— silaceus.
97. Monotoma picipes.
98. Ryzophagus ferrugineus.
99. ——— depressus.
100. ——— dispar.
101. ——— bipustulatus.
102. Hister cadaverinus.
103. —— carbonarius.
104. Saprinus æneus.
105. Geotrupes sylvaticus.
106. Aphodius erraticus.
107. ——— rufescens.
108. ——— nigripes.
var. depressus.
109. ——— merdarius.
110. ——— granum.
111. Limonius minutus.
112. Cryptohypnus 4-pustulatus.
113. Ctenicerus pectinicornis.
114. ——— tessellatus.
115. Athous niger.
116. Atopa cervina.
117. Cyphon pubescens.
118. ——— griseus.
119. Cyphon Padi.
120. Telephorus pulicarius.
121. ——— lividus.
122. ——— lituratus.
123. Podabrus alpinus.
124. Ragonycha pilosa.
125. Malthinus flaveolus.
126. ——— biguttatus.
127. ——— sanguinicollis.
128. ——— melanocephalus.
129. ——— brevicollis.
130. Necrobia rufipes.
131. Anobium castaneum.
132. Dendroctonus piniperda.
133. Hylastes ater.
133.*——— angustatus.
134. Baris Atriplicis.
135. Mecinus semicylindricus.
136. Gymnaëtron tricolor.
137. Cionus Scrophulariæ.
138. ——— Blattariæ.
139. Orobitis cyaneus.
140. Cælioides Geranii.
141. Ceutorynchus ruber.
142. ——— rubicundus.
143. ——— didymus.
144. Poöphagus Sisymbrii.
145. Nedyus assimilis.
146. ——— contractus.
147. ——— Ericæ.
148. ——— ovalis.
149. ——— pollinarius.
150. ——— Boraginis.
151. ——— Troglodytes.
152. Rhinonchus pericarpius.
152.*——— Castor.
153. Phytobius 4-tuberculatus.
154 ——— canaliculatus (*rare*).
155. Orchestes Quercus.
156. ——— calcar.
157. ——— bifasciatus.
158. Tachyerges Capreæ.
159. ——— Stigma.
160. Anoplus plantaris.
161. Balaninus Brassicæ.
162. Anthonomus obscurus.
163. Dorytomus longimanus.
164. ——— tæniatus.
165. Hypera Polygoni.
166. ——— Rumicis.

167. Hypera nigrirostris.
168. ——— variabilis.
169. Leiosoma ovatula.
170. Merionus elevatus.
171. Otiorhynchus sulcatus.
172. Omias sulcirostris.
173. Brachysomus hirsutulus.
174. Trachyphlæus tessellatus.
175. ——————— scabriculus.
176. Strophosomus squamulatus.
177. Sciaphilus muricatus.
178. Sitona lineata.
179. ——— sulcifrons.
180. ——— suturalis.
181. ——— canina.
182. ——— puncticollis.
183. Polydrusus micans.
184. Phyllobius maculicornis.
185. Apion subulatum.
186. —— marchicum.
187. —— humile.
188. —— frumentarium.
189. —— cruentatum, *Walt.*
190. —— Carduorum.
191. —— immune.
192. —— Ervi.
193. —— Spencii.
194. —— Loti.
195. —— flavipes.
196. —— apricans.
197. —— Viciæ.
198. —— Ononis.
199. —— vorax.
200. —— Æthiops.
201. Ramphus pulicarius.
202. Rhynchites megacephalus.
203. ——————— Germanicus.
204. Rhynchites nanus.
205. ——————— æneovirens.
206. Rhinomacer Attelaboides.
207. Leiopus nebulosus.
208. Grammoptera ruficornis.
209. Pachyta 8-maculata.
210. Donacia cincta.
211. ——— dentipes.
212. Crioceris melanopa.
213. Cassida rubiginosa.
214. Galeruca Capreæ.
215. ——— lineola.
216. Luperus rufipes.
217. Thyamis apicalis, *Waterh.*
218. ——— thoracica.
219. Mantura semiænea.
220. Macrocnema Spergulæ.
221. ——————— marcida.
222. Chrysomela varians.
223. ——————— marginata.
224. ——————— pallida.
225. Phædon unicolor.
226. ——— Cochleariæ.
227. Coccinella ocellata.
228. ——————— hieroglyphica.
229. ——————— 18-guttata.
230. ——————— globosa.
231. Rhyzobius Litura.
232. Cacicula pectoralis.
233. Anaspis frontalis.
234. ——— ruficollis.
235. ——— melanopa.
236. Salpingus ruficollis.
237. ——————— planirostris.
238. Sphæriestes ater.
239. ——————— immaculatus.
240. Notoxus monoceros.

The preceding list consists of insects, taken chiefly in the eastern part of Berwickshire, during the summers of 1844 and 1845. This will account for the repetition of several species, found in other quarters of the district, that have already appeared in the Club's Transactions. Nos. 14, 46, 63, 96, 171, 227, all new to Berwickshire, are from Dr Johnston's Cabinet. *Colymbetes bistriatus*, *Ips* 4-*pustulata*, *Cryptophagus Typhæ*, *Cyphon Padi*, *Gymnaëtron tricolor*, *Phytobius canaliculatus*, *Dorytomus longimanus*, *Donacia dentipes*, *Galeruca lineola*, *Luperus rufipes*, *Chrysomela pallida*, *Coccinella* 18-*guttata*, *and C. globosa*, were taken by Mr

Hislop, near Dunse, and in the west of the shire. *Tarus basalis* is found sparingly on the moor above Drakemire; a locality which likewise affords *Omaseus Orinomum*, *Trechus ruficollis* and *Miscodera arctica*. Nearly twenty specimens of the latter were procured. It is confined exclusively to small stones, by the sides of roads crossing the dry part of the moor. *Calathus piceus* and *Steropus Æthiops* are evidently very rare. My specimen of the former is provided with wings. *Epaphius Secalis*, not yet recorded as a Scottish insect, is abundant in damp fields, and at the borders of open drains. *Mylæchus brunneus* occurs in grass-fields near Penmanshiel wood. *Agathidium nanum* was detected on an old birch stump, feeding on *Lycogala miniata*. *Antherophagus pallens* was entering a bee-hive; it is occasionally found in our deans. Nos. 126, 127, 128, 129 are probably varieties of one variable species, of which the females have the eyes small and the antennæ abbreviated, while the males have the eyes very prominent and the antennæ long. In *flaveolus* the eyes are prominent in both sexes. *Poöphagus Sisymbrii* is attached to the water-cress, and swims with facility. *Dorytomus tæniatus* destroys the catkins of the sallow. *Sitona lineata* infests fields of tares, feeding on the leaves. *Rhinomacer Attelaboides*, a northern insect, is from the Peasedean, whence also the *Pachyta* 8-*maculata* was obtained, resting on the *Heracleum Sphondylium*. *Macrocnema marcida* feeds on *Cakile maritima*; *Mantura semiænea* on the *Rumex crispus*; *Macrocnema Spergulæ*, a scarce species, frequents corn-fields and the borders of woods; and *Thyamis apicalis* abounds, at evening especially, on *Achillæa Millefolium*. *Notoxus monoceros* was found among the *Ammophila arundinacea*, on the shore at the foot of the Pease Burn; a singular locality for a highly curious and interesting insect.

An account of the several days in each winter on which the Berwick Shipping Company's Stock of Ice was laid in, from the year 1821 *to* 1845. By Mr WILLIAM PAULIN.

Winters.	Days on which Ice was procured.	Quantities laid into Store.
1820–1	1821, Jan. 3, 4, 5, 6,	Ice-houses all filled.
1821–2	1822, Mar. 9—the only day, and 476 loads obtained,	453 tons imported from Norway.
1822–3	— Dec. 13, 14, 16, 31,	Ice-houses all filled.
1823–4	1823, Dec. 19; 1824, Mar. 3, 5, in all 1640 loads,	160 tons imported.
1824–5	1824, Dec. 2, 3, 4, 6, 7,	Houses filled.
1825–6	1825, Dec. 31; 1826, Jan. 10, 11, 12, 13, —	Do.
1826–7	1826, Dec. 6; 1827, Jan. 4, 5, 6, 12, 13, —	Do.
1827–8	1827, Dec. 31; 1828, Jan. 12; Feb. 13, 14, 15, 16, 18,	Do.
1828–9	1829, Jan. 16, 17, 19, 20, 22,	Do.
1829–30	— Dec. 24, 28; 1830, Jan. 4, 5,	Do.
1830–1	1830, Dec. 25, 27, 28, 29,	Do.
1831–2	1831, Nov. 19, 21; 1832, Jan. 3, 5, 6, 7, —	Do.
1832–3	1832, Dec. 29; 1833, Jan. 11, 17, 25, 26, —	Do.
1833–4	1834, Feb. 11, 15, 22, 136 loads, ½ inch thick,	924 tons imported.
1834–5	— Dec. 29; 1835, Jan. 3, 5, 6, 8, 9,	Houses filled.
1835–6	1835, Dec. 26; 1836, Jan. 30; Feb. 1, 3, 12, 13, 26, 27, only 3763 loads,	525 tons imported.
1836–7	1836, Dec. 12, 13, 26, 28, 29, 30, 31; 1837, Jan. 2,	Houses filled.
1837–8	1837, Nov. 30; 1838, Jan. 10, 11, 15, 16, 18. 19,	Do.
1838–9	1838, Dec. 20, 22; 1839. Jan. 7, 10, 11, 12, 18,	Do.
1839–40	1839. Dec. 30, 31; 1840, Jan. 1, 8, 9,	Do.
1840–1	1840, Dec. 25, 26; 1841, Jan. 8, 9, 11, 12,	Do.
1841–2	1841, Nov. 18, 19, 20; Dec. 20, 21, 22,	Do.
1842–3	1843, Jan. 12, 13, 14, 16, 17,	Do.
1843–4	1844, Jan. 4, 17, 18; Feb. 1, 2, 3, 5, 6,	Do.
1844–5	— Dec. 7; 1845, Jan. 30, 31; Feb. 1, 3, 4,	Do.

N. B.—When the time occupied in filling the houses exceeds 5 or 6 days, the frost may be considered not to have been severe, and, in consequence, not a sufficient quantity of ice obtainable for a full day's work. When only 4 or 5 days have been occupied, the frost must have been intense, and an abundant supply of ice.

Arrangement of the British Entomostraca, with a List of Species, particularly noticing those which have as yet been discovered within the bounds of the Club. By WILLIAM BAIRD, M.D., &c.

Sub-Kingdom, ANNULOSA.
Class, CRUSTACEA; Division, ENTOMOSTRACA.

The Entomostraca may be characterized by their being all aquatic,—by their being either covered with a shell, which is of a horny or coriaceous texture, and formed of one or two pieces, in some approaching in appearance to a bivalve shell, in others, being in the form of a buckler, which completely, or in part, envelopes the body of the animal; or being completely enclosed in a hard testaceous covering of several pieces,—by having branchiæ attached either to the feet or organs of mastication,—by their feet being jointed, and all more or less ciliated,—and by their undergoing a regular moulting or change of shell as they grow, in some approaching to a species of transformation.

Legion 1*st*.—BRANCHIOPODA—*Latreille*.

Mouth furnished with organs fitted for mastication. Branchiæ attached to the feet or jaws. Body sometimes naked, but generally having an envelope, in form of a buckler, enclosing the head and thorax, or in the shape of a bivalve shell enclosing the whole animal. Feet varying in number, all articulated and more or less ciliated. Antennæ two or four, articulated, and generally ciliated. Eyes sometimes two or even three, but most frequently only one, or if more, so closely approximated as to appear single. They are all free and unattached, swimming at large in the water, or creeping on aquatic plants.

Legion 2*d*.—PÆCILOPODA—*Latreille*.

Mouth not possessed of organs fitted for mastication, having instead an apparatus adapted for sucking. Feet partly formed for walking or prehension, and part branchiferous, and fitted for swimming. Body, in the greater number, enclosed almost totally within a buckler, consisting generally of one piece, more seldom of two. Parasitical upon fishes, &c.

Legion 3d.—CIRRHIPODA.

Mouth possessing organs of mastication, consisting of lateral jaws. Feet numerous, in pairs, consisting of many small ciliated articulations. Body enclosed in a hard testaceous covering, composed of several pieces. Fixed to rocks or to other marine substances.

BRANCHIOPODA.

ORDER 1.—PHYLLOPODA—LATREILLE.

Feet numerous, generally at least twenty in number, and sometimes many more. Articulations foliaceous and branchiform, being chiefly adapted for respiration, and not for locomotion. Eyes generally two, but sometimes three; in some situated at the extremity of two moveable peduncles. Antennæ generally of only one pair, though sometimes two,—in most, small and not fitted for assisting the animal in swimming. Mandibles always without palpi.

FAMILY 1.—APUSIDÆ.

Antennæ, one pair, short and styliform. Eyes, three. Feet, sixty pairs. Nearly the whole body covered by a large shield-formed carapace. Body composed of numerous rings.

Genus 1st.—APUS, *Schæffer.** There being only one genus in this family, the characters given above will apply to the genus.

Sp. 1st.—Apus cancriformis, *Latr.* Monoculus apus, *Linn.* Branchipus cancriformis, *Schæffer.*† Limulus cancriformis, *Lamk.* Binoculus cancriformis, *Leach.*

Sp. 2d.—Apus Montagui, *Leach.* Encyc. Brit. Suppl., t. 1.

FAMILY 2.—NEBALIDÆ.

Antennæ, two pairs, large and ramiform. Eyes two, pedunculated. Feet, twelve pairs; eight branchial and four natatory. Carapace enclosing head, thorax, and part of abdomen, almost in form of a bivalve shell.

Genus 1st.—Nebalia, *Leach.*‡ There is only one genus in the family.

Sp. 1st.—Nebalia Montagui, *Thompson.*§ Monoculus rostratus, *Montague.*

* Monogr., tab. 1—5.
† Element. Entomol., t. 29, p. 1—2.
‡ Zool. Miscell., I.
§ Zool. Research.

FAMILY 3.—BRANCHIPUSIDÆ.

Body not enclosed within, or covered by, a carapace of any kind. Antennæ, two pairs, the inferior pair being prehensile. Eyes two, pedunculated. Feet, eleven pairs, all branchial.

Genus 1st.—Branchipus, *Schæffer.** Body elongated, almost filiform. Abdomen very large, composed of nine articulations, the last bilobed and terminated by two large well developed plates, forming a tail. At the base of the prehensile or second pair of antennæ, there are setaceous appendages in form like the superior antennæ.

Sp. 1st.—Branchipus stagnalis, *Latr.*† Cancer Stagnalis, *Linn.* Branchiopoda stagnalis, *Lamk.* Branchipus Schæfferi, *Thompson.*

Genus 2d.—Artemia, *Leach.* Last articulation of abdomen simply two-lobed, and destitute of the two large plates. No setaceous appendages at the base of the prehensile antennæ.

Sp. 1st.—Artemia salina, *Leach.*‡ Cancer salinus, *Linn.* Gammarus salinus, *Fabr.* Artemisus salinus, *Lamk.*

No species of any of the genera of the above mentioned families have as yet, I believe, been noticed within the limits of this Club; but I have little doubt that some of them will be found hereafter.

ORDER 2.—LOPHYROPODA—LATREILLE.

Feet not numerous, and not exceeding ten in number, with more or less cylindrical joints. Branchiæ not numerous. Generally speaking, only one eye. Most of them have two pairs of antennæ, the inferior of which are used, in most of the genera, as organs of motion. Many of them have a palpus attached to the mandible.

Section 1st.—CLADOCEERA—LATR.

Body, except the head, which is distinct and projecting, entirely enclosed within a covering of two pieces joined together on the back, and divided within this envelope into rings, not very distinct. No foot jaws. Inferior antennæ branched, large and performing functions of swimming organs. Feet more or less foliated, and generally four or five pairs. No external ovary.

* Element. Entomol. † Hist. Nat. des Crust., &c., iv., 299.
‡ Dict. des Scien. Nat., xiv., 543.

FAMILY 1.—DAPHNIDÆ.

Two pairs of antennæ; superior very small; inferior large and branched, and used as organs of locomotion. Five pairs of feet. Head prolonged into a more or less blunt beak. Eye single, large. Intestine straight.

Genus 1*st.*—DAPHNIA—*Muller.*

Inferior antennæ large and branched, one branch having four, the other three articulations.

Sp. 1st.—D. pulex—Daphne pulex, *Mull.* Zool. Dan. prod. Daphnia pennata, *Mull.* Entomost. Daphnia pulex, *Straus.* Monoculus pulex, *Jurine.* *Hab.* common in ponds and ditches, &c., in all parts of Berwickshire.

Sp. 2d.—D. vetula—Daphne vetula, *Mull.* Zool. Dan. prodrom. Daphnia sima, *Mull.* Entomost. Daphnia vetula, *Straus.* Monoculus sima, *Jurine.* *Hab.* common in ponds and ditches in Berwickshire.

Sp. 3d.—D. reticulata—Monoculus reticulatus, *Jurine.** Daphnia quadrangula? *Muller.* Entomost. *Hab.* ditch near Berwick.

Sp. 4th.—D. rotunda, *Straus.* Mem. du Mus. d'Hist. Nat., v. t. 29, f. 27-28.

Sp. 5th.—D. brachiata—Monoculus brachiatus, *Jurine.* Hist. de Monoc., &c., t. 12, f. 3-4.

Sp. 6th.—D. mucronata—Daphnia mucronata, *Mull.* Entomost. Monoc. bispinosus, *De Geer.* Daphnia bispinosa, *Koch.* Deutsch. Crust., H. 8, t. 1.

Genus 2*d.*—SIDA—*Straus.*

Inferior antennæ, large and two branched, one branch having three, and the other two articulations.

Sp. 1st.—Sida crystallina, *Straus.* Mem. du Mus. v.—Daphnia crystallina, *Muller.* Monoculus elongatus, *De Geer.*

FAMILY 2.—BOSMINIDÆ.

Superior antennæ pendulous from the beak, and longer than in preceding family. Inferior large, two branched.

* Hist. des Monoc., &c., 139, t. 14, f. 3-4.

Genus 1*st*.—MACROTHRIX—*Baird*.*

Superior antennæ flat, having only one articulation. Inferior antennæ large, two-branched, each branch having three articulations. Second articulation of anterior branch, provided with a very long seta or filament. Eye accompanied with a black spot situate in front of it.

Sp. 1st.—M. roseus—Monoculus roseus, *Jurine*.†

This species has been taken by Sir W. Jardine, in Lochmaben Loch, Dumfriesshire, where it appears to form, in part, the food of the vendace.

Sp. 2d.—M. laticornis, *Baird*.‡ Monoc. laticornis, *Jurine*. Daphnia Curvirostris, *Muller*. Entomost.

Genus 2*d*.—BOSMINA.

Inferior antennæ large, two-branched, one branch having four, the other three articulations. Superior antennæ, long, curved, round, and many-jointed.

Sp. 1st.—Bosmina cornuta—Monoculus cornutus, *Jurine*.§ Daphnia cornuta, *Baird*. Lynceus longirostris? *Muller*. Entomost.

FAMILY 3.—POLYPHEMIDÆ.

Four pairs of feet, not contained within the shell. Eye very large. Lower part of shell forming a large vacant space for containing the ova and young.

Genus 1*st*.—POLYPHEMUS—*Muller*.

Head distinct from body; abdomen projecting externally from shell. Inferior antennæ or rami large, two-branched, one branch having three, the other four articulations.

Sp. 1st.—Polyphemus oculus, *Mull*. Entomost. Polyphemus stagnorum, *Leach*. Polyphemus pediculus, *Straus*. Cephaloculus stagnorum, *Lamk*. Monoculus pediculus, *Linn*. Mon. polyphemus, *Jurine*.

Genus 2*d*.—EVADNE—*Loven*.

Head not distinct from body. Abdomen inclosed within the

* Ann. Mag. Nat. Hist.
† Hist. des Monoc., &c., t. 15, f. 4-5.
‡ Ibid.
§ Ibid.

shell. Second pair of antennæ large, two-branched, one branch having four, the other three articulations.

Sp. 1st.—Evadne Nordmanni, *Loven*, *Edwards*, *Goodsir*. Edin. Phil. Jour. xxxiii., t. 6, f. 15-16.

This species has been taken in the Firth of Forth, by Mr Goodsir. We may reasonably expect it to exist also along the coast of Berwickshire.

FAMILY 4.—LYNCEIDÆ—*Baird.**

Two pairs of antennæ, superior very short, inferior of moderate size, two-branched, each branch having three articulations. Feet five pairs. Head prolonged into a more or less sharp beak. Eye single, but accompanied with a black spot, situate in front of it. Intestine convoluted, having one complete turn and a half. Abdominal portion of body jointed.

Genus 1*st*.—EURYCERCUS—*Baird.*

Subquadrangular. Abdomen very broad, in form of a flat plate, densely serrated.

Sp. 1st.—E. lamellatus.—Lynceus lamellatus, *Muller*. Monoc. lamellatus, *Linn*. Eurycercus lamellatus, *Baird*. Ann. Mag. Nat. Hist.

Hab. In Yetholm Loch: pool on Beaumont water, near Yetholm, &c.

Genus 2*d*.—CHYDORUS—*Leach*. Enc. Brit. Suppl.

Nearly spherical in shape. Beak very long and sharp, curved almost into the shape of a crescent. Inferior antennæ very short.

Sp. 1st.—C. sphæricus—Lynceus sphæricus, *Mull*. Chydorus Mulleri, *Leach*. C. sphæricus, *Baird*. Ann. Mag. Nat. Hist. *Hab*. Very common throughout the county.

Sp. 2d.—C. globosus, *Baird*. Ann. Mag. Nat. Hist.

Genus 3*d*.—CAMPTOCERCUS—*Baird.*

Ovoid-shaped. Abdomen long, slender, and extremely flexible; serrated.

Sp. 1st.—C. macrourus, *Baird*. Ann. Mag. Nat. Hist. Lynceus macruorus, *Muller*. Entomost.

* Ann. Mag. Nat. Hist.

Genus 4th.—ACROPERUS—*Baird.*

Somewhat harp-shaped, anterior margin terminating inferiorly in a more or less blunt point projecting forwards; inferior antennæ long.

Sp. 1st.—A. harpæ, *Baird.* Ann. Mag. Nat. Hist.

Hab. Pond on Beaumont water at Yetholm. Dunglass pond, &c.

Sp. 2d.—A. nanus, *Baird.* Ann. Mag. Nat. Hist.

Genus 5th.—ALONA—*Baird.*

Shell quadrangular-shaped, striated; inferior antennæ short.

Sp. 1st.—A. quadrangularis, *Baird.* Ann. Mag. Nat. Hist. Lynceus quadrangularis, *Muller.*

Hab. In the Pease burn, Cockburnspath: pool on Beaumont water, Yetholm.

Sp. 2d.—A. reticulata, *Baird.* Ann. Mag. Nat. Hist.

Genus 6th.—PLEUROXUS—*Baird.*

Anterior margin prominent on upper portion; the lower part being truncated, or, as it were, cut sharp and straight. First pair of feet very large.

Sp. 1st.—P. trigonellus, *Baird.* Ann. Mag. Nat. Hist. Lynceus trigonellus, *Muller.*

Hab. Pond at Fouldean, Berwickshire, and at Yetholm.

Sp. 2d.—P. hamatus, *Baird.* Ann. Mag. Nat. Hist. Lynceus hamatus, *Baird.* Trans. Berw. Nat. Club.

Hab. Yetholm loch, and pool on Beaumont water, near Yetholm.

Genus 7th.—PERACANTHA—*Baird.*

Oval-shaped, lower extremity slightly curved backwards, and, as well as the upper extremity of anterior margin, beset with strong hooked spines.

Sp. 1st.—P. truncata, *Baird.* Ann. Mag. Nat. Hist. Lynceus truncatus, *Muller.* *Hab.* Pool on Beaumont water, near Yetholm.

SECTION 2.—OSTRACODA—*Latreille.*

Body enclosed entirely in a covering of two valves, resembling a bivalve shell, not divided into rings. Posterior jaws branchiferous. No external ovary.

FAMILY 1.—CYPRIDÆ.

Two pairs of antennæ ; superior slender, jointed and setiferous, inferior large and pediform. Body enclosed in a bivalve shell. Eye single.

Genus 1*st.*—CYPRIS—*Muller.*

Two pairs of feet only, one pair always contained within the shell. Posterior or pediform antennæ, furnished with a pencil of long hairs or filaments. Abdomen terminated by a long slender bifid tail. Animal swims freely in the water.

Sp. 1st.—C. tristriata, *Baird.* Trans. Berw. Nat. Club. C. pubera, *Baird.* Mag. Zool. and Bot. *Hab.* Pond at Little Swinton.

Sp. 2d.—C. vidua, *Muller.* Entomost.

Sp. 3d.—C. monacha, *Muller.* Entomost. *Hab.* Newnham Loch, Northumberland.

Sp. 4th.—C. fusca, *Straus.* Mem. Mus. d'Hist. Nat.

Sp. 5th.—C. compressa, *Baird.* Trans. Berw. Nat. Club. C. punctata, *Koch.* Deutsch. Crustac., H. 21. t. 23. *Hab.* Yetholm Loch.

Sp. 6th.—C. minuta, *Baird.* Trans. Berw. Nat. Club. *Hab.* Pools near Yetholm.

Sp. 7th.—C. Joanna, *Baird.* Trans. Berw. Nat. Club. *Hab.* Pool on hill opposite Abbey St Bathans.

Sp. 8th.—C. elongata, *Baird.* Trans. Berw. Nat. Club. *Hab.* Pool at Yetholm.

Sp. 9th.—C. Westwoodii, *Baird.* Trans. Berw. Nat. Club. *Hab.* Yetholm Loch.

Sp. 10th.—C. gibbosa, *Baird.* Mag. Zool. and Bot.

Sp. 11th.—C. clavata, *Baird.* Mag. Zool. and Bot.

Sp. 12th.—C. strigata, *Muller.* Entomost. *Hab.* Pool on seashore, a little above high water-mark, at Thornton Loch, near Cockburnspath.

Sp. 13th.—C. elliptica, n. s.

Sp. 14th.—C. sella, n. s.

Genus 2*d.*—CANDONA.

Two pairs of feet, one pair contained within the shell. Abdomen terminated by a long slender bifid tail. Pediform antennæ

not furnished with a pencil of long hairs or filaments. Animal creeps at the bottom, or upon aquatic plants, &c.

Sp. 1st.—C. candida. Cypris candida, *Muller*. Entomost. *Hab*. At Cockburnspath, and at Yetholm.

Sp. 2d.—C. reptans. Cypris reptans, *Baird*. Trans. Berw. Nat. Club. *Hab*. Yetholm Loch.

Sp. 3d.—C. hispida. Cypris hispida, *Baird*. Trans. Berw. Nat. Club. *Hab*. Pool on Beaumont water, Yetholm.

Sp. 4th.—C. detecta. Cypris detecta, *Muller*. Entomost. *Hab*. Pool on Beaumont water, Yetholm.

Sp. 5th.—C. similis, n. s.

Genus 3*d*.—CYTHERE—*Muller*.

Pediform antennæ not possessed of long filaments. Three pairs of feet all external to shell. Animal creeps on marine plants, &c.

Sp. 1st.—C. flavida, *Muller*. Entomost. *Hab*. In pools of sea-water on the shore at Cockburnspath.

Sp. 2d.—C. reniformis, *Baird*. Trans. Berw. Nat. Club. *Hab*. In pools on the rocks on sea-shore at Cockburnspath and Berwick.

Sp. 3d.—C. albo maculata, *Baird*. Mag. Zool. and Bot. *Hab*. Berwick bay.

Sp. 4th.—C. alba, *Baird*. Trans. Berw. Nat. Club. *Hab*. Sea-shore at Dunbar.

Sp. 5th.—C. variabilis, *Baird*. Trans. Berw. Nat. Club. *Hab*. At Cockburnspath and Berwick.

Sp. 6th.—C. aurantia, *Baird*. Mag. Zool. and Bot. *Hab*. Berwick bay.

Sp. 7th.—C. nigrescens, *Baird*. Mag. Zool. and Bot. *Hab*. Berwick bay.

Sp. 8th.—C. inopinata, *Baird*. Zoologist, i., 195, *f. a. b.*

SECTION 3.—COPEPODA—*Latreille*.

Body divided into several very distinct rings; envelope consisting of a buckler, enclosing head and thorax; mouth possessed of foot-jaws; feet generally four or five pairs in number. An external ovary.

FAMILY 1.—CYCLOPIDÆ.

Head distinct from body, not possessing a moveable beak; body

generally of four, and abdomen of six, segments; foot-jaws two pairs, generally small; legs about five pairs. One eye.

Genus 1*st.*—CYCLOPS—*Muller.*

Foot-jaws large and strong, branched; antennules simple. Ovaries double.

Sp. 1st.—C. quadricornis, *Muller.* Zool. Dan. prod.—Entomost. Monoculus quadricornis, *Linn.*, *Jurine.* Cyclops vulgaris, *Desmarest*, *M. Edwards.*

Hab. Common in all ponds and ditches throughout the county.

Genus 2*d.*—CYCLOPSINA—*M. Edwards.*

Foot-jaws of considerable magnitude; simple; antennules two-branched; ovaries double.

Sp. 1st.—C. castor—Monoculus castor, *Jurine.** Cyclops cœruleus, rubens, and lacinulatus, *Muller.* Cyclops castor, *Desmarest.* *Hab.* Dunglass pond; Yetholm Loch.

Genus 3*d.*—CANTHOCARPUS.—*Westwood.*

Foot-jaws small, simple. Antennules simple. Ovary single.

Sp. 1st.—C. minutus—Cyclops minutus, *Muller.* Entomost. Monoculus staphylinus, *Jurine.* Cyclops staphylinus, *Desmarest.* *Hab.* Pools and ditches, common throughout the district.

Sp. 2d.—C. Stromii—Cyclops Stromii, *Baird*, Mag. Zool. and Bot. Cyclops brevicornis, *Baird.* Trans. Berw. Nat. Club. *Hab.* In pools on sea-shore, amongst corallines, &c. At Cockburnspath and Berwick Bay.

Sp. 3d.—C. furcatus—Cyclops furcatus, *Baird.* Mag. Zool. and Bot. Cyclopsina furcatus, *M. Edwards.* *Hab.* Berwick Bay.

Sp. 4th.—C. minuticornis—Cyclops minuticornis, *Muller.* Entomost. Cyclops inermis? *Tilesius.* *Hab.* Berwick Bay.

Genus 4*th.*—ARPACTICUS—*M. Edwards.*

Foot-jaws possessing strong cheliform hands; antennules simple. Ovary single.

Sp. 1st.—A. chelifer—Cyclops chelifer, *Muller.* Entomost. Cyclops Johnstoni, *Baird.* Trans. Berw. Nat. Club. Cyclops

* Hist. des Monoc, 50, t. 4, 5, 6.

armatus? *Tilesius*. *Hab*. Pools of sea water in rocks on shore at Cockburnspath and Berwick.

Sp. 2d.—A. nobilis. Nov. spec.

Thoracic and abdominal portions of body distinct from each other. The thorax is composed of four segments, and is large and rounded. Abdomen consists of six slender segments, the last bilobed, and giving off two long and two short setæ. The whole insect is beautifully coloured with green, red, and purple. Eye large, of a ruby colour. Antennæ short, of seven segments, all setiferous; the two first short and stout, the third much longer, toothed on upper edge, and giving off at its extremity several long setæ; four last small and short. Antennules composed of two segments, the first giving off a shoot from about the middle of its length, the second terminating in several stout setæ. The mandibles and anterior, or first pair of foot-jaws, are strong, and resemble the same organs in cyclops quadricornis. Posterior foot-jaws shorter and stouter than those of preceding species, and consisting of two joints and a terminal hooked claw. Thoracic pair of feet differ from abdominal ones. They consist of two stalks rising from a common base: the anterior or upper stalk consisting of one long joint, and a very short one which terminates in a strong claw; the posterior or inferior stalk is very short, toothed on the edge, and giving off several stout setæ. The abdominal feet resemble those of preceding species, the setæ with which they and the fulcra are provided being all plumose. The fulcra resemble those of *chelifer*. The setæ of tail, however, are not plumose. This species is, at least, three times larger than preceding, and has the body more rounded and much stouter. *Hab*. Berwick Bay, September 1844.

Genus 5th.—ALTEUTHA.*

Foot-jaws small, simple; body flat. Two strong falciform appendages from fifth segment of body.

Sp. 1st.—Alteutha depressa—Cyclops depressus, *Baird*. Mag. Zool. and Bot. *Hab*. Berwick Bay.

FAMILY 2.—PONTIADÆ.

Head distinct from body, with a beak in front. Thoracic por-

* *The Town of the Tweed.*

tion of body divided into five joints; abdomen into about two; superior antennæ long; inferior two branched; foot-jaws, three pairs, large and well developed; legs, five pairs; eyes, two in number.

Genus 1st.—PONTIA—*M. Edwards.*

Head furnished with a moveable beak; foot-jaws well developed; antennules two branched, serving the purpose of natatory organs. Last pair of feet differ in construction from preceding pairs.

Sp. 1st.—Pontia Patersonii—Anomalocera Patersonii, *Templeton.* Trans. Ent. Soc. II.

Genus 2d.—CETOCHILUS—*Roussel de Vauzéme.*

Head furnished with two small styliform prolongations. Antennules of two branches of nearly equal size. Third pair of foot-jaws smaller than in preceding genus. Last pair of feet of the same formation as the others.

Sp. 1st.—Cetochilus septentrionalis, *Goodsir.* Edin. New Philos. Jour. xxxv. *Hab.* Frith of Forth.

Genus 3d.—IRENÆUS—*Goodsir.*

Head furnished with a beak; a large tubular organ arises from the lower or abdominal surface of the body, in the superior extremity of which the organs of vision are situated. The right antennæ are very much swollen a little behind the middle.

Sp. 1st.—Irenæus splendidus, *Goodsir.* Edin. New Philos. Jour. xxxv. *Hab.* Frith of Forth.

As these last two species have recently been found by Mr Goodsir in the Frith of Forth, I have little doubt they will be found by future observers on the shores of Berwickshire also.

PÆCILOPODA.

ORDER—SIPHONOSTOMA.

Mouth furnished with a syphon, which possesses styliform mandibles. Thorax composed of several distinct rings, and having three or four pairs of feet. Foot-jaws well developed.

FAMILY 1.—CALIGIDÆ.

Head in form of a large buckler, having anteriorly large frontal plates. Four pairs of feet, which are furnished with long plumose hairs. Antennæ small, flat, and two-jointed.

Genus 1*st.*—CALIGUS—*Muller.*

Fourth pair of feet slender, of one branch, and serving the insect for walking. Not possessed of any appendage in the centre of the anterior part of the buckler.

Sp. 1st.—C.—Nov. spec? *Hab.* The salmon, at Berwick.

FAMILY 2.—ARGULIDÆ.

Head in form of a large circular-shaped shield. Antennæ short, thick, two-jointed; second pair of foot-jaws absent, being replaced by a pair of large suckers.

Genus 1*st.*—ARGULUS—*Muller.* Contains only one Genus.

Sp. 1st.—Argulus foliaceus—Monoculus foliaceus. *Linn.* Syst. Nat. Argulus foliaceus, *Jurine fils.* Ann. des Mus. d'Hist. Nat. vii. 431. Argulus delphinus, *Muller.*

FAMILY 3.—DICHELESTIDÆ.—(Dichélestiens, *M. Edwards*).

Head small, thick, obtuse in front, giving insertion to two slender antennæ at its anterior edge. Body elongated.

Genus 1*st.*—ANTHOSOMA—*Leach.*

Three pairs of feet, all foliaceous. Thorax provided above with large lamellar appendages.

Sp. 1st.—A. Smithii, *Leach.* Encyc. Brit. Suppl. i., t. 20, f. 1-6.

The order Lerneidæ, introduced here by M. Edwards, containing so many curious and outré forms, and the animals of which, till within a few years, were considered to belong to the Vermes, has been very little, if at all, studied in this country. As I have not had an opportunity of examining these curious little creatures alive, nor met with any from our Berwickshire coast, I will not enter upon their arrangement here, though I have no doubt many are to be found within the limits of our coasts.

The Pycnogonidæ have been constituted into an order of the

Pœcilopoda by M. Edwards, though most naturalists, up to his time, have arranged them amongst the Arachnides. These interesting little animals I have not had an opportunity of examining alive, and as it is still with some hesitation that M. Edwards admits them amongst the Crustacea, I will not introduce their arrangement here. In the mean time, I may state, that an exceedingly valuable paper upon these little creatures, whose "position in society" has puzzled naturalists so much, has been published by Dr Johnston in the Magazine of Zoology and Botany, i., 368,—in which additional reasons are given for arranging them amongst the Crustacea; and a list of six British species are given, four of which he has found on the coast of Berwickshire.

CIRRHIPODA.

The natural affinities of the Cirrhipoda with the Crustacea are now so well understood, that it is no longer doubtful where they ought to be placed. They form, in fact, a portion of the Entomostraca, their close connection with them having been pointed out by Burmeister and others, and their position assigned to them, as a family of this division, by Mr J. E. Gray, in the Synopsis of the Contents of the British Museum, 1842. As, however, they have generally heretofore been studied by conchologists, and arranged amongst or near to the Mollusca, I will not enter further into their history or arrangement here than to state, that our indefatigable member, Dr Johnston, has published in our Transactions, vol. i., p. 63, a list of the species, amounting to six, which he has found on the coasts within the limits of our Club, and to which I must refer you.

ULVA DEFRACTA.

In our "Proceedings" I have stated that this production is a "true vegetable," which a recent examination, with a better microscope than that I used formerly, proves to be incorrect. I procured some specimens this summer from Eyemouth, and there is no doubt that they are the spawn of a molluscous animal, probably of one of the Mollusca nudibranchia.— G. J.

On the Foundations of Ancient Buildings, and Coins of the Saxon Kingdom of Northumbria, recently discovered at Holy Island. By JOHN S. DONALDSON SELBY, Esq. of Cheswick.

In the month of June 1845, the foundations of what appear to have been extensive buildings were discovered by the workmen employed in forming a railway near to that part of Holy Island where the links and sandhills, called the Snook, are united to the enclosed and cultivated part of the island. These ruins, having for centuries been overwhelmed with sand, which here shifts with every high wind, were, during the last spring, uncovered, and again brought to light, by the prevalence, for a considerable time, of strong easterly winds, and thus offered to the workmen an opportunity to procure stones for the buildings and works on which they were employed, more easily and less expensively than from the adjoining quarries. These foundations indicate the former existence of buildings of considerable extent and importance, covering an area of 312 feet in length from east to west, by 341 feet in width from north to south, and are divided by cross walls into numerous divisions and compartments. The stones are loose and irregularly shaped, and appear to have been put together without mortar. About sixty yards from the southern end of these foundations, and on the top of the quarry from whence the stones forming the same appear to have been procured (being all of the blue encrinal limestone so abundant at Holy Island), the foundations of another building were discovered; and near to this spot were found two coins, composed of mixed metal, one of which is a styca of the coinage of Æthelred King of Northumbria, and the other a styca of Vigmund, Archbishop of York. The Saxon kingdom of Northumbria was composed of the united Roman provinces of Bernicia and Deira, and extended from the Humber to the Firth of Forth (whence the present name Northumberland—that is "land" "north" of the "Humber"), and from the German Ocean to the Irish Sea. It was governed by a series of Saxon monarchs, thirty four or thirty six in number—from Ella, who joined the two provinces in A.D. 587, to Eric who

died in 951, when Northumbria ceased to be a separate kingdom, and was added to the other dominions of Eadred. Several of the Saxon kings of Northumbria were intimately connected with Lindisfarne and its bishopric, now called Holy Island; and it was Oswald who was the founder of that see. He reigned from A.D. 634 to 642, and was the friend and protector of Aidan, its first bishop; and it is probable that he gave to the church of Lindisfarne several of the lands which compose the modern district of Norham and Islandshires. Æthelred reigned over Northumbria from 840 to 848, with the exception of a few months in the year 844, when Redulf usurped the throne. The styca of this Æthelred, referred to above, bears the king's name and title on the rim of the obverse, and the name of the mintmaster or moneyer, who was called Brother, on the rim of the reverse; and in the centre of each side is a cross. The legends are as follow:—"+ EDILREDREX" and "+ BROÐER." The other styca of Vigmund also bears his own name and title of Archbishop on the observe, and the name of his moneyer on the reverse, with a cross in the centre of each, that on the obverse being a little larger than that on the reverse. The legends are thus:—"+ VIGMVNDIREP" and "+ EDILAHVID." The coin of Æthelred is in good preservation, but the inscriptions on Vigmund's are a little worn and defaced. Vigmund was Archbishop of York from 851 to 854. In 1808, upwards of 500 Northumbrian stycas were found in the parish of Kirkoswald, in Cumberland; in 1832, about 8000 were found at Hexham, in Northumberland; and since, a considerable quantity has been found at York and at other places within the limits of the ancient kingdom of Northumbria, including many of Æthelred's and Vigmund's. Some of the coins found at Hexham have been analyzed, and found to contain, in 100 parts, from 60 to 70 of copper, 20 to 25 zinc, 6 to 11 silver, about 4 tin, with some very small portions of gold and lead. It is material to add, that no stycas have been found which were coined elsewhere than in Northumbria.*

* For an account of the Anglo-Saxon coinage, see Introduction to Gough's edition of Camden's Britannia, London, 1806, pp. 172 to 176; also Dr Hicke's Thesaurus; and Turner's History of the Anglo-Saxons. For an account of the stycas found at Hexham, see Archæologia, vols. xxv. and xxvi. Hawkins' Treatise on English Coins, pp. 37–54. A copy of the Treatise in the

Connecting the coins with the ancient foundations of buildings near to which they were found, as before mentioned, I think we are at liberty (and without a great stretch of imagination) to conjecture that they and the buildings are of equal antiquity, and both referrible to a period of time, since when nearly a thousand years have elapsed. The absence of mortar is not, of itself, a sufficient proof that no regular buildings were there, for dry stone masonry was practised by the ancient Britons, as is satisfactorily shewn by many specimens still visible in Somersetshire, Cornwall, the Isle of Anglesea, and elsewhere. Many conjectures have been made, and opinions formed, as to the uses to which these buildings in Holy Island may have been put, and for what purpose they were originally constructed. A village of fishermen may have stood there, or it may have been inhabited by quarrymen, when the limestone quarries in the immediate neighbourhood were anciently, as they have been very extensively, worked. A circumstance, however, in connection with well-known facts, has led me to form the opinion that these buildings have anciently been occupied and used as storehouses and dwellings by the *kelp-burners*, and those employed in the manufacture *of kelp* from sea-weed, which was very extensively carried on at Holy Island from an early period, and continued to be so until about the year 1790, when, from the diminution of the profits of this trade, arising from the introduction of Spanish barilla, and other foreign alkaline productions, kelp ceased to be made at Holy Island, as well as in the Scottish islands, where it had long been a principal source of revenue to the landowners, and of employment to the poor inhabitants. I am inclined to assign this origin to the ruins at Holy Island, from having discovered, all around

Archæologia, with the plates of the Saxon Stycas, is reprinted in the Archæologia Æliana, vol. iii., Part 2, Nos. 11 and 12; and in the third edition of Ruding's Annals.

Of the stycas of Ethelred, 350 were found at Kirkoswald; and of Vigmund, 58
And at Hexham, do, 2000; and of the Archbishop, . . . 800

2350 858

In Æthelred's mint were upwards of forty mintmasters; and in Vigmund's from six to eight. The styca of Æthelred found at Holy Island is similar to one in Plate XLII., vol. xxv., p. 306., No 27 of the Archæologia.

the place where they are situated, the remains of a great many of the pits in which the sea-weed was burned, and the kelp made. Though these pits have, in common with the ruins, been covered with sand for centuries, the marks of fire and appearance of scoriæ are plainly now visible. We have proof, from *The Rolls of the Priory of Lindisfarne*, and other documentary evidence, that the trade and business of *kelp-burning* was carried on at Holy Island as early as the 13th century, and that it continued to be carried on there as late as the year 1790, when, for the commercial and economic reasons I have given, it was finally abandoned. In the lease which I hold from the Crown of the manor and royalties of Holy Island, one moiety of the nett profits of all kelp manufactured there is yet reserved. Seeing the consideration with which the officers of the Crown have always regarded, and do yet continue to regard, this property, I think it highly probable that the business of *kelp-burning* was carried on at Holy Island during the existence of the Saxon kingdom of Northumbria, and may have been then (as it was in the last century to the land revenue department) a source of profit and revenue to the Saxon monarchs, who resided principally at the adjacent Castle of Bamburgh; or to the bishops of Lindisfarne, whose abode was at Holy Island until the year A.D. 875, when *Eardulph*, the sixteenth and last bishop of that see, was driven away by the Danes who then invaded and devastated the coasts of Northumberland, and when Holy Island, its church and monastery, were entirely deserted by all its inhabitants and clergy (the latter carrying with them the body of their patron, St Cuthbert), and continued waste for many years. "The island fell back" (says Mr Raine, in his history of North Durham, p. 71) "to its former inhabitants, the birds of the ocean, which the noise of men or the bell of the monastery had, for almost three centuries, scared from their original abode." The kelp-burners would, of course, disappear with the other inhabitants, when this desertion of the island occurred; their storehouses and habitations would, in time, fall to ruin, and be entombed in the ever-shifting sand which moves with every changing wind in this part of the island; and although they may have been occasionally partially uncovered, by the same means, during the ten centuries which have elapsed since they were

abandoned, they have escaped notice, until the recent discovery of the coins in connection with them has pointed out to *the antiquary their existence, their probable uses, period of erection, and final abandonment.*

On the Habits of Helobia brevicollis. By Mr James Hardy.

Helobia brevicollis is the predominant beetle on the heathy moors of Berwickshire, not only by the dry wall sides, but also on the borders of the wettest bogs; occurring singly, in pairs, or in companies more or less numerous, throughout the season. The period of transformation appears to vary: a pair was found coupled in the end of December 1843, and young brown insects were seen on 24th June 1844. Many solitary females, in the beginning of July, are retired from the promiscuous herds, to deposit their eggs in safety. I have endeavoured, without much success, to ascertain the food of this very prevalent species. It is, probably, a check on the numerous colonies of *Oniscus asellus* frequenting stones with it; and the heaths always afford abundance of the larva of *Haltica oleracea.* It is partial to stones which the *Formica rubra* has tenanted, lurking in the *latebræ* hollowed out by the industrious community. It often even inhabits the same stone with the ants; and, on one occasion, there were a number of gnawed ants under that part of the stone occupied by the *Helobia.* It would thus appear that these visits are aggressive; and I am persuaded that the ants are often forced to dislodge, and search out a more secure residence. On a second occasion, three or four had seized on and mangled a larva of one of the larger Carabi; they were also detected devouring earwigs; and a dead *Clivina fossor* augments the catalogue of their spoils. It also appears, that what Gesner relates of wolves in times of urgent hunger, that they attack and devour the weaker of their kind, holds true of the Helobiœ; as, in addition to the quantity of dismembered elytra and limbs lying under almost every stone, I once met with two recently slaughtered insects, beside a colony of six or seven others. One had its head already eaten off. An *Amara* was also present, and kept fast beside the slain

insects; while the real depredators, as is their wont, fled in all directions. The *Amara* could scarcely be blamed, and probably only awaited the fragments. While thus mutually destructive, they, in their turn, become the prey of *Triton palustris*, which, in winter, makes an occasional meal of them.

In examining the outskirts of a damp moss, I was somewhat surprised, in turning up a stone, below which a quantity of water had lodged, to find one of these insects take refuge in the water, and strive to hide itself among the withered grass at the bottom. When it came to the surface, being still watched, it had again recourse to the water; under which, nowise discommoded, it walked up and down like a water-beetle. It was fully five minutes before it re-emerged. Afterwards I discovered that it was likewise an excellent swimmer; able, without exhaustion, to remain a full quarter of an hour in water; and when offered some pieces of paper to rest on, using them for a little, and then again committing itself fearlessly to the water.

While the Helobiæ are thus enabled to accommodate themselves to the varying hygrometric condition of their abode, a too profuse moisture is not always agreeable. In the present rainy season, although numerous individuals remain in the spongiest places, yet the most numerous bands, consisting of some dozens, are up on the surrounding heaths. These companies, however, are of inconsiderable amount compared with those on the borders of some ditches liable to be overflowed. Upon turning up some stones here, under which some old mole runs lay concealed, nearly the entire surface of the excavation was seen blackened and crowded with these insects, which I could not compare to anything else than a shoal of tadpoles in spring. Most of them were holding on by the fore-legs; a restless individual removing, now and then, to a place of security, which was considered to be gained when it had thrust its head into the midst of the crowd.

The Helobia is rarely infested with the Acarus; I have observed only one instance.

An Address delivered at the Anniversary Meeting of the Berwickshire Naturalists' Club, on the 16th September, 1846. By Robert Embleton, Esq., President.

Gentlemen,

In resigning, a second time, the office of your President, I must be allowed to congratulate the Members, not only on the health and prosperity of the Club itself, but also upon the stimulus it has given to the cultivation and extension of the study of Natural History in other parts of the kingdom. During the past year, two Clubs similar to our own have been formed, under the direction of two of our Members,—one at Newcastle-upon-Tyne, under the Presidency of Ralph Carr, Esq.; the other at Cotswold, under Sir Thomas Tancred, Bart.; and I cannot entertain the slightest doubt, but that, as their nature and usefulness become known, they will be followed by many others in various parts of the kingdom.

Our last Anniversary Meeting was held at Dunsdale, Cheviot, and was attended by fourteen Members and nine visitors. Not being able to take our conveyances further than Heathpool, we had to encounter a walk of four miles to our place of rendezvous, the greater part of which was over the rocky bed of the mountain rivulet. The general equanimity in the temper of the Club was more than once nearly overturned; but after many a lingering look for the smoke of the Clachan, our philosophy met with its merited reward in a plentiful and substantial breakfast. As the breakfast hour had been considerably delayed, no time was lost in commencing our wanderings. Part of the company took their rods, and a plentiful supply of mountain trout at dinner was the best evidence of their success. The other Members set out for the top of the hill, up the bold and rocky ravine, which stretches from the shepherd's house to the very summit of the hill. During the ascent, many of our old familiar friends were observed, including *Epilobium alsinifolium et alpinum, Cornus suecica, Rubus chamæmorus, Vaccinium vitis idæa,*

Carex rigida, Hieracium diaphanum, pulmonarium et murorum, whilst *Saxifraga hypnoides* and *stellaris* grew in the greatest profusion. When about two-thirds of the way up, the quick eye of that acute Botanist, Mr. C. C. Babington, who honoured the Club with his presence that day, observed a Poa, which he at once suspected was the rare *Poa balfourii,* and which, upon examination, was found to be so. This was the first time it had been discovered as a native of England, the localities previously known being confined to the Highlands of Scotland; and the interest of its discovery was not a little enhanced by its being found in one of the beautiful haunts of the Club. Another plant, the *Palmella protuberans,* was also added for the first time to our Flora. At the height of nearly 2000 feet, *Crepis paludosa* was observed; and *Oxalis acetosella* was plentiful at the very summit. The day was one of extreme beauty, and the view from the summit well repaid the labour of the ascent. The whole country around was clothed in bright sunshine, only relieved now and then by the shadows of the clouds, as they chased each other across the mountain's sides. Descending on the south-east side, we reached a few small, scattered, and distorted trees, belonging to the species *Betula glutinosa,* and all that now remains of the once famous forest of Cheviot. Insignificant, however, as they are, they are not devoid of interest; many a moving tale is connected with them, and many moral associations: they serve as a link to connect the past with the present, and mark the spot where

"The hunter of deer and the warrior trod."

In our return we observed *Melampyrum montanum, Aspidium oreopteris, Orobus tuberosus var. tenuifolius,* and *Listera cordata.* Amongst the Fungi collected may be named *Agaricus ochracea, ceracea, ericetorum, sphagnicola; Uredo campanulæ,* and an undescribed species of *Dothidea.*—After dinner, the annual address was read by the President, the Rev. J. D. Clark; and Mr. Embleton was chosen President for the ensuing year. The following gentlemen were also elected as Members:—Rev. George Rooke, Embleton; Rev. Matthew Burrell, Chatton; Colonel Younghusband, Belford; and Charles Selby, Esq., Earl. An interesting paper, communicated by Gordon Joseph Forster, Esq., of Newton-by-the-

Sea, on the habits of the Honey Buzzard, in a state of confinement, was read; and a graphic account of a combat between a Weasel and a Pigeon, observed in the morning by George Darling, Esq., terminated the proceedings of the day.

The next meeting was held at Berwick, when, after the financial affairs had been arranged, the following places were fixed upon for the Meetings of the Club for the next season:

Norham,	... ...	1st Wednesday in	May.
Stitchell,	... ...	3d	June.
Cockburnspath,	...	4th	July.
Chatton,	... ...	3d	September.

Afterwards, there were read, 1st, A paper, by J. D. Selby, Esq., of Cheswick, on some coins found at Holy Island. 2dly, A description, coloured drawings, and dried specimens of a new British Agaric. 3dly, Specimens of Poa Balfourii, from Cheviot, were exhibited. 4thly, A specimen of the Great Butcher Bird *(Lanias excubitor)*, killed in January last at Scremerston. 5thly, Specimen of the Jack Snipe *(Scolopax gallinula)*, killed at Berwick on the 14th instant. 6thly, Specimens of the Peregrine Falcon, the Lanner, and the Kestril, were shown by Mr. Broderick, and the distinguishing characters of the Lanner pointed out. Microscopic observations were also made upon the potato, in its healthy and diseased condition; and an animated conversation took place as to the nature and extent of the disease. The walk was by the altered platform of the old Castle, where the station of the Berwick and Edinburgh Railway is intended to be placed; from thence to the scene of the Battle of Hallidon Hill; thence to the old main-road and the railway, which was followed home. Various interesting topics beguiled the way: the fell murrain amongst the potatoes, the scenery of the district, and the changes which had occurred in society, the earth's surface, and in warfare, when, in 1333, it is stated that 13,000 Scotchmen fell at the battle, whilst their opponents lost only between 30 and 40 warriors. It is rather curious that no remains have ever been found upon the spot. The Members afterwards dined at the "Hen and Chickens," and passed the remainder of the day in such a manner as leaveth no sting behind, and of which we shall not hereafter repent. Archibald Jerdan, Esq., was admitted a Member.

The Meeting in May was held at Norham; and although the early part of the day was wet and disagreeable, our time was spent not only pleasantly, but I trust usefully, in inspecting several beautiful and rare MSS., books, prints, and medals, connected with which many anecdotes were related by our learned and accomplished host, the Rev. Dr. Gilly. The Church, a beautiful specimen of the Norman style, was next inspected; and the different alterations and improvements, carried out under the direction of the Vicar, called forth the unanimous approval of the Members. The day having by this time cleared up, we sauntered along the side of

"Tweed's fair river, broad and deep,"

as far as the ford to Upsetlington, to the "hole in the rock." The river was full and rapid after the late rain; but there was nothing observed in our walk worthy recording, except a new habitat for *Stellaria nemorum* under a hedge, by the road-side. Some very fine fossil trees, similar to those found at Lennel some years ago, were inspected at the Vicarage on our return; they were dug out of the Sandstone Cliff, where the new and hideous bridge is erected. Amongst the ruins of the Castle, Mr. Embleton found *Marrubium vulgare* for the first time in this district. Henry Gregson, Esq., of Lowlyn, and the Rev. Hugh Evans, were admitted Members. A paper was read by Dr. Johnston on the medicinal properties of our wild Geraniums; also a list of the insects captured at the last meeting, which included *Tachinus silphoides* and *Sitonia subaurata*, hitherto unrecorded in our Lists. A male specimen of the Little Pipe Fish (*Syngnathus ophidion*), with the eggs of the female in its abdominal pouches, was also exhibited by him. Mr. Embleton mentioned that the Hoopoe, the Roller, and the Little Woodpecker, had all been shot in his neighbourhood during the past year. In the course of conversation, it was suggested that a series of very interesting and useful papers might be drawn out upon "Our Churches and Churchyards;" and I am happy to state, that a highly interesting paper, upon the Church and Churchyard of Norham, has been forwarded by Dr. Gilly; and I trust the example he has so readily set will be speedily followed by the other reverend members of our Club.

As there was "neither entertainment for man nor horse" to be had at the village of Stitchell, which had been selected for the June Meeting, the Members, impressed with the necessity of attending to the wants of the body as well as the mind, proceeded to the village of Ednam, where, under the care of Mr. Gray, the wants of the Club were amply provided for, in a neat and comfortable manner. The day was, in reality, a day in June—sunny, hot, and dry; and the chief point to ascertain was in what direction the most cool and shady walks were to be found. The beautiful woods around Newton Don were first visited; thence to Stitchell Linn, which, from the long-continued dryness of the weather, presented a very insignificant appearance. The walk then lay through the *inhospitable* village of Stitchell, to Stitchell Brae, whose covering is chiefly composed of *Trifolium striatum*, affording sufficient evidence of the character of the place. It has, however, associations connected with it which almost mark it as a sacred spot; for in the times of the first Secession in the Church of Scotland, multitudes were in the habit of assembling there, with nothing but the heaven for their canopy, to hear the Word preached. The woods that skirt the course of the Eden were visited, and the party returned to Ednam by the main-road. In the course of the ramble, the two varieties of *Rumex sanguineus*, *Scrophularia aquatica*, *Geranium lucidum*, and *Cystea fragilis*, were observed. Few insects were captured. There are many interesting associations, however, connected with the locality. Ednam claims Thomson as her son; and the father of the circumnavigator Cook is said to have been a stone-mason here, his famous son having been born after he had gone farther south. The famous Lieut.-General Sir Alex. Dickson was born at Sydenham, near to the village; and Stitchell has the honour of being the birth-place of Sir John Pringle, many years President of the Royal Society. After dinner, an hour was pleasantly passed in visiting the famous brewery, and other objects worth notice.

The Meeting in July was held at Cockburnspath, but the weather proved very unfavourable, rain falling the greater part of the day. The party proceeded down the Tower-dene, to

the mouth of the Pease-burn, and from thence to a "quarry," about half a mile along the coast, which abounds with the scales of a species of *Holyptechius* in the old red sandstone. From thence the party proceeded to the well-known Siccar Point; and returning by the direct road to Cockburnspath, they visited the magnificent and newly erected bridge over Dunglas-dene.—A paper was read by Dr. R. D. Thomson, which gave an exposition of the comparative nutritive and calorifacient qualities of different articles of food; illustrating his statements with a series of diagrams. A specimen of the Bridled Guillemot was exhibited by Mr. Hepburn, who, with Major Elliott, honoured the meeting with their presence. It was shot by Mr. Hepburn upon the Bass Rock, about six years ago; its peculiarities were pointed out. A specimen of a new British Sponge was shown by Dr. Johnston, and to which he has given the name of *Halichondria macularis*. The day was equally unfavourable to the entomologist and the botanist; very few insects were observed, and the only plants worth naming were *Ligusticum scoticum* and *Senecio viscosus*.

Such, Gentlemen, is a very hurried and imperfect sketch of the meetings of the Club for the past year; and it has been a matter of very great regret to myself, that my professional duties have been of such a nature as to prevent me from attending so regularly, as my duty as your President, and my inclination as a member, would have prompted me. But I look forward with pleasure to the time, when the means of our communication with each other will be so much increased, as to leave but little excuse for non-attendance at our meetings. The past year has been one remarkable for its beauty and the steadiness of its temperature, and by referring to the adjoined table, showing the mean height of the Barometer and Thermometer from January 1841, to the day of our meeting, it will be seen how much higher and steadier it has been than in any of the previous years.

Vegetation has been rapid and luxuriant, and the harvest has been gathered earlier, and in better condition, than it has been since the year 1826. Notwithstanding, however, the favourableness of the season, we have again to deplore the ravages of that fearful disease amongst the potatoes, in

a much worse form, and extending over the length and breadth of the land. Its cause, nature, and treatment have hitherto baffled all the talents that have been employed in its investigation. From the season, the entomologist has met with many of our rarer insects. In my own locality, to which my observations have been entirely confined, some have appeared in considerable numbers, which have hitherto been only very rarely seen, whilst many of the most common have been in diminished numbers, or not seen at all. Eight specimens of the caterpillar of the Death's-Head Moth, and one of the perfect insect, have been taken in this neighbourhood. Five specimens of the Convolvulus Moth, and several caterpillars of the Privet Moth, have been also captured; Acridium migratorum has been several times observed, and one lived with me for nearly a month. Amongst the more common Lepidoptera, the Admiral and the Painted Lady have appeared in immense numbers; but not a single specimen has been observed of the Peacock, Wood Lady, Wall Brown, or the Dark Green Aglaia, which in previous years I have often met with. The common Tortoise-shell Butterfly has not been nearly so plentiful as it generally is; but the Small Copper again made its appearance in a locality from which I had missed it for the last four years.

Such observations as these, if confined to one individual or to one locality, are but of little value; but if each member would take the trouble to mark down the most common and simple facts that come under his notice, a mass of information might be obtained, which might materially influence and advance the study of Natural History. In recording such facts, the most common walk would be found to furnish abundance of objects, and every time he would find something fresh to quicken his attention, and to recompense his researches; instruction becomes blended with amusement, and happiness and contentment found where others would in vain search for it.

> "If thou art worn, and hard beset
> With sorrow, that thou would'st forget;
> If thou would'st read a lesson that would keep
> Thy heart from fainting, and thy soul from sleep,
> Go to the woods and hills! no tears
> Dim the sweet look that Nature wears."

Register of the Barometer and Thermometer kept at Howick, from January 1841, *to* 15*th September* 1846.

Barometer taken at 10 A.M. Thermometer taken at 10 A.M. and 8 P.M.

	1841.			1842.			1843.			1844.			1845.			1846.		
	Mean height of Barometer.	Thermometer.	No. of rainy days.	Barometer.	Thermometer.	Rain.	Barometer.	Thermometer.	Rain.	Barometer.	Thermometer.	Rain.	Barometer.	Thermometer.	Rain.	Barometer.	Thermometer.	Rain.
January,	29.02	34 33	16	29.31	34 34	9	29.03	36 34	11	29.33	39 29	8	29.04	40 34	9	29.04	43 40	13
February,	29.03	37 36	15	29.04	39 32	6	29.04	33 32	22	28.38	36 35	15	39.32	36 34	8	29.31	46 46	9
March,	29.02	44 40	13	29.32	43 43	13	29.30	42 37	12	29.04	46 36	11	29.33	43 38	14	29.06	44 38	15
April,	29.03	48 42	15	29.33	47 49	5	29.04	46 35	15	29.33	55 43	6	29.31	53 46	9	29.31	47 43	19
May,	28.37	56 53	9	29.32	56 54	14	29.03	45 38	16	29.34	54 49	4	29.33	56 48	13	29.31	57 56	7
June,	29.03	58 54	18	29.34	63 62	6	29.30	49 43	13	29.32	61 53	13	29.30	67 57	17	29.32	68 63	9
July,	28.37	59 56	25	29.05	62 60	7	28.38	56 50	8	29.06	64 58	16	29.32	63 55	14	29.31	63 62	14
August,	29.04	61 59	19	29.35	63 58	3	29.31	61 53	14	29.30	62 55	15	29.31	65 58	16	30.02	66 59	11
September,	29.06	58 54	11	29.33	56 53	13	29.31	66 53	6	29.32	61 54	9	29.32	58 49	14	30.	65 60	1
October,	30.04	49 45	19	29.32	46 44	11	29.34	63 53	6	29.02	52 45	12	29.31	52 50	17			
November,	29.30	42 39	15	29.32	47 42	19	28.38	50 44	15	29.04	45 41	11	29.03	45 43	12			
December,	29.04	36 36	17	29.34	45 43	8	29 30	49 39	15	29.32	37 34	16	29.03	43 35	14			

On the Habits of the Honey Buzzard in Confinement.

By Gordon Jos. Forster, Esq.

The Honey Buzzard now in my possession was wounded in the wing, and taken about three months ago. It was at first confined in a small garden house, and for a day or two refused to eat anything, but at last began to feed upon small birds, but would not touch raw flesh or any kind of offal, nor has it yet done so, although it has not the smallest objection to a rat or a frog. Many birds of prey, after eating the muscular parts of any animal or bird, leave the entrails untouched; the Honey Buzzard, on the contrary, generally begins by opening the carcase, and then devouring everything it finds within it. It is very fond of the honeycomb of the wild bee, and when hungry will swallow large pieces of the comb containing the grub or larvæ, but when its appetite is not very keen it usually separates the cells, extracts the grub, and throws the wax away. There has been little honey in the combs this year, but when perchance any has dropt from the cells upon the ground, I have seen the bird repeatedly thrust its bill into the earth, where it appeared to be moistened by the honey. Unless very hungry it will not attempt to tear open a large bird, but is exceedingly fond of a fresh herring. There is something capricious in the appetite of birds, as well as in that of the human race. I had an eider duck for three years, and during that time, it never could be prevailed upon to taste shell-fish; its favourite food was barley bread, though if grain of any kind was thrown down to it, it would devour it in the same manner and with the same rapidity as the common duck. Of all the birds of prey with which I am acquainted, the Honey Buzzard is apparently the gentlest, the kindest, and the most capable of attachment; it seems to possess little of the fierceness of that warlike tribe. It will follow me round the garden, cowering and shaking its wings, though not soliciting food, uttering at the same time a plaintive sound, something like the whistle of the golden plover, but softer and much more prolonged.

Though shy with strangers, it is very fond of being noticed and caressed by those to whose presence it has been accustomed. In the same garden there are three lapwings, a blue-backed gull, and a curlew. The plovers are often seen with the buzzard sitting in the midst of them, showing no signs of caution or apprehension, but seem as if they were listening to a lecture delivered by him. The gull frequently retires into the garden house, probably to enjoy the society of the buzzard. The garden is not the garden of Eden, and yet these birds, of different natures, habits, and dispositions, appear to live in perfect harmony, peace, and good fellowship with each other.

G. J. F.

Newton-by-the-Sea, Aug. 29, 1845.

P.S.—I have had three living specimens of the Honey Buzzard in my possession, not one of them in plumage at all resembling the other. One of the three never could be induced to take any food, and after living about a fortnight, died, I believe, from pure inanition. Besides the plaintive cry above mentioned, the Honey Buzzard has another and more varied note apparently of alarm.

Description of an Agaric new to the British Flora.

AGARICUS CAPERATUS.

Desc.—*Pileus* convex, orbiculate, obtusely umbonate, even, very dry, of a uniform gall-stone yellow, usually paler about the top, covered with a mealy powder of the same colour, which, in some places, is gathered into an imperfect scaliness, the margin inflected, entire or more or less sinuated: *veil* as thick as writing paper, persistent, stretched between the margin and stem, to which it is closely attached, thickly covered with the same powder as the pileus, but more distinctly squammulose: *flesh* thick, solid and firm, white, not changing colour, mild and insipid in taste. *Gills* numerous, adnate, four in a set, dry and smooth, sienna-yellow, juiceless: *sporules* elliptical, very light honey-yellow. *Stem* cylindrical, as thick as a man's thumb, erect and solid, the

root rounded but not bulbous, whitened with the mycelia, the shaft of the same colour as the pileus, paler on the lower half, covered with the ochraceous powder or slightly squammulose, the flesh white, yellowish under the epidermis; the portion of stalk within the veil is pale, a very little fibrilose, but not powdered. Diameter of the pileus 3 inches; height of the stem 5 inches, the diameter nearly an inch; breadth of the gills 2-10ths.—From the woods at Anton's-hill, Sept. 16, 1845.

This truly magnificent agaric was ascertained satisfactorily to be the *Agaricus caperatus* of Fl. Dan. t. 1675, by the Rev. M. J. Berkeley, to whom a specimen was sent. It is not the *Ag. caperatus* of the English Flora, nor the *Ag. pudicus* of Bulliard; and is a beautiful addition to the already extensive list of British species, for which we are indebted to the researches of Miss Anne Hunter, an honorary member of the Club. The spores, Mr. Berkeley says, are very peculiar. "Its greatest peculiarity," says Miss Anne Hunter, "is its being so profusely covered over its pileus, curtain, and stem, with a yellowish powder, in such quantities as to make it disagreeable to gather, as gloves and everything it came in contact with was covered. And I am much struck with the toughness and permanency of the curtain, which remains after the pileus has attained its full size."

When small and young the pileus is obtusely campanulate, but in other respects it does not differ from the mature plant. Miss Hunter has found it on one spot only in the wood behind the house of Anton's-hill, and there sparingly. Like most of its genus it is eaten greedily by slugs and the maggot of a dipterous fly; and it seems to be, says Miss Hunter, "a most favourite food of a sort of beetle," which permits very few specimens to attain maturity without great mutilation.

On the Medicinal Properties of our Geraniums.

By Dr. Johnston.

A few weeks ago my friend Dr. Edgar brought a plant to me to have it named. It was a dried fragment of Geranium

pratense. The Doctor told me that a person resident in or about Ford had acquired great local fame, for the cure of fluxes in general, and the only remedy used was an infusion of this Geranium. One dozen stalks are "masked" in a pint of boiling water, and of this two ounces are taken three times a-day. Dr. Edgar's interest had been raised by the cure of a patient of his own, who had been greatly reduced by a chronic diarrhœa that had resisted the ordinary medicinal treatment, but yielded speedily to the geranium infusion. He felt relief from the second dose, and continuing to take it for three or four days, he was permanently cured. It was said to be a good medicine in the diarrhœa of teething children, and is easily taken by them, for the taste is "like tea without sugar, rather sweeter."

It is very likely that this remedy is inferior, for general use, to more powerful vegetable and mineral astringents of modern introduction into practice, but I think it worth while to bring the subject before the Club, since it relates to a matter of local interest; and there are cases in which it is well for a medical man to have a wide range of medicines to ring the changes upon. No Geranium has now a place in any British Pharmacopœia,* but several species hold a conspicuous place in the old Herbals. Of Geranium pratense and its immediate allies, Gerarde says, "none of these plants are now in vse in physicke; yet Fuschius sayeth that cranes bill with the blew floure (G. pratense) is an excellent thing to heale wounds."—Our author speaks in very different terms of our commoner species, Ger. molle and dissectum. "The herbe and roots dried," says he, "beaten into most fine powder, and given halfe a spoonful fasting, and the like quantitie to bedwards in red wine, or old claret, for the space of one and twentie days together, cureth miraculously ruptures or burstings, as myselfe have often proved, whereby I haue gotten crownes and credit: if the ruptures be in aged persons, it shall be needfull to adde thereto the powder of red snailes (those without shels) dried in an ouen, in number nine, which fortifie the herbs in such sort, that it neuer faileth,

* Several Gerania are introduced into Dr. Stokes' "Botanical Materia Medica," but without any indication of their properties.

although the rupture be great and of long continuance: it likewise profiteth much those that are wounded into the body, and the decoction of the herbe made in wine, prevaileth mightily in healing inward wounds, as myselfe haue likewise proved." (Historie of Plants, p. 939.)

Ray also furnishes us with a proof of the medicinal virtue of the Gerania. When he tells us that Geranium molle and robertianum are added to vulnerary potions and fomentations to stay fluxes and effusions of blood, and to relieve the pains of cholick, and of the stone and gravel, he merely gives us a summary of preceding observation; but he speaks from his own knowledge when he details the case of his host at Carlisle, who, subject to frequent severe paroxysms of pain from calculus, found in nothing so much relief as from a decoction of Ger. robertianum. (Syn. p. 361.) In a subsequent work, after repeating its virtues as a vulnerary herb, Ray mentions that a decoction of the same species is used by shepherds to cure their cattle passing bloody urine. (Hist. Plant. ii. p. 1059.)

Geiger informs us that G. pratense and sanguineum were formerly officinal, the root and herb being used, both having an unpleasant odour, and a very astringent taste, which is contrary to Dr. Edgar's information. Other compilers repeat the same tale* of the astringency of the Gerania in general, and of their popular use in fluxes and diseases of relaxation; but it is foreign to my purpose to enter farther on the subject than what is sufficient to show that the virtue ascribed to our district species is not imaginary.

Our Churches and Churchyards.

I. NORHAM. By the Rev. W. S. GILLY, D.D.

Among local objects of interest, there are none more worthy of attention than Churches and Churchyards. To the Antiquary, the Historian, the Naturalist, and the Etymologist, as well as to the Ecclesiologist, the parish sanctuary,

* For extracts from the works of L. Mérat, Geiger, and Gerbuier, I am indebted to the obliging kindness of Professor Christison.

and the ground on which it stands, are sure to present something that will add to their stock of information.

Much is to be learnt from the style and order of the architecture of the Church, from the stone and materials of which it is built, from the date of its original construction, from the changes and repairs through which it has passed,—from the sepulchral inscriptions traced on its tomb-stones,—from the historical and family recollections preserved in its records and registers,—from the relics and coins of various ages, which are occasionally exhumed within its precincts,—from the curious spelling and antique words detected in its epitaphs,—from the age of the yews and other time-honoured trees which shade its site,—and from the general character of the ground on which it stands, which, to say the least, is the best known of all remarkable places in every parish, for here the living bring their dead for interment, if they do not resort to it themselves for instruction. Every endeavour, therefore, should be made to rescue from oblivion the interesting objects that still may distinguish our Churches and Churchyards, and to perpetuate the memory of the past, as far as it is connected with these parochial monuments. In this Border land especially, we should show some anxiety to let nothing of good fame become obsolete,—for here Berwick has a celebrity of its own, and possesses the singular distinction of being mentioned expressly, and standing alone in every Royal and Parliamentary document as "*our town of Berwick-upon-Tweed;*" here Lindisfarne is celebrated as the Holy Island, from which the whole of the kingdom of Northumberland was first christianized; and here Norham is of sufficient importance to give a *county* name to the district in which it is situated—*Norhamshire.* As a sample of the many facts in history and nature which are illustrated in the local records of Churches and Churchyards, we will first mention Lindisfarne. An excursion to the Church of Lindisfarne will introduce the visitor to a knowledge of some of the most soul-stirring events connected with the religious and civil history of the North of England, from the Saxon Heptarchy to the Norman Conquest. The very stones of the old ruined Cathedral cry out with the names of great and

holy men, to whom, humanly speaking, we of the North are indebted for our Christianity. The Missionary Aidan and King Oswald, Cuthbert and the Royal Egfrid speak from the tottering walls, and we listen to voices

> "Most like to him whose voice of old,
> Was heard in desert air,
> Make straight the path for Christ the Son,
> Prepare the way—prepare."*

In the Churchyard of Lindisfarne the Ecclesiologist has two objects for his study. The one is the outline of a Norman Cathedral, with its very perfect west front, and which even in its ruins gives a noble idea of the rich workmanship and beautiful proportions of the architecture of the 11th and 12th centuries. The red sand stone, of which most of it was originally built, is still found on the beach of Cheswick; and the whiter stone, which was used for later repairs, in the quarries of Scremerston.

The other is the Parish Church, a decided specimen, in its arches, tracery, and columns, of the early English. A well kept Parish Register is not the least interesting and instructive of the objects belonging to Churches and Churchyards.

The register book of Lindisfarne contains some of those insertions which reward the inspection of the curious. For example:—

"7th Nov. 1680 being Sunday about 12 o'clock full sea, middle of the last quarter of the moon† was born, Jean, daughter to Mr. John Udney minister, and was baptized upon Twesday the sixtein of the said moneth."

"Buried 16 July 1691 William Cleugh, bewitched to death."

"13 Jan. 1722–3 Thomas Waddle and James Wilson, lost in the tide."

Having thus pointed to Lindisfarne, cursorily, as one of the parishes on the Border which is rich in memoranda of

* See the King of the Picts and St. Cuthbert, in Raines' North Durham, p. 60.

† There is a curious discussion in the Archæologia Æliand. vol. ii. part 3, p. 369–380, in which Cæsar's notice of the moon and tide, at the time of his invading Britain, is made use of to determine the place of his landing.

this kind, I will now select Norham for more particular observation.

NORHAM.

Whoever passes through the village of Norham, from the Castle Hill towards the bridge over the Tweed, will be struck, as he approaches the Cross, by seeing through an opening to his right two towers in a line with each other, the one on a level spot near him, the other on a woody eminence which rises like an amphitheatre above the former. These are the towers of the Norham and Ladykirk churches: the one looking like a church steeple, which it is; the other resembling a dovecot.

NORHAM CHURCHYARD.—The Churchyard is of considerable extent and beautifully situated. As you enter the enclosure, you observe a commodious house close to the eastern wall, and some buildings beyond it, forming a group, which do not require an inscription to announce that these are the parish schools, and schoolmaster's house. To the north the ground slopes gradually towards the river Tweed, and then rises abruptly and picturesquely in the form of a semi-circular bank, adorned with plantations, and with rocks peeping out from amidst verdure and foliage. To the west the Vicarage is seen embowered among lime and elm trees, and beyond it the high grounds and grass parks of Upsetlington, where herds of cattle at noontide crown the beauty of a landscape, in which Cuyp would have rejoiced. The ornamental grounds of Upsetlington are so situated that they seem to belong to the glebe, and add delightfully to the charms of this favoured spot.

A churchyard ought to be so kept as to become the pride and favourite haunt of the villagers, who should take pleasure in walking there, and gazing at leisure on the memorials which record the names of their predecessors. Here they are to rest in death, and here let them ponder on the chances and changes of this mortal life, which may soon reduce them, "ashes to ashes, dust to dust." Considerable pains have been taken to make Norham Churchyard an agreeable resort. A broad gravel walk runs through it—its sides are planted with yews, firs, and chesnuts, and a pathway has lately been

made which conducts to the Tweed, and serves as an agreeable summer evening promenade after the heat and toil of the day.

At the east end of the church, there is a large uneven surface in the churchyard, where it is said that Mr. Lambe, a former vicar, made excavations and found some curiously carved stones. In the winter of 1832, and again in December 1833, workmen were employed to remove the earth on this spot, and at irregular depths of from three to four feet below the sods, traces were found of an ancient building, the original destination of which antiquaries have not been able to determine. Most probably this was the site of the Saxon church of Egfrid, and previously of a Roman temple. The excavations extended 74 feet in length, and nearly 40 in breadth. The foundations of side walls, and apparently of cross walls two feet nine inches wide were discovered, and vestiges of pavement twelve feet broad along the whole length of the fabric, as if it had formed the aisle of a church, or a passage leading to cells. In two or three places this aisle or passage had portions of pavement running at right angles with it, and extending the whole breadth of the building. The hewn stones were of various dimensions: some of red sandstone, others of a harder texture, and one of wynd-stone. Several of these were very large, some of them bearing marks of Saxon and others of Roman times. In different places carved stones were found. These have all been preserved and built up in the form of the Bewcastle Cross, and enclosed within iron rails. One of the carved stones is the fragment of a Saxon tombstone, and still retains the letters "*P. Anima Ælf.*;" another contains the figure of a monk giving the benediction. The stones with the Saxon letters, and the figure of a monk (probably to represent St. Cuthbert), with some others on the pillar within the iron rails, were exhumed on a former occasion,* and were left in the vicarage garden, as relics of ancient times, by the

* Wallis, in his Antiquities of Northumberland, (vol. ii. p. 447), describes a stone found with an ancient inscription, which he copied. It contained the effigies of St. Peter with the keys, of St. Cuthbert, and of King Ceolwulph holding a sceptre. It is not known what became of this stone.

late vicar, Mr. Darnell. At the western extremity of the foundations discovered in 1832–3, the remains of a cell or prison were found, in which a niche, walled up, had the appearance of having been used to bury alive some miserable victim of tyranny or superstition. An embankment of clay, thick walls, and iron bolt-holes remained as the witnesses of some cruel confinement. One large stone, within the iron railing, comes more under the naturalist's notice than these memorials of man's doings. It is part of a fossil tree dug up from the northern bank of the Tweed in 1839–40, when they were constructing the road which leads from Ladykirk and Norham bridge. For the following description, we are indebted to the kindness, and to the extensive researches in Natural History of Dr. Johnston, the founder and life of the Berwickshire Naturalists' Club.

"I have now ascertained that your fossil trees are identical in kind with those from Lennel Braes. They are beautifully figured in a work of the late Mr. Witham, and about sixteen years ago created a great deal of interest, for they were amongst the first of the coniferous fossils that had been found in so old a formation. Previous to that time, it was believed that the fossils of our mountain limestone group of rocks were all *monocotyledonous*, but the fossil trees you have are cone-bearing, or a species of pines, and these again are *dicotyledonous*, and of higher organization than fossils of the first class."

There are but few monumental inscriptions of any interest in this churchyard. One records the death of a woman who died, "aged 100 years." Another, on an altar tombstone near the chancel door, states that the family of a farmer, who lies buried beneath, had been "tenants at Tindal House, ever since A.D. 1650, the year of the battle of Dunbar."

NORHAM CHURCH.—The exterior of the church announces its Norman origin; and the style of its recent enlargement and repairs shows that a successful attempt has been made to restore its ancient character and dimensions. A new tower and south aisle have been built within the last two or three years, and if the vicar and churchwardens can raise money enough to rebuild the north aisle, this will be not

only the finest church between the Tweed and the Coquet; but, when the east window of the chancel is put in order, it will also present to view as noble a specimen of Norman parish church architecture as is to be seen in any part of the kingdom.

The chancel end (with the exception of the east window, which was clumsily constructed about fifty years ago) displays, particularly on the south side, much of the bold rich carving and deep mouldings which distinguished the workmanship of the 12th century; and, after the lapse of centuries, presents a perfect model for the student of ancient masonry. The learned have not yet determined what sort of working plans were used in the best days of church architecture, whether drawings or models in wood or other material. The Cathedral of Lindisfarne was begun in 1093, about sixty or seventy years before Norham church. Its architect, Edward by name, was termed "Officiales Frater," and his skill and virtues are spoken of in high praise by the Monk Reginald, in his "*Libellus de Admirandis Beati Cuthberti Virtutibus*," published by the Surtees Society, but no mention is made of the designs from which the building was wrought; although much is said about the nature of the stone used, and the labour of conveying and fixing the stones, after they were hewn and carved. About the same time that Norham church was in progress, the works of Norham Castle were going on (between 1133 and 1194), and Reginald again employs several pages in giving an account of the architect, and of his skilfulness and knowledge. Among other things he describes a religious book of the artist, which was embellished with pictures and illuminated letters; but not a word is written of the drawings or plans by which the workmen were guided. Are we to attribute this silence to the secresy of Free Masonry?

The Church.—To have the best view of the interior, you must enter by the south-west door, and an imposing sight will present itself. The length of the whole church is 120 feet; nave 70; chancel 50. The massive columns between the aisle and nave, with the five Norman arches eighteen feet high and eleven feet wide, springing from octagonal capi-

tals:—the great arch between the nave and chancel, twenty feet nine inches high, and thirteen feet six inches, with its rich mouldings and clustered pillars, are majestic remains of the 12th century. The late improvements, which removed the plaster from the walls, and the ceiling from the timber roof, and exposed part of the zigzag string above the arches, together with the mouldings of the arches, enable the spectator to gaze upon some of the very forms and proportions on which the eyes of Edward I. and his barons rested, nearly 600 years ago, when they insulted Heaven in this church, with prayers for the success of their iniquitous invasion of Scotland.

A handsome font, carved after an antique model by a village mason, stands at the west end of the nave. The pews in the body of the church are decorated with fruials; and some of them, of carved oak, have been lately presented to the parish by Lord Crewe's trustees. All the pews are nearly of the same dimension, and of an uniform shape, with the exception of one, which has been left in its original condition, like a large square box, out of consideration for the feelings of an aged lady, who objects to its being altered. The pulpit and reading desk are also exceptions to the better taste which prevails in other parts of the church; but it is hoped that these anomalies will be corrected, and that funds will be found to put every thing in keeping with the general aspect of this venerable edifice.

The seats in the chancel are of carved oak; the rails before the communion table are the same, and correspond in configuration with the columns, arches, and mouldings of the nave. The space within the rails is handsomely carpeted, and two richly carved chairs of dark oak, with a folio bible on a bracket, above the communion table, constitute the decoration of the chancel, which now wants nothing but a new east window to make it complete. Solemnity is the character of Norham church, and the restoration of the north aisle will give it altogether a cathedral appearance. It is spacious, dry, and clean; well ventilated in summer, and well warmed in winter, and in the midst of much that is ornamental, there is nothing fantastical to offend the eye or to

render its aspect inconsistent with the sobriety of Protestant reformed worship.

Since the opening of the railroad from Edinburgh to Berwick, the castle, village, and church of Norham have become a favourite resort of visitors from Scotland; and many of our northern neighbours have acknowledged that this stately fabric furnishes a model for the improvement of ecclesiastical architecture on the other side of the Border. Neither church nor churchyard contains anything very ancient as a sepulchral relic, except a stone effigy, in the chancel, of Cospatrick, Earl of Northumberland, the ancestor of the noble family of Home, who died about the year 1080; and a Saxon tombstone preserved within the iron railing in the churchyard, which has already been described.

The oldest legible epitaph in the church is the following:—

"Her lyes Grace Selbe who decesed at the wel of God in the 6 of Agwst 1648."

The early parish registers of Norham church have been lost, and none remain of an older date than those commencing Oct. 1653; but in several of the volumes published by the Surtees Society, and in Raine's History of North Durham, many curious particulars of local interest will be found relating both to ecclesiastical and parochial matters. In "the Durham household book, or accounts of the bursar of the monastery of Durham from Pentecost 1530, to Pentecost 1534," published in 1844, there is a variety of entries for repairs done to the chancel of Norham church. The following is a sample, and makes mention of work done and prices paid for windows mended in 1533:—

"Norham.—Et eidem, pro 21 dies, pro operacione 42 pedum novi operis ad 2d. (5s. 10d.) et pro emendacione et le lettynge ibidem diversorum foraminum in Choro de Norham, per diem 5d., 8s. 4d. De domino Priore 4 lb. souder, versus Norham 16d. Et in vitro empto per Robertum Sanderson, ut patet in compoto inter nos, ½ credyl, 8s. Et in 6 ferri (sic) emptis pro fenestris ibidem, ad 9d., 4s. 6d. Et in 6 petris plumbi, 2s. Et pro operacione ferri, 18d. Et in Calce et Carbonibus, 5d." P. 268.

The parchment register book, beginning in 1714 and end-

ing in 1801, shows that it has been the practice of the several vicars, from that time to the present, to insert memoranda of events, and notes connected with the parish, which have been thought worthy of being recorded. For example:—

"An exact map of the lands belonging to the vicarage of Norham, in 1734." P. 177.

"A terrier of the glebe, lands, houses, and portions of tithes, fees, and dues belonging to the vicarage of Norham, made and attested by the vicar, churchwardens, and gentlemen of the vestry, Easter Tuesday, April 16, 1734." P. 179–180.

"The succession of ministers to the vicarage of Norham, from 1617 to 1831."

"Memorandum of an ancient custom touching the proclamation of banns of marriage, and the scorning of the kirk, by Thos. Drake, vicar, 14 Dec. 1736." P. 176.

Sundry memoranda by the vicars relating to the common and its enclosure, and to the foundation of a free school (p. 119–120), to vicarage repairs, to rights of pews, to repairs and enlargement of the church, (pp. 82–83, 86, 87, 121, 123, 169), to the building of Ladykirk and Norham bridge, pp. 88–89, and to the building of the new schools in Norham and Shoreswood, pp. 80–81.

Ancient History of Norham Church.—The site of Norham church and churchyard is a scene of great interest to the antiquary. Ubbanford was its ancient name, and there is reason to believe that a Roman temple once stood here. Several large carved stones have been dug up, which bear the character of Roman sculpture, and one still preserved in the pillar erected in imitation of the Bewcastle Cross, was evidently a portion of the ornamented capital of a column of considerable dimensions.

It is not unlikely that a Christian shrine of some sort was built on this spot, before or during the episcopate of Cuthbert, and was constructed of materials previously used for a heathen temple. But the first church on this site, of which we have any historical description, was erected, according to Simeon of Durham, in the reign of Eanred, by Ecgred Bishop of Lindisfarne. "Post quem Ecgredus XXII ano imperii Eanredi regis in præsulatum est sullimatus, vir natu nobilis et

operum strenuus, qui Patris Cuthberti, ecclesiam amplius predecessoribus suis rerum et terrarum largitionibus locupletare studuerat et honorare. Ædificata nanque in Northam Ecclesia, eaque in honore Sanctorum Petri Apostoli et Cuthberti Pontificis, nec non et Ceolwulfi Regis, et post Monachi dedicata, transtulit illo corpus ejusdem Deo dilecti Ceolwulfi ipsamque villam—Sancto confessori Cuthberto contulit," (p. 89).

The historian of the antiquities of Northumberland (Wallis), in his account of Norham, calls the founder *Egfrid*, and assigns the date to be A.D. 830; but the similarity of names given by Norman scribes may have led to some mistake in the spelling. At all events there was a church built here between 830 and 845, in honour of St. Peter the Apostle, and Bishop Cuthbert; and to give sanctity to the spot, the remains of King Ceolwulf, who laid aside the royal crown for the monk's cowl, were brought from their original place of sepulture, and deposited in Norham church. Here, too, rested for many years the body of St. Cuthbert himself, according to the authority of Camden (vol. ii. p. 1099), when the ravages of the Danes occasioned the transfer of the incorruptible corpse from place to place. For this reason Norham church, in the middle ages, had the reputation of being a sanctuary, highly favoured by heaven, and its offices were performed by a body of clergy, who boasted of miraculous protection. Reginald, who lived towards the end of the 12th century, tells the tale of a man who having been imprisoned by King Malcolm in Berwick Castle, and loaded with fetters of intolerable weight, implored the succour of St. Cuthbert. The saint came to his aid, conducted him out of his dungeon, —led him across the Tweed with all his irons hanging about him, and brought him in safety to the church at Norham, where his fetters were seen for many years afterwards suspended from one of the beams as a votive offering. See Reginald, pp. 41–44. The venerable Saxon church of Ecgred, or Egfrid, fell into decay, or was destroyed about the time of the invasion of David King of Scotland, in 1138; and the Norman church, which still survives in its nave and chancel, was completed before the death of Bishop Pudsey, who died 1195.

A cross, made out of the wood which composed the table of St. Cuthbert, and on which he had been in the habit of eating his meals, was preserved at the decay or destruction of the Saxon church, and placed on the altar of St. Cuthbert in the Norman church. Before this relic persons accused of crimes used to declare their innocence, before they waged battle in proof of their assertion. Reginald has recorded an instance of a duel fought at *Midhop* in the presence of Swain, priest of Fishwick, who was his contemporary.

Reginald has preserved another anecdote illustrative of the history of Norham:—

A boy named Haldene attended the school which was kept in Norham church (a custom very common, says Reginald). This boy having neglected his books, and dreading the punishment of his idleness, threw the key of the church into the Tweed (in Thenodam) at a place called *Padduel* (hodie Pedwel). The services of the church would have been interrupted, relates the historian, had not St. Cuthbert appeared to the priest, and told him to go to the fishermen at Pedwel. The priest went, and saw that they had just caught a salmon in whose throat the key was found. The key was thenceforth held in great veneration, and kissed devoutly by the people. Reginald, pp. 149, 150.

The cross and the key were doubtless among the sacred objects before which King John and Edward I., with their train of barons and prelates and knights, performed their devotions, when Norham church was desecrated by the presence of those ruthless invaders of Scotland in 1216 and 1291.

In the annals of Nicholas Trivet (p. 319) the scene which took place in Norham church, when the claim of Edward I. to the sovereignty of Scotland was asserted, is thus described:—

"Eodem anno rex Angliæ Scotiam appropinquans, (post Pascha) parliamentum tenuit apud Noreham, ubi consultis prælatis ac utriusque juris peritis, revolutisque priorum temporum annalibus, vocari fecit prælatos ac majores regni Scotiæ; et coram eis in ecclesia parochiali de Norham jus suum et superius dominium in regnum Scotiæ fideliter declaravit, petivitque ut hoc recognoscerent, protestando jus coronæ suæ usque ad effusionem sanguinis defensurum. Ab omnibus

igitur, qui jus in regnum Scotiæ vindicabant, recognitus est superior dominus Scotiæ, per litteras inde confectas eorum sigillis munitas tenorem subscriptum in Gallico continentes." The document signed on that occasion of solemn mockery is dated "Noreham feria tertia proxima post Ascensionem Domini, 1291."

Æneas Sylvius relates an incident illustrative of the condition and manners of the Borderers 400 years ago, in his account of his journey to Scotland in 1448, which has connection enough with our present subject to justify its admission in this place. "*The certain river*" therein mentioned, must have been the Tweed. *Norham* was "*the large village*" —"*the curate*" was the curate of Norham, and "*a certain tower*" was the castle of Norham.

"A certain river falling from a high mountain parts the two kingdoms over which Æneas ferry'd, and coming to a large village about sunset, he alighted at a country man's house where he sup'd with the curate of the place and his host. The table was plentifully furnished with pottage, hens, and geese; but nothing either of wine or bread appeared. All the men and women of the town flocked in, as to some strange sight; and, as our countrymen used to admire the Æthiopians or Indians, so these people stared at Æneas, asking the curate, what country-man he was? what his errand could be? and whether he were a Christian, or no? But Æneas being aware of the scarcity he should meet with on this road, had been accommodated by a monastery with a rundlet of red wine and some loaves of bread. When these were brought to table, they were more astonished than before, having never seen either wine or white bread. Big-bellyed women with their husbands came to the table side, and handling the bread and smelling the wine, begged a taste; so that there was no avoiding the dealing of the whole among them. After they had sate at supper till two hours within night, the curate and the landlord (with the children and all the men) left Æneas, and rub'd off in haste. They said they were going to shelter themselves in a certain tower, at a good distance, for fear of the Scots, who (at low water) used to cross the river in the night, for plunder.

They would by no means be persuaded to take Æneas with them, though he very importunately entreated them to do it. Neither carried they off any of the women, though several of them, both wives and maids, were very handsome: for they believe the enemy will not harm them: not looking upon whoredom as any ill thing. Thus Æneas was left alone (with only two servants and a guide) amongst a hundred women, who sitting in a ring, with a fire in the middle of them, spent the night sleepless, in dressing of hemp, and chatting with the interpreter. When the night was well advanced, they heard a mighty noise of dogs barking and geese gagling; whereupon the women sliped off several ways, and the guide ran away; and all was in such confusion, as if the enemy had been upon them. But Æneas thought it his wisest course to keep close in his bed-chamber, (which was a stable) and there to await the issue; lest running out and being unacquainted with the country, he should be robbed by the first man he met. Presently both the guides and the women returned, acquainting him, that all was well, and that they were friends (and no enemies) who were arrived." See Camden's Britannia, vol. ii. p. 1101.

Description of a new British Peziza.

By the Rev. M. J. Berkeley, M.A., F.L.S., &c.

Peziza rudis, *Berk.*; fasciculata turbinato-stipitata hymenio plano hic illic depresso rugoso flavo-fusco subvinoso; externé subtiliter fibrilloso-striata; stipite elongato lacunoso vel striato.

Hab. Pease Bridge Dean, on a shallow gravelly and peat soil, with Polytrichum aloides.

Whole plant of a watery yellowish brown with a vinous tint, paler when dry, of a rather firm texture. Cup $\frac{1}{2}$–$\frac{3}{4}$ inch high, $\frac{1}{3}$ of an inch broad, turbinato-stipitate minutely fibrilloso-striate. Hymenium plane, or more or less pitted and depressed, but not truly cup-shaped. Asci elongated clavate much attenuated below. Sporidia obovate-oblong. Stem more or less elongated, angular, pitted, sometimes striate.

Resembling somewhat in habit *Pez. punicea*, as figured by Purton Midl. Fl. tab. 25. Its closest affinity seems to be with

Pez. clavus Alb. and Schw., and like that it has a tougher texture than others of the section Mollisia. The sporidia in that species, which is extremely variable as regards colour and form, are regularly oblongo-elliptic, with a nucleus at either extremity, and not narrower at one end as in the present species.

List of Berwickshire Insects, with Notes on some of the Species.

By Mr. James Hardy.

1. Calathus piceus.
2. Amara similata.
3. ——— trivialis.
4. ——— cursor.
5. ——— convexior.
6. ——— tricuspidata.
7. ——— brunnea?
8. Bradytus marginatus.
9. Trechus aquaticus.
10. ——— suturalis.
11. ——— brunnipes..
12. ——— fulvus.
13. Blemus paludosus.
14. ——— pallidus.
15. Hydroporus minutus.
16. ——— planus?
17. ——— pubescens.
18. Gyrinus minutus.
19. Stenelmis parallelopipedus.
20. Hydræna nigrita.
21. Limnebius nigrinus.
22. ——— lutosus.
23. Cercyon boletophagum.
24. ——— apicale.
25. ——— obsoletum.
26. ——— melanocephalum.
27. ——— conspurcatum.
28. ——— crenatum.
29. Cercyon convexiusculum?
30. ——— merdarium.
31. ——— stercorator.
32. ——— lugubre.
33. ——— minutum.
34. ——— ferrugineum.
35. ——— stercorarium.
36. Phalacrus ulicis.
37. Ephistemus gyrinoides.
38. Alexia pilifera.
39. Leiodes dentipes.
40. ——— thoracica.
41. ——— polita.
42. ——— ferruginea.
43. ——— rufipennis.
44. ——— suturalis.
45. Catops fuscus.
46. Agathidium seminulum.
47. Atomaria nigriventris.
48. ——— linearis.
49. Corticaria gibbosa.
50. Ips 4-punctata.
51. Tetratoma ancora.
52. Anthrenus museorum.
53. Byrrhus fasciatus.
54. ——— æneus.
55. Anobium molle.
56. Cis concinnus.

57. Cis nitidus.
58. Nedyus erysimi, *var.* chloropterus.
59. ——— echii, (*at Kelso*).
60. Notaris æthiops.
61. Sitona subaurata.
62. Phyllobius calcaratus.
63. Apion pisi.
64. Haltica atra.
65. Thyamis tabida.
66. ——— atricilla.
67. ——— melanocephala.
68. ——— nasturtii.
69. ——— thoracica.
70. ——— pratensis.
71. ——— pallens.
72. ——— lurida.
73. ——— fuscescens.
74. Macrocnema spergulæ.
75. ——— chrysocephala.
76. Chætocnema aridella.
77. Cocinella 7-punctata.
78. ——— 5-punctata.
79. ——— impustulata.
80. Scymnus limbatus.
81. Bryaxis hæmaticus.
82. Autalia impressa.
83. ——— rivularis.
84. Astilbus canaliculatus.
85. Bolitochara brunnea.
86. ——— socialis.
87. Encephalus complicans.
88. Aleochara fuscipes.
89. ——— mœsta.
90. Ceranota daltoni.
91. Oxypoda alternans.
92. Tachyporus brunneus, *Erich.*
93. Tachyporus ruficollis.
94. Hypocyptus longicornis.
95. Conurus obscuripennis.
96. Bolitobius atricapillus.
97. ——— pygmæus.
98. Megacronus analis.
99. Mycetoporus splendens.
100. ——— lepidus.
101. Tachinus silphoides.
102. ——— collaris.
103. ——— marginellus.
104. ——— apiculis *Steph. not Erich.*
105. ——— elongatus.
106. Quedius impressus.
107. Raphirus mauro-rufus.
108. ——— nitipennis.
109. Philonthus varians, *Payk.*
110. ——— rubripennis.
111. Cafius xantholoma.
112. Othius melanocephalus.
113. Xantholinus glabratus.
114. ——— punctulatus.
115. ——— linearis.
116. ——— parumpunctatus.
117. Stenus bimaculatus.
118. ——— guttula.
119. ——— Juno.
120. ——— punctatissimus.
121. ——— oculatus.
122. Platystethus morsitans.
123. Oxytelus rugosus.
124. ——— sculpturatus.
125. ——— nitidulus.
126. ——— opacus.
127. Megarthrus depressus.
128. Syntomium nigroæneum.
129. Proteinus brachypterus.
130. Anthobium minutum.

131. Lathrimæum atrocephalum.
132. Omalium pusillum.
133. Omalium cæsum.
134. Acidota crenata.

In compiling the above list, I am happy to express my obligations to my friend T. V. Wollaston, Esq. of Cambridge, for his aid in ascertaining the obscurer species, and to Dr. Johnston and Mr. Hislop for the communication of information and specimens. To Mr. Hislop I am indebted for Nos. 6, 42, 50, 51, 52, 55, 58, 59, 75, 76, and 128, chiefly from the west of Berwickshire. Nos. 14, 19, 20, 22, 54, 64, 96, 134, and several of the species of *Thyamis*, are from Dr. Johnston's collection. In the last number of the Club's Proceedings, I remarked that my specimen of *Calathus piceus* was provided with wings. Mr. Hislop, who finds it in some abundance about the roots and under the bark of decaying stumps of trees near Mellerstain, informs me, that most of his specimens are winged. Stephens mentions a similar circumstance with respect to the *Calathus crocopus* from Yorkshire; a species usually described without wings. Erichson has also observed on *Calosoma*, "that one and the same species is sometimes winged, sometimes wingless." *Alexia pilifera*, for which there is only one British locality, was found with *Agathidium atrum*, under a decaying log of wood in Penmanshiel wood. *Bradytus marginatus* and *Phalacrus ulicis*, also rare species, were found on the moor above Drakemire. The latter insect, together with *Cercyon convexiusculum*,(?) several of the *Leiodes*, and *Agathidium seminulum*, were abroad very late in the evening; a circumstance that would indicate nocturnal predilections. The Leiodes frequently lurk during the day under stones and moss; and are observed to make their appearance in cloudy weather. Mr. Henderson informs me that *Cocinella 7-punctata* and *C. variabilis* have been in considerable abundance, during the season, in the vicinity of Chirnside. I remarked, of the latter species, that it was very late this season in showing itself; scarcely a mature specimen being seen about the middle of July. It frequents the spruce fir, from the *Aphis* of which its larvæ derives its principal sustenance; though it is not confined to this tree. The *C. 7-punctata* was the spe-

cies that abounded in such numbers throughout the district in 1826. This was probably owing to the prevalence of *Aphis avenæ* during that hot season; as it was in the corn-fields where the insects were noticed. I have observed only a single individual since. *Cocinella* 11-*punctata* is a coast species, where I have found its larva feeding on *Aphis avenæ* while frequenting *Poa trivialis*, likewise on a long wingless *Aphis* that abounds on the sea-reed; and as the *Aphides* that infest the herbage of sandy shores are very numerous, it may serve to check the over-production of several other species.

The specimen of *Tetratoma ancora*, sent by Mr. Hislop, differs so much from that figured in Curtis's British Entomology, vol. iii. fig. 123, that I was at first dubious as to their identity. I am convinced, however, that they are alike, the insect, perhaps, as in some of the *Mycetophagi*, being subject to a variety of colouring. On this account I have judged it as well to describe the insect in detail, along with three others of the recent additions to the Berwickshire Fauna, as to which, for the want of such descriptions, there might be a risk of falling into error.

TETRATOMA ANCORA. *Fab. E.* ii. 575. *Curt. Brit. Ent.* iii. pl. 123. *Steph. Mand.* iii. 91. *Steph. Man.* No. 1077.

Testaceous with a brassy tint, shining, coarsely and irregularly punctured throughout; head dark brown; eyes black; antennæ ferruginous at the base, fuscous towards the extremity with the tip paler: palpi tipped with fuscous; thorax coloured as the head, margined with testaceous, a fovea on each side upon the posterior margin; scutellum testaceous; elytra testaceous, with a common dark brown spot at the base behind the scutellum, a minute dark spot on each side beneath the shoulders, two lobate dark-brown spots in the middle of each elytron, which are connected with a common dark fuscous lunulate patch at the apex; beneath entirely brown-black; femora concolorous, the anterior paler at the base; tibiæ and tarsi ferruginous.

"Three specimens on fungus, old Fir post, Girrick," *Mr. R. Hislop.*

MACROCNEMA SPERGULÆ. *Walton?*

Ovate, somewhat flattened, less narrowed behind than in *M. napi*, above brassy or brassy green, beneath brassy black; head finely punctured as in *napi*; thorax finely and closely punctured, the punctures deeper than in *napi*, with a minute fovea in the middle of the base, not always present; elytra regularly punctate-striate, the punctures larger and deeper than in the thorax, not so coarse as in *napi*; interstices very indistinctly punctured; coxæ more or less testaceous; femora brassy black; tibiæ and tarsi pale testaceous; antennæ pale at the base, with the five or six last joints more or less fuscous.

Nearly allied to *M. napi*, from which it is distinguished by its less convexity; in being broader behind; by its more or less aeneous colour; and its less deeply punctured elytra.

Penmanshiel, *J. H.*; Berwick, *Dr. Johnston*; Nenthorn, *Mr. Hislop.*

BLEMUS PALUDOSUS. *Gyll.* ii. 34. *Steph. Mand.* i. 171. *Steph. Man.* No. 377.

Head and thorax black above and beneath; two deep impressions around the inner margin of the eyes; thorax wrinkled transversely, with a deep wrinkled fovea on each side at the base; elytra broader in proportion to the thorax than in *B. pallidus*, shining as if varnished with a dash of glossy black, delicately punctate-striate; the striæ obsolete on the sides and at the apex; an impression towards the middle of the second stria, another nearer the tip on the edge, and a third somewhat towards the base of the third stria, sometimes a fourth at the tip of the third and fourth striæ; abdomen black beneath, pale at the margins and tip; legs, mouth, antennæ and palpi testaceous.

This species reminds us of the *Leisti* in the texture of its legs and its gloss.

Under gravel in the channel of the Eye, near Butterdean Mill, *J. H.*

BLEMUS PALLIDUS. *Sturm. Deutch. Faun.* vi. 98, *pl.* 135. *Curtis, Brit. Ent.* vii. *fol.* 310. *Steph. Manual.* No. 378.

Less broad than the preceding; entirely pale testaceous; head with impressions as in *paludosus*; thorax very indis-

tinctly wrinkled across, less deeply foveated at the base, foveæ impunctate; elytra more coarsely punctate-striate than in *paludosus*, the two striæ not obsolete at the sides and the apex, impressions on the third striæ from the suture; eyes black; antennæ of the colour of the body; legs and trophi a shade paler.

The marking of the elytra is altogether of a coarser character than in *paludosus*, and the striæ are apt to run into those abnormal connections observable in *Omaseus melanarius* and other strongly sculptured Carabi.

Near Berwick, *Dr. Johnston.*

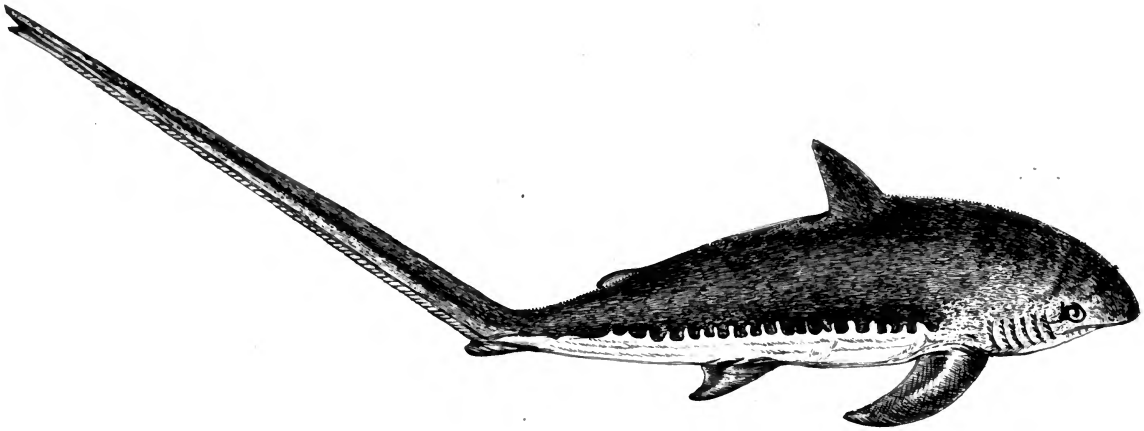
Description of a New British Sponge. By Doctor JOHNSTON.

HALICHONDRIA MACULARIS.

Sponge forming a thin circular spot one or two lines in thickness, and rather more than an inch in diameter, of a wax-yellow colour, spongious texture, but not reticular, and soft when recent; the surface even, somewhat hirsute, with pores invisible or scarcely visible to the naked eye, and no fecal orifices. *Spicula* numerous, long and straight, needle-shaped, smooth; they are all alike in figure and do not much differ in length.

This is amongst the least attractive of its genus. The only species to which it is closely allied is the *Halichondria sanguinea*, from which it is distinguished by its colour and less fleshy texture, and by the straitness of the spicula. These are remarkable for their length; and the obtuse head is very slightly sinuated a little below the extremity, but it requires a high magnifier to discover this character.

This new species was found spreading, lichen-like, on the inner surface of an old valve of Cyprina islandica, which was brought up, from a depth of about 35 fathoms, by the baited lines of our fishermen.



Long-tailed Shark

Address to the Members of the Berwickshire Naturalists' Club, read at the Anniversary Meeting held at Alnwick, September 22, 1847. By H. G. C. Clarke, Esq., M.D., President.

Gentlemen,

In conformity with established usage, I proceed to recapitulate the minutes of the year which is now closed.

Our last anniversary was held at Chatton, which from its central position in relation to the members on the English side of the Border, and the beauty of the weather, was numerously attended. There were present,—Dr. Johnston, Mr. Selby, Rev. J. D. Clark, Mr. Donaldson Selby, Captain Carpenter, Mr. Darling, Mr. Culley, Mr. Boyd, Rev. J. Parker, Mr. Broderick, Mr. Murray, Col. Younghusband, the Rev. M. Burrell, the Rev. Geo. Rooke, and Dr. Clarke.

After breakfast the party proceeded to witness a flight of Mr. Broderick's hawks, but, to speak truth, in this the Club were disappointed. The time for this sport seems to have gone by. We can conceive few scenes so animated and brilliant as that of a hawking party in days of yore, when large unenclosed tracts of country spread on every side, when the hawk and its quarry, and

"All the currents of their heady fight,"

could be distinctly seen, and the gay cavalcade joyously followed in pursuit. But now the land is almost everywhere enclosed and cultivated, and the partridges, which we flushed in the stubbles, betook themselves immediately to the sheltering covert of the turnip fields, from which it was impossible again to start them. The hawks themselves, however, with their keen and restless eyes—their bills and claws, so aptly symbolising their predatory nature—their jesses, hood, and bells, were observed with great interest by the Club, and not less so when they were let down the wind by their master—the circles they described in the air, with the cheerful clang of their little bells—their poise, self-balanced—their upward gyrations and their downward swoop, were all eminently beautiful, and we only required an open country and a heron

or two, to have had excellent sport. The Club were reminded of the fine metaphor of Shakspeare, who seems to have been as true an observer of external nature as he was master of all the movements of the human heart. When Othello's suspicions of the faith of Desdemona are first awakened, he exclaims,

> "If I do find her haggard,
> Tho' that her jesses were my dear heartstrings,
> I'd whistle her off, and let her down the wind
> To prey at fortune."

On our return several specimens of Veronica filiformis* were gathered in a stubble field. The seed might have been carried out with manure from the village, adjoining which there is an extensive nursery. A subsequent stroll by the banks of the idle Till—fit emblem of the Club on that day—was equally unproductive as the flight of the hawks, as neither anglers nor entomologists could boast of their success. To this, dinner succeeded, and the annual address of the President; after which, on the nomination of Mr. Selby, seconded by Captain Carpenter, Dr. Clarke was unanimously elected President for the year, and Dr. Johnston was re-elected Secretary.

Mr. Selby exhibited a beautiful drawing of a Hawk-moth, allied to the Death's-head Sphinx, but apparently specifically distinct: and in addition, four very fine specimens of the Sphinx convolvuli, three of the migratory locust, and one of the red comma butterfly, all taken in our district, and the latter in the garden at Twizell House.

Mr. Boyd also exhibited an individual of the Sphinx convolvuli taken near Yetholm. This gave rise to some conversation relative to the unusual number of several insects, generally considered rare, which had come forth this year; and the rarity of others which are considered common. Mr. Broderick remarked that he had seen the "Camberwell Beauty" on Twizel-moor about the middle of August. Mr. Selby promised to put the facts which had come to his knowledge on the subject together, and lay the paper before the Club.

Mr. Darling exhibited some very interesting specimens to

* Johnston's Flora of Berwick, i. p. 225, pl. 2.

show the manner in which the honey-bee made its wax; and he then read a notice of an anomaly in its history,—the only paper contributed to the transactions of the Club at this meeting.

BERWICK-ON-TWEED, *Nov.* 4, 1846.

There were present at this meeting the following members,—Dr. Johnston, Mr. Selby, Rev. J. D. Clark, Mr. Broderick, Mr. Macbeath, Mr. Murray, Mr. Turnbull, the Rev. T. Witham, Mr. Stevenson, and Dr. Clarke.

The Secretary read over his statement of receipts and disbursements, from which it appeared that he stood indebted to the Club in the sum of 3s. 6d.

It was agreed that the following were to be the places of meeting for the ensuing year:—

May.....First Wednesday.....Grant's House.
June .....Third Wednesday .....Embleton.
July.....Last Wednesday .....Coldingham.
Sept.....Full Moon Wednesday...Alnwick.
October .....Do.....Marshall Meadows.

Mr. Selby mentioned that on the 20th September, a fine female Honey Buzzard had been caught at Twizell in a trap baited with the comb of the wasp.

Dr. Johnston communicated a description of a specimen of the "Long-tailed Shark," which had been taken in Berwick Bay.

Dr. W. Baird sent a note intimating that he had added two Entomostracans, viz., 1. Bosmina longirostris, and, 2. Daphnia trispinosa, to the list of our district species. They were taken in Yetholm Loch.

GRANT'S HOUSE, *May* 5, 1847.

At this, the birth-place and favourite rendezvous of the Club, there was a good muster of members—a happy augury of our summer meetings. There were present,—Dr. Johnston, Mr. Embleton, Mr. Home, Mr. Boyd, Mr. Turnbull, Mr. Macbeath, Mr. Broderick, Mr. Stevenson, Mr. W. Dunlop, the Rev. T. Witham, and Dr. Clarke; and the club were favoured with the company of Dr. P. W. Maclagan, Mr. Bowerbank, Lieut. Thomas, R.N., Dr. M'Bain, R.N., Mr. Hepburn, and Major Elliot, as visitors. After breakfast one party followed

up the course of the Eye for about five miles, and at Blackburn Mill they descended to the east over the high grounds that lie between this place and Edmond's-dean, into which they dived, and, in its well-clothed recesses, spent the remainder of the time that was allowed them by the call to dinner at half-past three.

Another party followed the windings of the Pease-dean, till they reached the sea-side, returning by a different route. The weather was favourable on the whole, and the day was more devoted to the peculiar business of the Club than many of our late meetings.

After dinner, Dr. Johnston read a description of a new British Mould; and added some miscellaneous notes in natural history, which gave rise to a good deal of conversation.

Mr. Broderick announced the occurrence of the Cursorius isabellinus* in our district; and Mr. Hepburn exhibited a pretty assortment of rare moths captured in East Lothian—two or three of them for the first time in Scotland. Mr. Broderick also showed a very select collection of seedling pansies, raised by himself—a new feature in our proceedings, and one which we hope may be carried out into greater detail, as adding very much to the interest of our meetings.

Archibald Hepburn, Esq., Whittingham, Major Elliott, Berwick, and Patrick Clay, Esq., Newwater-haugh, were admitted members of the Club.

EMBLETON, *June* 16.

The meeting at Embleton was attended by the following members,—Dr. Johnston, Mr. Embleton, Mr. Collingwood, Mr. Home, Mr. Broderick, the Rev. Messrs. Clark, Rooke, and Walker, and by the Rev. John Acton Wood of Beadnell, and Mr. George Tate of Alnwick, who were subsequently admitted members, on the nomination of Mr. Embleton, seconded by Mr. Rooke. The party breakfasted with Mr. Embleton, and afterwards proceeded on their

* CURSORIUS ISABELLINUS.—A young male bird of this species was killed near Cheswick, on the 9th of November, 1846, by Mr. David Rowtin, (in the Preventive Service), who shot it during a strong gale from the south, being chased by gulls. It afterwards returned and settled on the land, where it was shot by him on the following day.

walk under his guidance. They went direct to Dunstanborough Castle, nothing worthy of particular note occurring by the way; and after wandering a while around the ruins, one party tarried to examine some geological phenomena of interest, explained to them by Mr. Tate, while another moiety proceeded to the gardens and grounds of Howick, distant about three miles. The party were sufficiently gratified by their walk, and returning by a different route, they reached Embleton in time for dinner; and here the geological party rejoined the mess, bringing with them some interesting fossils, which were freely divided amongst such members as take an interest in that department.

Dinner over, and the prosperity of the Club toasted as usual, a letter was read from Mr. Archibald Jerdon, communicating the discovery of Ornithogalum luteum, near Jedburgh. Mr. Broderick gave a notice that on the 9th May a fine specimen of the adult male Montagu harrier was taken in a trap near Alnwick. After some further talk, the party proceeded to the parsonage, where they were entertained by the hospitable Rector, and there they dallied till the time arrived for each to depart on his own way.

July came, but with it no meeting, for naturalists are citizens as well as other men, and have their duties to the commonwealth; and the general election, in which many of our members took a zealous part, completely engrossed the thoughts and attention of the Club.

GENTLEMEN,—I now resign into your hands the Presidency of this Club, with an unfeigned sense of your partial kindness in electing me to it a second time, and of my own want of desert to fill so distinguished an office.

When I recollect that we number amongst our associates such men as Sir William Jardine,* Mr. Selby,† and Dr. Johnston,‡ who have severally, by their ingenious labours,

* Author of the "Birds of Great Britain and Ireland," 3 vols.; Illustrations of Ornithology, &c., &c.

† Author of the "Illustrations of British Ornithology;" A History of British Forest Trees, &c., &c.

‡ Author of the Histories of British Zoophytes, and of the British Sponges and Corallines, &c.

earned an honoured name in the annals of science, and who, in turn, have added dignity to this office, and importance to our transactions; it is with no affectation of humility that I deem myself honoured in having, though at an humble distance, been permitted to tread in their steps.

Without such men, indeed, as our leaders and guides, beckoning us onwards by their own achievements, and imparting, by the electricity of kindred minds, some sparks of their own enthusiasm, this society would never have been established, or, if set on foot, would, for want of such elements of life, have speedily fallen into dilapidation and decay.

The Club, which has now existed for sixteen years, is linked to our memory by many agreeable recollections; and though the fickle climate of the North does not always grant us genial skies, never has the smallest cloud of angry discussion or cold indifference cast its shadow across our path; many a zealous student, on the contrary, now separated from us by distance, dates his dawning love for science to his pleasant wanderings with the Club by streamlet, dale, or hill, and to the feelings and associations thus enkindled and kept alive.

If, in the pursuit of our common object, the observance of nature, and the record of facts, which are the foundation of our philosophy, some days have passed by unmarked by discoveries either interesting or new, yet the whole district has been by degrees more accurately mapped and laid down, and its main features more distinctly appropriated and ascertained; and thus, by the institution of societies of kindred spirit and character to our own, (with one of which, the Tyneside Naturalists' Club, we are delighted to have been this day brought into personal and friendly communion), may the whole realm of Great Britain be brought within the domain of science, and its differences and resemblances, its analogies and contrasts, wrought into an harmonious whole—a record alike of the reasoning discernment of man, and the beneficent providence of God. Let it not be forgotten, too, that the labours of the naturalist do not terminate in immediate results—that they do not merely substitute a summary of exact knowledge for the hypotheses of ignorance, but add

directly or remotely to the sum of human happiness, by improving the condition, multiplying the comforts, and advancing the civilization of mankind. Beds of coal and iron, for example, give birth to numberless results no less useful and humanizing, than the processes by which these ends are accomplished are interesting and beautiful. The ravages of the marauding insect, or the parasite fungus, which laughs to scorn the labours of the husbandman, and in a few weeks lays waste the promise of the year, relinquish their noxious power, when the discovery of their antagonist or corrective has rewarded the labour of the persevering naturalist. The history of our science, indeed, warrants the assertion that no natural evil exists without its corresponding antidote, which the Author of Nature has left to the discerning sense and reasoning faculty of man to discover and apply. "The pestilence that walketh in darkness," which struck with horror the men of one age, from the vague mystery which hung over its origin, is patent as the sheen of the mid-day sun to those of another; nor do we doubt that the disease of the most useful of edible plants, which, with sudden and insidious step, lately gave up to wretchedness and death so many of our fellow-subjects, and hung with awful menace over the empire at large, is yet destined to become a palm of triumph in the hands of some ingenious student of Nature.

"Difficulty," says Burke, "is our helper;"—and the history of man is but a history of difficulties overcome—of mysteries made plain—and of the material elements, once his dreaded masters, enlisted in his service; and as there is no error so fatal to our advance as a supine belief that all calamities spring from the inevitable ordinance of God, which it would be impiety to endeavour to avert, so, it appears to us, there is no truth more clearly revealed—no commandment more distinctly traced by the finger of God himself, both within and without us, as that our senses and faculties were given to be employed for our advantage—that difficulties and obstacles are but steps in our onward course—and that Progress, incessant and continued, is the great law of the human race.

The following notice of the Berwickshire Naturalists' Club is extracted from the Rev. Dr. A. Hume's History of the Learned Societies of Britain, published in the present year :—

"'The Berwickshire Naturalists' Club' was founded September 22, 1831. Its general object was to encourage a taste for natural history in the district, and its special one to investigate the Natural History and Antiquities of the Eastern Borders.

"This Society possesses some features of a peculiar kind, which make it very interesting, especially to its own members. It meets by day, not in the evening; usually at eight or nine o'clock A.M. It examines the specimens of Natural History, &c., *in situ*, and the explanations, whether oral or written, are more interesting. It admits ladies and none else as honorary members. It is itinerating within a certain district, and a number of pleasing circumstances not directly connected with the general objects are associated with every meeting. Some of the members, who are familiar with the working of learned societies, give it a decided preference to any other of them.

"A candidate for membership requires the assent of three-fourths of those present at the meeting at which he is proposed. There are no specific fees, the contingent expenses being met by an annual contribution which averages about 7s. One meeting is held yearly, in Berwick-upon-Tweed, and the others are at different places appointed. The days are the 1st Wednesday in May; 3d Wednesday in June; last Wednesday in July; 3d Wednesday in September; and the Wednesday nearest to full moon in October. At the October meeting the accounts are balanced; and the places of meeting for the succeeding year are appointed.

"There were nine original members, of whom only five remain, and there were four candidates for admission as ordinary members at the 1st meeting of 1847. The Club has already issued one volume of Transactions, entitled, 'History of the Berwickshire Naturalists' Club,' and four parts of a second volume."

Instance of a singular Anomaly in the History of the Honey Bee. By GEORGE DARLING, Esq.

Mons. Huber, in his wonderful and accurate researches into the History of the Honey Bee, discovered that, if a young queen passes the 21st day without intercourse with the drone, she will be only partially fertile, laying nothing but the eggs of drone brood, nor does she lay these eggs in the appropriate comb, but in the comb proper for workers. This curious fact I have seen proved several times; but one not noticed by the careful Frenchman came under my observation this summer. I had placed a young queen in a small experimental hive; she was very soon impregnated, and filled a sheet of comb with eggs. I removed her to another hive, and, in the usual time, the bees turned out several young brood for queens to make up for her loss. One of these, at the proper time, emerged from the cell, and destroyed the others. Three days after hatching she began to lay eggs, and as I supposed all right, but about a week after, when I examined the hive, I found the queen thrown out, and three cells converted into royal ones; but to my surprise, I found that all the grubs were drones, both those in the forced royal cells, and those through the combs; and I have no doubt that the bees had, on finding their queen imperfect in her functions, killed and thrown her out; but here their instinct had not been sufficient to teach them that a drone grub could not be converted into a queen, for they sealed up the grubs and waited patiently the time for their hatching. The young drones never hatched, but shrivelled in the cells, which would lead to the conclusion that the food suitable for a young queen is not adapted to bring a drone to perfection.

The comb shown is where the drones were bred.

Observations and Notes made during the year 1846; *On the occurrence of Insects, &c.* By P. J. SELBY, Esq., of Twizell House.

The year 1846, memorable for the deficiency of the harvest throughout the greater part of Northern Europe, as well

as for the fatal effects of that extraordinary disease which first attacked the potato crop in 1845, was not unproductive of facts of an interesting nature to the Naturalist, and particularly to the Entomologist,—a notice of which, so far as they fell within my observation, I now offer to the Members of the Club. I may premise that the winter which followed the cold and ungenial summer and autumn of 1845, had been of a character remarkable for its warmth and mildness, the thermometer, during the months of January and February 1846, indicating, from my register, an excess of temperature of from seven to eight degrees above the corresponding months of 1845, and of the current year. Among my other notes, I find it recorded that the Ring-Dove commenced cooing on the eleventh day of January, a month before the average period, deduced from observations made during a series of years; and that the Missel and the common Thrush were in full song on the 10th of the same month. In consequence of this unwonted and unseasonable temperature, vegetation was prematurely called into activity, and many shrubs and trees were farther advanced by the middle of March, than they usually are in the early part of May.

A sudden change of wind, however, from south-west and west to north and north-east on the 17th of March, accompanied in Northumberland and Durham by a heavy fall of snow, and followed on the night of the 18th by an intense frost, during which the thermometer in many situations fell as low as 22° Fahr., proved fatal and destructive to all young and tender shoots, as well as to the blossoms of the wall fruit trees and pears, most of which were at the time fully expanded. South of York but little snow fell, neither was the frost so severe, though sufficient to destroy the prospect of an abundant crop of fruit. Cold north-east winds prevailed up to the 10th of April, when more genial weather set in, and towards the middle of May it became decidedly mild and warm, and the temperature kept increasing during the remainder of the month, and the greater part of June, with much sunlight, and scarcely a shower of rain. Towards the end of the month thunder-storms became prevalent, attended in some parts by hail or ice showers, which did con-

siderable damage in the districts where they fell, and the temperature, which had reached 70° and 80° in the shade, was for a time considerably reduced, but again reached a high grade during part of July and the two following months. I may here observe that the arrival of some of our summer birds of passage in Northumberland was a few days earlier than usual, but I remarked in this district, as well as in Kent and other counties visited during the summer, that even of the common or more abundant species, the numbers as compared with other years were comparatively few; and this I found to be the opinion of other observers in different parts of the kingdom. Of some species, indeed, I saw scarcely an individual, though I sought for them in localities adapted to their habits; such was the case with the Sedge and Reed Warblers, Whin-chat, &c. The Swallows, as well as the Swift, were also observed to be in greatly reduced numbers. The cause of such a deficiency, after so mild a winter, with the exception of the week in March, and a summer of unwonted warmth, must remain a matter of mere conjecture. It might possibly have arisen from the effects of tempestuous weather during their migratory flight, or, what is perhaps more probable, from a deficient brood of the previous year, the result of a season memorable for its low temperature and weeping character, alike unpropitious to the increase of the feathered race. Of Insects, also, there appeared to be a great deficiency during the earlier part of the year, particularly of the common species of diurnal *Lepidoptera*. This, it is reasonable to suppose, may be traced to the cold and ungenial character of the previous summer and autumn, and perhaps in some degree to the unwonted *mildness* of the winter which succeeded, for it has been remarked that severe winters, during which the earth is bound up in long continued frost and snow, are not so injurious to the larvæ and pupas of insects, as those of a moist and mild character. As the season advanced, lepidopterous insects became more abundant, and in August we were visited by some rare, and as northern, unwonted species. *Sphinx Convolvuli*, one of the largest of the family of the Sphingidæ, and generally considered an insect of some rarity, suddenly appeared in consi-

derable numbers, in almost every district of England, as well as in the southern parts of Scotland. At Twizell, six beautiful unworn specimens, apparently fresh liberated from the pupa, or chrysalid state, were caught in the flower garden, while hovering in front of the flowers, from whose tubes they were extracting the honied nectar, by means of their very long extensile tongues, an instrument admirably adapted for the purpose. Others were seen, but allowed to escape. At Belford, also, several were taken under similar circumstances, and the capture of many more was notified to me by various parties in neighbouring as well as distant localities, many of them in districts removed from the coast, a circumstance of some importance in the speculation as to whence, or to what cause we are to attribute so unusual a supply of an insect conspicuous for its size, flight, &c., and now noticed, perhaps, for the first time, in districts where it had previously failed to attract the attention of the observer. Are we to suppose that this numerous flight originated from eggs deposited, either in the earlier months of the same year, or by parent insects which had escaped observation during the previous autumn? If so, does it not appear somewhat extraordinary that a host of larvæ, for numerous they must have been, of so large a size, and so striking an appearance, as the caterpillars of this giant-like moth, should have escaped detection, which they appear to have done, for I do not find that the larvæ had attracted the attention of entomological observers, or been noticed in any of our periodical publications? It has also occurred to me, that perhaps the long continued and ardent heat of the summer might have vivified or enabled the imagos of many previous broods to burst those bonds which unpropitious seasons had long confined in the pupa state, deep buried in the earth, and which emancipation they were now enabled to effect, by the peculiar and adventitious circumstances of the summer of 1846. Such seems to be the economy of other lepidopterous species, whose imagos only appear, or at least do so in any considerable numbers, at uncertain, and sometimes at distant intervals, among which may be mentioned *Cynthia cardui*, *Vanessa antiopa*, *Pieris cratægi*, *&c.* If we reject both of these foregoing suppositions, we

must then, I presume, look for the influx of this body of Sphinxes to an importation or migratory flight from foreign or continental shores, of which fact we possess no evidence whatever; on the contrary, their general dispersion throughout the kingdom, as well as the fresh and unworn state in which they appeared, seem strongly to militate against a foreign or distant origin.

During August and September several locusts, (*Locusta migratoria,*) were taken in various localities along the Northumbrian coast, three or four of which are now in my collection, and were exhibited to the members of the Club at a former meeting. All the specimens I examined answered to the description of the *Locusta migratoria* of authors, and were probably stragglers from a flight which was observed near Sunderland, in the county of Durham, a short time before. The individuals sent to me were taken within a mile or two of the coast, and as no instance of an imperfect or larval locust has hitherto been detected in the districts where the perfect insects appeared, I attribute a foreign origin to these unwonted visitors.

In August also, caterpillars of *Acherontia atropos*, or Death's-head Sphinx, were found in considerable abundance in the potato fields, where they became more easily detected in consequence of the rapid decay of the foliage when attacked by the fatal disease. Among those brought to me were three, which, though of equal size, or even larger, differed in colour and markings from the others, which last exactly answered to the description of the larva of this Sphinx, as given by Stephens and other authors. The drawings, taken at the time from the two varieties, show the difference as it existed, and is conspicuously apparent in the head, the three first segments, and the ground colour of the body. I continued to feed the larvæ brought to me with great care, and when potato leaves could not be procured, substituted those of the common nightshade, (*Solanum dulcamara,*) upon which they seemed to thrive, and to relish as well as the potato itself. When arrived at their full growth, I put them into very large flower-pots, filled with earth, into which they retired. The pots were placed, during the winter, in an out-

house, where I expected the temperature would generally be above the freezing point, and since May I had them removed to a warmer situation, in the hope of seeing the perfect insects excluded during the summer months. As this had not taken place on the first of September, I emptied the pots of their contents, and although the whole of the caterpillars, with one exception, had undergone the pupal change, none of them were alive, nor had the interior matter of the chrysalis undergone any great change, the form of the moth being scarcely recognisable, from which it would appear that they had perished at an early period, and probably during the cold of winter, during which the protection afforded had not been sufficient to maintain their vitality. Two perfect insects of this species were brought to me in September 1846; these, it is probable, proceeded from an earlier brood than the caterpillars I endeavoured to rear. I may here mention that two instances of a butterfly, which, from the description given me, must have been examples of *Vanessa antiopa*, were observed in this neighbourhood; if correct, it is the first instance to my knowledge of their appearance in this locality.

In September, the common diurnal *Lepidoptera* became plentiful, such as the different species of *Pontia*, *Vanessa urticæ*, *Atalanta*, and *Io*. Several examples of *Cynthia cardui* (Painted Lady) were also observed; and of the *Noctuidæ* and *Geometridæ*, the supply of the species common to this district was about the usual average, judging from the numbers which resorted to the boles of the trees anointed with honey or syrup of sugar.

I append to the foregoing the mean temperature of the various months of the years 1845 and 1846, and January and February 1847, from observations taken at Twizell House, at 8 A.M., and 10 P.M.

Mean Temperature of the various Months of the Years 1845 *and* 1846, *and January and February* 1847, *from observations taken at Twizell House, at* 8 *a.m., and* 10 *p.m.*

1845.	1846.
January.	*January.*
8 A.M. 36° 9′	8 A.M. 42° 5′
10 P.M. 35° 26′	10 P.M. 41° 30′
February.	*February.*
8 A.M. 32° 26′	8 A.M. 41° 1′
10 P.M. 33° 22′	10 P.M. 42° 10′
March.	*March.*
8 A.M. 35° 16′	8 A.M. 40° 6′
10 P.M. 35° 22′	10 P.M. 39° 24′
April.	*April.*
8 A.M. 44° 7′	8 A.M. 43° 16′
10 P.M. 41° 4′	10 P.M. 42°
May.	*May.*
8 A.M. 46° 1′	8 A.M. 51°
10 P.M. 44°	10 P.M. 49° 15′
June.	*June.*
8 A.M. 59° 15′	8 A.M. 61° 29′
10 P.M. 54° 27′	10 P.M. 59° 10′
July.	*July.*
8 A.M. 55° 14′	8 A.M. 59° 13′
10 P.M. 52° 28′	10 P.M. 57° 21
August.	*August.*
8 A.M. 55° 7′	8 A.M. 59° 15′
10 P.M. 53° 27′	10 P.M. 57° 27′
September.	*September.*
8 A.M. 50° 11′	8 A.M. 56° 4′
10 P.M. 49° 8′	10 P.M. 55° 16′
October.	*October.*
8 A.M. 47° 7′	8 A.M. 47° 29′
10 P.M. 47° 21′	10 P.M. 47° 30′
November.	*November.*
8 A.M. 42° 13′	8 A.M. 43° 4′
10 P.M. 42° 22′	10 P.M. 41° 27′
December.	*December.*
8 A.M. 36° 10′	8 A.M. 33° 25′
10 P.M. 36° 27′	10 P.M. 34° 15′
January 1847, 8 A.M. 35° 17′	*February* 1847, 8 A.M. 34° 21′
10 P.M. 35° 10′	10 P.M. 36° 4′

A Letter to the Secretary from ARCHIBALD JERDON, Esq.

LINTALEE, *May* 18, 1847.

MY DEAR SIR,—I beg to send you herewith two specimens of the Yellow Star of Bethlehem, (*Ornithogalum luteum*, Lin.) which I trust will reach you safely.

The plant grows in two patches, at the roots of trees, on the banks of the Jed, near Ferniherst Castle, about two miles above Jedburgh. The soil is rather sandy, being sometimes overflowed by the river. I have no hesitation in pronouncing the plant wild. It flowers in April.

The other day I found another rather rare plant, the *Lathræa squamaria*, also on the banks of the Jed, near this. It is in full bloom just now, and appears to be growing on the roots of an elm. You have doubtless met with the plant, but it had never occurred to me before.

I remain, dear Sir,
Yours truly,
ARCH. JERDON.

Dr. George Johnston.

Notes on Nocturnal Lepidoptera, by ARCHIBALD HEPBURN, Esq.
In a Letter to the Secretary.

MY DEAR SIR,—Amongst the rare moths exhibited to the Members of the Berwickshire Naturalists' Club, at the meeting held at Grant's House in May last, may be mentioned:—

1. Euclidia mi., for which Torwood is the only other Scotch locality yet named; pretty common in two localities in the neighbourhood of Whittingham, East Lothian, where the whole series exhibited were taken.
2. Euclidia glyphica, common; new to Scotland.
3. Xylophasia combustata; not uncommon at Pressmenan Lake.
4. Celæna Haworthii, rare; Traprain Law.
5. Eudorea murana, abundant; Pressmenan.

6. Lophoderus ministranus ; abundant ; Pressmenan.
7. Eudorea lineola ; rare ; new to Scotland.
8. Xanthosetia hamana ; ex.-rare ; new to Scotland.
9. Polia chi ; very rare ; taken in July and September.
10. Chareas graminis ; not common ; Traprain Law.
11. Ptycophoda immutata ; pretty common ; new to Scotland.

Yours truly,

ARCHIBALD HEPBURN.

Whittingham, June 10, 1847.

P.S. I stated verbally, to a few of the members, that I had taken the very rare Graphiphora pyrophila last June, and had presented the specimen to the British Museum ; also that in 1845, I took Melitæa silene, for which the only other Scotch locality given by Messrs. Humphrey and Westwood, is Kilmun. A. H.

Description of a new British Mould. By GEORGE JOHNSTON, M.D., &c.

January 6, 1847.

I am willing to believe, with my Lord Bacon, that Mould "is something between putrescence and a plant." It settles a much mooted point as well as any other theory has yet done. Organic substance, in a state of decay, is Mould's fruitful matrix,—life from death,—the ever-yearning change from a worse to a better condition ; for life, even in this its lowest state, is better certainly than sad corruption. And how beautiful are many Moulds, when, with the microscope, we discover Nature's handicraft in them to the eye of sense ! We can scarcely but believe that they have a sort of enjoyment in their life, and in the evolution of their symmetrical figures. One sort is now vigorous and abundant on some plants in my little "Green-house," where it is as noxious as the Green-fly, or Aphis ; and it is rather singular that the species has not been yet recorded as a British production. I have the high authority of the Rev. M. J. Berkeley for this fact, who

informs me that our Mould is the Botrytis umbellata* of Decandolle.

BOTRYTIS UMBELLATA.

On a flat and smooth leaf, the decumbent filaments of this Mould form a cobweb-like mycelium, but on leaves with an uneven surface, and on the stalks of herbs, the mycelium is so filamentous and thin as to be scarcely perceptible; while the erect filaments are so numerous as to render the surface downy or hirsute. The decumbent filaments are also slenderer than the others, but there is no difference in their structure; they are smooth hyaline membranous tubes jointed at distant intervals, the joints alternately swollen and constricted, but not regularly so, and when moistened with water, the whole tube becomes swollen, tense, and cylindrical. The erect filaments are two lines in height, of a grey or cinereous colour, with a hoary sporuliferous head; they are sparingly and irregularly branched, and at the top four or five short divergent branchlets form a sort of imperfect umbel, collecting, as it were, the sporules into a round heap or summit. The main branches are either divergent or dichotomous; and many of the filaments are quite simple. The sporules are ovate or elliptical, often marked with a septum, sometimes transversely, and in others in a longitudinal direction; and this septum disappears when the sporules are moistened. The number of sporules is incalculable; they fall from the head and are found adherent to every fibre of the plant; and when this is shaken, they fly abroad in a little cloud.

My friend Mr. Bowerbank examined this Mould with the microscope. When highly magnified, many of the main filaments exhibited slight protuberances, which were supposed to be incipient branches; these were sometimes opposed to each other, and sometimes they were not quite in opposition. The sporules varied considerably in size, and were ovate or elliptical. Placed in water between glasses, after a lapse of two days it was found that most of the sporules had germinated, each emitting a single filament, which was sparingly and irregularly branched, and contained some very minute granules.

* Lam. et Decand. Fl. Franç. ii. 71. Duby Bot. Gall., ii. 921.

A Description of the Long-tailed Shark. By GEORGE JOHNSTON, M.D., &c.

On the 30th of July 1846, a long-tailed Shark was captured in our bay. It had got entangled in a herring net, and killed itself in its efforts to escape. None of our fishermen had ever seen the fish before, which may therefore be considered amongst the very rarest of our visitants.

The total length of the specimen was eleven feet and an inch, and the circumference in front of the dorsal fin, where the body was thickest, was three feet two inches. The length of the body was a little upwards of five feet six inches, being about half an inch shorter than the tail; and it was this disproportionate length of the tail that gave to the creature its peculiar and bizarre appearance. The body was fusiform, even, and very smooth to the eye, with a silky glossiness, of a leaden colour, paler on the sides, and white marbled with bluish on the ventral surface. Although apparently very smooth, yet the resistance to the finger when it was drawn from the tail forwards, proved that the skin was finely shagreened. The tail was shaped like a straight sword. Its origin was marked by a deep incissure or fosse in the back, and from this it tapered gradually to the tip, where it is obtusely pointed; and just in front and beneath the termination there is a small lobe. A sort of narrow fin ran along the inferior edge, becoming broader towards the base or origin, where it dilated into a falciform lobe.

Snout obtusely pointed; nostrils small, half way between the snout and mouth; mouth inferior, lunate; teeth proportionally small, triangular, cuspidate, smooth; eye circular, an inch in diameter, dark, with an elliptical pupil; pectoral fins falciform; dorsal fin with a dilated base prolonged behind into a lobe; ventral fins meeting below on the mesial line, and concealing the vents; adipose fin small, rhomboidal, elongated and pointed posteriorly; nearly opposite, but a little posterior, to this fin, on the ventral line, there is a small anal fin.

Length from the snout to the eye four inches; length from

the snout to the insertion of the dorsal fin two feet seven inches; length of dorsal fin one foot; length of the pectoral fins one foot eight inches; breadth at their base ten inches; breadth of the tail at its origin seven inches; length of its large lobe eight and a half inches.

SYNONYMA.

Ἀλώπηξ. γαλεὸς ὁ ἀλωπηξ, *Arist.* Hist. Anim. c. 6 and 9.—Alopecias, *Plin.* Hist. Nat. lib. 32, c. 53.—Vulpes marinæ, Ibid. lib. ix. c. 77.—Sea Foxes Holland's Pliny i. p. 262, c. 43.—Cercus, *J. Caii* Opusc. p. 110.—Renard *Rondel.* Poiss. i. p. 303, fig.—The Thresher, Borl. Cornw, p. 265.—Long-tailed Shark, *Penn.* Br. Zool. iii. 145, pl. 17.—Squalus vulpes, *Turt.* Gmel. i. 918. *Turt.* Brit. Faun. 112. *Stew.* Elem. i. 317. *Blainv.* Faun. Franç. Poiss. 95, pl. 24, fig. 1. *Jenyn's* Man. 498.

La Faux ou Renard, *Cuv.* Reg. Anim. ii. 388.

Carcharias vulpes, (Cuv.) *Flem.* Phil. Zool. ii. 377. Brit. Anim. 167. *Risso* l'Europ. merid. iii. 120. *Stark* Elem. i. 385. *Griffith's* Cuv. Pisc. 599 and 635. *W. Thompson* in Brit. Assoc. rep. an. 1840, p. 398.—Thrasher, Couch Corn. Faun. i, 50.—The Fox Shark, *Yarr.* Br. Fish. ii. 522. *Partington's* Br. Cycl. Nat. Hist. iii. 654, fig.

For the following additions to the Synonyma, I am indebted to my friend Dr. W. Baird, of the British Museum:—

Alopias vulpes, *Muller and Henle* Systematische Beschreibung de Plagiostoma, p. 74.

Vulpes, *Rondeletius* De piscibus marinis, p. 387.

Vulpecula, *Salvianus* Aquatil. Animal. Hist. p. 134, fig. 42. *Willoughby* Ichthyographia, B. 6. *Ruysch* Theatrum Univers. Omn. Animal, iii. p. 3.

Vulpecula marina, *Aldrovandus* De piscibus, p. 396–397. *Jonstonus* Depiscibus et Cetis, p. 15, t. 7, f. 3.

Vulpes marina, *Gesner* Hist. Animal. De Aquatilibus, p. 1249. *Blasius*, Anatome Animal. t. 51, f. 10, 11.

Galeus cauda longa, *Klein* Hist. Nat. Promoverd. Mess. Pisc. iii. 10.

Renard marin, *Perrault* Mem. pour serv. a l'Hist. Nat. I. t. 15–16. *Broussonet* Mem. sur les differ. espèces de chiens de mer, in Hist. de l'Acad. Royale des Sciences, 1780, p. 641.

Renard de mer, *Duhamel* Traité gen. des Pèches, et Hist. des Poiss. xxi. f. 1, 2.

Zorra di mar, *Bru de Ramon* Collecion de laminas que representan los animales y monstruos del Real gabinete de Historial Natural de Madrid, 1787, ii. 49.

Squalus cauda longiore quam ipsam corpus, *Artedi* Gen. Pisc. 508. *Do.* Synonym. nom. pisc. p. 96.

Squale renard, *Lacepede* Hist. Nat. des Poissons, i. 267.

Squalus vulpes, *Bloch* Syst. Ichthyolog. edit. Schneider, p. 127.

Alopias macrourus, *Rafinesque* Carrateri di alcuni nuovi generi e nueve specie di animal. p. 12.

Alopis vulpes, *Buonaparte* (Car. Lin.) Iconografia della fauna Italiana.

THRESHER or LONG-TAILED SHARK, Mitchell Trans. of New York, i. p. 482; and Med. Repository, 2 Hexade, vol. ii. p. 177. New York, 1835.

The Ἀλώπηξ, Aristotle tells us, is a Shark or galeoid fish; it is ovo-viviparous, having eggs, but bringing forth its young alive; and these young ones can re-enter the womb of their parent, as happens with most other sharks. Aristotle goes on to say, that "the fishes called *foxes*, when they feel that they have swallowed the hook, have a means of escape as well as the scolopendra, for running forward considerably towards the line they bite it through; for they are taken in some places with a number of hooks set together, in rapid and deep places."—There is certainly little in this history to enable us to identify the species, but it has been conjectured that Aristotle was led to confer upon his fish the name of Ἀλώπηξ, or Fox, "from the length and roughness of its tail," a character which suits the Shark in question, when at least we abate the "roughness" that the conjecturer has unwisely added to give greater plausibility to his guess.*

There is not to be found in ancient writers anything additional to what Aristotle has told us of the Sea-fox. In one place, Pliny mentions the Alopecias as one of those fishes which are confined to salt water; and in another the Sea-foxes are quoted for their cunning, the anecdote of their biting the line being instanced as the proof. It is thus translated by Doctor Philemon Holland:—"But the sea-Foxes in the like dangers haue this cast with them, namely, to gather in and let it go downe into the throat more and more still of the line, vntill he come to the weakest part thereof, which he may easily fret and gnaw asunder."

Athenæus affords no particulars for quotation.—Archestratus, who lived the life of Sardanapalus, gives this fatherly advice to his friends:—"If at Rhodes one should refuse to sell you the Sea-fox (galeus alopex), the fish which at Syracuse they call the fat dog, steal it, though you were to die for

* Jonston says,—"Vel a caudæ longitudine, vel insuavi ingratoque gustu, vel ab astu ingenioque, nomen (*Vulpecula*) sortibus esse videatur."—Aldrovandus thinks it not doubtful that the name comes from the ingrateful savour of the flesh, similar to that of the Fox. And Gesner and Salvianus derive the name from the same source.

it. Secure your prize,—then submit to what the fates decree!"† The ancients, we know, had womanish longings in their dainties, but it is scarcely to be believed that our long-tailed shark was the Rhodian galeus for the taste of which a man should risk the taste of death. I therefore agree with Aldrovandus and with Gesner, that Archestratus is not to be put on trial as to the delicacy of his taste, on the presumed identity of his Alopex with our Thresher.

Rondeletius comes forward as a witness to prove the assertion of Aristotle, that the young re-enter the body of their parent; but the evidence he adduces is indirect and scarcely satisfactory. His words are,—"Postremo fœtus suos, intra se recipit, ago cujus rei testes sumus oculati. Quum enim aliquando in litore dissecaretur, in ejus ventriculo catulos vidimus, quos pro cibo devorasse piscatores existimabant, sed cum vivi atque illæsi inventi essent, eos in metu intro receptos a parente dubitandum non est. Neque obstat caudæ longitudo; etenim quum adhuc parvi sunt et tenelli fœtus, mollis ea est et flexibilis. Id igitur cum vulpes faciat, paucique alii galei qui certissimis notis a Vulpe distant, dubiam nemeni esse debet quin marinam vulpem veram repræsentaverimus."—De piscibus, p. 338.

John Caius,—of whom we read that "few men might have had a longer, none ever had a shorter epitaph,—*Fui Caius*," —was the first to describe this fish as a visitant of the British coast, and his description of it is very good. The individual he saw was captured between Calais and Dover, on the 16th of June 1569. He tells us that the flesh is like that of the salmon, and eatable, but not grateful to every palate,—which I ween it would have been, had it indeed tasted as tastes our peerless queen of the Tweed, when she lies smoking on the boards of a Kettle!

The Rev. Dr. Borlase is next in order, and he thus writes:—"Of the shark kind (beside others which have been reckoned by Mr. Ray, who came to Penzance on purpose to collect and examine the sorts of our Cornish sea-fish) we have the sea-fox, *Vulpecula* or *Simia marina* of authors; this

† I am obliged to the Rev. Thomas Riddell of Masham, for the information taken from Aristotle and Archestratus.

shark we call the Thresher, from the motion of its long fox-like tail, with which it strikes or threshes its larger and less agile enemy the grampus, whenever it reaches to the surface of the water to breathe. This engagement lasts several hours, as I have been informed by an eye-witness," who, Borlase informs us in a note, was the Rev. Mr. Dyer, vicar of St. Clare.

Pennant had seen a British specimen, but both his figure and description is indifferent. Mr. Charles Stewart tells us, that the fish is "often found in the Scottish seas;" and I do not find an earlier notice of its visiting Scotland, my friend Dr. Wm. Baird having in vain sought for any such fact in the writings of Sir Robert Sibbald. That it visits Ireland occasionally, we learn from Mr. W. Thompson.

Mr. Couch, in his Cornish Fauna, says that the Thrasher is "rarely taken" on the coast of Cornwall. He has given a description of a specimen in Mr. Yarrell's work on British Fishes, which accords with our own. He found the stomach filled with young herrings. He further says,—"It is not uncommon for a Thresher to approach a herd of dolphins (*Delphini*) that may be sporting in unsuspicious security, and by one splash of its tail on the water, put them all to flight like so many hares before a hound."

Our fishermen ascribed the scarcity of herring in our bay, for a fortnight previous to the capture of this Shark, to its attacks upon the shoals, by which they were scattered and frightened away. Of such nugatory tales is much of our natural history of fish composed.

MISCELLANEA.

Nov. 10, 1846.—A *Quail* was shot at Letham, near Berwick, by John Pratt, Esq.

Jan. 14, 1847.—Mr. Lilly told me two anecdotes of the *Weasel*, that illustrate its habits. (1.) Riding along the post road, on a summer afternoon of last year, a rabbit came running up in a very exhausted state, and uttering cries of agony. Mr. Lilly alighted and took up the poor animal, when he

noticed a weasel in full gallop coming forward, evidently in hot pursuit. The weasel came close up to him, and was killed by a blow from the butt-end of his whip. (2.) Only two days ago, when it was a hard frost, Mr. Lilly was with a friend in the country, five miles from Berwick, when they saw a Weasel crossing the road before them, with something heavy in its mouth. The weasel was shot, and the prey was found to be a large toad.

The MALLET *(Mugil chelo)*.—"Coldingham. During the past and beginning of the present week, a rather singular circumstance occurred at Coldingham shore, in the appearance of a large shoal of fish, very rare in this locality, of the Mallet species. An unusual number of fish were observed swimming about for several days, going and returning with the tide, but no particular notice was taken of them until Monday last, when they set in very thick, literally crowding the harbour. The entrance was secured by nets, and a large quantity of the fish caught, and conveyed fresh to the Edinburgh market. They have not since been seen, and it is believed have not appeared on any other part of the coast. The case is not altogether without a precedent in this quarter, a somewhat similar occurrence having taken place about ten years ago, a little farther to the west."—*Berwick Advertiser*, April 10, 1847.

April 24.—To-day Mr. William Dunlop brought me a specimen of the male *Merlin*, which he had shot on the moor above Mayfield, on the 22d inst. The day previous he saw the bird strike down a partridge. The merlin and its mate were seemingly engaged in building a nest, which was placed on a *tree*,—a fact worth record.—N.B. Mr. Broderick questioned the accuracy of Mr. Dunlop's fact; because it was contrary to the general observation, and because the Merlin does not construct a nest at so early a period of the year. The Merlins, Mr. Broderick suggested, might be merely roosting on the tree; and the nest the remains of that of some bird's of the previous year.

The Acarides *of Berwickshire specifically described.*

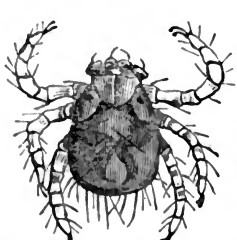
By George Johnston, M.D., &c.

"— — and whilst he expected the tides and returns of business, he filled up the empty places of leisure with his studies."—*Thomas Fuller.*

I propose laying before the Club, from time to time, descriptions of the Mites to be found within the limits of our district, because hitherto little attention has been directed to them. Yet they are pleasant to examine from their symmetrical neatness and their vivid colouring; they afford examples of many curious and admirable structures, and we may hope to discover corresponding traits in their economy; and they have as many relations of good and bad to man, and to his property, as any other family of insects. In describing these "minims of Nature," I shall follow no order, purposing to remedy the defects of this plan by a systematic index when our acquaintance with the tribe has been enlarged, and the field we occupy may seem to have been sufficiently explored.

1. Leptus autumnalis.

The autumnal Acarus or Harvest bug, *Shaw* Nat. Misc. ii. pl. 42. *White* Selborne, i. p. 153.—Acarus autumnalis, *Stew.* Elem. ii. p. 324.—Leptus autumnalis, *Lam.* An. s. Vert. v. p. 49: 2de edit. v. p. 63. *Latreille* in Cuv. Reg. Anim. iv. p. 290. *Griffith's* Cuv. xiii. p. 508. *Orr's* Cuv. p. 471.



Desc. *Body* oval or roundish, narrowest and truncate in front, rounded behind, uneven, sparsely covered with rigid hairs or bristles, of a uniform tilered colour: *Palpi* two, pediform, placed on each side of the mouth, short and folded under the breast, and in this position forming a shoulder-like prominence; they appear to be 4-jointed, and are terminated with a pair of claws: *Eyes?* two, distant, forming a spot on each side in front, but these disappear after death: *Legs* 3 pairs, alike and sub-equal, filiform, rather shorter than the body, bristled, armed with two curved sharp claws closing in the same direction and inwards; the

two first pairs are inserted nigher each other than they are to the hinder pair; each leg has six joints, the four proximal nearly equal, the fifth longer, the sixth still more elongate and suddenly narrowed at the insertion of the claws.

This mite may be compared to a grain of cayenne-pepper, which it closely resembles in colour and in size. Some specimens are very exactly oval, but the majority are roundish or somewhat cordate. In some there is a conical process at the anus. The body and legs are of the same colour. The skin is very finely striolate under a high magnifier.

In the course of the present summer I received from a friend many specimens of this mite, which, he informed me, was very troublesome to horses, cattle, sheep, dogs, and rabbits, and to the "herd's bairns," and people engaged about the infested animals. It adhered to the skin, and in numbers occasionally so great as to be collected into small clusters, hanging like a drop of congealed blood from the hairs. They produced extreme itchiness; and, says my correspondent, "in the worst case I have seen, that of a horse, the skin seemed exactly as if it had been rubbed with a liquid blister." Hence I infer that the mite had penetrated beneath the skin, as I know it does easily into that of man. When examining it, some individuals got upon my hands, over which they dispersed themselves with considerable quickness, and in a few seconds they had burrowed in the skin so deep as not to be perceived, but the place in which they had burrowed was indicated by itchiness, and by a blister that exactly resembled the pustule occasioned by the sting of a nettle. One individual was watched. Its race over the hand and the moment of its fixation was unfelt; neither was any uneasiness felt by its penetration of the skin. On getting under the cuticle it was killed by a strong squeeze. No itchiness ensued, nor blister; and the dead insect remains, after an interval of more than three months, unaltered, as is proved by the red speck that still marks the spot of its death and burial.

This troublesome insect prevails all along the sea-coast of East Lothian. In Berwickshire it is rare, but is found on farms near the sea-shore where the soil is light. It begins to appear in the early part of July and is very troublesome

in August. Then great numbers may be observed crawling upon and over all green things, on turnips, grass, and corn; but certainly the object of their pilgrimage and quest is the body of a living animal.

This account of the "Harvest-bug" corresponds with what we read of it in other authors. Gilbert White of Selborne writes,—"There is an insect with us, especially on chalky districts, which is very troublesome and teasing all the latter end of the summer, getting into people's skins, especially those of women and children, and raising tumours which itch intolerably. This animal (which we call an harvest-bug) is very minute, scarce discernible to the naked eye, of a bright scarlet colour, and of the genus of *Acarus*. They are to be met with in gardens on kidney beans, or any legumens; but prevail only in the hot months of summer. Warreners, as some have assured me, are much infested by them on chalky downs; where these insects swarm sometimes to so infinite a degree as to discolour their nets, and to give them a reddish cast, while the men are so bitten as to be thrown into fevers."

Dr. Shaw tells us that our acarus is much smaller than a common mite, and can but just be perceived upon the skin, to which it adheres by its claws, and particularly by the two short arms or tentacula, situated above the upper legs. It can scarcely be separated from the skin when once it has fixed itself; its motion when disengaged is considerably quick, though by no means equal to that of some other species of acari. On the part where it fixes, it causes a tumor generally about the size of a pea, sometimes much larger, accompanied with severe itching. The colour is a bright red, and, when microscopically examined, the lower part of the body appears to be coated with stiff bristles. It seems to be provided with a tubular snout, which is generally concealed or sheathed, but which may sometimes be distinctly seen. On the top of the head are two little processes or sharp implements, which turn outward each way.

But is the Harvest-bug of Shaw identical with the Berwickshire mite? There can be no reasonable doubt of it, from the sameness of their size, colour, structure, and habits.

True, on comparing our figure with that of Dr. Shaw, there is a considerable difference, but none that is essential. Dr. Shaw's figure represents the body pear-shaped,—in ours it is sub-quadrangular,—and in fact there is a difference in the form of different individuals, as we have already mentioned, and as we might infer from Dr. Shaw describing the insect as "globose-ovate," in his specific character. Shaw represents the palpi and the "little processes" at the mouth as visible and protruded, whereas we have shown them, as they usually are, concealed and folded under the breast; and when the four basal joints forming as many knobs in front are alone to be seen.

2. Acarus telarius, *Lin.*

Acarus telarius, *Lin.* Syst. 1023. *Turt.* Gmel. iii. 704. *Stew.* Elem. ii. 322. *Blumenb.* Man. 228. *Latr.* in Cuv. Reg. Anim. iv. 285. Griffith's Cuv. xiii. 584. *Loud.* Encyclop. Gard. p. 435, fig. 411 a. Orr's Cuv. 470.—Gamasus telarius, *Lam.* An. s. Vert. v. 59: 2d edit. v. 76.—Tetranychus telarius, *Dugès* in Ann. des. Sc. Nat. (1834) i. 15 and 25.

Hab. The leaves of plants in stove and green-houses.

Desc. Minute, of a dark red colour with pale colourless legs: *Body* ovate, convex, covered sparingly with long white bristles, a pale horse-shoe shaped spot in front; and on each shoulder an *eye* of a darker red than the body: *Palpi* porrect and approximate, short, thick, pointed; with a conical pointed snout between them: *Legs* 8, the anterior pairs rather thicker than the others, first and fourth pairs longer than the intermediate ones, shorter than the body, armed with long bristles, six-jointed, tapering from the third to a slender tarsal joint which is terminated with three or four short rigid bristles; basal joint short, 2d elongate, 3d and 4th short, 5th and 6th longer.—I could not assure myself that there were claws to the tarsus, but I think two can be sometimes perceived.—The bristles originate from a minute bulb. On the body they appear to be arranged in six or seven series across the back, two bristles only in the front row and four in those of the middle, while there are only two again in the series over the hinder extremity.

Amongst the adult specimens there may be always noticed others of a pale colour with a few minute red dots on the back. I suppose that these are immature individuals, but they have eight legs.

The description made from specimens taken from the leaf of the vine.

Linnæus gives us this history of the mite,—"Habitat in Europæ plantis, minus ventis expositis, caldario inclusis, tela ducens filis parallelis, quibus plantas suffocat hybernaculorum; in Tiliæ foliis aversis autumno frequens."*—In Loudon's work which we have quoted, we are told that it is the "Red Spider" of Gardeners. They know it well as one of the greatest pests to the stove and green-house, for by weaving its thin irregular web over the leaves, eating small holes in them, and depositing its eggs upon them, many of their finest plants are disfigured, weakened and even killed. It does not confine itself to house plants, but often infests others in the open garden. I have seen the china-rose trained against a wall sicklied all over with the myriads that thronged its leaves; and it has been pointed out to me on the leaves of the Red-flowering Currant and of the Jasmine. The mites of the latter varied much in colouring and size, and the dark spot on each side was more than ordinarily conspicuous.

M. Ant. Dugès has found the insect on a great variety of plants in France. From the form and manners he concludes the species was the same on all of them,—a conclusion which could not have been arrived at had reliance been placed upon their colour, for some were greenish and marked only with brown specks on the sides, but variable and evidently dependent on the alimentary matter contained in the lateral cæca of the digestive system; others were rust-coloured, or reddish, or brick-red, and such were especially those on the rose acacia; but upon the holly-hock Dugès found at the same time individuals presenting almost all the shades, which are probably connected with some circumstances in nutrition. On the vine I have found the colour to vary in intensity in different individuals, and on it I have also found the greenish individuals mentioned by Dugès.

* In a book which pretends to be a translation of the Systema Naturæ, this accurate history is thus romanced:—"Inhabits Europe, and spins a web on the bark of trees, from the top to the bottom of the trunks, which being dispersed by the winds, covers the fields with innumerable threads." Wonderful! and I wonder where Dr. Turton got this queer story.

The threads of its web are secreted from a conical nipple situated underneath and very near the extremity of the abdomen. They are drawn out and guided by the motions of the insect and by the action of the minute claws of the legs, which seem to be only used for this purpose. The threads are so slender that we fail to see them even with the assistance of a magnifier until after they are woven into a web or network. In the construction of this web all the feet are moved with great agility and quickness, but the movements of the mite itself are not quick, and it walks with difficulty over smooth and polished surfaces, as over glass. Upon leaves, especially on the under face of them, it finds a fitter hold, for supported on the bristles that jut out beyond the tarsal joint, it crawls over the uneven surface with ease. Here it busies itself in spinning its web by affixing the threads to the prominences and hairs of the leaf; and under this shelter a colony, consisting of many of both sexes in maturity and of young in all their ages, feed at full and multiply with rapidity their evil race. The plant shows their influence in its sickly yellow hue; the sap is sucked by myriad insect-mouths from the vessels of the leaf, and its pores are choked by excremential fluids,—and the gardener mourns the inefficacy of his remedies and the loss of his cherished flowers. There are, indeed, destructive enemies to them in their own class, but which the gardener cannot call to his aid, for they obey one only Master. A mite named by Dugès Dermanyssus feeds on them; and the grub or larvæ of the Hemerobiidæ or pearl-flies, (the same which prey on the Aphides,) devour them in such numbers and so fast that entire colonies quickly disappear before them. In half a minute the ravenous grub will suck the life out of the largest Aphis; and hence imagine in what short measure of time it will exhaust the vital juices of these least minims of creation!*

The egg of this mite is spherical, colourless, and proportionably large. The larva which comes from it is minute,

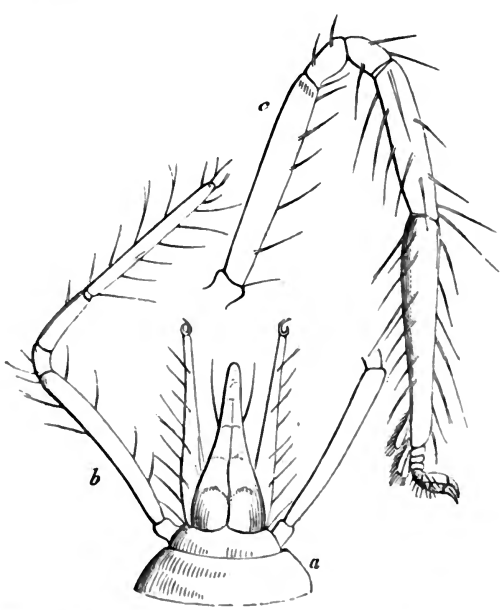
* "He found the polish'd glass, whose small convex
Enlarges to ten millions of degrees
The *Mite*, invisible else, of Nature's hand
Least animal."—Philips, *Cider*, Bk. i.

transparent, and in shape not unlike the parent, but it has six legs only and creeps very slowly. M. Dugès says that it undoubtedly passes through the immoveable nymph or pupa state before the full complement of legs is acquired.

M. Dugès believes that these mites pass the winter under stones, concealing themselves there when the infested leaves have fallen. In a garden near Paris he found several individuals thus concealed in the month of October; they were of a uniform brick-red colour, and had lost as yet none of their agility nor of their spinning power; and on them he observed most distinctly the secreting papilla of the thread.

3. Acarus longicornis, *Lin.*

Acarus petrarum ruber, antennis rostro longioribus, *Linn.* Faun. Suec. p. 349, no. 1205.—Acarus longicornis, *Lin.* Syst. 1026. (exclus. syn. Geoff.)



Hab. The sea-shore, on rocks above high-water mark, common.

Desc. Animal of a scarlet colour, about $\frac{1}{8}$th in length, neat and pear-shaped. *Body* dark blood-red, narrow-elliptical,

rounded, the back divided into a few large compartments, separated by a mesial line, the tail-part depressed, angulated and pointed, with a few hairs on the margin: *Rostrum* long, tapered, porrect, declivous, surrounded with a collar at the base, sparingly hirsute, but naked towards the apex: *Palpi* (fig. *b.*) originating in a little bulb from the collar of the rostrum, pediform, slenderer and shorter than the legs, longer than the rostrum, 4-jointed; the 1st joint narrow at its origin but gradually thickening outwards, 2d joint cylindrical, and as long as the first, 3d about one-half the length of the second, the 4th as long as the second and third together, more slender, cylindrical, furnished with a few long bristles; (no claw): *Legs* 8, (fig. *c.*) alike, filiform, equidistant, nearly equal in length, longer than the body, bristly, 5-jointed; the femoral joint elongate, thickening outwards, naked; the 2d and 3d short, the 4th twice as long as the second, the 5th as long as the fourth or longer, tapered, rather abruptly narrowed near the distal end, and furnished beneath with three or four pairs of neat semi-pectinate processes, one of the pairs situated at the insertion with the tarsus: Tarsus 2-jointed, short, terminated with a pair of sharp curved claws moving in the same direction, and separated by a large brush-like pulvillus.—Linnæus remarks that the rostrum, antennæ or palpi, and the legs are paler than the body, but this is only after death, for during life the mite is unicolorous. The bristles are colourless and sharp.

This pretty Acarus is common on our shore, where it may be seen, during the summer months, running quickly amongst stones and over the rocks above high-water mark. In shape and size it is like an Apion. The rostrum consists of a central conical tube, encased by a bivalvular sheath (fig. *a*), the blades of the sheath lying parallel to the proboscis and reaching beyond its extremity, where they meet. The apex of the blades is cut into two clawlike denticles. Presuming that the mite is insectivorous and suctorial, we may suppose that the use of this cleft structure is to enable the animal to hold its prey, while the proboscis is applied to its proper office. It is difficult to assign the purpose of the elongation of the palpi; and we are equally at a loss to conjecture the use of the semi-pectinate processes on the plantar edge of the lower joints of the feet.

The description in the Fauna Suecica leaves no doubt in my mind that this is the species Linnæus had then in view;

but in his Systema he has confounded it with another species, and has given it an erroneous specific character, for the palpi are not terminated, in our animal, by two bristles or setæ, but by several of the same kind as those on the sides. The Acarus longicornis of the Systema is therefore a mixed species; but the name ought to be restricted to the mite now described, being that Linnæus had immediately in view, as is obvious by his reference to the Fauna Suecica. The Acarus longicornis of Muller and Otho Fabricius is a different insect; and so also is the Bdella rubra of Latreille and Lamarck.*

In the description it is said that the back is divided into "compartments,"—not a very definite word as here applied, but I could not find a better, for they are not plates nor scales, but subquadrangular divisions, formed merely by a thickening, as it were, of the skin.

I cannot refer this Acarus to any of the families defined by Dugès, nor to any of his genera.

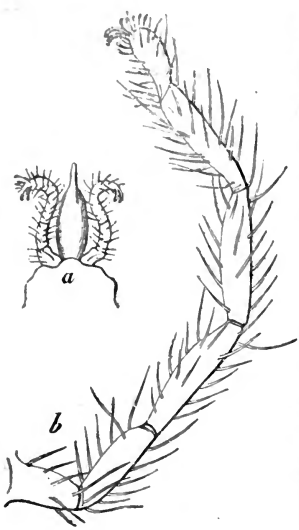
4. Acarus littoralis, *Lin.*

Acarus petrarum obscure rufus, pedibus sanguineis, *Linn.* Faun. Suec. p. 349, no. 1206.—Acarus littoralis, *Lin.* Syst. 1026. *Mull.* Zool. Dan. prod. 187, no. 2222. *Fabric.* Faun. Groenl. 225. *Turt.* Gmel. iii. 706. *Stew.* Elem. ii. 323.

Hab. On the sea-shore, on rocks above high-water mark.

Desc. Acarus of an ovate form, very dark red with scarlet legs: *Body* ovate, uneven, rounded posteriorly, narrower and rostrated in front, of a very dark red or almost black colour, clothed with a white appressed hirsuties; front separated by an uneven elevated line, lighter coloured than the body: *Rostrum* one-third the length of the body, red, porrect, thick with a suddenly narrowed lanceolate sharp point, apparently two-valved: *Palpi* inserted on the base of the rostrum and equal to it in length, rather thick and curved towards the slightly incrassated apex which is terminated with two minute claws; of a scarlet colour, hirsute: *Legs* 8, 6-jointed, alike in form, filiform, hirsute, longer than the body, the two anterior pairs distant at their origins from the posterior

* Of this insect (= Bdella longicornis) see a figure in Griffith's Cuvier, xiii. p. 505, pl. 22, fig. 3.



pairs, terminated with two minute curved claws moving in the same direction, the joint bearing them ovate, enlarged, and more densely hirsute beneath than the other joints, some of the hairs being capitate. Of the anterior legs the 1st joint is shorter than the 2d, 3d, or 4th, which are nearly equal, and twice as long as the 5th and 6th, which are ovate; but of the posterior legs the penultimate or 5th joint is as long as the third, which is slightly dilated.

The first and fourth pairs of legs are longer than the second and third; and the two first pairs are of a fine scarlet colour, while the lower half of the posterior pairs are of the same dark hue as the body. It is a smaller insect than the Acarus longicornis, but is similar in its habits and equally quick in its movements. (Fig. *a.* the rostrum and palpi: fig. *b.* a leg.)

Mr. Adam White, of the British Museum, has sent me an extract, translated by Mr. Jones, from the Iter Œlandicum of Linnæus, from which we learn that, on the 8th of June 1741, when the eminent Swede was on his travels, he found this mite on the coast of Œland:—"An acarus, which was small and red, similar to those which are found in the summer time on currants, but of almost double the size, ran about upon the stones which were by the shore: its body was of a reddish-brown but all the feet were of a blood-red colour."*—The description applies to our mite so well that I cannot doubt its being of the same species as that which engaged Linnæus's attention, and hence to me an additional interest in its examination,—an interest scarcely abated by the fact that the diagnosis given by his pupil Fabricius is less

* En Acarus. som war liten och ród, lik den som om sommaren plagar halla sig pá winbären, fast dubbelt storre, sprang pa stenarna som stodo wid stranden ratt allmen; des mage war rodbrun, men alla des fötter blodroda."—P. 96. Carl Linnæi Med. et Botan. Prof. Ups. Olandska och Gothlandska, Reda, 1741. Stockh. et Upsal, 1745.

applicable and, in one or two particulars, discordant, for Fabricius must be somehow in error. I add the description to complete the history of our mite:—"Corpus ovatum, glabrum. Antennæ quadriarticulatæ, filiformes. Caput et thorax sanguinea. Abdomen valde obtusum, magis obscurum utrinque punctis aliquot impressum."—Entom. Syst. iv. 433–44.

5. Hydrachna cruenta, *Müll.*

Hydrachna cruenta, *Mull.* Zool. Dan. prod. 191, no. 2273. *Mull.* Hydrach. 63, tab. 9, fig. 1.

Hab. Ponds, frequent.

Desc. Insect of a uniform scarlet colour: *Body* rounded, swollen, somewhat flattened on the dorsal and ventral surfaces, rather narrowest in front, smooth: *Eyes* 4, a pair on the outer and anterior angles of the body; one eye behind the other; sometimes only two are distinguishable, and even these with difficulty: *Palpi* 4-jointed, the terminal joint conical, pointed and slightly curved at its claw-like extremity: *Legs* 8, approximate at their origins, alike, slender, the posterior pair longest, and longer than the body, hirsute, and the tibial joints of the posterior pairs are besides furnished with long hairs on the outer edge; they are 6-jointed, the two basilar joints short, 3d longer, 4th, 5th and 6th elongate, the latter slender, cylindric, terminated with two small claws which can be drawn backwards and concealed in a sinus at the end of the joint.

This pretty insect is not uncommon in our district, and its colour renders it conspicuous. The body and legs are alike scarlet and unspotted, yet when attentively viewed some dusky indistinct bands may be perceived on the back,—too distinctly represented, however, in Muller's figure. The back is irregularly uneven or depressed. The skin seems to be minutely papillose under a high magnifier. In one specimen I perceived with difficulty two eyes only; in another four were plainly evident. Muller says that there are only 2 in his H. cruenta. The palpi are proportionably small when compared with Atax histrionicus, and only occasionally visible, being hidden under the bulging front. All the tarsi have claws.

6. Atax histrionicus.

Atax histrionicus, *Dugès* in Ann. des Sc. Nat. (1834) i. p. 147, pl. 10, fig. 13–17.

Body globose, smooth, of a transparent hyacinth-red colour, with 5 rather undefined dark spots, 2 on the shoulders, two behind, and one medial between the scapular ones: posterior part of the abdomen marked with an irregular dusky line forming almost a circle: *coxæ* and genital plates blueish grey, the latter oblong, rounded on the angles, with 6 stigma-like tubercles, 4 behind and 2 anteriorly: *Palpi* 2, pediform, furnished with a few scattered short bristles, porrect, approximate, one-third the length of the body, thicker than the legs but of the same colour, 4-jointed; basal joint minute, 2d and 3d thick and equal, 4th elongate, slender, tapered to a point and terminated with a curved claw: *Legs* 8, alike, slender, tapered, of a watery blueish-grey colour, hirsute, longer than the body, 6-jointed; 1st, 2d, and 3d joints nearly equal and shorter than the 4th, which again is shorter than the 5th and 6th, the latter terminated with two small claws retractile within an oblong sinus above their insertion; the tarsal joint of the posterior legs, however, has not the two claws but is simply pointed, and has a long stiff bristle originating in an indentation a little above the end and projecting considerably beyond it: of the legs, the hinder pair is the longest, then the 3d, 2d, and 1st are successively shorter; the bristles of the first pairs are comparatively few and short, and their tarsal and penultimate joints are naked, there being bristles only at the articulations; but the posterior pairs are more bristly, and the bristles on the outer edge of the fourth and fifth joints are long, the tarsal joint being comparatively naked

This description is made from a specimen taken in the pond at Netherbyres, Aug. 20, 1847. It is beautifully figured by Dugès; and is a beautiful species, the blueish members contrasting remarkably with the red body. In Dugès' figure the middle spot in front is represented more forward than it was in our specimen; but as he assures us that these dorsal spots all proceed from the viscera indistinctly visible through the skin, they may be supposed to vary somewhat according to the state of repletion of the insect. On the inferior edge of the second joint of the palpi there is a minute papilla, the use of which is unknown.

The species is the type of the genus Atax.* There are two eyes in front, one on each side of the scapular spots, and behind there are two others of a smaller size, but I could not see either pair until after the insect was compressed between plates of glass. From several pores in the smooth skin of the back there exudes, says Dugès, a viscous fluid which is drawn out into silken threads when the animal is held up between the fingers. These pores become visible when a specimen is compressed between two plates of glass and dried a little; they are situated on the posterior and somewhat depressed part of the back on each side of the anal region. It swims rapidly in the water by the quick movements of its ciliated legs; and the purpose probably of the hinder tarsi, which, as we have remarked, have no claws, is to push the animal forwards through the entangled filaments of confervæ. The eggs, Dugès informs us, are laid in transparent layers and of a gummy aspect; the little larvæ which are born of them are aquatic, flattened like the seed of the gourd or almond, furnished with two large round eyes placed on each side in front and a little separately, and with a large sucker containing the mandibles with a hooklet as in the adult. The palpi are very similar to those of the Arrenuræ, viz., inflated and terminated with a fifth joint in the form of a long recurved claw.

A Synopsis of the Berwickshire Species of Staphylinidæ.

By Mr. James Hardy.

The species of Brachelytrous insects forming the family Staphylinidæ having been little attended to by British entomologists, and the synonymes much confused, it appeared desirable in recording the local species, to place them on a proper foundation. Accordingly short descriptions have been appended to each species, such as will give a general idea of what is intended. For more precise information, reference must be made to the works I have chiefly followed in this

* The name of the river L'Aude, which runs by the city of Narbonne. Plin. Hist. Nat. l. 3, c. 5.

Synopsis, viz., Erichson's Genera et Species Staphylinorum, Gyllenhal's Insecta Suecica, Lacordaire's Paris Fauna, and Heer's Fauna Coleoptera Helvetica; or to a Monograph of the Scottish species, now in course of preparation. Berwickshire may be said to be rich in the members of this family, supplying in some of the genera, more species than have hitherto been recorded for all Scotland taken together. The proportion in reference to the British Fauna, cannot be ascertained without a revision of the entire order, which it is at present impossible to effect, while the types of so many supposed species are placed beyond the reach of an investigator in the country. Judging, however, from several collections of English insects, submitted to my inspection by friends favourable to these inquiries, the disproportion that will be found is more apparent than real. I may have occasionally erred in citing the synonymes of British authors. Those who are aware how much perplexity exists in this particular, will readily forgive mistakes, arising from imperfect descriptions.

Stirps, BRACHELYTRA, *Latreille.*
Family, STAPHYLINIDÆ, *Leach.*
Sub-Family, STAPHYLINIDES, *Mannerheim.*

(Staphylinini, *Erichson*, Gen. et Spec. Staphylinorum, 290.—Staphylinida, *Heer*, Fn. Col. Helvetica, i. 242.)

Antennæ 11-jointed, moniliform, inserted at the fore-front of the forehead, Labrum for the most part bilobed. Mandibles with a free membranaceous rim. Maxillary palpi with the last joint filiform or securiform. Anterior and posterior coxæ conic, the former exserted. Posterior trochanters simple. Tarsi 5-jointed. Prosternum at the base behind the fore coxæ, covered only with a membrane. Prothoracic spiracle in most instances free and uncovered. Abdomen with the seventh segment retractile.

Section I. STAPHYLININI GENUINI (Erichson) including OXYPORINI.

Haliday, Entomologist, 186. *Erichson* in Wiegmann's Archiv. 1841, p. 211.

Antennæ distant at the base, and placed apart from each other more than from the eyes.

ANALYSIS OF GENERA.

Labial palpi filiform, or the last joint but slightly enlarged and lopped.
- Tongue bilobed,
  - Middle legs distant, ...STAPHYLINUS.
  - " " approximated, OCYPUS.
- Tongue undivided,
  - Spiracle of the prosternum behind the fore coxæ, free and uncovered, ... PHILONTHUS.
  - covered by a triangular process, ... QUEDIUS.

STAPHYLINUS, *Linnæus. Erichson*, Gen. et Spec. Staph. 345.

Antennæ moniliform, second joint shorter than the third, both sub-clavate, the rest thicker, the last emarginate at the apex. Labrum bilobed with a membranaceous or coriaceous edge. Maxillary palpi filiform. Ligula membranaceous, short, sinuated in the middle, much shorter than the fimbriated paraglossæ. Labial palpi with the last joint often longest, subacuminate or truncate at the apex. Head suborbiculate or subquadrate. Thorax chiefly subquadrate. Intermediate coxæ more or less distant; anterior tarsi much dilated, posterior slender. Abdomen linear, sub-parallel, strongly margined, sixth segment beneath emarginate or sinuated in the male.

A. Antennæ about the length of the head, clavate, second and third joints obconic, 4–6 lenticular, equal, the remaining five forming an elongate club. Thorax semicircular, rounded at the base and on the sides, the anterior angles nearly acute. CREOPHILUS, *Kirby*.

1. ST. MAXILLOSUS (*Linn.* Fn. Succ. No. 841): Black, shining, pubescent, elytra with an angulated band, and four or five segments of the abdomen beneath cinereous tomentose; breast nigro-pubescent. L. 6—8 lines.

Gyll. Ins. Succ. ii. 279. *Erichson*, Gen. et Spec. Staph. 348.—Creophilus maxillosus, *Stephens*, Ill. M. v. 202.—Manual, No. 3048.—*Ent. Edinensis*, 310.

Common, under carcases, and the remains of birds and the smaller quadrupeds, and particularly abundant under decaying sea-weeds on the coast.

2. ST. CILIARIS (Creoph. *Steph.* Ill. M. v. 202): Black, shining, breast, abdomen and elytra fulvo-pubescent, the last with a villose cinereous angulated band and fringed at the apex with fulvous, the first four segments of the abdomen beneath silvery white tomentose. L. 7—8 lines.

Erichson, in Germar's Zeitschrift, iii. 408 (1841). Creophilus ciliaris, *Ent. Edinensis*, 311.—*Stephens*, Manual, No. 3049.

In the west of Berwickshire, in dead moles.—*Mr. Hislop.* In Penmanshiel wood, and Cockburnspath Tower Dean, in a dead hare, and under dead birds. —*J. H.*

Erichson remarks that it varies by the cinereous band of the elytra becoming obsolete, whence it happens, that viewed in a certain position, the elytra are entirely fulvo-pubescent, and in these individuals the abdomen is fulvous both above and beneath. I have not seen any instances of this variety, but it may be observed that the small examples are most richly adorned.

It differs so little from the preceding, that I can regard it only as a highly coloured variety. Intermediate states occur, and even the plainest specimens of St. maxillosus exhibit a tendency to assume fulvous tints. It is not confined to Scotland, as Mr. Haliday, to whom I am indebted for Erichson's description of it, informs me, that there are two Irish specimens in Dublin.

B. Antennæ longer than the head, scarcely thickened towards the apex, second joint short, obconic, the remainder somewhat transverse subglobose.

* Body entirely covered with variegated pile. TRICHODERMA, *Stephens*.

4. ST. PUBESCENS (*De Geer*, Ins. iv. 17): Black, obscure, clothed with a dense, clouded, nigro-fuscous pile; the head with a yellowish down, sprinkled with shining points; abdomen beneath densely silvery tomentose; femora with a testaceous ring; basal joints of the antennæ testaceous, excepting their backs, which are dusky. L. 5—7 lines.

Gyll. Ins. Suec. ii. 284.—*Stephens*, Ill. M. v. 205.—*Curtis*, Brit. Ent. pl. 758.—*Ent. Edinensis*, 311.—*Erichson*, Gen. et Spec. Staph. 372.—*Heer*, Fn. Col. Helv. i. 250.—Trichoderma pubescens, *Stephens*, Manual, No. 3053.

Rare in Berwickshire, taken once by myself near Penmanshiel.

** Body slightly pubescent or subglabrous, thorax very thickly punctured.

5. St. erythropterus (*Linn.* Fn. Suec. No. 842) : Black, opaque, pubescent, very finely punctate, the antennæ at the base and apex, elytra and legs rufous, head broader than the thorax, thorax narrowed towards the base, immaculate, the scutellum and the patches on the posterior segments of the abdomen with shining yellow sericeous down. L. 6—7 lines.

Erichson, Gen. et Spec. Staph. 377.—*Heer*, Fn. Col. Helv. i. 251.—Staphylinus castanopterus.—*Grav.* Micr. 10.—*Gyll.* Ins. Suec. ii. 295.—*Stephens*, Ill. M. v. 206.—*Ent. Edinensis*, 312.—*Stephens*, Manual, No. 3055.

Rare in Berwickshire, and hitherto only taken by Dr. Johnston.

The specimens in the Linnæan cabinet as examined by Mr. Westwood (Ent. Trans. iv. 46) consist of two of St. Cæsarius, Cederheim, and one of the present species. The former being placed first gives some warrant for regarding them as the insects the great Naturalist had in view, but his description is applicable only to the present species.

6. St. stercorarius (*Oliv.* Ent. iii. 42): Black, opaque, pubescent, sub-depressed, thickly and deeply punctate, head and thorax deep black or with a brassy tint, nigro-pubescent, base of the antennæ, elytra and feet rufous, scutellum velvety black, abdomen with silken cinereous streaks. L. 5—7 lines.

Gyll. Ins. Suec. ii. 296.—*Stephens*, Ill. M. v. 206.—Manual, No. 3056.—*Ent. Edinensis*, 312.—*Erichson*, Gen. et Spec. Staph. 380.—*Heer*, Fn. Col. Helv. i. 251.

Rare in Berwickshire. New Water Haugh, *Dr. Johnston.* Road in Penmanshiel Wood, *J. H.* Near Nenthorn, *Mr. Hislop.*

7. St. latebricola (*Grav.* Mon. 113): Black, head rather small, subquadrate triangular and with the thorax æneous, deeply punctate, with intervals between the punctures, and shining fulvo-rufous pubescent, elytra and legs rufous, antennæ black, piceous towards the apex, scutellum black tomentose, abdomen with silken cinereous patches. L. 5—5½ lines.

Erichson, Gen. et Spec. Staph. 382.—*Heer*, Fn. Col. Helv. i. 252.—Staphylinus æriceps, *Kirby*, *Stephens*, Ill. M. v. 206.—Manual, No. 3057.—*Holme*, Ent. Trans. iii. 116.

Very rare. My specimen was found under a stone among heath, near Drakemire.

Another Scottish specimen was taken in Sutherlandshire by James Wilson, Esq. According to Dr. Erichson, it is one of those species that frequent the nests of ants, having been gathered by Dahl in those of Formica rufa. The species most allied to it is St. chalcocephalus, Fab. which appears to be larger and broader, more thickly punctate, with a more triangular head, the tibiæ and tarsi alone rufous. This is given as British by Mr. Stephens (Illust. Brit. Ent. M. v. 207.—Manual, No. 3058) but his insect of that name cannot, as he himself suspects, be the continental one, as he ascribes to it, in the first of the works cited, the characters found in the thorax of Ocypus picipennis.

Ocypus. *Kirby.—Erichson*, Gen. et Spec. Staph. 403.

Antennæ filiform, often thickest about the fourth or fifth joints, the rest decreasing in width. Labrum bilobed with a membranaceous edge. Maxillary palpi sub-filiform. Ligula membranaceous, bilobed, a little shorter than the

fimbriated paraglossæ. Labial palpi with the third joint longest, cylindric, truncate, or more or less subsecuriform. Head large, suborbiculate or subquadrate. Thorax quadrate, disk punctulate. Intermediate coxæ approximated, separated by a narrow carina. Anterior tarsi much dilated, posterior slender. Abdomen as in the preceding.

A. Antennæ with the last joint emarginate at the apex. Labial palpi with the apical joint cylindric or subfusiform. Mandibles toothed within. Goerius, *Leach*.

1. O. olens (Staph. *Müll.* Faun. Fridr. 23): Winged, black, immaculate, opaque, above very thickly punctulate, sparingly nigro-pubescent, head broader than the thorax, antennæ ferruginous at the apex, elytra of the length of the thorax. L. 11—13 lines.

Erichson, Gen. et Spec. Staph. 405.—Staphylinus olens, *Fab.* Syst. El. ii. 591.—*Gyll.* Ins. Suec. ii. 286.—*Heer*, Fn. Col. Helv. i. 253.—Goërius olens, *Stephens*, Ill. M. v. 208.—Manual, No. 3063.—*Ent. Edinensis*, 313.

Common along the sea banks, and ascending the river banks to a considerable distance.

Known in Berwickshire by the name of the "Deil's bull-dug," (dog) and the "Devil's coach-horse." Legend avers that the insects acquired this name, and its revolting accompaniment of shape, in consequence of their having violated some fruits placed votively on the shrine of the Virgin. If so, the innocent have shared the penalty with the guilty, as very few of the family appear to have escaped being branded!

The distribution of this species is very wide, being found throughout the entire of Europe, and extending along the coasts of Northern Africa to the island of Teneriffe.

2. O. brunnipes (Staph. *Fab.* Syst. El. ii. 595): Wings rudimentary, black, head and thorax shining, thickly punctate, with a smooth shining dorsal line, more distinct on the latter, elytra and abdomen more obscure, the former about one-half shorter than the thorax, antennæ at the base and apex and the legs red. L. 6—8 lines.

Erichson, Gen. et Spec. Staph. 410.—Staphylinus brunnipes, *Gyll.* Ins. Suec. ii. 289.—*Stephens*, Ill. M. v. 207.—Manual, No. 3061.—*Heer*, Fn. Col. Helv. i. 280.

Under stones, and in rotten stumps in woods and dry moors, not very common. Berwick, *Dr. Johnston*. Penmanshiel Wood and the sea-banks between Redheugh and Dulaw, *J. H.*

Though most frequently found in autumn, this species also occurs in early spring. It varies considerably in size. Large specimens are often mistaken for O. pedator (Tasgius rufipes); but omitting other distinctions, the dilated apical joints of the palpi readily mark that species.

3. O. fuscatus (Staph. *Grav.* Micr. 164): Winged, black, head rotundate ovate, and with the thorax nigro—or olivacco-æneous, shining, somewhat widely punctured with large and small punctures, the latter with a smooth dorsal line, elytra dull brassy olivaceous, with a conspicuous puncture within the apex, scarcely of the length of the thorax, abdomen nearly opaque, legs piceous black, tarsi obscure ferruginous, antennæ black, fusco-piceous at the apex. L. 6—8 lines.

Erichson, Gen. et Spec. Staph. 411.—Staphylinus politus, *De Geer*. Ins. iv. 422.—Staphylinus punctulatus, *Marsh.* Ent. Brit. i. 501.—Staphylinus Morio,

Gyll. Ins. Suec. ii. 228.—Staphylinus subpunctatus, *Ib.* iv. 474.—Staphylinus Cantianus, *Kirby, Stephens,* Ill. M. v. 207.—Manual, No. 3062. Goërius punctulatus, *Ib.* Ill. M. v. 209.—Manual, No. 3066.—Goërius Morio, *Ib.* Ill. M. v. 209.—Manual, No. 3067.—Goërius confinis, *Kirby, Ib.* Ill. M. v. 211.—Tasgius confinis, *Ib.* Manual, No. 3077.—Staphylinus semipolitus, *Holme,* Ent. Trans. iii. 118.

Rare; under stones, on old grass pastures, in dry and upland districts, chiefly in autumn. Near Penmanshiel, on Cauldside Hill, near Dulaw, and near an old wall on the sea banks, beyond the Magdalene Fields, Berwick.

Variable in size, and in the more or less frequent puncturing of the thorax. Occasionally, in very large females, it is very obscurely tinted, and almost destitute of the brassy lustre on the head, thorax and elytra. This variety appears to be the Goërius Morio of Stephens. Holme says that his Staphylinus semipolitus is distinguished from St. Cantianus of Kirby, only by the brassy lustre of the tibiæ. In Dr. Greville's collection is a slender specimen of O. fuscatus named dubiously by the Rev. G. T. Rudd as Kirby's St. Cantianus. The same entomologist, who had gone over all Kirby's collection, informed me that this was the Ocypus confinis of that author.

This species is rapacious in its mode of subsistence, as I detected it devouring Quedius frontalis.

4. O. PICIPENNIS (Staph. *Fab.* Syst. El. ii. 591): Winged, black, fulvo-brunneous pubescent, head and thorax brassy, shining, thickly and finely punctured, sub-carinated, an irregular line of impressions on each side of the thoracic keel, elytra dull brassy, thickly pubescent, abdomen lineated with fulvo-brunneous down, the segments crossed by a row of about four deep impressions, legs piceous black, tarsi rufescent, antennæ piceous, rufous at the base. L. 6—8 lines.

Erichson, Gen. et Spec. Staph. 412.—Staphylinus æneocephalus, *Payk.* Mon. Staph. 11.—*Gyll.* Ins. Suec. ii. 291.—*Stephens,* Ill. M. v. 207.—Manual, No. 3059.—*Ent. Edinensis,* 311.—*Holme,* Ent. Trans. iii. 116.—Staphylinus sericeus, *Marsh,* Ent. Brit. i. 508.—Emus æneocephalus, *Lacord.* Faun. Ent. Paris, i. 373.—Emus chalcocephalus, *Ib.* 374.—Staphylinus chalcocephalus et æneicollis, *Holme,* Ent. Trans. iii. 116.

Under stones and in moss, in arid situations, both on the coast, and barren upland pastures and heaths. It couples in autumn.

This species shows great disparity in size, some specimens being a third more slender than others. The tint also varies, some rubbed specimens being of a bright burnished brass, while some large females are almost black, with the slightest trace of metallic decoration. The stripes on the abdomen are often obliterated.

There are some slight differences between our insects and the continental ones as described by Gyllenhal and Erichson. Both describe the antennæ as being somewhat dusky at base, and speak of the pubescence of the head and thorax as being thin, which is scarcely the case on specimens not abraded. Neither of them allude to the brassiness of the elytra, nor is it mentioned in any of the allied species, and Erichson represents the pubescence of the elytra as running in stripes "plagiatim," a character not noticed by Gyllenhal, and which occurs in none of our specimens. The St. sericeus of Marsham, however, which presents several of these exceptional characters, is cited by these writers without any doubt. "Antennæ et palpi ferruginei. Totum corpus suprà fusco-æneum." Ent. Brit. i. 508.

B. Antennæ with the last joint truncate at the apex. Labial palpi with the apical joint securiform. Mandibles toothed within. Tasgius, *Leach.*

5. O. ater (Staph. *Grav.* Micr. 116) : Winged, black, subdepressed, head subquadrate, and with the thorax polished and shining, distantly and deeply punctured, with a distinct shining longitudinal line dividing both; the thorax rather elongate, narrowing towards the base; elytra rather longer than the thorax, less shining, thickly punctate, an obvious impression placed before the apex; abdomen rather shining, traversed, especially beneath, with large irregular punctures; antennæ black, the apex piceo-ferruginous; legs black; tarsi piceous; maxillary palpi in the male subsecuriform and truncate; in the female cylindric and slightly truncate. L. 7—9 lines.

Erichson, Gen. et Spec. Staph. 416.—Staphylinus ater, *Heer*, Fn. Col. Helv. i. 256.—Staphylinus obscurus, *Marsh.* Ent. Brit. i. 514.—Staphylinus fuscatus, *Gyll.* Ins. Suec. iv. 474.—Goërius fuscatus, *Stephens*, Ill. M. v. 210. Manual, No. 3069.—Tasgius confinis, *Curtis*, Brit. Ent. fol. 438.—Goërius Kirbii, *Leach*, *Stephens*, Ill. M. v. 210 ?—Manual, No. 3068 ?

Very rare: New Water Haugh, *Dr. Johnston.* I have taken it in the east of Berwickshire, but the precise locality has not been marked.

This species has been found both in Asia and America. Immature insects have the head and thorax faintly piceous, the elytra and abdomen piceous brown, and all the joints of the antennæ piceous at their apices and bases. Goërius Kirbii appears to be such a specimen, and a female, as the head in that sex is somewhat ovate.

C. Antennæ with the last joint truncate at the apex. Labial palpi with the apical joint securiform. Mandibles elongate, bent, acute, toothless. Anodus, *Nordm.* Ocypus, *Stephens.*

6. O. Morio (Staph. *Grav.* Micr. 6): Winged, black, opaque, subdepressed, slightly pubescent; head subquadrate, broader than the thorax, and with it very thickly and deeply punctate, the latter narrowed behind, and with an obsolete dorsal line; elytra of the length of the thorax, minutely and densely punctate, and very opaque, the antennæ at the apex and the tarsi ferruginous; maxillary palpi with the last joint, in the male subsecuriform, in the female cylindric. L. 5—8 lines.

Erichson, Gen. et Spec. Staph. 417.—Staphylinus Morio, *Gyll.* Ins. Suec. iv. 373.—*Heer*, Fn. Col. Helv. i. 256.—Staphylinus similis, *Payk.* Fn. Suec. iii. 371.—Ocypus similis, Staph. Ill. M. v. 211.—Manual, No. 3071.—*Ent. Edinensis*, 313.

Var. Latior; fœm.

Ocypus picipes, *Stephens*, Ill. M. v. 212.—Manual, No. 3072.

Var. Angustior; mas.

Ocypus angustatus, *Kirby*, *Steph.* Ill. M. v. 212.—Manual, No. 3073.

Not uncommon under stones on the coast, at the sides of roads on the high moors, and by the borders of woods. It couples in autumn.

PHILONTHUS. *Leach.*

Erichson, Gen. et Spec. Staph. 426.

Antennæ of nearly equal thickness, the joints after the third subglobose, the terminal joint truncate at the tip, more or less emarginate and acuminated beneath. Labrum bilobed with a membranaceous margin, sparingly ciliated. Palpi fusiform, subelongate, the apical joint slender, truncate or acuminate. Ligula membranaceous, rotundate, entire, slightly shorter than the paraglossæ. Head suborbiculate, or ovate, sometimes subquadrate. Thorax quadrate, oblong, or

sub-rotundate, compressed in front, convex, glabrous above and smooth, or impressed with punctures, rarely many, often disposed in series upon the disk. Sides of the prothorax behind the anterior coxæ, without an appendage, whence the prothoracic stigmata are uncovered. Femora destitute of spines, posterior tarsi with the first and last joints subelongated, anterior dilated in both sexes, in the males only, or simple. Abdomen linear, chiefly tapered to the apex, the sixth segment beneath emarginate in the male.

* Thorax without rows of dorsal punctures on the disk.

1. Ph. laminatus (Staph. *Creutzer.* Ent. Vers. 128) : Black, shining; head rounded, narrower than the thorax, thorax rounded on the sides, both highly polished, smooth, brassy-green, and beneath a lens finely and obsoletely punctulate; elytra broadest behind, green, rarely blue, thickly and finely punctate; antennæ, legs, and abdomen black, the last with the fourth segment beneath in the male prolonged, and almost concealing the fifth; anterior tarsi dilated in both sexes. L. 4½—5 lines.

Stephens, Ill. M. v. 226.—Manual, No. 3128.—*Ent. Edinensis,* 316.—*Erichson* Gen. et Spec. Staph. 430.—*Heer,* Fn. Col. Helv. i. 257.—Staphylinus laminatus, *Gyll.* Ins. Suec. ii. 298.—Philonthus æneus, *Stephens,* Ill. M. v. 227.

Common. Found under stones at the approach of winter. Readily recognised by its bright gloss. The two oblique punctures on each side of the disk of the thorax in front are never alluded to in descriptions, whence this species is often taken for Ph. æratus, Kirby. That, however, is a variety of Staph. intermedius, De Jean and Lacordaire (Faun. Ent. Paris, i. 338) with these oblique punctures placed abnormally, somewhat in a line. In Mr. Hislop's Berwickshire collection, there is a specimen of Ph. splendens, with the outmost punctures in like manner brought inwards.

2. Ph. splendens (Staph. *Fab.* Syst. El. ii. 594) : Black, shining; head broad, quadrangular, less in the female, and with the thorax brassy black, highly polished, the latter with the sides subsinuated; elytra bright brassy, rather deeply and widely punctate; the sixth abdominal segment beneath deeply incised in the male; anterior tarsi of the male slightly dilated, in the female simple. L. 4½—6 lines.

Stephens, Ill. M. v. 227.—Manual, 3131.—*Ent. Edinensis,* 316.—*Erichson,* Gen. et Spec. Staph. 429.—*Heer,* Fn. Col. Helv. i. 258.—Staphylinus splendens, *Gyll.* Ins. Suec. ii. 297.

Less frequent than the preceding, but generally distributed.

It subsists principally upon Aphodii and other insects, and upon larvæ.

* * Thorax with two rows of punctures on the disk, four in each.

3. Ph. æneus (Staph. *Rossi,* Faun. Etrusc. i. 249) : Black, head large and subquadrate in the male, narrow and ovate in the female, as well as the thorax nigro-æneous, polished, the latter about the size of the head in the male, with the sides slightly impressed, somewhat expanded before the middle, and subsinuated behind it, its punctures rather deep; elytra brassy, sometimes coppery, very thickly punctate; abdomen thickly and finely punctulate, griseous pubescent, antennæ and legs black; anterior tarsi of the male strongly dilated, of the female simple. L. 4—5½ lines.

Erichson, Gen. et Spec. Staph. 437.—*Stephens,* Manual, No. 3133.—*Heer,* Fn. Col. Helv. i. 258.—Staphylinus æneus, *Gyll.* Ins. Suec. ii. 314.—Philonthus puncticollis, *Kirby, Stephens,* Ill. M. v. 228.—Philonthus politus, *Stephens,* Ill. M. v. 228.—Staphylinus politus, *Mus. Linnæi,* nec descrip. ejus, *Westwood,* Ent. Trans. iv. 47.

Under decaying garden rubbish, and in carcases of dead birds, &c., not unfrequent.

The larva lives upon the larvæ of Diptera and other insects, and also feeds upon carrion. It has been described by Bouché, Hist. Nat. Ins. i. 179. The perfect insect is a native of Asia and America, as well as of the European continent.

4. Ph. scutatus (*Erichson*, Gen. et Spec. Staph. 438): About the size of Ph. laminatus, but less broad and more parallel, head orbiculate, a little narrower than the thorax, and with the thorax brassy black, shining, and polished, and under a lens minutely and very obsoletely punctulate; thorax not so broad as the elytra, slightly narrowed in front, and subsinuated on the sides behind, the punctures of the dorsal series with the space between the two last in each row widest, all the punctures small; elytra of rather a pale brassy green, thickly and finely punctate, shining, and as well as the abdomen griseous-brown pubescent; the latter beneath with the fourth segment of the male lengthened at the apex and nearly covering the fifth; antennæ and legs black; tarsi piceous or ferruginous, the anterior slightly dilated in both sexes. L. 4½—5 lines.

Philonthus cognatus, *Stephens*, Ill. M. v. 229.—Philonthus lucens, *Ib.* Manual, No. 3136.

Not uncommon under stones, on heaths and old pastures, in spring and autumn; and occasionally under bark of trees.

Penmanshiel, Coldingham Moor, Dulaw, and the sea-banks near Berwick, *J. H.* Dunglass Dean, *Dr. Johnston.*

This is the Staph. rotundicollis of Menetries Cat. Rais. 145, according to Erichson, and taken by him near Lankora, on the western shore of the Caspian Sea. As, however, it is cited by De Jean, (Cat. 70) as a variety of Staph. carbonarius, he supposes that more insects than one have been placed together under the name. Ph. laminatus, and Ph. intermedius are the only other species of the genus, so far as observed, with the 4th ventral segment of the abdomen prolonged in the male.

5. Ph. decorus (Staph. *Grav.* Micr. 19): Black, head subovate, narrower than the thorax, and with it smooth, æneous green, slightly dull; the latter somewhat longer than broad, obtusely rounded at the base, slightly narrowed anteriorly, the dorsal punctures small and neat, with the two anterior in each row most remote; elytra flat, subquadrate, obscure æneous-olive, thickly and neatly granulate punctate; abdomen with the ventral segments often marginated with ferruginous; antennæ, as well as the legs, black, tips of the trochanters, the tibiæ occasionally, the tarsi and all the spines rufo-piceous; anterior tarsi simple in both sexes. L. 5 lines.

Stephens, Ill. M. v. 230.—Manual, No. 3137.—*Erichson*, Gen. et Spec. Staph. 443.—*Heer*, Fn. Col. Helv. i. 260.—Staphylinus decorus, *Gyll.* Ins, Suec. ii. 316.

Among moss, chiefly in woody places, not uncommon. Berwick and Dunglass Dean, *Dr. Johnston.* Penmanshiel Wood, Kitchencleugh Dean, and on the sea banks between Dulaw and Redheugh, *J. H.*

6. Ph. politus (Staph. *Fab.* Syst. El. ii. 594): Black, shining, narrowed before and behind; head and thorax above dark green, polished, the former small, ovate, much narrower than the thorax, the latter with the front somewhat narrowed, its base strongly rounded, the last two in each row of the dorsal punctures

widest, all the punctures small; elytra broadest behind, dark green, thickly and minutely punctate, the punctures distinct; antennæ black, with the first joint testaceous beneath, rarely concolorous; legs slender, black, anterior tarsi of the male moderately dilated, of the female simple. L. 4—5 lines.

Erichson, Gen. et Spec. Staph. 443.—*Ent. Edinensis*, 316, secund. descrip. —*Stephens*, Manual, No. 3135.—*Heer*, Fn. Col. Helv. i. 260.—Staphylinus politus, *Gyll.* Ins. Suec. ii. 317.—Philonthus maculicornis, *Kirby*, *Stephens*, Ill. M. v. 229.—Philonthus melanopterus, *Wilkin*, *Ib.* v. 229.

Common; chiefly under stones and in moss. The dark variety, with the basal joint of the antennæ entirely black, is rare.

7. Ph. marginatus (Staph. *Fab.* Syst. El. ii. 597): Black, shining, head ovate, the sides of the thorax, legs, and the basal joint of the antennæ beneath yellow; elytra broadest behind, dark olivaceous virescent, fulvous pubescent, abdomen shining, versicolorous, fulvous pubescent, beneath with the edges of most of the segments ferruginous, anterior tarsi strongly dilated in the male, slightly in the female. L. 4 lines.

Stephens, Ill. M. v. 233.—Manual, No. 3146.—*Curtis*, Brit. Ent. pl. 610.—*Ent. Edinensis*, 317.—*Erichson*, Gen. et Spec. Staph. 444.—*Heer*, Fn. Col. Helv. i. 261.—Staphylinus marginatus, *Gyll.* Ins. Suec. ii. 322.

Common.

8. Ph. umbratilis (Staph. *Grav.* Micr. 170): About the size of Ph. varius, black, shining; head orbiculate, in the male of the breadth of the thorax, in the female narrower; thorax subquadrate, not narrowed in front, sides straightish, with deep dorsal punctures, the two anterior in each row nearest; elytra little longer than the thorax, very slightly narrowed in front, thickly, finely, and distinctly punctulated, of a dark sub-æneous green, griseous pubescent; the tips of the three last ventral segments of the abdomen slightly ferruginous, more intensely in the centre; antennæ black, with the second and third joints piceous at the base; legs fusco-piceous, anterior tarsi of the male much dilated, of the female simple. L. 3 lines.

Erichson, Gen. et Spec. Staph. 445.—*Heer*, Fn. Col. Helv. i. 261.—Staphylinus subfuscus, *Gyll.* Ins. Suec. ii. 326.—Philonthus subfuscus, *Stephens*, Ill. M. v. 233.—Manual, No. 3145.

Under garden rubbish, &c. Not uncommon at Penmanshiel, *J. H.* In the west of Berwickshire, *Mr. Hislop*.

Out of a long series of the insect, I only obtained two females. It occurs in America as well as in Europe.

9. Ph. varius (Staph. *Gyll.* Ins. Suec. ii. 321): With the habit of Ph. politus, black, shining; head subovate, small, a little larger in the male, much narrower than the thorax, and with it very glossy and polished; thorax compressed in front, whence it appears narrowed anteriorly, dorsal punctures deepish, the space between the second and third in each row slightly more apart; elytra green-æneous, shining, somewhat narrower at the base, finely and scarcely thickly punctate; abdomen, antennæ and legs black, the last rarely piceous, anterior tarsi strongly dilated in the male, slightly in the female. L. 3—3¼ l.

Erichson, Gen. et Spec. Staph. 447.—*Stephens*, Manual, No. 3141.—*Heer*, Fn. Col. Helv. i. 261.—Staphylinus varians, *Grav.* Micr. 20.—Philonthus varians, *Ent. Edinensis*, 316, nondescriptionis.—Staphylinus carbonarius, *Grav.* Micr. 23.—*Stephens*, Ill. M. v. 230.—Philonthus chalcopterus, *Marsh.* *Ib.* v. 231.—Philonthus pilipes, *Kirby*, *Ib.* v. 231.

Common among moss, and under stones in fields.

It varies with five punctures in each row of the dorsal series. This state of the insect is not to be confounded with Ph. obeninus, Grav.=Ph. varians, Steph., which is a much more robust insect, with the head large, orbiculate, about the breadth of the thorax. It sometimes also varies with four punctures in the dorsal series, and then appears to be the Ph. sericeus of Stephens.

10. Ph. albipes (Staph. *Grav.* Micr. 28) : With the habit of minute varieties of Ph. varians, but smaller and more slender, small, deep black ; head and thorax polished and shining, the former rather small, oval, with the usual punctures; thorax narrowed to the front and compressed, sides somewhat straightish, the dorsal punctures placed rather apart, the two anterior in each row most approximating, two oblique punctures on the sides, and three on the anterior angles, the punctures minute, shining, black, and in the type on each side posteriorly, presenting in some lights a silky gloss ; elytra subquadrate, rather narrow, sometimes widest behind, not quite flat, thickly and minutely punctulate, fuscous brown, or deep black, somewhat shining, viewed transversely thickly griseous pubescent ; abdomen black, rather shining, distinctly, minutely, but not very closely punctulate, thickly griseous pubescent ; beneath with the segments delicately edged with dull ferruginous, in the type with bright testaceous, broadest on the fifth and sixth, pubescence approaching to fuscous; legs black, with the joints and tarsi piceo-testaceous, or variously tinged with yellow and piceous, in the type entirely testaceous yellow ; anterior tarsi of the male slightly dilated, of the female simple ; antennæ slender, black, with the base beneath piceous or ferruginous ; palpi black, piceous or sub-testaceous. L. 2—2½ lines.

Erichson, Gen. et Spec. Staph. 419.—*Heer*, Fn. Col. Helv. i. 262. Staphylinus albipes, *Gyll.* Ins. Suec. ii. 327.

Very rare : taken near Penmanshiel in August.

It has been found near Newcastle, first by Mr. Bold, and afterwards by myself.

Having at first doubtfully referred my specimens to this species, I have been since convinced of having done so accurately, by the examination of typical specimens named by Gravenhorst for M. Foerster, of Aix-la-Chapelle, and kindly communicated by that naturalist, through Francis Walker, Esq. The only differences I can perceive, are the darker colour of our specimens, the deeper hue of their legs, which are sometimes almost black, the slighter ferruginous tint of the margins of the ventral segments, and a deficiency of silken gloss on the sides of the thorax behind. Erichson does not notice this variety, but Gyllenhal states that in Swedish insects the base of the femora and the tarsi are at times obscure. I have not been able exactly to refer it to any described British species. Philonthus nitens, Gabrius suaveolens (for it varies with five punctures in the dorsal series, and in the colouring of the elytra), and Quedius caliginosus, Stephens, may be adduced as not unlikely synonymes ; and Quedius sericans, Q. fuscipennis, and Q. rufipes, are not without relative particulars, only the head in two of these is said to be orbiculate.

11. Ph. Xantholoma (Staph. *Grav.* Mon. 41) : Black, shining, depressed ; head often broader than the thorax, subquadrate, sub-depressed, sub-ovate, and less in the females, two large punctures between the eyes, and an obsolete intervening depression, with several large punctures above the eyes, which are smaller and crowded in the female ; thorax narrow, longer than broad, narrow-

est at the base, the sides subsinuated, the dorsal punctures three in each row, very large, nearly equidistant, with a fourth usually smaller and more apart, placed on the anterior margin, with three on the anterior angles, the limb often piceous; elytra nearly one half longer than the thorax, with nearly parallel sides, flat, black, or fusco-testaceous, opaque, densely and minutely punctulate, rather thickly griseous pubescent, the inflexed lateral margins entirely luteous, or dusky along the upper border; abdomen elongate, opaque, minutely and densely punctulate, traversed on each segment by a line of punctures, two on each side, clothed with dark slaty down and pubescence, with two lines of cinereous spots down the back, and other two less distinct, bordering the lateral margins; beneath somewhat shining, thickly and minutely punctulate, and with the breast thickly cinereous or slaty pubescent, with a tint of fuscous near the apex, sixth segment of the male emarginate and slightly longitudinally channelled, fifth slightly emarginate and longitudinally impressed; legs nigro-fuscous, sometimes fusco-testaceous, the femora darker, anterior tarsi slightly dilated in both sexes; antennæ black, the basal joints ferruginous at the base. L. 3½ lines.

Along the whole Berwickshire coast, under decaying sea-wrack. I have found only a single male to correspond with the slender body, long elytra, and the minutely and thickly punctulated abdomen found in the female.

Erichson, Gen. et Spec. Staph. 452.—Staphylinus Xantholoma, *Gyll.* Ins. Suec. ii. 323.—Cafius Xantholoma, C. lateralis, C. littoralis, et C. tessellatus, *Stephens*, Ill. M. v. 246, 247.—Catalogue, 3013–3016.—Manual, No. 3173.

12. Ph. Fucicola (Cafius, *Leach*, Steph. Ill. M. v. 246): Closely allied to the preceding but larger and broader; brunneous, depressed; head very large and subquadrate in the males, subovate and more oblong in the females, pitted and marked as in the preceding; thorax nearly as in the preceding, with the dorsal punctures larger, sometimes five in each row, black or piceous, with a ferruginus margin, piceo-ferruginous beneath; elytra not so long and broader than in the preceding, somewhat widest behind, flat, not quite opaque, thickly and minutely punctulate, thinly griseous pubescent, black, fuscous or piceous, with the shoulders fuscous, the inflexed margins luteous; abdomen variegated brown, somewhat shining, sparingly pubescent, with two lines of cinereous spots on the back, and two less distinct on the sides, a row of transverse punctures on each segment, about three on each side, rather strongly and somewhat widely punctulated; beneath shining brunneous or ferruginous, rather strongly and widely punctured, sparingly fulvo-griseous pubescent, the sexual marks as before; legs, mouth, and palpi rufo-ferruginous, posterior femora dark beneath, anterior tarsi slightly dilated in both sexes; antennæ black, sometimes ferruginous at the apex, the bases of the basal joints piceous. L. 3—5 lines.

Erichson, Gen. et Spec. Staph. 454.—Cafius Fucicola, *Curtis*, Brit. Ent. pl. 322.—*Stephens*, Manual, No. 3172.

Berwick. *Dr. Johnston.*

The most obvious distinctions between this and the preceding are the slight pubescence, and less opacity of the elytra and abdomen, and the deeper and wider punctulation of the latter. The male abdomen is evidently more deeply and widely punctate than the female, and this degree of puncturing extends to males of the smallest dimensions; but whether there be intermediate varieties that connect this with the fine and abundant punctulation of Ph. Xantholoma,

I have not specimens to decide. It may be further remarked, that however large the specimens, the male is always the lightest tinted.

13. Ph. cephalotes (Staph. *Grav.* Micr. 22): With the habit of Ph. æneus, and Ph. parumpunctatus and about the size of the latter; elongate, black, head and thorax shining and polished, the former large, suborbiculate, broader than the thorax, and furnished with ample mandibles in the males, suboval and about the breadth of the thorax in the females; thorax subcylindric, slightly narrowest and subsinuated behind, the punctures on the disk deepish, rarely five in each row, equidistant, or the two first and two last placed nearest in pairs; elytra broader, and a little longer than the thorax, flattish, thickly and somewhat deeply punctulate, punctulations distinct, dark, brassy green, sometimes pitchy at the tips of the lateral margins, shining, griseous pubescent; abdomen finely but not closely punctulate, griseous pubescent, the edges of the ventral segments, the fifth and sixth broadly, and the anus ferruginous, with rufescent pubescence; legs dark pitchy, tibiæ and sometimes the joints more dilute, tarsi rufescent, posterior nearly simple in both sexes; antennæ nigro-piceous. L. 3—3½ lines.

Erichson, Gen. et Spec. Staph. 455.—*Heer*, Fn. Col. Helv. i. 263. Staphylinus cephalotes, *Gyll.* Ins. Suec. ii. 320. Bisnius cephalotes, *Stephens*, Ill. M. v. 247.—Manual, No. 3174.—Bisnius rotundiceps, *Kirby*, *Stephens*, Ill. M. v. 248.—Manual, No. 3175 (*fœm. jun.*).

Rare: under garden rubbish, at Penmanshiel, *J. H.* Dunglas dean, *Dr. Johnston*.

14. Ph. fimetarius (Staph. *Grav.* Micr. 175): Elongate, narrow, black, shining; head sub-orbiculate, having, when the basal joint of the antennæ is placed transversely, the appearance of being obcordate, and angulated in front, slightly narrowed behind, a wide shallow triangular impression in front, with its centre deepened, four punctures between the eyes, placed rather forwards, and about sixteen above them; thorax narrow, somewhat elongate, the sides straightish and parallel, the punctures in each row deep, and of considerable size, the two last rather widest; elytra considerably longer than the thorax, widest behind, rather bright green brassy, shining, rather thickly, finely and irregularly punctulated, griseous pubescent; abdomen with the ventral segments, the fifth and sixth broadly, and the anus edged with ferruginous; legs thrown stiffly back in death, piceous or yellow, anterior coxæ picescent, anterior tarsi simple in both sexes; antennæ thickened externally; palpi piceous. L. 3 lines.

Stephens, Ill. M. v. 232.—Manual, No. 3144.—*Erichson*, Gen. et Spec. Staph. 456.—*Heer*, Fn. Col. Helv. i. 263.—Staphylinus fimetarius, *Gyll.* Ins. Suec. ii. 324.—Philonthus lucidus, *Stephens*, Ill. M. v. 232.—Manual, No. 3143.

Generally distributed, especially under dead birds, &c.

The head and thorax have sometimes an æneous lustre.

15. Ph. sordidus (Staph. *Grav.* Micr. 176): About the size of the last, but more parallel, related also to Ph. cephalotes, but smaller; head and thorax polished and glossy black, the former nearly about the width of the thorax, suborbiculate; thorax not so narrow in proportion to the elytra as in either of the preceding, sides straightish or slightly sinuated behind the middle, punctures of the dorsal series small, but deepish, neat, with the intervals rather wide, the two anterior in each row nearest; elytra scarcely longer than the thorax, subquadrate, flattish, widely and rather strongly and deeply punctate, dark brassy green, lucid shining; abdomen finely but not thickly punctate, apex of the fourth, fifth, and sixth segments narrowly rufous, often con-

colorous; legs nigro-piceous, or almost black, joints and tarsi palest, anterior tarsi simple in both sexes; antennæ slender. L. 2½—3 lines.

Stephens, Ill. M. v. 233. Manual, No. 3144.—*Erichson*, Gen. et Spec. Staph. 456.—*Heer*, Fn. Col. Helv. i. 262.—Staphylinus sordidus, *Gyll.* Ins. Suec. ii. 326.

Rare: Dunglas dean.—*Dr. Johnston.* Near Penmanshiel.—*J. H.* Girrick, by Nenthorn.—*Mr. Hislop.*

*** Thorax with two rows of punctures on the disk, 5 in each.

16. Ph. sanguinolentus (Staph. *Grav.* Micr. 36): Deep black; head and thorax finely polished and glossy, the former rather large, subrotundate, the latter subquadrate, with straightish sides, the dorsal series of punctures deepish, but not large, the posterior in each row, most apart; elytra rather wider and longer than the thorax, flattish, thickly and finely punctulate, conspicuously griseous pubescent, with a semi-elliptical patch on each side of the suture, narrower or wider, and an oblique dash upon the shoulders, sometimes obsolete, sanguineous; abdomen subopaque, with a dense fine down, thickly and finely punctulate; antennæ slender, as well as the legs, black, anterior coxæ orange coloured, tarsi and sometimes the tibiæ obscure piceous; anterior tarsi dilated in both sexes, more strongly in the male. L. 3—4 lines.

Stephens, Ill. M. v. 238.—Manual, No. 3162.—*Erichson*, Gen. et Spec. Staph. 467.—*Heer*, Fn. Col. Helv. i. 265.—Staphylinus sanguinolentus, *Gyll.* Ins. Suec. ii. 338.

Very rare: two specimens have occurred near Penmanshiel in August.

17. Ph. varians (Staph. *Payk.* Mon. Staph. 45): Deep black, shining; head rather small, oval; thorax broadest behind, narrowed in front, the sides very slightly rounded, thoracic punctures small, the three in the middle of each dorsal row nearest, the lateral punctures five on each side, and one near the posterior angles; elytra about the length of the thorax, slightly narrowed at the base, broadest behind, thickly and finely punctulate, griseous black pubescent, black, with a reddish streak proceeding from the shoulder, and inwardly evanescent, sometimes obsolete; abdomen tapered towards the apex, somewhat shining, and irridescent, thickly and minutely punctulate, with the edges of some of the ventral segments sometimes dull rufescent; antennæ slender and with the legs black, the anterior coxæ testaceous, anterior tarsi of the male strongly, of the female slightly, dilated. L. 2½—3 lines.

Erichson, Gen. et Spec. Staph. 470.—Staphylinus opacus, *Gyll.* Ins. Suec. ii. 340.—Philonthus opacus, *Heer*, Fn. Col. Helv. i. 265.—Philonthus lituratus, *Kirby, Stephens*, Ill. M. v. 238.—Manual, No. 3159.—Philonthus aciculatus, *Stephens*, Ill. M. v. 238.—Manual, No. 3161.—Philonthus bipustulatus, var. b. *Ent. Edinensis*, 317.

Var. a. Approaching to the size of Ph. sanguinolentus, with the head larger, ovate, or subcordate, elytra and abdomen broader, thorax with the lateral punctures on each side, five, and two on the posterior angles; entirely deep black, except the anterior coxæ, which are testaceous. L. 3½—4 lines.

Staph. aterrimus, *Marsh.* Ent. Brit. i. 513.—Philonthus aterrimus, *Stephens*, Ill. M. v. 235.—Manual, No. 3152.

Var. b. With the legs fuscous.

Philonthus punctiventris, *Kirby, Stephens*, Ill. M. v. 335.—Manual, No. 3150.—Philonthus opacus, *Stephens*, Ill. M. v. 236.

Var. c. With the first joint of the antennæ beneath testaceous or pitchy.

Philonthus obscuripennis, *Kirby, Stephens*, Ill. M. v. 237.—Manual, No.

3155.—Philonthus longicornis, *Kirby, Stephens*, Ill. M. v. 237.—Manual, No. 3156.

Var. d. Black, immaculate.

Philonthus intaminatus, *Kirby, Stephens*, Ill. M. v. 235.—Manual, No. 3151.

Var. e. Black, elytra fuscous, ferruginous at the apex, legs fuscous, anterior coxæ testaceous.

Staphylinus agilis, *Grav. Mon.* 77.—*Gyll.* Ins. Suec. ii. 341.—Philonthus agilis, *Stephens*, Ill. M. v. 237.—Manual, No. 3157.—Gabrius suaveolens, *Kirby, Stephens*, Ill. M. v. 249?—Manual, No 3179?

Common in Berwickshire in the summer months. Var. a. occurs most frequently in garden refuse. Var. e. has not yet been found within the district.

According to Erichson, this species has been found throughout Europe, at the Cape of Good Hope, and in the West Indies.

18. Ph. debilis (Staph. *Grav.* Micr. 35) : Smaller than Ph. ventralis, minute specimens of which it greatly resembles, black, shining; head suborbiculate, somewhat narrower than the thorax, with four punctures between the eyes, two on each side, and four placed in an oblique quadrangle on each side above the eyes, and a few scattered ones; thorax narrower than the elytra, rather longer than broad in the female, somewhat narrowed in front, sides very slightly rounded, the two last punctures in the dorsal series most apart, the others equidistant, lateral punctures five on each side, the punctures minute; elytra slightly longer than the thorax, the sides subparallel, thickly and finely punctulate, shining olivaceo-fuscous, griseous pubescent; abdomen minutely and thickly punctulate, slightly shining, thickly clothed above and beneath with grisco-fuscous pubescence, ventral segments, especially the fifth and sixth with rufo-piceous edges; antennæ thickening to the apex, the three basal joints subtestaceous, the rest fuscous; palpi piceous; legs testaceo-fuscous, posterior coxæ, and sometimes the femora, darker; anterior tarsi of the male much dilated, of the female feebly. L. 2—2 1-3d lines.

Erichson, Gen. et Spec. Staph. 472.—*Heer*, Fn. Col. Helv. i. 266.—Bisnius fuscicornis, *Kirby, Stephens*, Ill. M. v. 248.—Manual, No. 3177.

Very rare: taken beneath garden rubbish at Penmanshiel. This species has been taken in the North of Africa, and in the United States of America.

19. Ph. ventralis (Staph. *Grav.* Micr. 174) : Related to Ph. debilis, but larger and broader, about the size of Ph. fimetarius, nigro-piceous; head and thorax polished and shining, the former scarcely narrower than the thorax, orbiculate; thorax narrower than the elytra, longer than broad, sides sub-parallel and straightish, dorsal punctures considerably sized and deep, the three in the middle most approximating, the posterior pair most apart and largest, the side punctures five each, smaller, the sides often piceous; elytra not longer than the thorax, with the sides parallel, not quite flat, rather thickly but scarcely minutely punctured, the punctures with distinct intervals, shining, fusco or nigro-piceous, griseous pubescent; abdomen finely and rather thickly punctulated, shining, griseous pubescent, all the segments beneath, the fifth and sixth broadly, and the anus margined with rufo-testaceous; antennæ stoutish, thickened towards the tips, nigro-fuscous, the first joint, and the second and third at the tip and base, sub-testaceous; legs rufo-testaceous, or with a duskier tinge, especially on the posterior pair; anterior tarsi simple in both sexes. L. 2¼ lines.

Stephens, Ill. M. v. 237.—Manual, No. 3158.—*Erichson*, Gen. et Spec. Staph. 473.—*Heer*, Fn. Col. Helv. i. 267.

Among garden rubbish, &c. Penmanshiel, rather common.—*J. H.* Girrick. —*Mr. Hislop.* Berwick,—*Dr. Johnston.*

It has been found in North America, and in the Isle of St. Vincent.

20. Ph. discoideus (Staph. Grav. Micr. 174): Less than Ph. ventralis, black; head and thorax polished and shining, the former suborbiculate or subcordate, of the breadth of the thorax, and sometimes approaching it in size; thorax narrower than the elytra, its sides parallel and straightish, dorsal punctures nearly equidistant, deep, moderate sized, the margin often sub-piceous; elytra as long as the thorax, nearly quadrate, sub-depressed, rather thickly and not quite minutely punctulate, fulvo-griseous pubescent, shining, nigro-fuscous, the sides, tips, and sutural margins rufo-testaceous; abdomen short, beneath with the edges of the segments piceo-testaceous, griseo-rufous pubescent, apex of the fifth in the male emarginate, with a narrow shining edge, middle of the base in the fifth with a triangular, and of the fourth with an ovate opaque elevation, bordered by a shining rim; antennæ short, incrassate, as well as the legs, mouth and palpi fusco- or rufo-testaceous; anterior tarsi much dilated in the male, slightly in the female. L. 2—2¼ lines.

Erichson, Gen. et Spec. Staph. 474.—*Heer*, Fn. Col. Helv. i. 268.—Quedius suturalis, *Stephens*, Ill. M. v. 224.—*Ent. Edinensis*, 316.—Quedius discoideus, *Stephens*, Manual, No. 3109.

Rather rare: Berwick, Dunglas dean, and the Lammermuirs, *Dr. Johnston.* Girrick, *Mr. Hislop.* Penmanshiel, *J. H.*

This species has been found in the West Indies.

**** Thorax with two rows of punctures on the disk, 6 in each.

21. Ph. fulvipes (Staph. *Fab.* Syst. El. ii. 597): Of the size of Ph. fimetarius, head and thorax polished and shining; head small, narrower than the front of the thorax, somewhat oval; thorax narrower than the elytra, compressed and somewhat narrowed in front, the sides very slightly rounded, dorsal punctures sub-equal, the anterior ones in each placed out of the rank, lateral punctures five, all the punctures minute; scutellum black or fuscous; elytra a little longer than the thorax, broadest behind, not quite flat, bright rufo-testaceous, very finely punctulate, not very abundantly testaceous pubescent; abdomen very thickly and finely punctulate, with a short and rather sparing griseous pubescence; antennæ thickened towards the tips, black, the three basal joints beneath rufo-testaceous, above piceous; mouth testaceous; palpi piceous or piceo-testaceous; legs fusco-testaceous, the joints and tarsi paler, posterior coxæ, and the femora in the middle nearly black; tarsi of the male strongly, of the female scarcely, dilated. L. 2½—3 lines.

Erichson, Gen et Spec. Staph. 485.—*Heer*, Fn. Col. Helv. 270.—Staphylinus fulvipes, *Gyll.* Ins, Suec. ii. 343.—Philonthus rubripennis, *Kirby, Stephens*, Ill. M. v. 239.—Manual, No. 3165.—Philonthus corruscus, *Ent. Edinensis*, 318?

Among stones and gravel on the banks of the Berwickshire rivers and brooks.

Irrespective of the dark colour of the legs, which in the continental specimens is of a bright testaceous, the proportions and other characters stated by Gyllenhal and Erichson are such as to identify our insect with theirs. The base of the antennæ and the legs are much paler in a state of immaturity. Ph. rubripennis of Kiesenwetter (Entomologische Zeitung. v. 346.—Ray Soc. Reports. 1847, p. 328), for whose description I am indebted to A. H. Haliday,

Esq., differs by its subquadrate head, the paler hue of the palpi, the thorax not narrowed in front and with the sides straight, the elytra of a more sordid tint, and with a coarser pubescence on the elytra and abdomen. It likewise frequents river banks, but in shady places, under mouldering leaves and roots, and avoids the sandy tracts which are the favourite resort of Ph. fulvipes. Ph. corruscus is a stouter insect than either, with a large suborbiculate head, five punctures in the dorsal series, black legs and antennæ.

The distribution of this species extends to North America.

22. Ph. aterrimus (Staph. *Grav.* Micr. 31): Minute, slender, linear-elongate, black, shining and polished; head oblong-ovate, in the male of the breadth of or slightly wider than the thorax, widest in front, and slightly narrowed behind, triangularly flattened and obsoletely foveolated on the forehead, in the female narrower; thorax in the female about half the breadth of the elytra, in the male rather broader, oval, the base slightly narrower, sides straightish, the punctures of the dorsal series neat, deepish, approximating, the anterior smallest, and slightly out of the range, lateral punctures five, small but deep; elytra sub-oblong, considerably longer than the thorax, slightly wider at the tips, distinctly and somewhat widely punctured, the punctures rather minute, black, or sub-piceous, especially on the sutural and hinder margins, thinly griseous pubescent; abdomen finely punctulate, griseous pubescent, edges of the segments beneath and the anus sometimes piceo-testaceous; antennæ black, with the basal joints pitchy; palpi picco-testaceous or black, the apical joint very acute; legs piceo-testaceous, darkening with age; anterior tarsi simple in both sexes. L. 1¾—2 lines.

Erichson, Gen. et Spec. Staph. 492.—*Heer*, Fn. Col. Helv. i. 271.—Staphylinus aterrimus, *Gyll.* Ins. Suec. ii. 349.—Gabrius aterrimus, *Stephens*, Ill. M. v. 250.—Manual, No. 3186.—Staphylinus nigritulus, *Grav.* Micr. 41.—Gabrius pallipes, *Kirby*, *Stephens*, Ill. M. v. 250.—Manual, No. 3187.

In moist situations, rare: Berwick, *Dr. Johnston*. Penmanshiel wood, and the sea banks near the Cove shore, and Redheugh, *J. H.* Girrick, near Nenthorn, *Mr. Hislop*.

This species is likewise native to North America.

***** Thorax with two rows of punctures on the disk about 8 in each.

23. Ph. parumpunctatus (*Erichson*, Gen. et Spec. Staph. 499): With the habit of Ph. æneus, to which and Ph. cephalotes it is much allied, black, shining; head narrower than the thorax, orbiculate, and with the mandibles moderate in the female, very large and wider than the thorax in the male, subquadrate, with strong prominent mandibles piceous at their tips, rather depressed in front, and obsoletely foveolated in the centre, four transverse punctures between the eyes, with numerous punctures behind them, bounded internally and obliquely with an irregular row of from 5—7; thorax narrower than the elytra, widest across the apex, whence it narrows rather sinuously to the posterior angles; the punctures in the dorsal series about seven or eight closely placed, irregular in number, size, and disposition, with a variable number scattered on the sides scarcely exceeding twelve on each, several of which are sometimes placed in an irregular arc outwardly nearest the margins, the punctures deep and of considerable size; elytra longer than the thorax, thickly and somewhat deeply punctate, brassy, shining, griseous pubescent; abdomen rather widely and finely punctulate, thinly pubescent, beneath with the edges of some of the segments, especially the fifth and sixth, and the apex, picco-tes-

taceous; palpi piceous or black; antennæ with the first joint long in the male, as well as the legs, which are shortish, black, the joints, tibiæ and tarsi sometimes piceous; anterior tarsi scarcely dilated in the male, simple in the female. L. 4 lines.

Staphylinus punctus, *Gyll.* Ins. Suec. ii. 346.—Philonthus Watsoni, *Kirby, Stephens,* Ill. M. v. 240.—Manual, No. 3168 *(fœm.).*—Philonthus minax, *Kirby, Stephens,* Ill. M. v. 241.—Manual, No. 3170 *(mas.).*—Bisnius puncticollis, *Howitt, Stephens,* Ill. M. v. 439 *(mas.).*

In marshy situations: on the borders of Penmanshiel wood, and on Coldingham moor, *J. H.* Girrick, near Nenthorn, *Mr. Hislop.*

Most of the specimens I have examined have the wings rudimentary. The type is described as having wings.

Erichson mentions this species as having been taken by Professor Eversmann on the Uralian mountains.

****** Thorax frequently punctate, with a smooth longitudinal central line.

24. Ph. proceruleus (Staph. *Grav.* Mon. 95): Narrow, elongate, sub-parallel, xantholiniform, black, head and thorax shining; head oblong, subquadrate, about the breadth of the thorax, smooth, slightly impressed and channelled in front, with a narrow smooth central line above, the sides strongly, thickly, but not quite closely punctured, in a sublinear disposition; thorax more than half the breadth of the elytra, elongate, sub-parallelo-grammic, slightly narrowed behind, slightly convex, with a shining polished central line, the sides strongly, thickly, but not quite closely punctured, the punctures sublinear next the central space; elytra oblong, a third longer than the thorax, thickly, finely but distinctly punctured, black, with the apex and the suture partially piceous, griseous pubescent; abdomen parallel, sub-opaque, closely and finely punctulate, rather thickly fulvo-griseous pubescent, the edges of part of the ventral segments and the apex piceo-testaceous; antennæ short, thickening outwardly, black or nigro-piceous, the base more dilate; maxillary palpi, with the terminal joint long and much acuminate, piceous or testaceous; legs piceo-testaceous; the anterior tarsi slightly dilated in both sexes. L. 2—3 lines.

Erichson, Gen. et Spec. Staph. 511.—*Heer,* Fn. Col. Helv. i. 272.—Gyrohypnus proceruleus, *Stephens,* Ill. M. v. 264.—Xantholinus proceruleus, *Ib.* Manual, No. 3217.

Very rare: under garden rubbish at Penmanshiel, in August.

QUEDIUS, *Leach. Erichson,* Gen. et Spec. Staph. 523.

Antennæ filiform, slender, moderate in length, the last joint subacuminate. Labrum bilobed, sometimes entire, with a membranaceous edge. Palpi elongate, slender, filiform. Ligula very short, membranaceous, rotundate, entire, shorter than the minute divergent paraglossæ. Head moderate, suborbiculate or subovate, little separated from the thorax, eyes usually large. Thorax suborbiculate, the sides sometimes widish, convex, smooth above, with a series of punctures on each side, usually three, and a few (2–5) towards the sides anteriorly. Sides of the prothorax behind the anterior coxæ furnished with a corneous or membranaceous triangular appendage, by which the prothoracic spiracles are concealed. Intermediate coxæ approximating, anterior tarsi dilated, posterior with the first joint elongated. Abdomen oblong, or elongated and much attenuated posteriorly; the sixth segment beneath emarginate in the males.

* Thorax with a corneous process behind the anterior coxæ.

Div. Thorax with two rows of punctures on the disk placed obliquely, 3 in each.

1. Q. LATERALIS (Staph. *Grav.* Micr. 35) : Black, shining, broad, head, thorax and scutellum glossy; head large, narrower than the thorax: eyes middle sized, scarcely prominent; thorax broad, suborbicular, wider than the elytra, the sides dilated and slightly flattened out, discoidal punctures nearly equidistant, lateral, two or three; scutellum very smooth; elytra flattish, rather thickly punctured, thinly pubescent, the shoulders and reflexed margins ochreo-testaceous, suture piceous; abdomen short, finely and thickly punctulate, irridescent cupreo-versicolorous, beneath with the edges of several of the segments rufous, the sixth emarginated, triangularly impressed and smoothened at the apex, in the middle, fifth slightly sinuated, and smoothly sub-impressed in the male; antennæ piceous, first joint, and base and apex of the second and third, rufous; mouth and palpi ferruginous; legs piceous or blackish, femora with a metallic tinge, the joints, tibiæ and tarsi more dilute; anterior tarsi much dilated in both sexes. L. 5¼—6 lines.

Stephens, Ill. M. v. 216.—*Ent. Edinensis*,315.—*Erichson*, Gen. et Spec. Staph. 525.—Microsaurus lateralis, *Curtis*, Brit. Ent. pl. 638.—*Stephens*, Manual, No. 3082.—Philonthus lateralis, *Heer*, Fn. Col. Helv. i. 273.

Rare: five or six specimens were taken in Howpark Dean, under Agaricus integer, in July.

2. Q. FULGIDUS (Staph. *Fab.* Syst. El. ii. 596): Black, shining, head, thorax and scutellum glossy; head rather large, suborbiculate, and as broad as the thorax in some males, ovate and narrower in the female, beneath a strong lens extremely minutely punctulate, a puncture near the margin of the eye on each side, two above, and two behind each eye; eyes small, scarcely prominent; thorax rather broader than the elytra, the sides and base nearly equally rounded, the lateral margins dilated, disk convex, under a lens exceedingly finely and dispersedly punctulate, dorsal punctures rather small and placed near each other; elytra a little longer than the thorax, each elytron very slightly elevated in the middle, and longitudinally depressed near the suture, shining, rather widely punctured, black, or with the suture and the apex pitchy, or entirely bright rufous; scutellum very smooth; abdomen narrowed to the apex, thickly and finely punctulate, black, very slightly irridescent, or with each segment and the anus tipped with rufous beneath and above, beneath with the sixth segment obseletely emarginate in the middle, and triangularly smoothened, and the apex of the fifth triangularly smoothened and shining in the male; antennæ slightly thickened towards the apex, nigro-piceous or black, or dilute ferruginous outwardly; palpi piceous; legs, black or fusco-piceous, with the joints, tarsi, and sometimes the tibiæ, piceous or rufescent; anterior tarsi much dilated in both sexes. L. 3¼—5 lines.

Erichson, Gen. et Spec. Staph. 525.

Var. a. Black, with the elytra concolorous, legs more frequently piceous.

Staphylinus nitidus, *Grav.* Micr. 31.—Quedius nitidus, *Stephens*, Manual, No. 3087.—Staphylinus variabilis, *Gyll.* Ins. Succ. ii. 303.—Quedius variabilis, *Stephens*, Ill. M. v. 218.—Philonthus variabilis, *Heer*, Fn. Col. Helv. i. 273.—Staph. mesomelinus, *Marsh.* Ent. Brit. i. 510.

Var. b. Black, with the elytra red, the legs, anus and edges of the segments of the abdomen often rufo-piceous.

Staphylinus fulgidus, *Fab.* Syst. El. ii. 596.—Philonthus fulgidus, *Heer*, Fn. Col. Helv. i. 273 —Quedius hœmopterus, *Kirby, Stephens*, Ill. M. v. 217.—Q. hœmorrhous, *Kirby, Stephens*, Ill. M. v. 217.—Staphylinus rufitarsis, *Marsh.*

Ent. Brit. i. 512.—Quedius rufitarsis, *Stephens*, Ill. M. v. 220.—Manual, No. 3095.—Emus floralis, *Lacordaire*, F. E. Paris, i. 380.

In dark cellars and outhouses, and occasionally under bark, and on the sea coast, rare; var. a. at Penmanshiel, and with Pristonychus Terricola, on the sandy coast at the Ewe Lairs, by Linhead; and var. b. on a barren shore between Redheugh and Dulaw, *J. H.* Var. b. at Berwick, *Dr. Johnston*.

A very variable insect, the impressed and dilated sides of the thorax characterise it from any other of the local species, with which it would be liable to be confounded.

3. Q. IMPRESSUS (Staph. *Panz.* Fn. Germ. 36, 21): Black, very shining; head narrower than the thorax, suborbiculate, obsoletely depressed in front in the male; eyes middle sized, slightly prominent; thorax scarcely narrower than the elytra, slightly rounded on the base, moderately on the sides, and somewhat narrowed in front; slightly convex, discoidal punctures of considerable size; scutellum very smooth; elytra a little longer than the thorax, minutely and scatteredly punctulate, with three series of large, remotely placed punctures on each elytron, one near the suture, the other two on the disk, and a fourth of more minute and closer punctures along the upper edge of the inflexed margins, glabrous, shining, nigro-subvirescent, with the sutural, apical and lateral margins piceo-testaceous; abdomen finely and remotely punctulate, with a shining coppery versicolorous gloss, especially beneath, apex of the sixth segment beneath emarginate, slightly depressed and polished, seventh groved in the centre in the male; antennæ black, fuscous outwardly; legs dark piceous, with the joints and tarsi paler; femora with metallic tints; anterior tarsi much dilated in both sexes. L. 3½ lines.

Stephens, Ill. M. v. 219.—Manual, No. 3092.—*Ent. Edinensis*, 315.—*Erichson*, Gen. et Spec. Staph. 530.—Staphylinus impressus, *Gyll.* Ins. Suec. ii. 307.—Philonthus impressus, *Heer*, Fn. Col. Helv. i. 274.

Not very common: inland and on the coast.

* * Thorax with a membranaceous process behind the anterior coxæ.

Div. Thorax with two rows of punctures on the disk, placed obliquely, 3 in each.

4. Q. MOLOCHINUS (Staph. *Grav.* Mon. 46): Black, head and thorax shining; head narrower than the thorax, suboval, somewhat convex, a puncture on each side between the eyes in front, the forehead in the middle being destitute of punctures, about four impressions behind the eyes, with other crowded punctures on the sides; eyes of a considerable size, and somewhat prominent; thorax wider than the elytra, somewhat narrowed in front, the base considerably rounded, the sides slightly, the two last of the dorsal punctures nearest, lateral punctures about three, the punctures moderate-sized; scutellum finely punctulate; elytra shorter than the thorax, narrow, subquadrate, scarcely flat, thickly and finely punctate, slightly shining, dull red or pitchy; abdomen long, thickly and finely punctulate, with short depressed pubescence, black, with a dull versicolorous irridescence; with the fifth and sixth segments emarginate, and a smooth shining depression along the middle of all the segments until the tip of the third in the male; antennæ slender, rufous, piceous in the middle; legs dusky piceous, coxæ and the femora in the middle darker and slightly metallic tinted, apex of the femora, base and apex of the tibiæ, and the tarsi, subrufescent; anterior tarsi much dilated in the male, considerably in the female. L. 4¼—5 lines.

Ent. Edinensis, 314.—*Erichson*, Gen. et Spec. Staph. 535.—Staphylinus molochinus, *Gyll.* Ins. Suec. ii. 302.—Philonthus molochinus, *Heer*, Fn. Col. Helv. i. 267.—Staphylinus picipennis, *Payk*, Fn. Suec. iii. 373.—Quedius picipennis, *Stephens*, Ill. M. v. 216.—Manual, No. 3085.—Q. denudatus, *Kirby*, *Ib.* Ill. M. v. 216.

Under stones, rather unfrequent.

5. Q. FRONTALIS (Philonth. *Nordm.* Symb. 76): Closely resembling Q. fuliginosus, but broader and more robust; head and thorax shining; head narrower than the thorax, suboval, with six transverse punctures between the eyes, three on each side, the first upon the margin, the next smaller at no great distance, and close to it the third, with a wide interval between it and the fourth on the other side, and with several scattered punctures behind the eyes; labrum rounded, entire; eyes very large, slightly prominent; thorax about the breadth of the elytra, the base strongly, the sides slightly rounded, slightly narrowed in front, dorsal punctures nearly equidistant, lateral, about five, punctures deep and of considerable size; scutellum finely punctulate, the punctures placed apart; elytra a little longer than the thorax, minutely, very closely, and somewhat rugose punctate, the puncturing sometimes waved, opaque nigro-griseous pubescent; abdomen thickly and finely punctulate, rather densely nigro-griseous pubescent, black, with green versicolorous irridescence, the sixth segment beneath emarginate, slightly depressed and polished at the tip, fifth indistinctly sinuated and with a polished depression in the male; antennæ and palpi orange-coloured; legs black, tibiæ and tarsi rufo-piceous; anterior tarsi much dilated in both sexes. L. 5—6 lines.

Erichson, Gen. et Spec. Staph. 536.—Quedius tristis, *Stephens*, Ill. M. v. 215.—Manual, No. 3083.—*Ent. Edinensis*, 314.

Common everywhere in dry places. I have found it devouring Philonthus laminatus, an insect nearly as large as itself. It often occurs by pairs.

6. Q. FULIGINOSUS (Staph. *Grav.* Micr. 34): With a narrower habit than the last, to which it nearly approaches; head a little narrower than the thorax, suboval, punctured as in the last; labrum subsinuated in the middle; eyes very large, slightly prominent; thorax at the base about the breadth of the elytra, slightly narrowed in front, the base rounded, the sides scarcely, punctures of the dorsal series approximating, lateral, three or four, the punctures deep and of a considerable size; scutellum quite smooth; elytra about the length of the thorax, subquadrate, not so broad as in the last, very thickly and finely punctate, not quite so rugose as in the last, subopaque, or slightly shining, with a thickish nigro-pubescence; abdomen finely and thickly punctulate, with nigro-griseous pubescence, not so dense as in the preceding, more or less cupreo-violaceous irridiscent: sixth segment beneath notched, impressed and polished, and the fifth with a deep lunulate impression, and sinuated at the tips; antennæ rufescent, more or less piceous above; palpi picco-testaceous; legs black or piceous; tarsi rufescent, the anterior pair strongly dilated in both sexes. L. 5—6 lines.

Erichson, Gen. et Spec. Staph. 537.—Philonthus fuliginosus, *Heer*, Fn. Col. Helv. i. 276.—Staphylinus tristis, *Grav.* Micr. 34.—*Gyll.* Ins. Suec. ii. 301.—Quedius picicornis, *Kirby*, *Stephens*, Ill. M. v. 215.—Q. gracilis, *Stephens*, Ill. M. v. 215.

Common in moist situations. I found a pair in copulâ in a marshy spot in a field, extensively peopled by the former species.

7. Q. PICIPES (Staph. *Mannerh.* Brach. 26): Of the size of Q. fulgidus,

black, shining, head, thorax, and scutellum very glossy; head subequal in both sexes, suboval, a little narrower than the thorax, a puncture on each side of the eyes in front, near the margin, two placed obliquely above and one behind the eyes, with the sides behind minutely punctulate; eyes large, prominent; thorax as broad as the elytra, somewhat narrowed in front, the base strongly, the sides slightly rounded, the latter not dilated, the dorsal punctures placed moderately apart, lateral punctures about two, punctures of considerable size; scutellum very smooth; elytra almost shorter than the thorax, flattened, red, shining, thickly and rather finely punctured, thinly griseous pubescent; abdomen gradually narrowed to the apex, finely and rather widely punctulate, black, shining, with a fine coppery versicolorous gloss, tips of the ventral segments sometimes narrowly rufous, the sixth segment narrowly excavated, and slightly impressed and smoothened at the apex in the middle, fifth slightly polished in the male: antennæ slender, subgeniculate, as well as the palpi and legs rufous; coxæ and tibiæ with a slight coppery tint; anterior tarsi slightly dilated in both sexes. L. 3½—4¼ lines.

Erichson, Gen. et Spec. Staph. 537.—*Stephens*, Manual, No. 3084.—Quedius pyrrhopus, *Kirby*, *Stephens*, Ill. M. v. 228.—Philonthus gracilicornis, *Grav. Mss. Heer*, Fn. Col. Helv. i. 274.

In moist shady situations in woods; Kitchen Cleugh Dean and Penmanshiel Wood, in August.

8. Q. RUFICOLLIS (Raphirus, *Kirby*, Steph. Ill. M. v. 244): Of the size or slightly larger than Q. semiobscurus, head, thorax, and scutellum shining; head in both sexes large, scarcely narrower than the front of the thorax, suborbiculate, black and glossy, two punctures rather large between the eyes, placed on the margin, and two placed obliquely above the eyes; eyes large, prominent; thorax about the breadth of the elytra, scarcely narrowed in front, base strongly, sides slightly rounded, convex, dorsal punctures nearly equidistant, lateral punctures three, two between the dorsal series and the margin, and one near the margin, all the punctures shallow, shining, rufous, or slightly clouded on the disk; scutellum quite smooth, piceous; elytra longer than the thorax, not quite flat, sides nearly parallel, thickly and rather finely punctulate, nearly as in Q maurorufus, shortly griseous pubescent, shining, rufous, with the disk darker; abdomen about the breadth of the elytra at base, gradually but not suddenly narrowed to the apex, rather thickly and finely punctulate, with long griseous pubescence, somewhat shining, finely versicolorous irridescent, the edges of all the segments narrowly and about half of the terminal one rufo-testaceous, beneath sometimes rufescent; thorax testaceous beneath; breast dusky behind; antennæ rather long, slender, the apex scarcely thickened, related in structure to Q. picipes, basal joint long, second and third thin, clavate, the third somewhat longer than the second, testaceous, brightest at the base; palpi and mouth testaceous; legs testaceous red, the posterior coxæ slightly darker; anterior tarsi rather strongly dilated in the male, moderately in the female. L. 3—3¾ lines.

Raphirus ruficollis, *Stephens*, Manual, No. 3125.

Very rare: in a damp field, near Penmanshiel.

Apparently nearly related to Q. scitus, but that species appears to have the antennæ somewhat thickened, the eyes smallish (mediocres), the elytra sparingly and rather strongly punctate, the abdomen narrower than the elytra, sparingly punctured and rufo-testaceous, the tarsi much dilated in both sexes.

9. Q. PELTATUS (*Erichson*, Gen. et Spec. Staph. 540): Of the size and appearance of Q. semiobscurus, but more dilated in the middle of the body, dark brunneous, shining, head, thorax, and scutellum glossy; head suborbiculate, considerably narrower than the thorax, rather flattened, with a puncture on the margin of the eye on each side and two placed obliquely above the eyes, black; eyes middle sized, prominent; thorax at the base about the breadth of the elytra, nearly orbicular, the base and sides equally rounded, slightly narrowed anteriorly, slightly convex, punctures on the disk rather approximating, deep and rather large, two last rather closest, and two or three on the sides, very smooth and glossy black, the margins sometimes piceous; scutellum quite smooth; elytra broad, wider than in either of the two next species, slightly longer than the thorax, flattish, finely punctulate as in Q. maurorufus, the punctures disposed rather widely, somewhat as in Q. semiobscurus, but of the depth of those in Q. maurorufus, rather shining, brunneous, the back blackish, the sides occasionally and the apical margins pitchy testaceous, thinly but conspicuously griseous pubescent; abdomen at the base narrower than the elytra, very much tapered and attenuated towards the apex, sparingly but distinctly punctulate, splendidly metallic versicolorous irridescent, the edges of the ventral segments, half of the sixth and the anus testaceous; antennæ thinnish, piceous, with the middle of several of the joints darker; mouth and palpi piceous; legs rufo-piceous, joints and tarsi rufous, posterior femora with metallic gloss; anterior tarsi of the male strongly, of the female moderately dilated. L. 2¼—3 lines.

Raphirus attenuatus, *Stephens*. Ill. M. v. 242.—Manual, No. 3117.—Philonthus peltatus, *Heer*, Fn. Col. Helv. i. 583.—Quedius præcox, *Erichson*. Käfer der Mark Braud. i. 492.—Philonthus præcox, *Heer*, Fn. Col. Helv. i. 278.

In marshy situations, in shady woods, under withered leaves and herbage, or under the bark of trees, accompanied by the two next species, very rare; from the bottoms of the deans in Penmanshiel Wood, in August.

10. Q. SEMIOBSCURUS (Staph. *Marsh.* Ent. Brit. i. 512): With rather the habit of Q. fulgidus, but much less, and with the elytra more deeply punctate, brunneo-piceous; head, thorax, and scutellum shining; head rather large, a degree less than the thorax, subrotundate, punctured as in the preceding, black; eyes large, oblong, prominent; thorax suborbiculate, widest behind, surpassing the elytra in breadth, the base rounded, the sides scarcely, convex, the dorsal punctures rather strong, the two posterior nearest, with two rather large lateral punctures, one near the dorsal series, the other near the margins, black, rarely brunneous on the margins, red when immature; scutellum very smooth; elytra squarish, sides parallel, slightly shorter than the thorax, strongly and somewhat widely punctate, brunneous black, with the apex and sometimes the suture slightly piceous, sparingly griseous pubescent; abdomen about the breadth of the elytra at base, gradually narrowing to the apex, not very strongly but rather widely punctured, rather shining, the base blue and violet, the apex green and coppery irridescent, the tips of the last two or three segments above, and the edges of all the segments beneath and the anus rufo-testaceous; antennæ thinnish, the apex scarcely thickened, piceous, some of the basal joints darkened in the middle, the first often ferruginous; mouth piceous; palpi rufo-testaceous; coxæ brunneous, rest of the legs reddish with brunneous dashes on the middle of the femora and tibiæ; anterior tarsi much dilated in the male, moderately in the female. L. 3 lines.

Raphirus semiobscurus, *Stephens*, Ill. M. v. 241.—Manual, No. 3115.—Quedius umbrinus, *Erichson*, Gen. et Spec. Staph. 541.—Philonthus umbrinus, *Heer*, Fn. Col. Helv. i. 277.—Staphylinus maurorufus, *Gyll.* Ins. Suec. ii. 309.

Not common: in marshy places, under withered leaves, and herbage, by the sides of streams, most frequently in woods. Grant's House in May, *The Club.* Penmanshiel Wood, Kitchen Cleugh Dean, and the sea-banks near Redheugh, *J.H.*

The description of Stephens is quite as inexplicit as that of Marsham, but from his possessing the specimen of that author, from the place assigned to it in the disposition of his species, and his reference (Syst. Cat.) to Gyllenhal's description, which is a good one, this would appear to be the insect Marsham had in view, rather than that to which, on the authority of Spence, Erichson has referred it. Dejean arranges it as a synonyme of the maurorufus of Gyllenhal.

11. Q. MAURORUFUS (Staph. *Grav.* Mon. 56): About the size of weaker specimens of the preceding, which it closely resembles, generally narrower, brunneous, or nigro-brunneous; head, thorax, and scutellum shining; head a little narrower than the thorax, suborbiculate, punctured as in the last, black; eyes large, less prominent; thorax about the breadth or slightly narrower than the elytra, subrotundate, narrowest anteriorly, rounded at the base, dorsal punctures moderate sized, nearly equidistant, two lateral punctures on each side as in the preceding, black, brunneo-testaceous, or obscure on the disk with the margins testaceous; scutellum very smooth; elytra about the length of the thorax, squarish, the sides parallel, slightly shining, thickly and somewhat finely punctulate, suture rather elevated, rather thickly griseous pubescent, fuscous or fusco testaceous, with the shoulders and at times the suture more dilute; abdomen at base scarcely narrower than the elytra, the apex narrowed, rather faintly and widely punctured, with longish appressed griseous pubescence, shining, with changeable irridescence, sometimes very faint, the edges of the two or three terminal segments above, and of all beneath and the anus testaceous; thorax beneath reddish testaceous; antennæ thin, not thickened at the apex, the first joint testaceous, the rest testaceo-piceous; mouth and palpi testaceous; legs reddish-testaceous; anterior tarsi of the male much dilated, of the female moderately. L. 3 lines.

Erichson, Gen. et Spec. Staph. 542.—Raphirus maurorufus, *Stephens*, Manual, No. 3116.—Philonthus maurorufus, *Heer*, Fn. Col. Helv. i. 278.—Staphylinus attenuatus, *Grav.* Micr. 61.—Staphylinus præcox, *Gyll.* Ins. Suec. ii. 310.—Raphirus præcox, *Stephens*, Ill. M. v. 245.

Rare: in marshy situations in woods: Penmanshiel Wood.

12. Q. PICIPENNIS (Raphirus *Steph.* Ill. M. v. 243): With the habit of Q. attenuatus, but larger and broader, narrowed at both ends, especially posteriorly, head and thorax shining; head suborbiculate, narrower than the thorax, a puncture on the margin of each eye, and two placed obliquely behind; eyes large, rather prominent; thorax narrower than the base of the elytra, narrowed in front, base strongly, sides slightly rounded, dorsal punctures moderately asunder, the last most apart, lateral punctures mostly two, one near the dorsal series, and one near the margins, punctures small; scutellum opaque, densely and minutely punctulate; elytra broader than the rest of the body, widest behind, a little longer than the thorax, faintly depressed on each side of the suture, very minutely and strigose punctulate, opaque or scarcely shin-

ing, nigro-fuscous, with the apical margin piceous, densely clothed with depressed griseous pubescence; abdomen very long, apex slender and much tapered, closely and minutely punctulate, subopaque, dull irridescent, with a rather dense appressed fusco-griseous down; the two last segments with their tips ferruginous; beneath finely versicolorous irridescent, as well as the breast fuscous pubescent the edges of all the segments ferruginous; antennæ longish, slender, the first and second joints subequal, entirely testaceous; palpi ochreous with the last joint sometimes piceous; legs dilute flavo-testaceous anterior coxæ concolorous, intermediate sometimes piceous, posterior black; anterior tarsi in the male much, in the female scarcely dilated. L. 2¾—3¼ lines.

Raphirus picipennis, *Stephens*, Manual, No. 3120.—Quedius semiobscurus, *Erichson*. Gen et Spec. Staph. 544.

Very rare: I took a single specimen under a stone, in a dry old pasture, near Penmanshiel, in November.

13. Q. ATTENUATUS (Staph. *Gyll.* Ins. Suec. ii. 311 : Black, rather narrow, head and thorax polished and glossy; head a little narrower than the thorax, round, punctured as in the preceding; eyes large, prominent, but less so than in the next; thorax somewhat narrower than the elytra, moderately narrowed in front base strongly, sides slightly rounded, rather convex, the two anterior dorsal punctures rather widest, lateral punctures two, a minute one near the dorsal series, and a larger near the lateral margins, the punctures small; scutellum brassy, thickly and finely punctulate: elytra about the length of the thorax, scarcely widened at the apex, very finely and closely strigose punctulate, fusco-rufous, palest at the apex, subvirescent æneous across the base, or entirely subvirescent æneous, shining, thickly but finely griseous pubescent; abdomen elongate, much tapered at the apex, densely and finely punctulate, opaque, with a slight versicolorous irridescence, rather densely griseous downy, with the appearance, especially on the sides, of darker patches, occasioned by changes of light, all the segments beneath edged with rufous, and irridescent; antennæ slender, scarcely thickened at the apex, the apical joint largest, testaceous; palpi testaceous, with the apical joint piceous; legs flavo-testaceous, intermediate, and especially the posterior often dusky, with the slightest metallic tint; anterior tarsi of the male rather strongly, of the female slightly dilated. L. 2½—2¾ lines.

Ent. Edinensis, 315.—*Erichson*, Gen. et Spec. Staph. 546.—Philonthus attenuatus, *Heer*, Fn Col Helv i 279?—Raphirus nitipennis, *Leach*, *Stephens*, Ill. M. v. 242.—Manual, No. 3118.—Raphirus rufipennis, *Kirby*, *Stephens*, Ill. M. v. 243?—Manual, No. 3121?

Not very abundant, but generally distributed under stones, in dry old pastures, in the upland parts of Berwickshire.

Considerably less and narrower than Q. picipennis, to which it approximates. Q. rufipes appears also to be a nearly allied species, but is larger and broader, and with a smaller head.

14. Q. BOOPS (Staph. *Grav.* Micr. 21): Considerably less and narrower than the last, to which it is allied, black, shining; head and thorax polished and glossy; head large, scarcely narrower than the thorax, punctured as in the preceding; eyes very large, covering nearly the entire sides of the head, prominent; thorax a little narrower than the elytra, nearly equal in length and breadth, somewhat narrowed in front, base considerably, sides slightly rounded, rather convex, punctured as in the preceding, punctures small, but rather deep,

black, sometimes piceous; scutellum finely and sparingly punctulate, of the colour of the elytra; elytra of the length of the thorax, slightly rounded above, thickly and finely punctulate, nigro-piceous, rather shining, varying in depth of tint, occasionally with the slightest brassy tinge, thinly pubescent; abdomen elongated, much tapered to the apex, finely and rather thickly punctulate, thinly griseous pubescent, black, slightly shining, faintly irridescent, the edges of some of the segments above, and of those beneath picco-rufous; antennæ short, thin, testaceous, the tip faintly darker; palpi testaceous, apical joint sometimes piceous; legs fine'y testaceous, posterior varied with dusky; anterior tarsi much dilated in the male, moderately in the female. L. 2—2¼ lines.

Erichson, Gen. et Spec. Staph. 548.—Staphylinus Boops, *Gyll.* Ins. Suec. ii. 312.—Raphirus Boops, *Stephens*, Ill. M. v. 242.—Manual, No. 3119.—Philonthus Boops, *Heer*, Fn. Col. Helv. i. 280.

Under stones and among moss, in dry upland woods, pastures, and heaths, not uncommon.

15. Q. SCINTILLANS (Staph. *Grav.* Mon. 70): Of the shape and size of the last, shining, obscure æneous, head, thorax and scutellum polished; head large, rather narrower than the thorax, obsoletely impressed on each side on the front between the antennæ, two minute punctures between the eyes placed one on each margin, with two shallow foveolæ close to and a little behind the punctures, one on each side, or with a single central foveola only, two punctures placed obliquely above the eyes; eyes large, prominent as in Q. Boops; thorax about the breadth of the elytra, subrotundate, narrowest in front, convex, dorsal punctures approximating, deep, but not large, lateral punctures four or five; scutellum very smooth and polished; elytra rather longer than the thorax, the sides parallel, the extreme base much depressed, obsoletely depressed on each side the suture, which is rather elevated, an obsolete impression at the tip of each elytron, rather strongly, ruggedly, and distantly punctulate, shining brassy green, with a thin short golden sericeous pubescence; abdomen at the base slightly narrower than the base of the elytra, gradually tapering to the apex, finely punctulate, black, somewhat opaque, with the edge of each segment bearing an oblique fasciæ of shining golden sericeous pubescence, meeting across the bases of the apical segments, beneath irridescent, with the edges of all the segments reddish, clothed with a fuscous or reddish changeable down, especially on the sides; antennæ short, slightly thickened towards the apex, third joint thinner than the second and about its length, testaceous, a shade darker at the tips; palpi testaceous, the last joint piceous; legs bright testaceous, especially the anterior and intermediate, posterior coxæ piceous, and the femora slightly darker; anterior tarsi strongly dilated [in both sexes]. L. 2—2½ lines.

Erichson, Gen. et Spec. Staph. 549.—Philonthus scintillans, *Heer*, Fn. Col. Helv. i. 275.—Raphirus fuscipes, *Kirby*, *Stephens*, Ill. M. v. 243?—Manual, No. 3122?

Very rare: a specimen was taken by Dr. Johnston in May, in Dunglas Dean, and another by myself, among moss, from the bottom of Kitchen Cleugh Dean, in November.

Although slightly differing from the type in the puncturing of the head; and the golden silken pubescence of the elytra, and the fasciæ of the abdomen are not alluded to by Erichson in his description of Q. scintillans; yet the proportions and other stable characters are so much alike, that I have sought in vain

for permanent marks of dissimilarity to that species. The specimens which I have described are both males, which are sometimes distinguished by minute differences from the other sex. Nôt unlikely, the beautiful pubescence may perish in long kept specimens. It is by much the prettiest species of the genus.

Additions to the list of ENTOMOSTRACA found within the limits of the Berwickshire Naturalists' Club—with a Description of the Caligus Strömii. By W. Baird, M.D., F.L.S., &c.

Since the publication of my paper on the "Arrangement of the British Entomostraca with a list of Species, particularly noticing those which have as yet been discovered within the limits of the Club," Vol. ii. p. 145, I have ascertained the existence of two species which had not then been noticed.

1st. Bosmina cornuta, p. 149.—I have now no doubt of the identity of Muller's Lynceus longirostris with this animal—and therefore, in accordance with the law of priority, I propose naming it the Bosmina longirostis. This exceedingly curious little creature I found in the summer of 1846 in Yetholm Loch, along with the following.

2d. Daphnia mucronata, p. 148.—A very good figure and description of this species is given by De Geer under the name of Monoculus bispinosus. The name given to it by Muller, however, was published in his Zool. Dan. Prodr. previous to De Geer's work making its appearance, and therefore the name of mucronata must stand.

The Alona (Lynceus) quadrangularis, p. 151, occurred along with these two species, in the same part of the loch.

In 1845 I found upon a salmon at Berwick a species of Caligus which, at that time, I thought was new; marking it, however, with a doubt in the list then published, p. 157. Upon more careful examination I found it approached very near the Caligus Vespa of M. Edwards, differing, however, considerably in size and other more minute distinctions. In the Copenhagen Transactions, Vol. 10, p. 23, and t. 7, f. 1—6, the celebrated Ström has described and figured a species of Caligus under the name of "Laxe luus" or salmon louse, and which he shortly defines "Monoculus thorace abdomineque ovata, cauda lobata." It is evi-

dently the same as the specimens I found upon the salmon of the Tweed, and as Ström is the only author who seems to have noticed it, I have named it after him.

Caligus Strömii—Ström, Kirbenhavn. Selskabs Skrifter, x. 23, t. 7, f. 1—7.

Female—Carapace oval, the frontal plate somewhat prominent, without sucking disks; thorax about the same length as the carapace, narrower at upper extremity, broader at posterior extremity and terminating in two rounded lobes. The horny tubercles on the medium line of the lower portion of thorax above the vulva, large and simple. Abdomen long and narrow, nearly as long as the thorax, terminating in two lobes which give off several short, stout, plumose setæ. The sternal fork is short and simple. The oviferous tubes are long.—Length of whole body (exclusive of tubes) half an inch.

Male—The male is much smaller than the female. The carapace is oval, much larger in proportion to thorax than in female; thorax narrow and posteriorly notched rather than lobed on each side. Abdomen much shorter than in female, terminating setæ of caudal appendages longer and beautifully plumose. About half the size of female.

The Cal. Vespa (female) of M. Edwards is only 3 lines long, and has the carapace narrow in front and very broad posteriorly, while in this species the carapace is almost an exact oval, and the animal (female) is fully half an inch in length. In C. Vespa the horny tubercle at base of thorax is small and setiferous, while in this species it is simple and of considerable size. The Vespa is said by M. Edwards to have been found in the gills of a salmon. This species I found on different parts of the body of the fish; and I have since then received specimens from Dr. Johnston, who found them also on the body of the salmon. M. Edwards does not appear to have ever seen the male.

Address to the Members of the Berwickshire Naturalists' Club, delivered at the Anniversary Meeting, held at Belford, September 13, 1848. By JOHN S. DONALDSON SELBY, Esq., President.

GENTLEMEN,

ON this anniversary our Club completes the 17th year of its hitherto prosperous and useful existence, and it becomes my duty, as your President, previous to the resignation of the office, which, for the past year, I have had the distinguished honour to hold, to place before you a cursory view of the proceedings of our Society during that period. Conscious of the inefficient and imperfect manner in which I have discharged the duties of my office, and of my inability to do justice to the various subjects I am expected to discuss, and to draw your attention to, on this occasion, I would bespeak your kind indulgence and forbearance. A great love and admiration for the science of Natural History, in all its various departments, and an earnest wish for its advancement and zealous prosecution in this country, is all I can lay claim to; and although zeal without knowledge is often deemed dangerous, and not to be relied on, I fear it will be the only justification you will be able to plead for having elected me as your President.

Our 16th anniversary meeting was held at Alnwick, 22d September, 1847. The members of the Club, by special invitation, breakfasted with Mr. Dickson, by whom they were most hospitably entertained. Through the courtesy of his Grace the Duke of Northumberland, the party were permitted to examine the various collections contained in Alnwick Castle, consisting of Egyptian antiquities, brought home by his Grace, and of those British and Roman remains, which have been found at various periods on the Northumberland estates of the family of Percy.

On this occasion, the Members of the Tyneside Naturalist Field Club came to Alnwick, to meet our members, by special appointment, forming a most harmonious and interesting

union of the two bodies. The day being wet, the united party, after inspecting the Castle and its contents, together with the gardens and conservatories, &c., were compelled to take shelter at the White Swan Inn, where the business usually transacted after dinner was proceeded with. An able address was read by the President, Dr. Clarke, on whose proposal, Mr. Selby, of Cheswick, was unanimously elected President for the ensuing year. Mr. Selby, of Twizel House, read a paper containing his observations on the occurrence of rare insects in this district in 1846. A fine collection of China Asters was exhibited,—also specimens of the Goose-bean of Canada, grown by Mr. P. Clay, of New Water Haugh. Specimens of *Didymium furfuraceum*, growing on the living and fresh leaves of the Hypnum rutabulum, were shown by Mr. Selby, gathered in Twizel Dene, by himself. Dr. Johnston exhibited specimens of the larvæ of the Bots (Æstrus Equi) adhering to the stomach of the horse; and of the cells of the Leaf-cutter Bee, taken from the roof of a thatched cottage at Birgham, and sent to him by Miss E. Bell, an honorary member of our Club. The day clearing up, the members availed themselves of this opportunity to take a stroll as far as Hulne Abbey, through the park and grounds, and returned to dine at the White Swan Inn, having much admired the scenery on the banks of the Aln, and gained appetite and zest for the good things provided for their entertainment by Mrs. Wilson.

On the 20th October, the Club met at Marshall Meadows, and partook of an excellent and substantial breakfast provided by our kind and hospitable colleague, Mr. Murray. After breakfast, the Secretary produced his budget, and annual and financial statement, and like other Chancellors of the Exchequer, complained of arrears, and increased expenditure beyond income—consoling himself and us with a prospect of an increase in the number of our members. He reported that the members amounted to 59, the Earl of Home and eight others having joined the Club during the past year. It was agreed that the subscription for the current year should be 5s. 6d., and the following stations for the meetings of the ensuing year were fixed upon, viz. :—

1st Wednesday of May, at Hutton.

3d Wednesday of June, Millfield.

Last Wednesday of July, Abbey St. Bathan's and Grant's House.

3d Wednesday or the Wednesday nearest the full moon of September, at Twizel House and Belford.

The only paper read was a description of the *Echiurus vulgaris*, by Dr. Johnston. The party afterwards walked towards Berwick, where they dined at the Red Lion Inn, having previously visited Halidon Hill, and its vicinity, and formed divers conjectures as to the respective positions of the Scottish and English armies, who, on the 19th of July, 1333, encountered there; when the Scottish army, commanded by Lord Douglas, was defeated, with immense slaughter, by the English, led by the King, Edward III., in person, who, on the following day, entered Berwick as a conqueror! Nothing novel, or worthy of notice, was observed during the walk. But I gather from the notes made by the Secretary, that the members, who, on the 20th of October, 1847, from the summit of Halidon Hill, surveyed the surrounding country in a state of the highest cultivation, were duly impressed with the advantages they possess over their ancestors of the 14th century; and that the scene presented to their view on that day was infinitely preferable to the "tented field,"

> "The neighing steed, and the shrill trump,
> The spirit-stirring drum, the ear-piercing fife,
> The royal banner, and all quality,
> Pride, pomp, and circumstance of glorious war,"

with which the triumphant Edward, and his mail-clad barons and chivalry, entered the town of Berwick, after the defeat of the Scottish army. Happy, indeed, will it be for this empire, and the world at large, if, from the more universal cultivation and diffusion of science and the arts of peace, mankind may be rendered hereafter more aware of their real interests, and that wars, foreign and domestic, shall for ever cease.

> "Peace has her victories
> No less renowned than war"

On the 3d of May, 1848, the Club met at Hutton, on the Whitadder. The Secretary and two members only partook

of breakfast together, but at dinner the party was joined by the President, Mr. Murray, and Dr. Clarke, and by the Rev. Mr. Edgar, and Mr. Dobie, as visitors.

After breakfast, Dr. Hood, Amisfield, was elected a member of the Club, on the nomination of Dr. Johnston, seconded by Mr. Dunlop. The day was remarkably fine, and the small party next proceeded on a walk—first to Hutton Hall, now a half ruinous mansion, in a very beautiful situation; thence up the river Whitadder to Whitehall, at which point they retraced their steps, following the river to the mill at Edington, and thence back to the village of Hutton, to dinner. Some of the party attempted to angle, but the finny prey was not to be lured, owing to the brightness of the day, and the low state of the water.

Several fine specimens of fibrous Gypsum, of white and beautiful pink colours, were found *in situ* on the banks of the Whitadder, and I think it probable that large quantities of this useful mineral may be there obtained, which being now extensively used by agriculturists, may become a source of profit to the proprietors.

After dinner, Dr. Johnston read a report upon a large specimen of *Goniaster equestris*, dredged near Embleton; and upon two specimens of *Retepora cellulosa*, remarkable for their beauty and excellent state of preservation. These specimens were forwarded by Mr. Embleton to Dr. Johnston, to be exhibited to the Club, and were much admired. A specimen of *Carabus nitens*, captured by the President on an elevated situation on the muir at Godscroft, in the week preceding the meeting, was exhibited; who also laid before the members a paper relating to the temperature of the year 1847, as observed at Cheswick.

At our meeting at Millfield, on the 21st June, there were present—Dr. Johnston, the Rev. J. Baird, Captain Carpenter, Mr. Cully, Mr. Melrose, Mr. Boyd, Mr. Broderick, Colonel Younghusband, and Dr. Hood. The President was detained on his way to the meeting at Barmoor, by important business, and was prevented getting forward in time. From the Secretary's notes I gather the following information. The members, after breakfast, walked away by Langton to Yeavering,

where they crossed the river Glen, and pursuing their course up this water, they came to the College Burn, which they tracked upwards to Hethpool Lynn. Here our Secretary makes a remark, which in my opinion is questionable as to its correctness, when he describes the scenery of the Linn, and its neighbourhood, as a place more famed for its appropriateness for pic-nic parties than for any remarkable beauty. This being a matter of taste, we will not further discuss it. The walk was peculiarly adapted to the researches of Botanists, and to the Naturalist in general; and one plant was noticed for the first time in our district, the *lesser Dodder* or *Cuscuta epithymum*. Other plants worthy of notice were *Hordeum murinum*, on the road side from Millfield to Yeavering; *Hyoscyamus niger*, about Langton, on the Glen; *Euonymus europæus*, on the banks of the College Burn; *Sium inundatum*, in the pools on the haughs of this burn; *Teesdalia nudicaulis*, very abundant and fine in the bed of the College; *Gnaphalium minimum* and *Myosotis versicolor*, abundant in the same situations; *Viola tricolor*, with all the petals yellow, and the spur only with a blueish tint. Various other plants, of even greater beauty, were seen, but being of less rarity, it is unnecessary to specify them. The Ash and the Bountree were also observed, in situations where they were evidently and truly indigenous; and, if ever an idea has been entertained of these trees being originally aliens to our district, it has now been entirely removed by the observations made by the members of our Club, on the 21st of June last.—The painted Lady, a butterfly usually rare in this district, has this season been observed in great abundance, and was a casual topic of conversation. After dinner, the Rev. Christopher Robinson was duly admitted a member of the Club. A paper by the Rev. Thomas Riddell, on pollen masses of an Orchis adhering to the antennæ of the Honey Bee, was read; and Dr. Johnston exhibited a fine gramineous-leaved fossil from the banks of the Whitadder, near Clarabad Mill. He also laid before the Club, a continuation of his description of the Berwickshire Acarides.

On the 26th July, the Club met at Abbey St. Bathan's, and breakfasted at the picturesque residence of our fellow-mem-

ber, Mr. Turnbull. After a hearty and genial repast, the party walked down the banks of the Whitadder, and over and about Cockburn Law, visiting Odin's Hall, and searching every bosky dell in their route. Dr. Hood found *Polypodium phegopteris* for the second time* in Berwickshire. And the entomologists of the party were tolerably successful.† Towards the hour of four p.m. the party was seen in detachments wending their way towards Grant's House, where they were joined by a few friends, to whom evil fate had denied the gratification of the morning's repast and excursion. The party at dinner consisted of the President, Dr. Johnston, Mr. Carpenter, and his two sons, Dr Clarke, Mr. Hepburn, Major Elliot, Mr. John Turnbull, Dr. Hood, Mr. Renton, Mr. Hardy. The Rev. Hamlet Clarke, John Campbell Renton, Esq., M.P., for Berwick, and Mr. George Carpenter, were elected members of the Club.

The President laid before the meeting the Transactions of the Tyneside Naturalist Field Club, in two numbers; and an Address to the Entomological Society of London by William Spence, Esq., Secretary thereof, which had been sent to him for the use of the Club; and was requested to convey the thanks of the members to the Secretary of the Tyneside Club, and to Mr. Spence for the same, respectively. Mr. Hepburn laid before the Club a paper on the Wood-Pigeon; and Mr. Hardy exhibited a fine collection of rare Berwickshire Coleoptera.

Mr. Hardy has added to the Berwickshire Flora, the *Ophioglossum vulgatum;* it was found towards the end of May, in a wood near Milne-Graden Mains. It was not then in full flower, but would be so in the course of June. He found

* The other habitat is Blackburn Rig Dean.—*J. Hardy.*

† "I may mention that the excursion of Wednesday produced three new Berwickshire insects:—1. *Melasoma ænea*, of which I took two, and Dr. Hood afterwards one specimen. It occurred on the Alder, a little below the Retreat. The larva was very abundant. 2. *Cyphon pini*, two specimens swept up at Ordweel. 3. *Rhinonchus castor*, from the heath below Odin's Hall. Ceutorhynchus quercus and Luperus flavipes were likewise met with. Hydroporus davisii, H. rivalis *Gyll.*, Peryphus tibialis and Helobia nivalis occurred among gravel by the side of the Whitadder. Argynnis aglaia was taken above Ordweel; and a specimen of Plusia chrysitis below the Retreat."—*James Hardy.*

near the same place, *Gallium mollugo* and *Gallium boreale* abundantly, and the latter also on Scaithmuir, below Lennel Hill. He has also communicated the following habitats of some of our rarer plants, viz., *Pyrola minor*, in a wood between the farm of Swinton Hill and Simprim, and in a wood on the farm of Milne Graden; *Cardamine amara*, in a ditch near the Sowmire, at Swinton; in abundance in a wood on Milne Graden estate; *Lythrum salicaria*, in a pond on Simprim farm.

I have also to communicate the following observation in Botany, by our Secretary:—*Leontodon taraxacum*. Growing on Spittal Links, intermingled with the ordinary state of the plant, there grows abundantly, a variety of Dandelion, which is remarkable for its superior neatness and prettiness. It is smaller in all its parts, and the leaves lie expanded in a stellate or roseate fashion on the ground. They are very deeply cut, almost to the midrib, into many regular and neat segments, all pointing backwards; the terminal are as usual the largest. The flower stalk is firm and round, gently tapered upwards, erect, or gracefully bent in a sigmoid flexure. The flowers small, and very neat, with the calyx segments all erect—the exterior broadly ovate, acute, with purplish margins,—the apices of the floret with 5 equal obtuse serratures. It flowers in May. This variety is very distinct from the Leontodon palustre of Smith, with which, however, it agrees in the erect and appressed position of the outer scales of the involucre; nor can it be referred to any of the varieties distinguished by Koch. It is further to be remarked, that its peculiarities do not depend on the dry sandy nature of its locality, for with it, the ordinary plant grows profusely, nor do they ever intermingle their characters.

The foregoing is but an imperfect summary of the transactions of the Club for the past year, and I have to regret that other duties, occupying a large portion of my time, have prevented me from attending our meetings so regularly as I could have desired. It will, I trust, readily be believed and admitted, that I entertain the same sentiments respecting the pleasure and gratification afforded to all our members who are so fortunate as to be able to attend our meetings with greater re-

gularity than I have been able to do, as those expressed by several of my predecessors in this chair. But it is not pleasure alone which we seek in our walks and wanderings. The object and intention of the Club have been beautifully and graphically described in the Addresses of some of our former and earliest Presidents, to which I would direct the attention of all, and more particularly that of our more recently elected members, who may probably not have had an opportunity of seeing them, and could not have had the gratification of hearing them delivered. Therein they will see it demonstrated how truly it may be said of science in general, and of the science of Natural History in all its departments in particular, that—

> "Its ways are ways of pleasantness,
> And all its paths are peace."

To a mind agitated and harassed by the toils of a profession, or the labours incident to the performance of public duties, and the transaction of private business, what can be more restorative or grateful than such relaxations as these genial and cheerful meetings afford? The utility of our pursuits is as unquestionable as their innocency, and it has been well said, that "The Deity has never affixed pleasure (in its true sense) to any sublunary pursuit, that is unsuitable to the dignity and condition of man."

If the cultivation of the abstract and pure sciences has the effect of calming the mind of man, how much more easily and pleasantly are we influenced by the contemplation of the beautiful and perfect works of Nature. Permit me to express a hope that greater encouragement may be given in this kingdom to the cultivation of this department of science than it has hitherto received at the hands of our greater universities and schools;—that Natural History may be made a regular branch of education in all schools and seminaries of sound learning, not only because it has a tendency to make devotional feelings habitual to the student of Nature, but because it exercises his observant and reflective powers, sharpens his faculty of discrimination, excites his curiosity, gratifies a taste for beauty and ingenuity of contrivance, and furnishes a source of pure and exhaustless enjoyment. What then can

be better adapted for youth? The chief aim of a great part of education is no other than what I have mentioned. To train the youthful mind to thought and observation is, or ought to be, the great object of all education; and by what process can this be more effectually accomplished than by the study of Natural Philosophy, and the contemplation of the beautiful economy of Nature?

In Sweden, Natural History is the study of the schools, by which men rise to preferment, and there are no people with more acute and better regulated minds than the Swedes. That our youth should have their minds so trained and directed, at our Schools and great universities, would, in my opinion, be a most desirable addition to the course of study generally pursued at such seats of learning. Such studies are eminently calculated to withdraw the mind from the gratifications of sense, and the inferior objects of human pursuits, and to invite it to the contemplation of the Supreme and Eternal Cause.

Although the additions to, and discoveries made by the several members of the Club, in the Natural History of our district, during the year of my Presidency, are neither few nor unimportant, I would impress upon them the necessity and propriety of greater exertions in the former, as well as in the department of Archaiology, and the antiquities of Berwickshire and Northumberland, in which latter department, we have been of late singularly deficient, notwithstanding the many opportunities which those counties afford for these researches.

In conclusion, I would insist upon the great importance of our pursuits and labours, both in a scientific and economical point of view, tending as well to our individual advantage as to that of our common country.

I beg to apologise for the length at which I have thought it my duty to address you, and most respectfully to vacate the office which, by your favour, I have had the honour to hold.

On the Temperature of the Year 1847. By J. S. DONALDSON SELBY, Esq. [In a Letter to the Secretary.]

CHESWICK, *January* 19, 1848.

DEAR SIR,—I send you the annexed table, which you may insert in the Transactions of the Berwickshire Naturalists' Club, if you think it worthy the notice of the members. I have compiled it from a register kept by my gardener here, and with considerable care and attention, by my orders. He is an intelligent person, and takes pleasure in such observations, so that I have little doubt of its correctness. For the present year, 1848, we intend to extend our observations to the pressure of the atmosphere, the force and duration of the winds, and all meteorological phenomena which we can observe, either peculiar or ordinary—such as the aurora, shooting stars, rainbows, &c., &c.

It appears that the mean temperature for 1846 was 4 degrees higher than for 1847, and that 12·36 inches more rain fell in the former than in the latter year.

In 1846, rain or snow fell on 171 days.
In 1847, do. do. do. 82 days only.

Should the result of a widely extended series of observations of similar meteorological phenomena be nearly the same, I think the greater injury to the potato crop, and many other productions of the soil in 1846, as compared with this past year, will be in a great measure accounted for. We have not had so high a mean temperature in the north of England, as that of 1846, since 1842, and seldom does it reach that point; and in 1842, although 141 days were wet or snowy, yet only 17·8 inches of rain fell in that year.

In 1845, the mean temperature was 48 degrees, and the rain which fell was 32·39 inches; and, in this year, the potato blight first appeared in England—the temperature being nearly the same as in the past year, but the quantity of rain more by 8·19 inches, than that which fell in 1847.

Should you deem the table and these remarks of any in-

terest or value to the Club, I beg to place them at your disposal,

And am, dear Sir,

Yours truly,

JOHN S. DONALDSON SELBY.

The following *Meteorological Table* is compiled from the daily register kept at Cheswick, by Alexander Aitkin, gardener to John S. Donaldson Selby, Esq., being for the year ending December 31, 1847.

Cheswick is situated in latitude 55 degrees 41 minutes N., longitude 1 degree 53 minutes W. It stands 95 feet above the level of the sea, from which it is distant one mile, on the coast of Northumberland, 5 miles south from Berwick-upon-Tweed.

Months in 1847.	Thermometer.			Pluviometer.			
	Lowest.	Highest.	Mean.	Rain in inches.	Dry Days.	Rainy Days.	Snowy Days.
January,....	21	41	35	3·7	25	4	2
February, ..	15	47	21	1·14	23	5	
March, ...	18	54	27	0·46	28	2	1
April, ...	25	55	40	1·11	26	3	1
May,.....	32	70	58	3·73	23	8	
June, ...	41	73	62	2·16	20	10	
July,.....	44	80	68	1·86	28	3	
August,.....	44	71	54	1·78	25	6	
September,	28	60	42	1·24	25	5	
October,....	32	58	41	2·33	22	9	
November,.	28	56	44	1·48	21	8	1
December,.	25	50	37	3·84	17	9	5
Mean for year,	...	...	44	24·20	283	72	10

The mean temperature for the year 1847 was 44° of Faht.'s thermometer, and the number of inches of rain fallen during the year, 24·20.

Mean temperature for 1846 was 48° of Faht.; inches of rain for do. was 36·56; rainy and snowy days in 1846, 171, and in 1847, 82 days; fair days in 1846, 194, and in 1847, 283 days.

Notes on the Wood Pigeon. By Mr. Archibald Hepburn.

We have no means of ascertaining with certainty, whether or not the Wood Pigeon is indigenous to Scotland, but if we cast a retrospective glance at the physical features of the country and the state of its agriculture, and note the changes which have preceded the settlement of this bird in other districts, I think we shall be entitled to conclude, that it can only be ranked as a colonist, of comparatively recent appearance, even in the south. For the sake of convenient illustration, I shall confine my remarks chiefly to the facts connected with the history of the species in East Lothian.

An adequate supply of food is the first desideratum with every organised being; and, secondly, a safe retreat from the inclemency of the weather, and for the purpose of rearing its young. If we look at the wretched system of agriculture, called *infield* and *outfield*, which prevailed throughout the greater part of last century, and the scanty breadth of turnips and red clover, which constitute so large a proportion of the food of this bird, one cause of his scarcity becomes very obvious. So far back as the middle of the 16th century, our primeval woods had almost disappeared, and the various legislative enactments respecting the planting of trees were disregarded. About 1650, large plantations of oak, elm, beech, ash, and Scots pine, were formed on Lord Tweeddale's estate, near Gifford. In 1720, the noble woods at Tynningham were planted; and, in later times, considerations of beauty, shelter, and profit, have added greatly to the extent of our woodlands. The grand old woods of England furnish an abundant supply of acorns and beech mast to the pigeons during the winter; but, notwithstanding all the happy ameliorations effected in the climate by judicious planting and draining, both are a most precarious crop in this country; and, moreover, the beech, so far as I can learn, was only introduced into Scotland about the middle of the 17th century. Turnip husbandry, and the cultivation of red clover, were introduced about 1740, but it was not till 20 or 25

years afterwards that their value was generally perceived; a constant supply of food was thus secured. The increase of fir plantations, which are their delight, the introduction of the pheasant in an evil hour, about the beginning of the present century, and the strictness with which the woods are guarded during the breeding season, have all contributed to the great increase of wood-pigeons, until, from being altogether unknown, or at all events exceedingly rare, they have become the most abundant, and undoubtedly the most destructive of all our agricultural pests. I am acquainted with a man, now 65 years of age, whose bird-nesting days were spent in the woods near Gifford, already mentioned, and he states that the wood-pigeons were then so very rare that the discovery of a nest was looked upon as a great feat; and there are several people in the parish of Dirleton, who remember having gone to look at a wood-pigeon feeding in a cottage garden during the "long snow storm" of 1791.

Wood-pigeons assemble in large flocks, and subsist on the gleanings of our fields, in the beginning of the winter, after which they attack the leaves of the red clover, with such severity, that it generally perishes; and the great difficulty now experienced in growing a full crop of this plant, is in a great measure owing to the ravages of these birds. The leaves of the winter-sown wheat are also sought after, but the leaves and bulbs of the Swedish turnips are their chief support during winter. Personal observation does not enable me to state that these birds can break up a fresh bulb; but wherever one is broken by hares, rabbits, pheasants, partridges, or rooks, they can make a meal on the remnant, and most of these bulbs ultimately perish. By stripping off the leaves, the system of the plant is unnecessarily exhausted in putting forth new ones to supply its necessities in spring, and if the crop is allowed to stand for seed, its progress towards maturity is greatly retarded. At all seasons they attend closely upon the sower for the uncovered grains, and after the young leaves peep forth they will, where the land is suitable, dig down, by means of sidelong pushings with the bill, for the remains of the seed. Tares are their favourite food, the pea and bean, wheat, oats, and barley. The leaves of the two first-named

legumes are often completely stript, to the great injury of the crop. Newly-sown turnip seed is often picked up; and no sooner has the valuable Swedish turnip escaped the ravages of its insect foes, by putting forth its second pair of leaves, than the wood-pigeons commence their well-known depredations. When food becomes scarce in summer, they again resort to the red-clover. As the season advances, the ripening corn next attracts their attention, and choosing some quiet corner, if possible near a wood or hedgerow (hence the evil eye with which farmers in general regard those noble ornaments of the landscape), they resort thither, day after day, notwithstanding the frequent report of the watchman's gun, or rattle, until the crop is carried.

In March they begin to pair, the vast flocks break up, and their disposition becomes altogether changed. Their proverbial shyness gives place to greater confidence in man, and they admit of a nearer approach, both in field and woodland; nay, a few pairs will take up their abode in the trees about the homestead, and their plaintive cooings may be heard from March to November. They nestle in almost every species of tree, both in woods and hedgerows, and even in the hedgerows where these are permitted to grow tall and bushy; and in such situations, their nest is often constructed with the stems of the *wrack*, or *creeping Couch-grass*, instead of twigs. Two or three broods are reared in the season, and as the male may sometimes be heard cooing over the eggs, it would appear that he occasionally assists in the labours of incubation. When the nest is robbed, the birds do not always forsake the neighbourhood, and I am credibly informed that the wood-pigeons, on the estate of Seacliff, in this county, which may be from 800 to 1000 acres in extent, having a considerable breadth of woodlands, were so persecuted by three boys, hired by the proprietor, at the rate of one half-penny for every pigeon's egg, that, toward the end of the breeding season, they built no more nests on being robbed, but laid two or three sets of eggs in succession in the same nest.

But after this long catalogue of injuries, the benefits which these birds confer on agriculture must also be noted. In April, the ripened seed-vessels of the ivy-leaved Speedwell

(Veronica hederifolia), and the chickweed (Stellaria media) are in good request, so also are the young leaves and seed pods of the wild mustard (Sinapis arvensis)—a poor return, indeed, for their systematic plunderings the livelong year.

In conclusion, I beg to state that, after having made a series of inquiries relative to this bird amongst farmers, from almost every county in Scotland, from the borders to the sunny valleys in the wilds of Ross-shire, where the prudent storemaster raises a little patch of turnips to cherish the sickly members of his flock, most of them agree in saying that the appearance and subsequent increase of the wood-pigeon has followed the introduction of the clovers and turnip, and the extension of fir plantations, and all parties look upon these birds as the greatest curse to agriculture. It is the duty of all landlords to lend a willing aid in their destruction, and those funds, which most agricultural societies devote to premiums for fat stock, might be more beneficially employed in promoting this object.

Note and Description of the Female Bridled Guillemot. (Uria lachrymans.) By Mr. ARCHIBALD HEPBURN.

Amongst the various specimens of birds obtained during an excursion to the Bass, on the 25th of July, 1840, there was one of a Guillemot, whose peculiar markings on the head attracted my attention, and, on pointing these out to the boatmen, who were also the lessees of the rock, they at once declared, that though the bird was pretty common on the Isle of May, only one or two specimens had been killed at the Bass. The markings on my specimen did not agree with those of the common Guillemot (Uria troila), to be seen in the Edinburgh College Museum, nor with descriptions to which I had access, until I obtained the loan of "Yarrell's British Birds" in July, 1846, and then it appeared to me to agree most closely with the description of Uria lachrymans, and this opinion was confirmed by Prideaux Selby, Esq., of Twizel, at the meeting of the Berwickshire Naturalists' Club, at Cockburnspath, in August, 1846. In the interim, I had re-

peatedly endeavoured to obtain more specimens, but without success, and not having visited the Isle of May, I cannot verify the boatmen's report; however, its occurrence there is by no means improbable, seeing that it has been found on the coasts of Yorkshire and Durham. Mr. Yarrell does not state that the bird has been found breeding there, nor am I entitled to assert that my specimen had resorted to the Bass for that purpose; the evidence then is merely conjectural as to this being the first instance of this species having been found breeding in Great Britain, and, not having seen the second edition of Yarrell's work, it is very possible that this discovery, if, indeed, it is entitled to rank as such, has been anticipated.

I prepared the skin, and ascertained that the bird was a female. On examining the digestive organs, the œsophagus was found to be very wide, thin, its lower portion and the proventiculus considerably dilated; stomach moderately muscular, its epithelium dense and plicate; intestine long, rather wide; cœca of moderate size.

Bill shorter than the head, straight, stout, compressed, tapering, and acute; the upper mandible with the dorsal outline slightly arched, the sides sloping, the lip decurved with a slight notch; the lower mandible with a long and narrow angle, the dorsal line ascending and straight, the sides almost flat, the tip acute; the edges of both mandibles are sharp and inflected; the nasal groove broad, and feathered; nostrils sub-basal, longitudinal, and linear.

The eyes of moderate size; apertures of the ears very small; head large, and somewhat ovate; body depressed, and rather full; feet short, placed far behind; tarsus short, strong, scutilate in front; wings small, narrow and acute; primary quills curved; first and second longest; tail of twelve feathers.

Bill black, around the eye a narrow ring about 1-12th broad, of pure white, and a line, slightly decurved, of the same colour, about 11½-12ths in length, passing from the eye backwards and downwards on the neck; head, throat, and upper part of the neck, and lower portion of the neck behind, and back, dull greyish black; wings and tail of the same colour; tips of the secondaries and all the under parts of the body white; tarsi and feet brownish black; nails black.

	Inches.	Twelfths.
Length from the tip of the bill to the end of the tail - - -	19	4
Length of the wing from the flexure -	8	"
Bill along the ridge - -	1	11
Tarsus - - -	1	3
Middle toe - - -	2	6
Its claw - - -	0	7

Compare the above with the measurement of the Common Guillemot in "M'Gilivray's Manual of British Birds."

A Female.

	Inches.	Twelfths.
Length - - -	16	6

Male.

Length - - -	17	"
Wing from flexure - -	7	6
Bill along the ridge - -	1	6
Length of tarsus - -	1	5
Middle toe - - -	1	7
Its claw - - -	0	5

As the skin had been too much stretched in the course of preservation, this would materially affect the total length; but it is quite obvious, on comparing the measurement of the other parts, that this is the largest of the two birds. It was long contended that this bird was only a variety of the common Guillemot, but Mons. Thiéneman, and Mr. Proctor of Durham, have proved its title to the rank of an independent species. I am indebted to the kindness of Professor Goodsir, for reading the foregoing description at a meeting of the Wernerian Society of Edinburgh, in 1847; the specimen was laid upon the table, and yet, I am informed that Professor Fleming dissented from Mr. Selby's opinion, contending that it was only a variety. However, in his chapter on Zoology, in the "History of the Bass Rock," he states that the Bridled Guillemot (Uria lachrymans) has been shot there, which I take to be a rescinding of his former opinion.

August 28, 1848.

A Letter from William Brodrick, Esq., to the Secretary.

Belford, *July 24th*, 1848.

My Dear Sir,

As I shall not be present at the Meeting on Wednesday next, I wish to tell you that I have obtained, since our last meeting, a rather scarce and interesting bird, viz., a specimen of the Horned or Sclavonian Grebe (*Podiceps cornutus*), in the perfect *summer* plumage, killed a few weeks back, near Newton-on-the-Sea. As the bird is seldom met with in this plumage, perhaps the circumstance is worth mentioning to the Club.

Believe me to be very truly,
Yours,
Wm. Brodrick.

Catalogue of some of the rarer Border Coleoptera, shown to the Berwickshire Naturalists' Club, at their Meeting at Grant's House, 26th July, 1848. By Mr. James Hardy.

1. Tarus basalis. Moor above Ecklaw.
2. Lamprias chlorocephalus. Mouth of the Pease-burn.
3. Dyschirius æneus. Swinton. The pool, on the side of which it was taken, was frequented by Bledius fracticornis.
4. Dyschirius gibbus. Penmanshiel. Border of a rivulet.
5. Amphigynus (Calathus) piceus. Near Nenthorn.
6. Omaseus orinomum. Hill near Ecklaw.
7. ——— bulwerii. Mourne Mountains, Ireland.
8. Pterostichus oblongopunctatus. Northampton. These three appear to me to constitute one species, varying in lustre, and the colour of the tibiæ.
9. Steropus æthiops. = cognatus, *Steph.* } Penmanshiel.
10. Miscodera arctica. Moor near Drakemire.
11. Amara patricia. = Bradytus marginatus, *Curt.* } Moor near Drakemire.
12. Ophonus puncticollis. Coast at the Ewe Lairs, near the Cove shore.
13. Trechus (Epaphius) secalis. Penmanshiel.

14. Trechus cognatus. Heath near Ecklaw.
15. Tachys obtusus. } Penmanshiel.
= immunis, *Kirby*. }
16. Blemus pallidus. Gravelly shore near Redheugh.
17. —— paludosus. Border of a moss; Penmanshiel.
18. Tachypus striatus. Tweed below Kelso.
19. Peryphus decorus. *Panz.*
= viridi-æneus, *Spence*. Stitchell Lynn.
20. Philocthus æneus. Swinton-hill.
21. Hydroporus assimilis, *Payk.* } Near Milne Graden.
= frater, *Steph.* }
22. —— latus. Braid Bog-burn.
23. —— rivalis, *Gyll.* } Near Milne Graden.
= fluviatilis. }
24. —— angustatus. Swinton-hill.
25. —— davisii. Pease Dean.
26. —— lineatus, *Fab.* } Swinton-hill.
= ovalis, *Marsh.* }
27. —— xanthopus, *Steph.* } Swinton-hill.
= flavipes, *Steph.* }
28. Colymbetes paludosus. Generally rare; but not uncommon in a rivulet of pure water in Pease Dean.
29. —— ater. Swinton-hill.
30. —— chalconotus. Ib.
31. Gyrinus minutus. Peat pits near Penmanshiel.
32. Parnus auriculatus. Near Scaithmuir.
33. Heterocerus marginatus. Borders of a pool near Swinton-hill, and of the Pease burn, burrowing in the clay.
34. Hydrochus angustatus. Borders of grassy pools, Swinton-hill.
35. Hydrochus parumoculatus. Nova species. Newcastle.
36. Hydræna riparia. Simprim.
37. Octhebius pygmæus. Pool at Swinton-hill.
38. Phalacrus æneus. Lennel-hill.
39. —— ulicis. Bogs near Quixwood.
40. Ephistemus globulus, *Payk.* } Penmanshiel.
= gyrinoides, *Marsh.* }
41. Leioides humeralis. Near Dunse.
42. Agathidium nanum. Penmanshiel Wood.
43. Clambus armadillus. Pease Dean.
44. Catops chrysomeloides. Penmanshiel.
45. —— velox. Penmanshiel.
46. —— anisotomoides. Sea coast of Cockburnspath.
47. —— moria. Howpark Dean.
48. Sphærites glabratus. Penmanshiel Wood. The only other native specimen is in Stephens' collection.

49. Nitidula pusilla. Bark of fir; Prestonhaugh.
50. Strongylus ferrugineus. In a Lycoperdon, near Lennel-hill.
51. Cateretes pedicularius, *m.* Langstruther Bog.
52. ——————— do. *m.* and *f.* Pressmennan Lake, East Lothian.

This appears to be the Anisocerus spirææ of Howitt.

53. Tetratoma ancora. Mellerstain, by Mr. Hislop.

This variety described in the Club's Proceedings, is the T. picta of Newman; T. ancora, var. B. of Gyllenhal.

54. Ips quadripustulata. Prestonhaugh.
55. — quadripunctata. Do.
56. — ferruginea. Milne Graden Woods.
57. Cryptophagus typhæ. Burr-reed, at Butterlaw, by Simprim.
58. Rhyzophagus depressus. Blackburn-rigg Wood.
59. Aspidiphorus orbiculatus. In moss, Kitchencleugh Dean.
60. Trinodes hirtus. Under a decaying pine, Penmanshiel Wood.
61. Rhyzophagus cœruleus, *Waltl.* Isis, 1839. } Newcastle.
= cyaneopennis, *Hdy.* Ann. Nat. Hist. }
62. Aphodius depressus. Magdalen Fields.
63. ——— erraticus. Penmanshiel.
64. Ctenicerus tessellatus. Banks of the Eye, near Blackburn-rigg Wood.
65. Atopa cervina. Dry pasture near Blackburn-rigg Wood.
66. Ragonycha pilosa. Blackburn-rigg Wood.
67. Ptinus rufipes. } Penmanshiel.
= germanus. }
68. Anobium castaneum. Trunk of beech, Penmanshiel Wood.
69. Hylesinus fraxini. Under bark of ash, near Milne Graden.
70. Hylastes rhododactylus. Kitchencleugh Dean.
71. Tomicus bidens. Scotch fir, Milne Graden and in Penmanshiel Wood.
72. Gymnaetron nigrum. On Veronica beccabunga, Swinton-hill, Scaithmuir, and Nenthorn; and on V. anagallis, near Stitchell.
73. ——— tricolor. On Plantago lanceolata, at Swinton-hill and Scaithmuir.
74. Cionus scrophulariæ. On Scrophularia nodosa, in Pease Dean.
75. —— blattariæ. Do.
76. Orobitis cyaneus. Bog near Howpark.
77. Poophagus sisymbrii. On water-cress.

78. Nedyus erysimi. Fairneyside sea-banks.
79. Ceutorhynchus sulcicollis. On mustard, Dunse.
80. Nedyus (species non determinata). Coast near Cockburnspath.
81. Ceutorhynchus guttula. Scaithmuir Toll.
82. Nedyus (species non determinata). Milne Graden.
83. Phytobius myriophylli. On Lemna minor, near Swinton-hill.
84. Anoplus plantaris. Penmanshiel Wood. It attacks the young buds of the birch, which wither in consequence.
85. Orchestes bifasciatus. Sallows, Penmanshiel Wood.
86. Hydronomus alismatis. On Alisma plantago, in pools near Swinton and Simprim.
87. Otiorhynchus monticola. On Traprain Law, East Lothian, at the base as well as the summit.
88. Trachyphlæus tessellatus. Coast near Cockburnspath.
89. ——— scaber. Do.
90. Sitona humeralis. Milne Graden Woods.
91. Polydrusus micans, *Linn.* Penmanshiel Wood.

This species deposits its eggs on the leaves of the hazel, the lobes of which near the apex it twists round, and glues down in the form of a pouch, which is open at both ends. These it perhaps closes on finishing laying. The eggs are small, oval, white, semi-translucent. I counted 31 in the nest of a female I surprised in the act of oviposition.

92. Otiorhynchus rugifrons. Coast near Cockburnspath.
93. Apion vorax. Milne Graden Woods.
94. Rhynchites megacephalus. Birch, Kitchencleugh.
95. —— nanus. Birch and sallow, Penmanshiel Wood.
96. —— æneovirens. Hazel, do.
97. Attelabus curculionoides. Oak, do.

It folds up the leaf of the oak in the shape of a soldier's knapsack. It begins near the base of the leaf, and cuts obliquely inwards from the outer edge on either side to the mid-rib, leaving a portion of the leaf growing. It then appears to bite the part of the leaf it is going to use, all along the mid-rib, both below and above, to render it pliant. It next cuts off the mid-rib, till it bends with the weight of the apical portion of the leaf, in a line with the two oblique incisures it has already made from the sides. This prevents the sap from entering that portion it intends to use as a protection for its eggs. I have not noticed its operations any further; but, by examining the leaves operated upon, it appears to bring the two edges of the leaf together; and, after the egg is placed at the apical end, this double portion is folded up, and the ends pushed in. The mid-rib is placed uppermost.

The process can easily be imitated with the fingers. The egg is yellow, and nearly circular; a single one occurs in each bundle. Sometimes two insects occur on a leaf, but in this instance the male appears to have surprised the female in the midst of her work. It is only the young fresh leaves that are attacked. The insect also eats the leaf for its own subsistence. It is nearly fourteen years since the insect was so abundant as during the present season.

98. Rhinomacer attelaboides. Swinton Hill. It probably frequents the elm.
99. Leiopus nebulosus. Glyn Fyn Dean.
100. Rhagium inquisitor. Broom, Pease Bridge.
101. Grammoptera ruficornis. On broom, and Rosa tomentosa. Pease Bridge.
102. ——— lævis. Pease Dean.
103. Pachyta octomaculata. Newcastle. Occurs in the Pease Dean, on Angelica sylvestris.
104. Crioceris puncticollis. On a thistle, on the banks of the Eden, at Nenthorn.
105. ——— cyanella. Penmanshiel.
106. Cassida obsoleta. Grass, Penmanshiel.
107. Haltica pseudacori. Nenthorn.
108. Macrocnema napi. On Cardamine sylvatica. Pease Dean.
109. ——— chrysocephala. = Rapae. } Penmanshiel.
110. ——— spergulæ, *Gyll.* = picicornis, *Steph.* } Ib.
111. Macrocnema picina. Sowmire, at Swinton.
112. ——— mareida. Cakile maritima, foot of Peaseburn.
113. Mantura obtusata. On Helianthemum vulgare, at Stitchell Lynn.
114. Cryptocephalus moræi. On Hypericum pulchrum, near Blackburn-rigg Wood.
115. Chrysomela hyperici. On Hypericum pulchrum, Penmanshiel.
116. ——— varians. On ditto, Blackburn-rigg Wood.
117. ——— pallida. Cockburn, Mr. Hislop.
118. Phædon aucta. Coldingham-moor.
119. Coccinella oblongo-guttata. Penmanshiel Wood.
120. ——— ocellata. On whin, do.
121. ——— impustulata. Do.
122. ——— hieroglyphica. Near West Preston. Heath.
123. ——— 14-guttata. Fairneyside. Nettles.
124. ——— M.-nigrum. Firs, Penmanshiel Wood.

124. Scymnus limbatus. Howpark Dean.

125. Anaspis fasciata. Meadowsweet, on the banks of the Eden, at Nenthorn.
126. Salpingus ruficollis. Beech, Pressmennan, East Lothian.
127. Notoxus monoceros. Foot of the Pease-burn.
128. Scydmænus pusillus. Penmanshiel.
129. Bryaxis juncorum. Bog, do.
130. Arcopagus puncticollis. Moss, Penmanshiel Wood.
131. Euplectus nanus, *Reich.*
= Reichenbachii, *Lch.* Do.
132. Autalia impressa. Do.
133. —— rivularis. Swinton-hill.
134. Calodera nigricollis. Border of a pond, Swinton-hill, with Myrmica rubra.
135. Myrmedonia canaliculata. On the coast at Ewe-lairs, with M. limbata, in nests of Formica fusca.
136. Ocalea picata. Damp situations, Penmanshiel Wood.
137. Myrmedonia limbata. On the coast at the Ewe-lairs, in nests of Formica flava. The nature of the association of Staphylinidæ with ants has hitherto not been determined. This species lives upon the ants, as I ascertained by finding an individual surrounded by the fragments of its prey.
138. Calodera longitarsis. Simprim.
139. Tachyusa flavitarsis, *Sahlb.* Pressmennan. New to Britain.
140. Bolitochara lunulata. Howpark Dean ; in fungi.
141. ——— obliqua. Milne Graden ; under bark.
142. Homalota graminicola. Penmanshiel, edge of streams.
143. ——— elongatula. Swampy places, Penmanshiel.
144. ——— brunnea. Howpark Dean.
145. ——— socialis. Penmanshiel Wood, in fungi.
146. ——— vicina. Penmanshiel.
147. Gyrophæna boleti. Howpark Dean.
148. ——— complicans. Penmanshiel Wood.
149. Aleochara ruficornis, *Grav.*
= Ceranota daltoni, *Steph.* Penmanshiel Wood.
150. ——— obscurella. Under sea-weed ; common.
= Polystoma id. *Steph.*
151. Oligota pusillima. Penmanshiel.
152. Oxypoda longiuscula. Pease Dean.
153. ——— ferruginea, *Er.* Blackburnrigg Wood.
154. ——— alternans. Do.
155. Gymnusa brevicollis. Side of Sisterpath-burn ; a new British insect. Mr. Haliday has taken it in Ireland.

156. Myllæna dubia.
= Ceutroglossa attenuata, *Matthews.* } Simprim.
In a gravelly stream.
157. Conurus lividus, *Er.* Sea coast of Cocksburnspath.
158. Mycetoporus splendidus. Blackburn-rigg Wood.
159. Hypocyptus læviusculus. Penmanshiel.
160. Tachinus elongatus. Sea-coast at Ewe-lairs.
161. Staphylinus maxillosus.
Var. ciliaris. Cockburnspath Tower Dean.
162. Staphylinus latebricola, *Grav.*
= S. æriceps, *Kby.* } Drakemire.
163. Ocypus morio.
= Staph. cantianus. } Penmanshiel.
164. Quedius lateralis. Wood near Mellerstain.
165. ——— picipes. Penmanshiel Wood.
166. ——— semi-obscurus. Do.
167. ——— maurorufus. Do.
168. ——— peltatus. Mellerstain.
169. ——— ruficollis. Blackburn-rigg Wood.
170. ——— scintillans. Kitchencleugh.
171. Philonthus scutatus. Coldingham-moor.
172. ——— albipes. Penmanshiel.
173. ——— sordidus. Do.
174. ——— umbratilis. Do.
175. ——— debilis. Do.
176. ——— discoideus. Do.
177. ——— ventralis. Do.
178. ——— sanguinolentus. Do.
179. ——— fulvipes. Stitchell Lynn.
180. ——— parumpunctatus. Penmanshiel.
181. ——— cephalotes. Do.
182. ——— aterrimus. Do.
183. ——— procœruleus. Coast at Ewe-lairs.
184. Othius pilicornis. Mellerstain.
185. —— læviusculus. Dunbar, East Lothian.
186. Leptacinus parumpunctatus. Penmanshiel.
187. ——— batychrus. Do.
188. Lathrobrium quadratum. Kitchencleugh.
189. ——— multipunctatum. Coast at Ewe-lairs.
190. ——— longulum. Coast at Redheugh.
191. Lithocharis ochraceus. Penmanshiel.
192. Astenus angustatus. Sowmire, at Swinton.
193. Rugilus orbiculatus. Sisterpath-dean.
194. Dianous cœrulescens. Do.
195. Stenus bimaculatus. Kitchencleugh.
196. —— guttula.
= Kirbii. } Simprim.

197. Stenus Juno, *Pk.* Kitchen Cleugh.
198. —— pubescens, *Kirby.* = subimpressus, *Er.* } Swinton-hill.
This and the next species are found about the roots and stems of Equiseti. They swim rapidly when thrown into the water, and gain the shore by their repeated jerks.
199. Stenus binotatus, *Liungh.* = St. lævior, *Kby.* } Swinton-hill.
200. —— nitidiusculus, *Kby.* = tempestivus, *Er.* } Kitchen Cleugh.
This species frequents the borders of rivulets, in the moistest situations, and is often seen crawling over the wet herbage.
201. —— phæopus, *Kby.* nitidus, *Kby.* } = plancus, *Er.* Swinton-hill.
202. —— picipes, *Kby.* = rusticus, *Er.* } Milne Graden.
203. —— bupthalmus. Coast at Ewe-lairs.
204. —— pusillus, *Kby.* Penmanshiel.
205. —— nanus, *Steph.* = pusillus, *Er.* } Do.
206. —— pallipes, *Grav.* = immunis, *Marsh.* } Nenthorn and Mellerstain.
207. —— flavipes, *Kby.* = filum, *Er.* } Penmanshiel and Nenthorn.
208. —— proboscideus, *Gyll.* = ossium, *Kby.* } Kitchen Cleugh, Mellerstain, &c.
209. —— impressus, *Germ.* = aceris, *Kby.* = juncorum, *Leach.?* } Penmanshiel.
210. —— Boops, *Gyll.* = nigricornis, *Kby* = speculator, *Er.* } Common.
211. —— oculatus. Penmanshiel.
212. —— fulvicornis, *Kby.* = paganus, *Er.* } Do.
213. —— brunnipes, *Kby.* = latifrons, *Er.* } Do.
214. —— tarsalis, *Gyll.* = nigriclavis, *Kby.* } Blackburn-rigg Wood.
215. Bledius fracticornis. Borders of a pond, at Swinton-hill, burrowing in the sand, and the cracks formed in the mud, whence they were driven by pouring water over them.
216. —— opacus, *Block, Er.* = Hesperophilus hæmopterus, *Kby.* }
Under a stone on the coast at the Ewe-lairs, not far from the foot of the Pease-burn.

217. Bledius subterraneus, *Er.* On the banks of the Eye and the Pease-burn, forming shallow runs under the sand. Mr. Haliday found it on the shores of Lough Neagh. I have also found it on the Derwent, near Gibside, co. Durham.

218. Phytosus spinifer, *m.* and *f.* This I found for the first time in the month of April, under sea-weed, at the Ewe-lairs.

219. Oxytelus sculptus, *Grav.* = antennatus, *Kby.* } Penmanshiel.

220. ——— flavipes, *Steph.* Under sea-weed, on the coast at the Ewe-lairs. It is also common near South Shields.

221. ——— nitens, *Marsh.* = luteipennis, *Er.* } Penmanshiel.

222. Trogophlæus pusillus. Border of streams, under rubbish, fuci, &c. Penmanshiel, Swinton-hill, and Ewe-lairs.

223. Trogophlæus bilineatus. Penmanshiel. This, as well as the other species, burrow in mud.

224. ——— fuliginosus. Do.

225. Coprophilus striatulus. Swinton-hill.

226. Megarthrus sinuatocollis, *Lacord.* = depressus, *Steph.?* } Penmanshiel.

227. Phloeobium clypeatum = Megarthrus retusus, *Kirby.* Penmanshiel.

228. Deliphrum tectum. Penmanshiel.

229. Lathrimæum atrocephalum. Do. Sap of birch trunks.

230. Olophrum piceum. Marshes. Penmanshiel Wood.

231. Omalium concinnum. Penmanshiel.

232. ——— iopterum, *Kby.* Pressmennan Wood. Found at Penmanshiel and Mellerstain.

233. Arpedium subpubescens. On the furze, Penmanshiel.

234. Omalium florale. On the broom, Pease Dean.

235. ——— læviusculum, *Gyll.* = læve, *Steph.* } Sea-weed at Ewe-lairs.

236. ——— pusillum. Fir bark, Blackburn-rigg Wood.

237. Acidota crenata. Milne Graden.

238. —— cruentata, *Mann.* = rufa, *Steph.* } Penmanshiel Wood.

239. Lesteva impressa, *Kby.* = punctata, *Er.* } Swamps; Penmanshiel Wood.

240. Boreus hyemalis. Winter.

241. Cheiropachus sp. Parasitic on Hylesinus fraxini.

242. Aëpus fulvescens. Coast east of Dunbar, in company with Anoura maritima.

On the Discovery of Anacharis alsinastrum in Berwickshire.

By George Johnston, M.D., &c.

On the 3d of August, 1842, I found, in the lake at Dunse Castle, a plant, which interested me from its neat and peculiar habit. It grew, entirely submerged, amongst the ordinary pond *Potamogetons*, and a plant in flower could nowhere be seen. A specimen was sent to Mr. Babington, and afterwards, at his request, two or three other specimens were forwarded to him; and I learned, from Mr. Babington, that he had submitted them to the inspection of Mr. Borrer. It is unnecessary to say more than that my quest after the name and character of the plant was very unsatisfactory; and the interest in it decayed and died away under the persuasion that the plant might have been introduced into the lake with some other aliens from the south. This persuasion was confirmed by Dr. Philip W. Maclagan, at a subsequent period, who, on seeing a specimen in my possession, at once told me it was an *Udora*, and, he believed, the same as the Canadian species. I presumed, therefore, the more that it was foreign to our district; and my interest lay dormant, until revived by the perusal of Mr. Babington's description of the *Anacharis alsinastrum*, in the "Annals of Natural History" for February, 1848, for in this *Anacharis* I immediately recognised my Dunse Castle herbelet.

On writing to Mr. Babington, he replied, that he "had totally forgotten the plant" I had sent him, and the specimens were lost. I could not comply with his demand for other specimens, seeing that the habitat is sixteen miles distant from my residence; and to few provincial practitioners is given the leisure to ride thirty-two miles in order to cull a simple for the gratification of his own or of another's curiosity. My good fortune, however, was on the ascendant. A few weeks only had passed over, when I again found the *Anacharis* in a habitat in which it was, beyond all doubt and suspicion, most truly indigenous. On the 9th of August, whilst angling in the Whitadder, at Newmills, in the Liberties of Berwick, I was most agreeably surprised to find the

plant growing with *Potomogeton crispum, pusillum,* and *perfoliatum,* in the bed of the river, at a depth of about fifteen inches. In the lake at Dunse Castle, the *Anacharis* had a long slender stem, but here, influenced by the stream, it grew in a roundish tuft or bunch, with stems not exceeding three or four inches in height. None of them rose to the surface, and on none of them were there any flowers.

On September 4, I again discovered the *Anacharis* in great abundance, in a small creek at a still and deep reach of the Whitadder, between Whitehall and Edington Mill. Here it had the habit of the plant in Dunse Castle Loch, with stems from two to three feet in length. None of them were in flower.

It would be presumptuous for me to say, whether the *Anacharis alsinastrum* is identical with the *Udora canadensis* or not. I have specimens of the latter from Dr. P. W. Maclagan, gathered in Detroit River, July, 1848, and they resemble exactly our Whitadder plant, as found at the Newmills station; but, like this, the Canadian specimens have also no flowers. I can see no difference of any moment in the shape of the leaves, for this differs in the British as in the American plant; and the structure and marginal serratures are exactly alike. The spinulose serratures begin in both about the middle of the leaf, and are of a brown colour, and firm texture. The apex of the leaf in the Canadian *Udora* is usually more pointed or lanceolate than of the Whitadder *Alsinastrum,* but, in an aquatic plant, such a slight character is of no consequence. Pursh, in fact, of the American plant, says:—"Michaux describes the leaves to be oblong and obtuse, which is only the case in the early part of the season; at flowering time they constantly are long linear and acute." —*Flor. Amer. Sept.* p. 33.

The American plant is "frequent from Canada to Virginia." Dr. P. W. Maclagan writes me, that it is extremely common in Upper Canada, "but I never could make more than one species, although I looked at them well after I got Mr. Babington's paper. Dr. Gray makes but one species in the Northern States." Dr. Gray's description of *Udora canadensis* is as follows:—"A perennial ? herb, growing under water

with elongated branching stems, thickly beset with pellucid and veinless, 1, nerved, sessile, whorled or opposite leaves," which, in the specific character, he says are "oblong, ovate or lanceolate, finely serrulate (½ long)."—All this agrees with our Berwickshire plant. Dr. Gray continues,—"The stammate flowers break off as in *Valisneria*, and float on the surface, where they expand and shed their pollen to fertilize the stigmas, which are raised to the surface by the excessively prolonged calyx tube which varies in length according to the depth of the water."—*Bot. North. Un. States*, p. 462.

The ACARIDES *of Berwickshire specifically described.*

By GEORGE JOHNSTON, M.D., &c. (Continued from page 233.)

7. TROMBIDIUM HOLOSERICEUM.

Blaine-worm, *Mouf.* Insect. Theat. c. 19, p. 141.—Araneola ruberrima boves mordens, *Blain worms*, *Twings*, et in Borealibus, *Tings*, quæ inter buprestas numeratur, a Mouf. 141, 9, *Merret* Pinax, 203.—Araneus exiguus, coccineus, vulgo Anglice a Tant dictus, *List.* Anim. Ang. 100, tab. fig. 38. —Araneus Anglicus coccineus minimus, *Petiv.* Mus. p. 65, no. 701.—Acarus terrestris ruber abdomine depresso, *Lin.* Faun. Suec. p. 348, no. 1200. *Geoff.* Hist. Insect. ii. 624.—Acarus holosericeus, *Lin.* Syst. 1025. Faun. Suec. 2d edit. 482. *Mull.* Zool. Dan. prod. 186, no. 2216. *Fabric.* Faun. Gröenl. 222. *Turt.* Gmel. iii. 709. *Stew.* Elem. ii. 324.—Scarlet Acarus, *Loud.* Encyclop. Garden. p. 435, fig. 411 *b.*—Trombidium holosericeum, *Latr.* Gen. Crust. et Insect. i. 145. *Lam.* An. s. vert. v. 63; 2de edit. v. 83. *Latreille* in Cuv. Reg. Anim. iv. 284. Griffith's Cuv. xiii. 503, pl. 17, fig. 2. *Risso* l'Europ. merid. v. 179. Orr's Cuv. 470. *Leach* in Edin. Encyclop. vii. 416; and in Sam. Ent. Com. 131. *Walck.* and *Gerv.* Insect. Apt. iii. 179, pl. 36, fig. 1.

DESC. Mite ⅛th, of a uniform scarlet colour and velvet appearance, with legs about the length of the body: *Body* quadrangular with obtusely rounded angles, widest in front, sinuated behind, the back flattened, foveolate, a square space in front circumscribed by an impressed line, and behind it a short mesial line with two lateral foveolæ, and a deep im-

pressure still further backwards: *Venter* paler, convex, marked with two ridges across the corslet, a deep cleft down the posterior half, and two foveolæ near the vent: *Palpi* porrect, pediform but short, stout, very hirsute, pointed, 4-jointed, the second joint large, the terminal with a dark claw and with a moveable pear-shaped appendage suspended underneath: *Legs* 8, alike, in two distant sets, the anterior pair stoutest and rather longer than the posterior pair, the second and third pairs shorter and nearly equal, all of them filiform, densely hirsute, 7-jointed, the joints short, becoming almost insensibly longer, the ultimate elongate, obtuse, and terminated with two small curved smooth claws moving in the same direction.—The whole insect is thickly clothed with short hairs; those on the back are capitate and barbed with numerous erecto-patent spinules, but the hairs of the venter and limbs are sharp-pointed, although equally spinulose: the hairs on the inner aspect of the legs are longer than those on the outer edge.

Lister, who has given an excellent description of it, tells us that this insect is called a Tant in England. Our children call it the Soldier, from its scarlet colour; and from its brilliancy it draws their notice and admiration.* It is often to be seen in spring and early summer creeping across footpaths and in gardens; but abounds more on sandy parts of the seashore. It creeps with a moderate degree of quickness, and, when touched or alarmed, simulates death like a spider, folding the legs curiously under the belly. I find it mentioned by Mr Stewart that it "feeds on young caterpillars, on their emerging from the egg state."

The following paragraph in the "Enquiries into Vulgar and Common Errors" of the learned Sir Thomas Brown, relates to this insect:—"There is found in the summer a kind of spider called a Tainct, of a red colour, and so little of body that ten of the largest will hardly outweigh a grain; this by country people is accounted a deadly poison unto cows and horses; who, if they suddenly die, and swell thereon, ascribe their death hereto, and will commonly say, they have licked a Tainct. Now to satisfie the doubts of men, we have called this tradition unto experiment; we have given hereof unto

"* La vivacité de sa teinte rouge, l'aspect velouté de sa robe, sa fréquence fixent fréquemment l'attention des enfans, qui lui donnent dans beaucoup d'endroits des noms particuliers."—GERVAIS.

Dogs, Chickens, Calves, and Horses, and not in the singular number; yet never could find the least disturbance ensue. There must be therefore other causes enquired of the sudden death and swelling of cattle; and perhaps this insect is mistaken, and unjustly accused for some other. For some there are which from elder times have been observed pernicious unto cattle, as the *Buprestis* or Burstcow, the *Pityocampe* or *Eruca Pinuum*, by *Dioscorides*, *Galen* and *Ætius*, the *Staphilinus* described by *Aristotle* and others, or those red Phalangious Spiders like *Cantharides* mentioned by Muffetus. Now, although the animal may be mistaken, and the opinion also false, yet in the ground and reason which makes men most to doubt the verity hereof, there may be truth enough, that is, the inconsiderable quantity of this Insect. For that a poison cannot destroy in so small a bulk, we have no reason to affirm. For if, as *Leo Africanus* reporteth, the tenth part of a grain of the poison of *Nubia*, will despatch a man in two hours; if the bite of a viper and sting of a scorpion is not conceived to impart so much; if the bite of an Asp will kill within an hour, yet the impression scarce visible, and the poison communicated not ponderable, we cannot as impossible reject this way of destruction, or deny the power of death in so narrow a circumscription."—Bk. iii. p. 144–5.

A Trombidium, a native of Guinea and Surinam, is employed as a dye; "and," say Kirby and Spence, "it would be worth while to try whether our T. holosericeum, so remarkable for the dazzling brilliancy of its crimson, and the beautiful velvet texture of its down, which seems nearly related to T. tinctorium, would not also afford a valuable tincture." —Introd. Entom. i. p. 325.—The experiment is not worth the trial. The insect is, indeed, not uncommon, yet the expense of collecting a sufficiency of it for making the experiment would render any dye that might result valuable only as a costly rarity.

8. Leptus phalangii.

Leptus phalangii, *Leach* in Edin. Encyclop. vii. 413.—Acarus phalangii, *Turt.* Gmel. iii. 705. *Stew.* Elem. ii. 323.

Desc. Mite ovato-ventricose, of a uniform scarlet colour, glossy. *Body* convex dorsally, rounded at both ends, rather widest behind, even, covered with scattered short stiff

bristles; *venter* concave, smooth: *Rostrum* conoid, contracted at its origin, bulged at the origin of the palpi, whence it tapers to a cylindrical obtuse bifid point: *Palpi* rather longer than the rostrum, and originating from near its base, armed with a few bristles on the external edge, 3-jointed, 1st joint thick and large, 2d slenderer, 3d small and armed with two claws: *Legs* 6, all arising from the anterior third of the body, the first and second pairs almost coalescent at their origins, and the third a little more distant; they are all alike, the second pair rather shorter than the others, slender, filiform, scarcely so long as the body, bristly, of a uniform red or scarlet colour, 7-jointed, 1st joint short and stout, 2d small and globose, 3d thrice as long, 4th like the third, 5th longer, 6th nearly twice as long as the fifth, slender, the 7th or tarsal elongate-elliptical, larger but much shorter than the penultimate, and armed with two claws and a few bristles at the apex: *Bristles* of the body short and black, narrow at their origin, erect, thick and rough or somewhat barbed; those of the legs longer, sub-appressed, stout and setaceous, barbed with numerous spinules: *Skin* minutely striolate.—I could detect no eyes on the body; nor is there any appendage to the palpi as in Trombidia in general. In one specimen there was a comparatively large papilla on one side, and in another a protuberance behind with a deep lunate sinus. Specimens vary much in size; and in the very small ones the legs are proportionably longer to the body.

This mite lives on the Phalangia, especially on Phalangium opilio and cornutum, or long-legged spiders, attaching itself to the body and legs. It is common enough, and familiar to naturalists. When detached, it creeps slowly and awkwardly, as with a labour to itself; and if it falls perchance on the back it cannot recover the right position on a smooth and even surface. The legs make a beautiful object for the microscope. The head is like that of a tortoise when protruded beyond the shell.

The above description is made from specimens taken on the Phalangium opilio, for which I am indebted to Mr. James Hardy; and compared with fine specimens taken from Phalangia, in New-waterhaugh plantations. It agrees with the description of the Leptus phalangii given by other authors, except in asserting the absence of eyes. Latreille says that there are two black eyes in his species, and others either copy him or have seen them. Dugès says that

in the species examined by him there are two small brownish oval eyes situated towards the anterior rounded angles, and very distant from each other.* In all other respects the description of Dugès applies strictly to our insect. Some describe the legs as "longer than the body," which may be the case in very small individuals; and the same authors tell us that the mite lives on "spiders" as well as on Phalangia,† an assertion which no observation of mine confirms. According to Dugès the parasite infests the female Phalangia more than the males, for the latter frequently remove them from the body by means of their palpi, which are longer than in the females. To put themselves beyond the reach of these organs, the mites fix themselves principally behind the insertion of the posterior legs.

Mons. A. Dugès was, I believe, the first to discover the real character of the mites of the genus Leptus. It had been previously suspected that they were imperfect animals, but our knowledge was merely conjectural until Dugès ascertained that they were the larvæ of Trombidia and of allied genera. In June of the year 1832 this naturalist collected several specimens of a Leptus from the Phalangium opilio and cornutum, and placed them in closed vessels containing a little earth. They buried themselves to a greater or less depth in the interstices of the smaller lumps, where they became motionless, and so remained for twenty days. Dugès was here able to see through the skin the development of the eight legs, or at least the eight legs in a perfective state; and then he saw issue from this oviform smooth yellowish-red nymph, a perfect Trombidium of a scarlet colour and small size. This Trombidium he has described, and beautifully figured, under the name of Tr. phalangii, and he admits that it may be a variety of Tr. holosericeum. Until this point, however, is decided, it would be premature to identify our Leptus phalangii with the larva of the Trombidium phalangii of Dugès, for I am not aware that this is a native of Britain, and certainly it has not yet been detected in the Eastern

* Sept. 6.—I thought I detected these eyes as described by Dugès to-day, but uncertain whether the so-called eyes are not bristles.

† See Kirby and Spence, Introd. Entom. iv. p. 572.

Borders. Hence I have advisedly omitted all references to foreign authors in relation to our Leptus phalangii, which there can be scarce a doubt, from the structure of its bristles, is the larva of the true Trombidium holosericeum.

9. Erythræus rupestris.

Acarus lapidarius fuscus, linea dorsali bicolori, *Lin.* Faun. Suec. 349, no. 1202.—Acarus rupestris, *Lin.* Syst. 1026. Faun. Suec. 2d edit. 484. *Mull.* Zool. Dan. prod. 187, no. 2224. *Turt.* Gmel. iii. 706. *Stew.* Elem. ii. 323.—Erythræus phalangioides, *Latr.* Gen. Crust. et Ins. i, 146. *Leach* in Edin. Encyclop. vii. 416. *Stark* Elem. ii. 205. *Lam.* An. s. Vert. v. 61; 2de edit. v. 80. Griffith's Cuvier, xiii. pl. 11, fig. 5 (not good).—Rhyncholophus De Geer, *Duges* in Ann. des Sc. Nat. (1834) i. 30.—R. phalangioides, *Koch.* Uebers. 51.—Trombidium phalangioides, *Gervais* in Walck. Insect. Apt. iii. 176.

Desc. Mite two lines in length, depressed, of a purplish-red colour, with a paler or yellowish-orange fascia down the back enlarged into a roundish patch at both ends or one only; the legs much longer than the body, filiform, purplish-red or scarlet: *Body* quadrangular, narrowed in front, with swollen shoulders, behind which the sides are widely but not deeply sinuated, the posterior end obtusely rounded, the whole covered with short stiff black hairs: *Back* flattened, uneven, marked between the shoulders with a pale roundish spot, continued down the middle as a narrow fascia into another spot placed above the anal region, which is suddenly and obliquely depressed: *Venter* somewhat convex, of the same colour as the back, with a large yellowish patch behind: *Rostrum* declivous, setaceous, acute, shorter than the palpi: *Palpi* porrect, tapered, of a uniform red or scarlet colour, hirsute, 1st joint minute, 2d large, 3d smaller, the fourth unquiculate, slightly curved at the apex with three or four acute serratures beneath it, and a pear-shaped bristled appendage hangs underneath from the articulation: *Legs* 8, homologous, filiform, hirsute, all of them longer than the body, of a fine red colour variable in its intensity, the last joint usually paler, and the two basal joints often of a fine lemon yellow; 6-jointed, 1st joint small and subglobose; 2d longer, oval; 3d elliptical, twice as long as the second; 4th rather longer than the third, swollen on the inner edge; 5th longer than the fourth, filiform and narrow; 6th ovato-elliptical, heavy, and enlarged, truncate or obtuse at the end, and furnished with two small

simple curved claws moving in the same direction: Of the legs, the first pair originate from a knob in front on each side of the palpi, they are stouter than the others, and as long as the third pair; the 2d pair arise in a sinus between the origin of the first pair and the shoulders, they are the shortest of any; the 3d and 4th pairs arise from the lateral sinus behind the shoulders, and near each other, the 4th pair are by far the longest, and are nearly twice as long as the third: *Bristles* of the body straight or slightly curved, sub-acute; those of the legs longer and setaceous; many of them obsoletly barbed or indistinctly serrulate on one side only.

Mites, like every other class of creations, differ in glory one from another, and this must be conceded to be one of the most glorious of its order, both in point of size and beauty, and of activity in its habits. It varies, however, much in size, some specimens being not more than one half the bulk of others; and it is equally variable in its markings. It may in general be readily recognised by its dark red colour, with a conspicuous fascia down the back, expanding at both ends into a roundish patch; but in some individuals there is no posterior spot; in others, I have seen the fascia continued to the hinder margin without ever becoming broader; in others, both spots are rather obscurely and indefinitely marked; and in one there was merely an elongate triangular spot between the shoulders without any fascia. The spots and fascia are sometimes scarlet, but more frequently of a yellowish-orange colour. In the first individual of this kind which I examined, the two basal joints of all the legs were lemon-yellow, forming a beautiful and decided contrast with the others; in another specimen the yellow colour pervaded the three upper articulations; but certainly in most of my specimens all the joints were red and alike, except, perhaps, the ultimate ones might be a little brighter.

I am indebted to Mr. James Hardy for my specimens of this fine species. He tells me that "it is very common on clay banks, over which it courses with exceeding rapidity, showing extreme dexterity in finding a hiding-place when pursued. I have twice taken it with the red ant (Myrmica rubra) in its power. In the first case it was dragging the ant across a road, and it did not lose its hold until after it was placed in the quill; and next morning it still held on by its

prey. The ant was not dead; and this was also the case in the second instance.* Other two individuals had each possession of the leg of a species of Tipula, apparently immature. One of them appeared to be tapping it, as a 'nigger' would a sugar-cane!"

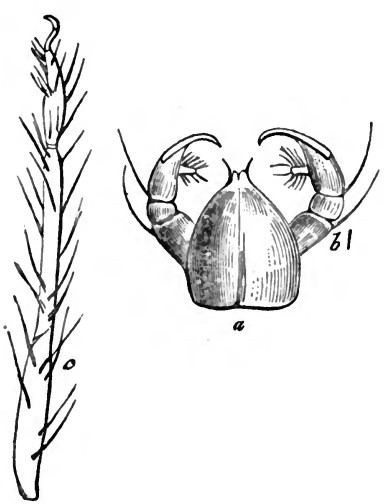
This is a Linnæan species, and hence an additional interest in its examination. It was described, in the Fauna Suecica, in so graphic a manner that no one, with specimens before him, can fail to identify it. Here is the description:—"Habitat in lapidibus et campis.—Descr. Magnitudo et figura A. aquatici, sed corpus obscurum; abdominis linea dorsalis longitudinalis utrinque dilata, anterius in aliis alba, in aliis rubra; communiter anterius albida, posterius rubra; cæterum abdomen nebulosa nigrum est, pedes rubri."—The mite is also well characterised by Latreille, who makes it the type of his genus ERYTHRÆUS,—"E. pedibus longissimis, articulo ultimo lato, compresso; posticis primis deinde longioribus; corpore obscure-rubro; fascia dorsali flavo-aurantia."—I cannot refer to the figures either of De Geer or Hermann, quoted by Latreille, but, according to Dugès, these figures represent two distinct species. Dugès names one of them Rynchophus Degeer; the other R. Hermann; and he informs us that the latter is very small, and has been only superficially examined by him; while the R. Degeer is larger, and as big as a flea, almost globular, or rather oval, of a cinnamon-red colour, brighter along the back, and garnished with black flattened longish slightly curved bristles. There are four eyes in two latero-anterior groups; two stiff bristles on the contracted front of the body; the legs in their form and proportion similar to still larger species, the anterior not thicker than the others, but, what is a very remarkable character, the trochanter or 2d joint is thick and globular. The legs are of the same red colour as the palpi and rostrum, and are covered with black flattish bristles laid to the surface.—This description inclined me at first to think that Dugès' Rynchophus Degeer was distinct from our Erythræus rupestris, but the slight differences may more probably be ascribed to the diffe-

* In a subsequent letter, Mr. Hardy informs me that the mite attacks or feeds on Formica fusca also. "It may be questioned whether it kills these insects or merely finds them in a disabled state."

rent manner in which two individuals will describe the same object, and to the really considerable variety in the mite itself. The figure copied into Griffith's Cuvier gives a faint idea of the beauty of the finer specimens, and is taken from one in which the dorsal fascia has suffered no dilatation at either end.

10. Leptus oribatus.

Desc. Mite minute, of a shining vermilion-red colour: *Body* ovate, ventricose, narrowest in front, even and unsegmented, sprinkled with a few blackish bristles pointed backwards: *Rostrum* separate from the body, conoid, thick, narrowed in front with an obtuse bifid apex (Fig. *a*): *Palpi (b)* originating from about the middle of the rostrum, large, 4-jointed, the basal joint thick and large, the 2d minute, the 3d larger, and the ultimate armed with a long curved simple claw; there is also a bristly process on the inner side of the third joint: *Legs* 6, the first pair not so distant from the second as this is from the third, pale or colourless, gracile, filiform, as long as the body, bristly, especially the three distal joints (Fig. *c*), and most so the tarsal joint; the *bristles* setaceous, pointed downwards, of moderate length: Of the legs the 1st or basal joint is thick and short; the 2d shorter but narrower; 3d elongate, gracile; 4th not quite so long as the third; 5th longest; 6th about half as long as the fifth: This joint of the first leg is dilated in the middle, and obliquely tapered at the end, where it is terminated by a curved claw (Fig. *c*): of the second leg the joint is scarcely dilated, and there seems to be two claws moving in the same direction; of the third leg the joint is filiform, of a reddish colour, and apparently without a claw.



Some of the bristles of the body are very minutely serrulated, but those of the legs appear to be smooth; they all originate in a minute bulb. The skin is membranous, and, when the body is pressed between plates of glass, it ruptures, suddenly diffusing the contents around. It is difficult to unravel the structure of the rostrum; and the palpi are held bent upon themselves. I think that I am right in ascribing only one claw to the first leg, but it is not easy to avoid error where such high magnifiers are used as is necessary in the examination of these minute insects. There are no eyes.

I found a single specimen (June 24th) on a decayed branch of birch in Snail's Cleugh. Its vivid colour drew upon it a notice which led to its untimely fate. It crept slowly, and showed no peculiar habit. I describe it here because I entertain a suspicion that it is the larva of an Erythræus.

11. Gamasus coleoptratorum.

Acarus insectorum rufus ano albicante, *Lin.* Faun. Suec. p. 348, no. 1198.—Poux des Bourdons, *Reaum.* Insect. vi. p. 23 and 38, pl. 4, fig. 13, 14 (bad).—Acarus coleoptratorum, *Lin.* Syst. 1026. *Mull.* Zool. Dan. prod. 186, no. 2218. *Fabric.* Faun. Grœnl. 224. *Stew.* Elem. ii. 323. *Turt.* Gmel. iii. 705. *Lin.* Faun. Suec. 2de edit. 483.—Gamasus coleoptratorum, *Latr.* Gen. Crust. and Insect. i. 147. *Leach* in Edin. Encyclop. vii. 415; and in Sam. Entom. Comp. 131. *Lam.* An. s. Vert. v. 59; 2de edit. v. 77. *Stark* Elem. ii. 205. *Gervais* in Walk. Insect. Apt. iii. 216. *Koch* Uebers. 86, tab. 10, fig. 47.—Le Gamase de Coléopteres, *Duges* in Ann. des Sc. Naturell. (1834) ii. 25, pl. 8, fig. 26, 27.

Desc. *Body* ovate, depressed, pointed in front, sinuated on the sides anteriorly, the back smooth and even with a few distant bristles and a strong pricker on each shoulder, yellowish-brown with a soft white border all round but widest behind, and a narrow white fascia across the back, about its middle, widening where it touches the margin; the posterior brown part only about half as large as the anterior and semicircular or triangulate; the white anal part covered with very short bristles curved backwards: *Venter* white and soft, with a yellowish-brown elongate triangular coriaceous sternal

shield between the insertions of the two mid pairs of legs; and an anal tubercle with a minute dark speck in front of it: *Rostrum* thick, triangulate, thickened at the base where the palpi originate: *Palpi* pediform, longer than the rostrum, bristly, converging and bent downwards at the apex so as to appear blunt, 6-jointed, the two basal joints thick, the others tapered, the terminal small and very bristly, the penultimate with a singular palmate or pectinate bristle at its inner articulation with the terminal, and a moveable spine below it; on the inner side of the third joint there are two small clavate processes: *Legs* 8, equally distanced in their origins, yellowish-brown with pale joints, bristly, the first pair slenderer and rather longer than the hinder pair, which again are rather longer than the body, and fully a third longer than the intermediate pairs; these are nearly equal in length, but the second pair is the stoutest: the legs are all six-jointed, tapered, 1st joint short, 2d elongate, 3d shorter, 4th as long as the second, 5th short and small, only slightly divided from the 6th, which is long and tapered, and continued into an abruptly slender pedicle, terminated with a large *vesicle* and a pair of minute spreading claws: *Bristles* originating from a minute bulb, setaceous, smooth; those of the upper articulations are shorter than the diameter of the joint and patent, those of the lower considerably longer, pointing downwards; those from the distal end of the tarsal joint reaching almost to the vesicle: *Pricker* arising from the coriaceous skin on the shoulder, between the fore and hinder pairs of legs, from a bulbous base on which it appears to be moveable; it is straight and not sharp pointed: The *vesicle* of the fore legs is much more shortly pedunculated than the others, and the bristles overtop it.

The structure of the oval apparatus is complicated and difficult to describe, not because of the minuteness of the parts,* for they are comparatively large, but because of the difficulty of bringing them in one view under the microscope so as to discover the relation of the respective parts to each other. There is in the centre a triangular upper lip, consisting of two pieces joined by a plain suture, and each pointed with a short stylette. On each side of this lip we see a maxillary process forked at the apex with two small claws; and external to the maxillæ, and probably coalite with them, two delicate organs

* "—— est trop petite pour que nous puissons parvenir à bien distinguer les parties dont elle est composée."—Reaumur.

beautifully pectinated on the outer edge, and one of them furnished with two or three long moveable setæ. The mandibles are large and powerful. They are situated above, and internal to the palpi; and each mandible consists of a two-jointed cylindrical shaft, capable of being pushed far beyond the palpi, or withdrawn underneath them, and terminated with a pair of elongate powerful brown-tinted chelæ, denticulated on their inner or cutting edges.

As I cannot reconcile this description to that of Dugès, I am doubtful of its accuracy. Dugès says that the palpi are of moderate size, armed with a mobile bristle, and are used in cleansing the mandibles. The lip, he continues, is broad, embraces the mandibular arms when they are pushed out, and it is terminated by a mesial point and two lateral fangs. The mandibular arms have a short simple slightly toothed pincer, with a moveable nipper (mordant) placed above; they are formed essentially of two articulations fleshy in part, and which can be retracted within each other like the tubes of an opera-glass. The pincer is much compressed and sufficiently sharp to pierce like a lance when its two nippers are closed. The mouth is covered above with a sort of triangular labrum, similar to the prolongation observable in the Erythræus and other Acarides.—So far Dugès.

The Gamasus coleoptratorum is an active insect. It is found abundantly in the partially dried dung of horses and kine, and in heaps of stable and curtain manure, running about restlessly in search of what appears to be its more appropriate habitat, for the mite is truly the parasite of the scarabs or dung-loving beetles, especially of the shard-born beetle of Shakspere,—the droning beetle of Gray,—of the Necrophagi and Histeres. It loves also to infest our humble bees.* When an insect so beridden is taken up, the mites

* "You have doubtless often observed the common dung-beetles (*Geotrupes* Latr.) covered on the underside of their body with small mites (*Gamasus coleoptratorum* Latr.) which look as if they were engaged in suction —they are often so numerous that no part is uncovered; they also attack other beetles, and are sometimes found on humble-bees. They are easily disturbed, run with great swiftness, and may often be seen in hotbeds and fermenting dung prowling in search of the stercorarious beetles." Kirby and Spence, Introd. Entom. iv. p. 227.

disperse in fear and try to escape in every direction. They soon die if kept in a dry vessel. In winter Dugès informs us that they are to be found under stones, where they doubtlessly live on other acarides; for he has seen the Gamasus testudinarius devour little Trombidia.

Gœdaert had a queer notion that the Gamasi were given to the humble bees for their good,—to rouse them from their indolence and somnolency, and to prick them on to more active industry! He was probably one of those naturalists who see a good in everything; but Gœdaert was here unquestionably wrong, and the "busy bee" may still furnish the moralist a true lesson for his child.—Reaumur says he is in doubt whether the mites draw their nourishment from the body itself of the humble-bee, as many parasites of other animals are known to do; he rather thinks there is reason to believe, that they only clean, if we may so speak, the bee of the honied liquor with which many parts of the body are often moistened,—that they love this sweetened juice and are nourished with it. What seems to him to give support to this opinion is the fact that the mites are to be seen in hundreds, and sometimes even in thousands, running upon the combs in the nest. From these combs they get upon the body of the bee, and when this flies abroad, they are carried willingly upon it throughout its devious course, certain that it will return at length to the nest again! This conjecture of Reaumur is refuted by the structure of the mouth of the Gamasus, which proves it to be a non-suctorial insect; nor can one attentively observe a humble bee loaded with the mite, lying in the dust or path-way, without a conviction that it is suffering pain and weakness from its pest. This conviction may be supported by the following pretty anecdote told by Mr. Westwood; to whom it was communicated "by Mr. Daniel Bidder, an indefatigable, well-informed, and old collector of insects, as well as a close observer of their proceedings." Many years since (Mr. W. was writing in 1835), when collecting in the New Forest of Hampshire, Mr. Bidder "sat down on a bank to take some refreshment, the sun was obscured by clouds, when presently he saw a specimen of the Apis terrestris, or humble bee, alight near him.

and begin to scratch, and make a disturbance; there being no sun the ants had retired, but it was an ant's nest on which it had taken its station; the ants immediately came out to attack it, and observing the insect covered with acari, soon destroyed or carried them off; when the bee, thus relieved from its enemies, carefully cleansed its body and wings with its feet, and then took flight again, evidently much relieved." Brit. Cyclopæd. Nat. Hist. i. p. 17.

12. Gamasus testudinarius.

G. ovatus, scuto dorsi brunneo ovato integro, lateribus anoque albis, pedibus anticis corpore vix longioribus.—Le Gamase testudinaire, *Dugès* in Ann. des Sc. Nat. (1834) ii. 27.—Gamasus testudinarius, *Gervais* in Walck. Ins. Apt. iii. 219.—Acarus insectorum rufus, ano albicante, *Geoff.* Hist. Insect. ii. 623.

Desc. *Body* ovate, somewhat angulated at the shoulders and thence narrowed forwards, the back convex, even, bristly, partially covered with an elytrous yellowish-brown ovate skin surrounded by the white soft marginal border which becomes enlarged and broad posteriorly: *Venter* white and membranous, with a coriaceous sternal plate of an elongated triangular shape, the base towards the circular and raised anal pore: *Chelæ* of the mandibles yellowish-brown with curved points, the external claw with two denticles, and the inner with a single denticle on the cutting edge: *Palpi* coloured like the legs, the 2d joint somewhat bulged, and the apex armed with bristles; there is also a moveable seta on the inner aspect of the penultimate joint: *Legs* of a uniform yellowish-brown colour, bristly, the first pair about the length of the body, a little longer than the fourth pair which is longer than the intermediate pairs, the second pair stoutest; 1st joint short and thick, 2d smaller, 3d originating with a constricted articulation, incrassated upwards, slightly curved, elongate, 4th shorter than the third, 5th as long as the third, 6th elongate slender and straight in the first pair of legs, but decidedly tapered in the others, and in all terminated with a pedicellated vesicle and two very minute claws.

The bristles of the body are short setaceous and curved. On the vertex, and between the shoulders, a stronger and longer bristle projects forwards on each side. The bristles of the legs are straight, smooth, and longer than the body ones, especially those of the tarsal joints; they all point downwards.

This mite frequents the same places, and infests the same beetles as the G. coleoptratorum, which it equals in size; nor am I aware of any peculiarity in its habits. There are, however, some unessential differences in the oral organs, which it is impossible to describe intelligibly without the aid of figures; nor do I think that specific characters can be derived from them. It is a common mite, and yet I am at a loss to discover whether it has been described. The character of Acarus coleoptratorum, given by Linnæus—"A. rufus, ano albicante,"—suits it well, but the description in the Fauna Suecica proves that the name has been rightly appropriated to a species equally common. Ours is surely what has been usually named in British lists Gamasus marginatus, but it is not the G. marginatus of Latreille, "pedibus anticis corpore duplo longioribus,"—the anterior legs being scarcely if at all longer than the body; nor is it the G. marginatus of Leach, in which the anterior legs are "nearly twice as long as the rest" (Ed. Encyclop. vii. 415), for in the insect before us it requires a nice eye to say that they are longer than the posterior pair. Dugès has described a G. marginatus (Gamase bordé) which is more closely allied to our species, but they seem to differ in the shape and character of the sternal plate, and in the colour of the chelæ of the mandibular arms, which are stated to be "noirâtre." In our species they are yellowish-brown. —I am thus driven on to conjecture, for I have not access to works in which any related species are described. Acting under the belief that such a common mite cannot have escaped notice, I refer it to the Acarus testudinarius of Hermann. Latreille says that this is allied to Gamasus marginatus; and Dugès tells us that it differs very little from his Gamase bordé. Gervais has merely mentioned the name. Koch places it in a different section of the genus from G. marginatus, but in the one immediately following and not far distant,—a view which rather strengthens the truth of my conjecture. It must, however, be remarked that the mite has nothing in common with the Acarus testudinarius of Schranck.

13. GAMASUS MARGINATUS.

G. ovatus brunneus supra infraque coriaceus abdominis

marginibus solis membranaceis albidis, pedibus anticis corpore longioribus.—G. marginatus, Latr. Gen. Crust. et Ins. i. 148. Leach in Edin. Encyclop. vii. 415; and in Sam. Entom. Comp. 131. Lam. Anim. s. Vert. v. 59 : 2d edit. v. 77. —Le Gamase bordé, Dugès in Ann. des Sc. Nat. (1834) ii. 26.

Desc. Mite of the size of G. coleoptratorum, of a chesnut-brown colour, the venter, rostrum, palpi and legs a shade lighter than the back: *Body* ovate, narrowest and rostrate in front, edged behind with a colourless pellucid narrow border, sparingly covered with short curved bristles, the back a little convex, glossy, with a few irregular punctures or foveolæ, the venter entirely coriaceous, striolate like the ends of the fingers, with the anus almost marginal; the sternal plate in the form of an escutcheon with the point forwards: *Rostrum* porrect, triangulate, sharp-pointed, the chelæ of the mandibles dark-brown: *Palpi* rather longer than the rostrum, and originating from its base, curved at the bristly apex, the 1st joint curved, the 2d incrassated and bulged on its inner aspect: *Legs* bristly, the first pair a little distant from the others at their insertions which are close together; first pair slender and longer than the body, the fourth pair next in length, the second and third nearly equal, but the second are considerably thicker than any of them: Of the first pair the 1st and 2d joints are thick and short, the third elongated and narrow at its origin, the 4th and 5th shorter than the 3d and almost equal, the 6th elongate, slender, and filiform, armed with longer bristles, and terminated with a pedunculated and lobulated vesicle; the tarsal joint of the other legs is tapered, and the vesicle is deeply two-lobed, and furnished with stronger claws, each vesicular lobe being itself emarginate. The structure is exceedingly beautiful.

This mite is also common, and has the same habits as G. testudinarius, to which it is nearly related. I find it under slates, &c., on warm borders in gardens, and in hot-beds. It runs quickly, holding the long fore-legs forwards as if they were antennæ, and then their length appears proportionably longer to the body than they do when the insect is under the microscope.

In the Règne Animal, iv. 282 and 285, Latreille has referred this mite to his genus Macrocheles, and also to Gamasus,

14. Gamasus lagenarius, *Dugès.*

G. oblongus antice rostratus albus maculis fuscis decussatim coalescentibus postice pictus. Long. 1-3d lin.—La Gamase lagenaire, *Dugès* in Ann. des Sc. Nat. (1834) ii. 28.—Gamasus lagenarius, *Gervais* in Walck. Ins. Apt. iii. 219.

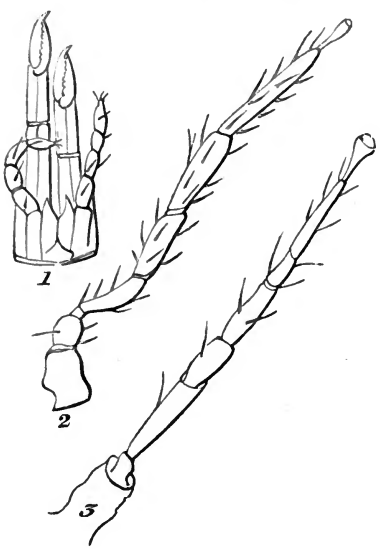
Desc. *Body* ovate-oblong, narrowed and rostrate in front, of a watery-white colour, spotted posteriorly with fuscous-brown, three spots on a line before and behind, the outer spots connected by a crucial band so as to form a marking something like the letter *x*, the back convex and even, covered with short curved bristles: *Palpi* pediform, longer than the retracted mandibles, bent at the apex, bristly, 5-jointed, the 2d joint bulged, the ultimate one minute, cylindrical, obtuse, tipped with numerous short bristles; on the inner aspect of the joints there are also a few short *spines* of which the one near the insertion of the terminal joint is moveable: *Legs* 8, nearly equally distanced in their origins, of a watery-white colour, unspotted, bristly, all terminated with a pedunculated lobated vesicle, and two divergent minute claws; 1st joint short and thick, 2d twice as long, 3d elongate, incrassated upwards, slightly curved, 4th also curved, about half as long as the third, 5th straight, as long as the fourth, 6th filiform and elongate, with a nearly sessile vesicle in the first pair of legs, but of the other legs the tarsal joint is decidedly tapered, and the vesicle is on a rather long pedicle: *Bristles* setaceous, smooth, originating in a small bulb, all pointing downwards.

This mite is less than the Gamasus coleoptratorum; and the structure of the mouth and oral apparatus is so nearly the same as not to require description. The chelæ of the mandibles are dark brown, elongated, straight, curved at the apices, and very minutely denticulated. The skin of the back is continuous and uniform, but the posterior portion is marked with brown in a manner not easily described, and yet which furnishes the most distinctive character of the species. As these spots depend on the contents of the cœca, their distinctness and measure of coalescence may be presumed to vary with the nature and quantity of the food. I found my specimens on the gills of a decaying mushroom, and it is also found in moss. It is as rapid as its congeners in its motions.

15. Eumæus inornatus.

Desc. Mite minute, of a uniform dusky brown colour, very

exactly ovate, rostrate in front, convex dorsally, even, smooth, and rather glossy: *Venter* flat, even, of a paler tint than the back: *Rostrum* one-third the length of the body, broad at the base, triangulate, acuminate: *Palpi* originating from near the base of the rostrum and rather longer, bent at the apex, filiform, very sparingly hispid, 4-jointed, the joints nearly equal, the 2d a little swollen, and the ultimate one with a contracted bristly apex (Fig. 1.): *Legs* 8, shorter than the body, equidistant at their origins, of a uniform yellowish-brown colour, armed with short setaceous bristles pointed downwards; the 1st pair (Fig. 2) rather more slender and longer than the others, and the tarsal joint almost cylindrical; the 4th pair (Fig. 3) longer than the 2d & 3d, which are nearly equal; all 6-jointed; 1st joint large and as broad as long, 2d minute, 3d elongate and incrassated outwards, 4th about as long as the third, 5th longer than the fourth, 6th elongate, tapered, divided into three unequal portions by cross septa, and terminated with a pedicellated inflated diaphanous vesicle furnished above with two minute divergent claws.—The second joint of the first pair of legs is larger than that of the other legs, and there is a minute articulation between it and the third joint, by which means the mite is enabled to bend this leg at a more sudden and acute angle than the others; the vesicle is also smaller and more companulate, nor were any claws distinguishable on it. (Fig. 2.)



The Rostrum (Fig. 1) is formed of two parallel shafts coalescent at the base, where it is covered underneath by a tricuspidate labrum. The shafts become separate above the origin of the palpi and translucent. Each shaft is cylindrical or very imperceptibly tapered, consisting of two joints of nearly equal length, and armed with strong brown didactyle forceps,

the claws of the forceps elongate, applying close to each other, the apex of the outer curving over the inner one, which is alone moveable. They resemble the claws of the lobster or scorpion; and the inner edge of each claw is serrulate. The shaft is marked with a longitudinal and mesial line. The shafts are extrusive, being pushed out like a telescope, and can be readily extended beyond the palpi; and one can be moved independently of the other.

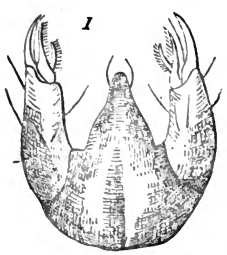
When compressed between plates of glass, a few bristles are seen scattered over the body. The skin is firm and coriaceous, like that of a beetle of the same size. The legs arise from the anterior third of the body, and from the sides of the venter; and their bristles are setaceous and smooth.

I find this mite amongst moss, but the structure of the oral apparatus and of the tarsi would lead us to infer that it is a parasite. It is moderately quick. When placed on the back, it cannot recover its right position on a level surface. It offers no peculiar attraction, but it is very curious in the pretty contrivance of the structures of the mouth and feet revealed by the microscope; and our admiration is scarcely awakened (for art might imitate the work as it lies magnified in view), until we call back to judgment the fact that the entire body, of which these form only a small portion, is not half-a-line in length! Then indeed we estimate aright their most exquisite and minute beauty, which even the subtlest artist from fairy land would in vain attempt to imitate.

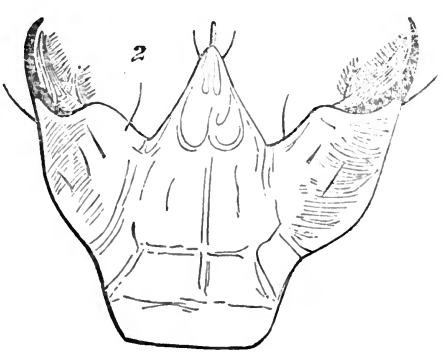
The mite is not described by Linnæus nor by Muller. In the classification of Mons. A. Dugès it is referable to the family Gamasei, although the body is not depressed; but it cannot be referred to any genus in that family characterised by Dugès. It is not amongst those mites which Gervais has collected together in Walckenaer's History of Apterous Insects. I conjecture that it belongs to the genus Eumæus (= Leionotus, *Koch*) of Koch, but as he has given no character of the species in his Uebersicht, I must impose upon ours a name and discriminative mark. (1) *Eumæus inornatus*, ovatus piceus, abdomine pedibusque pallidioribus, dorso convexo lævi nitido.—Long. vix $\frac{1}{3}$ lin. æquat.—Habitat in muscis.

16. Cheyletus eruditus, *Latr.*

Cheyletus eruditus, *Latr.* Gen. Crust. et Ins. i. 153. *Lam.* Anim. s. Vert. v. 58 ; 2de edit. v. 75. *Latreille* in Cuv. Reg. Anim. iv. 285. *Risso* l'Europ. merid. v. 181. *Leach* in Edin. Encyclop. vii. 414. *Stark* Elem. ii. 206. *Koch.* Uebers. Arachnid. 78, tab. 9, fig. 45. *Gervais* in Walck. Insect. Apt. iii. 165.—Acarus eruditus, *Turt.* Gmel. iii. 707.



Desc. Mite minute, about half a line in length: *Head* distinct and separate, triangulate, much narrower than the body (Fig. 1) : *Rostrum* declivous, conical, and armed with a bristle on each side a little below the truncate apex (Fig. 1): *Palpi* mandibular, very large and powerful, extended considerably beyond the rostrum, arising on each side of the head below the rostrum, 2-jointed, the basal joint sub-cylindrical, slightly kneed, a long bristle on its proximal side, 2d joint oblique and continued into a process on the outer side whence originates a curved acute finely proportioned claw, immediately within which there are two slender setæ, and within these again a pair of semipectinated processes or combs, the innermost one scarcely half the size of the other (Fig. 2) : *Body* ovate



or rather shaped like a coffin, soft, obtuse and rounded at both ends, the back flattened, even and naked, the sides coriaceous and of a yellowish-brown colour, while the front, the middle, and the anal region are soft and opaque white: *Legs* 8, slender and tapered, of a clear watery-white colour,

the two anterior pairs rather distant from the posterior, the first pair slenderer and longer than the others and nearly as long as the body, the others about equal; 6-jointed, the three basilar joints short, the 4th twice as long as the second with a single bristle, the 5th elongate cylindrical with three or four bristles near the lower end, the 6th still longer than the fifth, tapered, with two bristles on its upper half, one on each side, with a very short stout one on the inner side; all the bristles point downwards, and the lowermost project far beyond the extremity of the joint, which is armed with two unequal curved claws.

The rostrum contains an awl-shaped stylette (Fig. 2), which can be pushed out beyond the snout. The furniture of the mouth is one of the most beautiful structures that can be seen anywhere, nor is it possible to view it, as it is brought out in detail under the microscope, without an expression of wonder. The coriaceous part of the skin, when highly magnified, appears striolated in a very delicate manner.

This mite has much of the aspect of a Gamasus, but differs essentially in the structure of the mouth. We are told that it is found in books kept in damp places, particularly about the backs, and is very injurious by eating away the paste with which the sheets have been glued together. My specimens were taken by Mr. Hardy in two of his insect boxes. On two different occasions, Mr. Hardy found it dragging away the larvæ of Atropus pulsatorius, and he thinks it probable that it feeds on them rather than on paste. "Having placed," he writes me, "a box on the ground in a damp place, I found it peopled by large numbers of the Atropos, of very great size, and at the same time by Gamasus coleoptratorum, which, I believe, had the same errand as the Acarus eruditus."

The young have 8 legs. Schranck saw it come from the egg itself with that number.—Kirby and Spence, Introd. Entom. iii. p. 107.

17. Acarus geniculatus. *Lin.*

Acarus niger, geniculis femorum globosis, *Lin.* Faun. Suec. 350.—Ac. petrarum niger, abdomine globoso lucido, femoribus subclavatis, *Geoff.* Hist. Insect. ii. 626.—Acarus geniculatus, *Lin.* Syst. 1025. *Turt.* Gmel. iii. 705. *Lin.* Faun. Suec.

2d edit. 482.—Oribata clavipes, *Griffith's* Cuvier, xiii. pl. 23, fig. 6.=Notaspis clavipes, *Hermann* sec. Dugès in Ann. des Sc. Nat. (1834) ii. 46.—Oribata geniculata, *Gervais* in Walck. Ins. Apt. iii. 256.—Damæus geniculatus, *Koch* Uebers. Arachnid. 106.

Desc. Mite about a line in length, of a uniform pitch-black colour, with nodulous legs longer than the sub-globular body, tardigradous: *Body* divided into a rostrum, thorax and abdomen: *Rostrum* thick, declivous, armed with two curved bristles on each side below the apex, which is conoid or triangulate: *Thorax* square, much narrower than the abdomen, broader than long, rough, and somewhat tuberculate behind, plane, deeply and acutely cut on the sides at the origin of the first and second pairs of legs: *Abdomen* globose, rounded, sparingly bristled, the back even, with two punctures and two short striæ forwards, slightly notched on the sides behind the thorax, corneous, and separate from the ventral portion by a distinct rim underneath: *Venter* convex, smooth, with two distinctly circumscribed more polished elevated spaces in the middle, each with a distinct mesial cleft; the anterior space larger than the one immediately behind it: *Legs* 8, alike in form, knobby, armed with coarse bristles, originating near each other, two pairs from the thorax, and two from the anterior portion of the abdomen, the first and fourth pairs longest, the second a little shorter than the third; all of them are 6-jointed, and the joints are incrassated or knobbed near the distal ends; 1st joint short, 2d elongate, 3d short, 4th as long as the second but slenderer, 5th about half as long, 6th abruptly slenderer, elongate, tapered insensibly downwards, furnished with two bristles on the external edge near the distal end, and with several on the inner edge, especially at the apex, which is terminated with a powerful sickle-shaped smooth claw; the bristles smooth and setaceous; the colour of the joint brown.

There is no mistaking this mite from its size, its beetle-like form and consistency, its deep black colour, and its gouty unfashioned legs. There are no visible palpi, nor mandibles, nor eyes. The integument is hard and horny; and the mite has some resemblance to the Gibbium scotias, and still more so to some of the minute Curculionidæ. The bristles on the back are coarse and erect, and arranged in two distant rows on each side of the mesial line. Those on the legs are often coated with a coagulated membrane, probably the juice of the fungi on which the individuals were feeding. They all point

downwards, and those of the tarsus exceed the claw even when this is fully stretched out. There is no second claw, but a short spine, often scarcely to be seen, on the inner side of the joint at its base. The colour of the integument of the mite, when bruised and compressed, is pitch-brown.

The walk of the Acarus geniculatus is slow and measured; and when it falls on the back, it recovers the right position with great difficulty. It rests with all the legs spread out in the fashion of a spider. It is found in profusion, in summer, on the Boleti and on Agarics, growing in plantations. The mite lives about the root of the fungus, and many were nestled in excavations made by slugs in the stalk.*

In my search for the name of this mite I found three species in the Systema Naturæ, viz., the Acarus coleoptratus, geniculatus, and tremellæ, to which it was evidently nearly related. They belong to the genus Oribata of Latreille, and this author has described with greater fulness two of these species, but his descriptions, I remarked, do not coincide with the short Linnæan characters. Linnæus says of his *Ac. geniculatus* that it is black, with the joints of the thighs subglobose; whereas Latreille's character, correctly translated by Leach, is "brownish-red, shining and hairy; feet pale-brown; thighs rather clubbed." The Linnæan character of *Ac. coleoptratus* again is,—"A. ater, lateribus nigro-subcoleoptratis;"—that of Latreille, "O. abdomine obscure castaneo, glaberrimo; lateribus solute alatis."—The extended description of the Ac. coleoptratus in the Fauna Suecica proves it to be distinct from the insect before us; and I had therefore concluded that the Ac. geniculatus of Linnæus was before me, when Latreille's authority made me halt.

Again on the search, I ascertained that no one of the seven Oribatæ described by Latreille was identical with ours; and of those figured in Griffith's edition of the "Règne Animal," the only one to which it bore a resemblance, was the O. clavipes, pl. 23, fig. 6. There were, however, sufficient differences between the living animal and the portrait to show that

* I have found this mite on Boletus scaber and luteus, on Amanita muscaria, and on two or three Agarics in June and July. It is always on the stalk of the fungus, but two or three individuals had crept in between the gills of the Agarics.

either they were not one and the same, or that the painter was much in fault. The latter I found to be the case, according to Mons. A. Dugès. He tells us that in the figure of Hermann, of which Griffith's is evidently a copy, the legs are represented too long, the corselet or thorax too narrow, its lateral apophyes too much detached, and that the hairs on the back are erroneously represented arranged in a circle instead of in two lines. Assuming these criticisms to be correct, I think that so altered as to meet them, the figure would suit our insect well; and so I conclude the mite to be the Notaspis clavipes of Hermann.

Now, according to M. Gervais, this Notaspis is synonymous with the Acarus geniculatus of Linnæus, and the descriptions will not allow a dispute on this point. Hence we were brought back to our first conclusion, and willingly, for we do love to look upon a Linnæan species. Latreille's Oribata geniculata is of course a different species.

18. Acarus baccarum, *Lin.*

Acarus arboreus ruber distentus, lateribus obscurioribus, *Lin.* Faun. Suec. p. 349, no. 1201.—Acarus baccarum, *Lin.* Syst. 1025. Faun. Suec. 2d edit. 483. *Mull.* Zool. Dan. prod. 187, no. 2225. *Turt.* Gmel. iii. 705. *Stew.* Elem. ii. 322.

Desc. Mite of a reddish-orange colour darker on the sides, with legs similarly coloured, and longer than the body: *Body* ventricose, broadly ovate or purse-shaped, widest behind and almost truncate, very slightly sinuated on the sides at the middle, where there is a faint and false appearance of a transverse division; the *vertex* swollen and paler with a darker spot in front of it; *venter* convex, of the same colour as the back with a deeper fascia, smooth, furnished with some short bristles; the *back* armed with pale bristles arranged in four longitudinal series: *Eyes* 2, placed one on each side anteriorly, dark-brown, very distinct: *Rostrum* conical, porrect, bristled: *Palpi* two, pediform, longer than the rostrum, upper half bent downwards, bristly, 4-jointed, 1st joint short, 2d large, 3d small, 4th elongate, slenderer, cylindric, furnished towards the extremity with long bristles: *Legs* 8, equidistant, originating anteriorly and close together, homologous, hirsute and bristled, pellucid, paler on the upper half, the distal of the colour of the body; 1st and 2d pairs nearly of the same length; 3d shorter, and the 4th

pair still a little shorter; 6-jointed, 1st joint short, 2d a little longer, 3d still longer, 4th twice as long as the third, 5th longer than the fourth, and much slenderer, the 6th shorter than the fifth, and obliquely narrowed near the extremity, which is armed with two strong simple curved claws moving in the same direction, the tarsal portion of the joint underneath them being covered with short equal bristles: *Bristles* of the body and legs setaceous, smooth, and somewhat curved; those on the legs patent, while the shorter hirsuties is appressed.

The *Rostrum* consists of two valves in close apposition, of an elongate triangular shape cut into on the apex with a deep incisure. When closed they form a conical labrum which protects and covers two strong *mandibles*, broad at the base, but narrowing rather abruptly on the upper half and terminated with a neat sickle-shaped claw, which moves in a concave joint. I believe that, when not in action, this claw fits into the cleft of the sheaths of the labrum. Both the sheaths and mandibles are sparingly furnished with bristles.

The Linnæan specific character of Acarus baccarum is,—"A. abdomine distento rubro, lateribus obscurioribus." The character is, in some respect, made more obviously distinct by killing the insect in spirits. In a short time the colour of the body becomes a straw-yellow, but the darker parts remain unchanged; and then the reddish patch on each side near the posterior angles, the reddish spot in front, and the broad fascia across the venter form a stronger contrast. The insect is large for a mite, although much less than the Trombidium holosericeum with which Linnæus contrasts it. It is found during the summer in gardens running over the leaves of flowers; and may be often seen on strawberries. Linnæus says, "habitat in baccis Ribis aliisque, frequenter cursitans." I find it often on rasps and brambles in our deans. Its motion is remarkably quick, and it runs about describing short and imperfect circles as if at a loss whither to go, and ever changing its mind as to the course it should pursue.* When

* "Incredibly great, also, is the rapidity with which a little reddish mite, with two black dots on the anterior part of its back (*Gamasus baccarum, F.*), common upon strawberries, moves along. Such is the velocity with which it runs, that it appears rather to glide or fly than to use its legs." Kirby and Spence, Entom. ii. p. 311.—If intended to apply to our species, the paragraph is somewhat exaggerated.

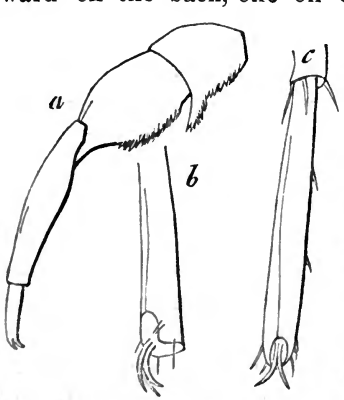
at rest I have seen it clean its legs, or rather the tarsi, by putting them between the mandibles and as it were nibbling them. On one occasion the process was this:—the foot of one anterior leg was cleaned, then one of the third pair, then the front leg of the opposite side, and then the third leg which had been previously cleaned; but there was no uniformity in its proceedings in this respect. The little creature seemed fond of the work, and did it with admirable neatness.

The mite belongs to the same group as the Ac. longicornis and littoralis.

19. Hydrachna naïca.

H. orbicularis albescens maculis fuscis fusè signata, oculis 2, pedibus pellucidis albis sparse spinosis, palpis articulis inferioribus crassis minutissime serrulatis.

Desc. *Body* subglobose, even and smooth, whitish or cream-coloured, marked with several dusky-brown spots, three in front united together by a lighter shading and thus forming a fascia produced behind on the back by a jutting down of the middle spot, two large ones behind of a subquadranglar shape, and a small spot on each side with difficulty distinguishable: *Venter* convex, smooth, the anterior half brownish, the posterior half whitish, and running up like a sinus into the dusky colour: *Eyes* two, black, very distinct, placed forward on the back, one on each side of the mesial spot:



Palpi (Fig. *a*) pediform, proportionably large, thicker than the legs, 4-jointed, the 1st and 2d joints thick and short, minutely serrulated on the outer edge, a rough or granulous mucro at the articulation of the first joint, 3d joint elongate and slender, 4th small and unquiform, and terminated with two minute claws: *Legs* 8, homologous, all of them much longer than the body, of a uniform clear watery colour, sometimes very faintly tinted with brown, gently tapered, rather sparingly bristled; all arise from the venter in front, are near each other at their

insertions, and 6-jointed; the first pair scarcely stouter but longer than the second and third, which are nearly equal, but the hinder pair are the longest and extend far beyond the body; 1st joint very small, 2d longer, 3d still longer, 4th twice as long as the third, 5th as long as the fourth, 6th (Fig. *b*, *c*) about the length of the fifth, slenderer, obtuse, obliquely truncate and excavated at the extremity, which is armed with a few short spines and weak bristles, and with three ? claws moving in the same direction: *Bristles* smooth and sharp, patent, not longer than the diameter of the joints excepting those at the articulations, the bristles on the middle joints in whorls: *Skin* when highly magnified minutely areolar.

Found amongst submerged plants in the Whitadder.

This is a small species, about one-half the size of the Atax histrionicus. It is very conspicuous, however, in the water from the whiteness of its markings, for the colour is otherwise liable to great variation. When I first found the insect the body was beautifully marbled with irregular black patches, divided by greenish-yellow irregularly branched lines; and instead of a large white patch beneath, pale lines only radiated from the vent. The insect was then, I suppose, gorged with food, and it was not until being kept some time in a phial of water that the markings were defined as we have described them. In investigating the species, this variation in the colouring must be kept in view. It moves with quickness, keeping the palpi bent. It creeps on the bottom and over plants, but I did not observe it ever to swim in the water, and the structure of the legs would lead us to believe that it cannot do so, for the legs are not furnished with the long cilia which garnish those of most other aquatic species. It readily throws itself on its back. The structure of the end of the tarsal joint is very curious: it is dilated a little and excavated like a spoon on one side, the edge armed with one or two small spines and weak bristles, but the claws are attached to a moveable centre-bit or tendon, and by its means can be withdrawn into the spoon-shaped sinus or pushed beyond its rim (Fig. *b*, *c*). The advantage of this admirable structure to an insect that creeps amidst hair-like and matted confervæ is obvious, for, with the claws withdrawn, it can glide through the entangled masses without check and

constant stops to its progress; and with the claws extended, the smoothest leaf of a Potamogeton, or the most slippery soil, affords but an easier course to its race.

This species cannot be identified with any described by Muller or by A. Dugès; nor indeed can it strictly be referred to any of the genera into which the latter naturalist has distributed the family. The mite belongs apparently to the genus Atractides of Koch (Uebers. des Arachnidens. Drittes Heft. p. 22), which contains six species. Of these the names only are given in the book just quoted, and I have no access to the larger work in which they are described and figured. I am thus forced to remain ignorant whether our species has been already noticed and named,—it is certainly neither Atractides clavicornis nor A. spinipes;—and in this position I may be excused for bestowing upon it a name different from any yet borne by its genus.

On Insects Injurious to the Turnip Crop. By Mr JAMES HARDY.

The cultivation of the turnip crop may be said to constitute the foundation of the modern practice of husbandry; as by it increased numbers of cattle and sheep are reared, sustained, and prepared for the market, with the least possible trouble, and with the greatest possible economy; the soil, exhausted by a succession of scourging crops, has its fertility restored by the application of a better quality of manures; and the land is kept in a state adapted for cropping, and freed from weeds, without the necessity of periodical intervals of barrenness. A failure of the turnip crop, in a district such as Berwickshire, cannot but be regarded as one of the deepest calamities; involving, as it does, the ruin of one of the most valuable branches of rural industry; while, with but partial success in raising it, the farmer has his means restricted, his just calculations nullified, and his exertions and labours insufficiently repaid. In respect to a subject, with which such important interests are combined, a very essential duty of the cultivator must be, to acquaint himself with the causes, whence originate his blighted hopes, and disappointed expectations; and to search after the means, if any such can be obtained, by which those evils may be remedied. With this view, he will avail himself of the investigations of the physiologist, into the diseases to which plants are subject; or of the naturalist, as to the injuries that accrue from the attacks of insects or other animals; regarding which, he himself may have neither the leisure nor the means to institute experiments, or to attend to their distinctions, instincts, or modes of living. The disease once ascertained, suggestions as to reparation or cure may be hazarded, in accordance with its symptoms; but, if misunderstood, grievous errors in practice will be the consequence. It is with this object, that I venture to bring forward the results of the observations of naturalists respecting several of the insects that have been ascertained to be pernicious to the turnip crop; noticing, at the same time, the various remedies which have been applied to obviate their attacks. The amount of novelty, or of practical benefit, arising from the remarks I may have to make may be but small; with many of the circumstances I may mention, many of you are already well acquainted. My object, however, will be gained if I succeed in awaking in practical agriculturists, an interest in a subject in which they are deeply concerned, which may lead them to follow out inquiries that may enable them successfully to cope with formidable enemies.

The insects most hurtful to the turnip crop, are—1. The Turnip Beetle, or Turnip Fly. 2. Weevils. 3. Wireworms. 4. Caterpillars of Butterflies and Moths. 5. Caterpillar of the Turnip Saw-fly. 6. Grubs of two-winged Flies. 7. Aphides or Plant Lice.

1. THE TURNIP BEETLE, OR TURNIP-FLY (*Haltica nemorum*).

The turnip beetle, or, as it is properly termed, the turnip fly, belongs to a family of insects, all of which are vegetable feeders. In its natural condition, like every other creature, it has its useful purposes to fulfil in the scale of creation. Its apparent destination is to keep in check a numerous class of plants termed, from the form of their flower being similar to that of a cross, the *Cruciferæ*. Several of these, such as the wild mustard and radish, (runch,) are prevalent and noxious weeds; and, unless some such restricting agent had existed, they would so increase and flourish as to occupy a space inconsistent with the distribution of vegetables of equal relative importance. In this limited sphere its ravages are perfectly legitimate, and even wholesome; it is only when, by the extensive cultivation of the turnip, a plant belonging to the same natural class as its indigenous favourites, that its numbers, in consequence of the additional supply of nourishment thus afforded, have, in connection with the labours of the agriculturist, become so unduly increased, as to become a general scourge. It is a minute creature,

scarcely exceeding a grain of turnip seed in size, is oblong-egg-shaped, somewhat flattened, and narrowest towards the head. Like other beetles, it is hard and scaly, and not readily susceptible of injury from the external application of force. The general colour is a shining black, and the head and second division of the body are of this hue, which would be continuous over the wing cases, but for two pale yellow streaks down each. The last conceal, when in repose, a pair of thin transparent wings, which, along with its leaping powers, supply it with the means of transport. The upper surface is prettily polished, and thickly beset with punctures. The antennæ, or horn-shaped organs of the head, are black, with their base chestnut; the joints, shanks, and feet, being sometimes of a tawny hue. The hinder thighs are remarkably thickened, a structure similar to that of the Kangaroo among quadrupeds; which, from the additional volume and strength of muscle it confers, enables it to take those surprising leaps by which it eludes its enemies.* It does not, however, like a grasshopper, keep up a chase by a continuous leaping; but, usually, at the end of its spring, falls on its back among the herbage, where, being very inconspicuous, it is not discovered till it has recovered the position requisite for taking another bound. Its under side is quite black, and this makes it less easy of detection, while thus stationary. In its perfect state as a beetle it is less susceptible of injury from a low temperature than most other insects; and, although many must perish from this cause, considerable numbers frequently survive the winter. I have noticed it in the turnip fields in December, and taken it alive under stones near walls in January; but it is most frequently found in the shelter of hedges or plantations during the inclement part of the season, where it may be observed, in the vernal months, in the vicinity of its chosen plants. These spring early, considerably before the period for turnip making; some of them, indeed, are the firstlings of the season; and, from first to last, keep up an uninterrupted supply of food.† The principal are: *Cardamine amara*, (Bitter Lady's Smock) which occurs in ditches and swamps in many parts of Berwickshire, and, from the injury inflicted on its foliage, is apparently much relished by the insect; *C. sylvatica*, (Wood Lady's Smock) which grows by the border of most of our gravelly streams; *C. pratensis*, (Meadow Lady's Smock, or Bog Pink) a native of marshy ground†; *Nasturtium officinale* (Common Water Cress); *Erysimum alliaria*, (Garlic Treacle Mustard, or Jack by the Hedge) a not unfrequent plant under the shade of hedges and trees in a gravelly soil; *Sinapis arvensis*, (Wild Mustard) which every one knows as a troublesome weed, and *Raphanus Raphanistrum*, (the Runch or Jointed Charlock). Many of these, from the places of their growth, in marshes, and by water courses, on uncultivated grounds, barren banks, and in woods, it is quite impossible to eradicate. The difficulty of this is increased from the seeds containing an essential oil, which preserves them from decay for a protracted period; added to the fact that they have been the denizens of the soil for ages. Certain of them, however, such as the runch and wild mustard, fall legitimately under the farmer's control; and fields where these abound, will more readily be haunted by the turnip beetle, than others from which it can derive no preliminary nutriment. It is quite possible that, in a field in this condition, a double brood may be on the ground before the turnips are put in. It thus happens in this, as in many other respects, that slovenly farming is both personally and generally hurtful: injurious to the practiser's own interest, and baneful to those who have the misfortune to be placed in his vicinity. Some farmer's are so well aware of these facts, that they are able, from observing the amount of damage sustained by the wild plants in spring, to predicate the degree of peril that awaits the ensuing crop; and to have recourse to such precautionary expedients as may meet the evil threatened. The turnip fields themselves, where the crop is long on the ground, preserve many of the beetles alive; and the plots kept for

* Kirby's Bridgewater Treatise, ii., 180, 181. † Curtis, British Entomology, fol. 630.

seed, or neglected roots left in the soil, and growing up with the corn crop still further prolong their existence, until the seedlings of the next crop shewing themselves in a state to which they have a still greater predilection, invite them forth from their hiding places, to the great chagrin of the cultivator, who, for the first time, becomes aware of the presence of thousands of his tiny foes, ready to lay waste the produce of his fields. As a pupa, or chrysalis, a state in which the embryo of most insects resists the severest winters, numbers probably remain in the soil, and are hatched into winged insects in spring. One of the benefits derivable from the practice of eating off turnips by sheep folded on the ground, is certainly the destruction of many insects in this condition.

Whilst feeding on the turnip crop in an advanced state of growth, the presence of the beetles is scarcely perceptible; it is owing to their attacking the tender germ, just as it emerges from the soil, and eating off the seed-leaves which supply the plant's earliest nutriment, as likewise the true leaves, as soon as they appear, that they become a plague. The evil is greatly aggravated in a dry season, with a parching wind, and much sunshine; as the edges of the wound are shrivelled up as soon as it is inflicted; whereas, in a moist atmosphere, with a plentiful supply of sap from beneath, the hurtful effects of evaporation are, in some respects, neutralized. In some insects, the grub subsists on a different kind of food from that preferred by the insect evolved from it; but, in the present case, the plant has to sustain the attacks of the larva, in which stage the voracity of an insect is at the extreme, as well as to support the parent insects and all their progeny when they have become beetles. The beetle lays its eggs on the underside of the turnip leaf, and they are hatched in ten days. The worm produced betakes itself to mining between the upper and under skins of the leaf; during which process, it devours only the soft, pulpy, internal parts. It feeds within its burrow for sixteen days. Its change into the pupa state, during which it lies quiescent, without sustenance, and incapable of receiving any, takes place in the ground, under the shelter of the turnip leaves. Making its way through the cuticle, it enters into the soil about an inch and a-half, where it remains for about a fortnight, when it re-appears as a winged beetle.* There are four or five broods in a season.†

From this detail the following results are deducible:—1. As it requires forty days, although in certain junctures the inactive stages may be abridged, before the insect arrives at its final condition, and ten days ere its grub commences operations, it would appear that the greatest injury to the earliest sown crops is occasioned by the full grown insects that first arrive upon the ground; whether they are the remains of the preceding year's broods; their descendants, hatched in the early months, on native plants; or, the production of pupæ, that have lain in the soil of adjacent fields till a milder temperature has enabled them to complete their transformations. 2. The eggs of the insect are not affixed to the seed, nor committed to the earth with it, as some crude observers have confidently affirmed. 3. The insect does not originate from the manure, an opinion that has likewise been broached. The insects found there are adapted to live upon putrescent substances alone; the beetle, in its different stages, lives exclusively on living herbage. Equally ridiculous is the idea, that it is the product of putrefaction; a doctrine that might well be consigned to the catacombs with its originators.‡ 4. Neither does the insect exist in the soil;

* Transactions of the Entomological Society of London, ii., part i., 1837. Entomological Magazine, v., 342.

† Curtis in English Agric. Soc. Jour., ii., *apud* Gardeners' Chronicle, June 22, 1844, p. 413.

‡ The Egyptians had recourse to the doctrine of equivocal generation to explain the origin of the immense swarms of insects and reptiles that appeared simultaneous with the subsidence of the Nile. As regards the production of insects and the lower classes of animals, it is still a favourite popular tenet. Some of those philosophers who maintain it, perhaps do so, not so much as the result of opinion, as of strong traditional prejudice.

provided no weeds of the turnip kind have been mixed with the preceding crop. It could no more subsist in a field of grain than it could on a bare fallow. 5. It is not in consequence of plants being diseased that the fly attacks them, but because the turnip is its natural food. Insects, as regards their means of subsistence, are subject to the same general laws as the rest of the animated creation; some are carnivorous, others herbivorous, while another portion act as scavengers, and clear away nuisances. It is the last that follow in the wake of a disease, and render it more virulent; but a leaf-eating insect would no more desert the healthy foliage to feed on the contaminated, than a cow or a sheep would turn from the salubrious pasture to riot on garbage. In some parts of a field, plants will not be thriving so well, will be less robust, and more backward than others, and these will probably perish, while the remainder will surmount the danger. But this feebleness is not disease, but the consequence of insufficient food, and the plant being placed in circumstances unsuited to its growth. Supply the deficiency, or remove the obstacles, and it will bear comparison with the most vigorous. The insects select these parts, not as being distempered, but as affording a more tender and palatable fare; and the plants suffer, not merely from having their strength normally impaired, but from the protracted period in which they are allowed to pine in an infantile condition.

The scent of this insect is remarkably keen, and it is by its means that it is attracted to its booty from afar. The poet Thomson represents the insect myriads as coming "warping on the eastern winds," to devastate the promise of the opening year; this insect, however, advances contrary to the breeze which wafts to it the perfume from fields of germinating seedlings. It is most prevalent in low-lying situations, where high hedges or plantations impede the circulation of air; or along the sea-coast, where the temperature is little liable to extremes. It seldom does any hurt on airy and more exposed grounds, and I have known instances, where, for upwards of thirty years, it has not occasioned even partial injury. It comes forth most abundantly in the heat of the day; even in the midst of winter, several may be seen basking upon a sunny wall. In cold weather it remains torpid and inactive. It has been mentioned, as an instance of its destructive powers, that an individual who confined a few, for the purpose of observing their habits, found that they consumed ten young turnip plants every day,* In the turnip fields, remarks a practical observer, "it is surprising with what rapidity the work of devastation proceeds; one day blanks will be noticed in the rows of plants of 2 or 3 inches in length, in another day or two these blanks will have extended to a foot; in a few days more the openings will have increased to 3 or 4 feet; and thus in 10 or 12 days the farmer's prospects for plenty of winter food for his flocks is partially or wholly blasted."† Messrs Kirby & Spence state that in the opinion of an eminent agriculturist, the loss sustained in 1786 to the turnip crops in Devonshire, amounted to no less than £100,000 from this cause alone.‡

It is chiefly after mild, open winters, and a genial spring, that the turnip beetle is so numerous as to create alarm. In wet and inclement seasons, and after long droughts, it is scarce. The winter and spring of 1847-8, were remarkably favourable to its preservation and rapid production. It first gave warning of its presence by attacking the beds of turnips in gardens, and when these were devoured, the radishes were resorted to. It was aided in the work of destruction by *Haltica* (*Macrocnema*) *Sperguläe* of Gyllenhal,§ a coppery green or brassy tinted insect of the same

* Duncan, Quart. Journal of Agriculture, viii., 354.

† Fernie, Gard. Chron., July 18, 1846, p. 486.

‡ Kirby & Spence, Introduction to Entomology, i., 185. Wilson, Art. Entomology, Encyclopædia Britannica, ix., 185.

§ Gyll. Insecta Suecica, iii., 571. Hardy, Berwickshire Naturalists' Club's Proceedings, ii., 195. Macrocnema picicornis, Kirby, Stephen's Illustrations of British Entomology. Mandibulata, iv., 321.

family, larger in size, but less abundant, though generally distributed. Its habits are similar to those of *H. nemorum*. In the fields it was joined by *Nedyus contractus*, a small weevil, which, when numerous, is often nearly as pernicious as the *Halticæ*, by puncturing and nibbling the foliage: the edges of the wounds becoming withered as if scorched, or corroded by an acid, like those inflicted by the turnip beetle. Owing to their combined attacks many fields proved a complete failure, and repeated sowings had to be resorted to, to obtain a braird.

Many plans have been adopted to destroy this pest and have met with more or less strenuous advocacy, although no one generally applicable has as yet been discovered; nor, indeed, in the nature of the case, is perhaps attainable. Those who have propounded them, being chiefly practical men, could scarcely have deceived themselves, and if the remedies do not succeed with others, it is perhaps more owing to alteration of the circumstances, such as the diversities of soil and its condition, and the vicissitudes of climate, and to the pains-taking of the experimenters, than to inherent defect. Mr Paul of Starston, in Norfolk, invented a bag-net, which, being quickly drawn over the turnips, secured the beetles while leaping off the plants. The smell of elder, or bour-tree, is said to be disrelished by them, and bush-harrows made of fresh cut branches of this tree have been recommended to be drawn over the turnips to drive them away; or branches of it strewn over the field impregnate the surrounding atmosphere with loathsome exhalations. A board, freshly painted or tarred, placed on a machine, and drawn over four drills, has also been tried. The insects, on being disturbed by a piece of cloth suspended from beneath, leap up and stick to the board. This implement is much used in Cornwall, where it is called the "fly-catcher." Mr M'Gall gave an account of a similar instrument at the Annual General Meeting of the Club for 1847. The fittest time for using it is during the heat of the day, as then the insects are least sluggish. Mr Beards, agent to the Duke of Buckingham, preserves his crop by causing an old sack to be ripped open and nailed to a pole, leaving the pole, for the purpose of handles, about eight inches at each end longer than the sacking. One side is then smeared with tar, and two men, one at each end of the pole, draw the sacking, with the tarred side downwards, regularly over the field, letting it sweep the ground. It is carried obliquely, and is freshly tarred with a brush every "bout," or oftener if required. Gas-tar is preferable as it leaves a strong, disagreeable odour.* These mechanical processes require frequent repetition, as many of the insects will miss the board and fall into the drills, or on their backs, and thus escape. Some, with much reason, adopt the plan of allowing plenty of seed, so that the insect may satisfy its wants, and still leave sufficient for a crop. By this means also the growth of the young plant is greatly accelerated, and thus the more speedily placed out of the insect's reach; though, it must be confessed, that its deficiency in vigour may keep it somewhat longer in jeopardy. Mr Sullivan states, that in East Lothian, from 2 to 2½ lbs. of seed, per acre, are sown;† and Mr Ramsay of Derwenthaugh, near Newcastle, finds 2 lbs. of seed quite enough, if the land is properly prepared;‡ in Berwickshire practice many adopt 3 lbs.§ In some parts of England, and elsewhere, however, where the attack of the fly, from its greater prevalence, is much dreaded, 4 and 5 lbs. per acre (drilled) is strongly recommended, and even 6 or 7 lbs. have been used.‖ Mr Poppy of Ipswich recommends an expedient very similar to the one now mentioned. He caused thick rows to be sown alternately with thin rows; the former being more juicy and less fibrous from their rapid growth, were preferred by

* Proceedings of the Royal Agric. Soc. of England, 8th May, 1844.

† Gardeners' Chronicle, Nov. 16, 1844, p. 771. ‡ Ib., 1847, p. 245.

§ Of the last quantity, the Earl of Leicester used to say, that it gave "plenty for the fly, plenty to hoe, and plenty for a crop."

‖ Ib., Sept, 2, 1848, p. 596. Ib., June 15, 1844, p. 394.

the insects, while the latter came up by their side uninjured.* The same end may be attained, though less neatly, by scattering a quantity of seed broadcast over the drills after the crop is sown. Attempts to secure the crop, by procuring a double braird, have been attended with considerable success. Seeds of different ages are sown together; or one portion is steeped, while the other half is used dry; or one sowing after another is given to the land, after the interval of a few days. If the earliest started seed come up in dry weather, the fly will perhaps take it, and being satiated, will be less severe on the supplementary braird; but if the first appear in wet weather, it will remain the standing crop in consequence of the insects being confined to their hiding places. In connection with this topic, it was stated by Mr Woodward of Little Comberton, Worcestershire, before the weekly Council of the Royal Agricultural Society of England, 8th May, 1844, that he had, the previous year, "prepared a field for turnips, and brought the whole of it into the same state of cultivation; but, having sown one half of the field on the 1st of June, and the other half on the 2d, with the same seed, in the same condition, he had the surprise and mortification to find, without any obvious solution of the mystery, that the first sowing went, while the second only stood." In explanation, it may be remarked, that, probably, the first sowing preceded the other in germinating, and that the insects, having been primarily attracted to it, and finding a plentiful supply, never removed from it. In general they are sluggish if once they establish themselves on plants adapted to their taste, as is seen by the unsparing manner in which they conduct their depredations. One of the causes why the Swede is more difficult to raise than the common turnip, "is from its being sown before other turnips, at a season of the year when commonly less rain falls than at a later period, and being slower in growth, and less able to withstand the attack of the fly."† To distract the attention of the insect, Mr Le Keux proposes to sow it along with stone white turnips, when the beetle will attach itself to the latter, and the Swedes will be preserved.‡ To this it is objected that the insect may be attracted to the Swedes by the strong scent of the white turnip.§ Be this as it may, the plan has sometimes succeeded in practice. Taking advantage of the perfect scent of the insect, it might be possible, in some instances, to employ a trap to clear the neighbourhood of a field, or diminish the number of the beetles, before the crop be sown. An acquaintance informs me that he once had his attention directed to a portion of a turnip on the side of a public road, on which an immense assemblage of the fly had taken place. They had been lured from their retreats by the beautiful day, and had been drawn thither, as to a common centre, to have their wants supplied. I have likewise remarked that where the wild plants which they frequent in spring are isolated, or grow in patches, the insects are more than usually crowded. In accordance with these observations, it may be proposed to sow a quantity of seed in small pits dug near the field, or garden if preferable, early in the season. If the bait proves tempting, and a sufficient number of insects are collected in any of the pits, a spadeful of earth might at once be placed over them while busy feeding; and the insects thus entrapped might be destroyed by pouring in boiling water, or some acrid solution. Different growths of seeds might be obtained in the pits by sowing the seeds steeped, or dry, or of different ages. Smoke from dry weeds and stubble, driven across the fields in favourable directions of the wind, has been found beneficial in clearing a space from insects.‖ Some render this more pungent by burning sulphur on the fumigating heaps; the sulphurous acid produced, as well as the smoke, is very annoying to the little pests.¶ It has been proposed to apply to the

* Quart. Journal of Agriculture, viii., 363.

† Poppy, in Mark Lane Express.

‡ Trans. of the Ent. Soc. Lond., ii., part i. Ent. Mag., v., 343.

§ Curtis, Roy. Agr. Soc. Journ. ii., *apud* Gard. Chron., June 22, 1844, p. 413.

‖ Kollar on Injurious Insects, 143. ¶ Gard. Chron., Aug. 7, 1847, p. 531.

plants an infusion of wormwood, or quassia, which renders the plants so bitter that the insect is forced to decamp. Boiling water is poured on the wormwood, or other nauseous ingredient, and the infusion may stand from 12 to 24 hours. It is applied to the fields with a wisp of straw; a single sprinkling is said to be quite effectual, unless rains or heavy dews fall, when it may be expedient to repeat the operation.* On the same principle, Justice, an old writer, recommended scattering "bear chaff," steeped in vinegar, among the plants that are infected.† Gardeners have facilities in protecting their small plots not enjoyed by farmers. They find a mixture of soap and water a good remedy—1 lb. of soap to 12 gallons of soap-suds, or 6 gallons of soft water to a pound of soap, applied with the garden engine.‡ Weak brine has likewise been employed. Pure water itself, while it annoys the insects, hastens the growth of the plant, so as to place it beyond their power to hurt it. This, however, is an operation no extensive farmer can undertake. "This is evident from the consideration that one day's showers—say equal to one inch of rain—scatter over each acre a hundred tons of water, a quantity which a man, horse, and water-cart could not spread in a week."§ In soils infested with cruciferous weeds deep cultivation may be useful to bury the embryo of the future beetle, at a depth at which it cannot hatch. To destroy those brought to the surface by the farm operations, Sir John Sinclair advised having the land subjected to fire, by means of the cuttings of hedges, clearings of ditches, and spare straw, strewed over the field, and burned immediately before sowing. But what above all is of essential importance is the adoption of such a mode of cultivation as shall ensure a rapid germination of the turnip seed, a regular and equal braird, and vigorous growth of the young plants during the stage of their existence, in which they are most liable to injury. To obtain a good bed for the seed depends very much upon the state of the soil at the time of sowing. It cannot be too finely worked; for besides the advantage which a porous tilth imparts to the seedling in facilitating its egress, the beetle will be less sheltered from inclemencies of the weather than it would be if the ground were cloddy or rough. If too moist, much of the seed will perish, or come up enfeebled; if too dry, it will be long in vegetating, or spring forth irregularly; either of them favourable conditions for a formidable inroad of the fly. The land, if it can be avoided, should never be wrought while wet, or, as it is termed, "poached." As, in dry seasons, frequent ploughings often occasion great evaporation, it is sometimes advantageous to allow the land to lie for a day or two after the last working, before drilling up, that the moisture which it still contains may be equally diffused, or, as it is expressed, that "the land may come to its natural sap." Much benefit also, in the retention of moisture in the pores of the soil at this stage, arises from rolling the ground with a heavy roller, after it is harrowed. I may here notice the beneficial effects of charcoal, or even common salt, in preventing the escape of damp; and that a top-dressing of muriate of lime, one of the most deliquescent salts, will communicate a lengthened state of freshness to the soil. The same effect will follow even in a severe drought, by applying as a manure, bones dissolved in muriatic acid; or, what is equivalent, bones mixed with common salt, to which vitriol is added to induce solution.‖ I need scarcely advert to the value of phosphate of lime, guano, and good farm-yard dung, in active fermentation (taking care, in the last case, that the seed is placed in contact with the manure,) to hasten forward the young plant to rapid maturity, and thus abridge the period of danger. Deep sowing has been profitably practised by many farmers in the west of Scotland;¶ and even at home its benefit has been felt in dry seasons; a healthy braird being produced, nearly in a state approaching to the "rough leaf," and thus the better adapted to set the

* Kollar on Injurious Insects, 142. † M'Intosh's Practical Gardener, 76.
‡ Duncan, Quart. Journ. of Agric., viii., 362. § Gard. Chron., June 22, 1844, p. 413.
‖ Professor Way, in Gardener's Chronicle. ¶ Ayrshire Agriculturist.

beetle at defiance. The seed itself requires little previous preparation; the newer it is, it will germinate the sooner; and it has even been suggested, in the case of Swedes, to obtain seeds raised in some early climate, such as the South of France, that they may be used for sowing the crop of the same year. To separate the light and imperfectly ripened seeds, and those eaten by the mites, they should be placed in a tub of water, and all that float should be rejected. Steeping the seed forwards its appearance by a day or two; and this is not unfrequently practised with Swedes, which are later in springing than the common turnip. In dry seasons, however, it is hazardous, as the soil will deprive the seed of its moisture, which will then shrivel and contract, and germination will thereby be prevented. In some favourable seasons, the seedlings will be above ground within three days; more usually in five or six; in some instances, weeks may elapse. Now is the critical period with the crop; as the plant, having exhausted itself in producing the seed-lobes, remains stationary for a time, assailed by a host of foes, till the true leaves are expanded, to whose agency it is to owe its future existence; and now is the effect of good manures most apparent in stimulating the vital processes that are to render it invulnerable. A limited and early sowing will be more apt to be endangered by the beetle, than a more general one; as the former will be exposed to its full attack, when it has little other food; while the latter will have to contend with a divided enemy, whose virulence will diminish with augmented supplies and a wider dispersion. Mr Wilson, Edington Mains, relates an instance of the disadvantages of too early a seed time, even when all other circumstances were favourable. Several years since, he sowed ten or twelve acres of rape in May, before the time when other turnips are sown. The land was in excellent condition, and the braird one of the finest he had ever witnessed, but afterwards the fly got in, and so great was the destruction, that he did not believe there were above ten or twelve plants left remaining—not above one to the acre. The whole insects of the neighbourhood had apparently resorted thither.

There still remains another class of remedies to be noticed; which consists in powdery materials, with which the seedling plants have been recommended to be dusted. Ashes, soot, road-dust, where the road-metal is calcareous—and above all quick-lime, have been applied for this purpose. M. Wundram, a German clergyman, finds the road dust to be highly efficacious. A night is to be chosen, in which a great quantity of dew has fallen, and the dust is thickly sprinkled over the plants, so that they are coated with the powder. The beetles, it is stated, "all at once disappear, particularly if the sun shines brightly the following day, and the dust is dried on the plants."* It is questionable if the dust of any of the Berwickshire roads would be of much avail, as the substance employed by M. Wundram, was in reality a pulverized carbonate of lime. The quantity of quick-lime with which some propose to dust the plants, is a bushel to the imperial acre.† A correspondent of the *Gardeners' Chronicle*, for May 4, 1844, p. 284, who has both experience and confidence in the remedy, gives 6 bushels to the acre, measured before slaking. He loses not a day, but applies it soon after the seedlings appear. He sows it with a machine. I subjoin his table of expenditure for dusting with lime ten acres:—

Eight quarters of lime,	...	...	...	...	£0	16	0
Carriage,	...	...	...	...	0	5	0
Two men, slaking and riddling,			...	...	0	3	0
Beer,	...	...	...	...	0	2	0
Horse, for sowing the lime,	...		...	...	0	4	0
One boy, for ditto,	...	...	...	...	0	1	0
					£1	11	0

All these applica ions require to be repeated if the foliage has been washed with rain.

* Kollar on Injurious Insects, 142, 143. † Gorrie, Memoirs of the Cal. Hort. Society.

Attempts have been made, and with a good result, it would appear, to impregnate the plants through the coats of the seed, with properties which render them nauseous. "The substances that have been tried with this view," says the Rev. Jas. Duncan, "are oil, brine, and sulphur, and the result in many instances seems to have been highly satisfactory. Sometimes the seeds have been steeped in milk, with a little brimstone added; and I have just been informed that a farmer in Forfarshire completely saved his crops from the beetle for a long series of years, by keeping the seed for some time previous to sowing in a considerable quantity of flour of sulphur, and sowing the sulphur along with the seed. In this way the juices of the plant might be tainted by absorption, so that the insect had no relish for it; and the disagreeable odour arising from the sulphur strewed in the soil would help to drive it away. The sulphur was found in no degree to injure the vegetative powers either of the seed or the plant. This plan was followed by the farmer alluded to, for fifteen years, with complete success; his turnips being quite free from the insect, while his neighbours continued to suffer from its depredations."* Some damp the seed and mix it with sulphur, others pour it with the seed into the bag previous to sowing. Half an ounce of sulphur to a pound of turnip seed, or an ounce to three pounds, are the quantities specified. An East Lothian farmer informs me that he has used it for seven years, during which he has sustained comparatively little damage from the fly. Mr Calder, Fairneyside, has derived much benefit, by keeping his seed during the winter, mixed with sulphur, at the rate of a pound of sulphur to a bushel of seed. He states that in this way only can he be sure of its proving effectual, and mentions as an instance of the success attending it, that having parted with some of his sulphur-treated seed to a neighbour, it was sowed by him every two drills alternately with seed that had undergone no preparation; and the consequence was that the young plants from the latter were totally taken off by the fly, while the others escaped. When the young plant appears, bearing up on its leaves, the coat of the seed, the latter on being rubbed between the fingers, still smells strongly of the sulphur, and thus for a time, it shields these tender and essential organs. In those cases where the sulphur treatment has succeeded, the baffled flies had still ample scope in the surrounding district; it remains to be ascertained, whether a more general application, might not deprive it of its efficacy, by the fasting myriads acquiring a relish for what they might otherwise reject with disgust. The remedy is an old one; and, from the following extract from the *Newcastle Journal* for Aug. 21, 1779, with which, as a curiosity, I shall conclude these remarks on the turnip beetle, was in vogue nearly 70 years ago:—

"An excellent recipe for preventing the flies damaging the seedling leaves of turnips, cabbages, cole, weld, flax, and many other vegetables, for less than sixpence an acre charge.

"Mix 1 oz. flour of brimstone with 3 lbs. of seed daily, for three days successively, in an earthen glazed pot, and keep it covered close, altogether well at each fresh addition, that the seed may be the more tainted by the sulphur; then sow it as usual on one acre of ground, and let the weather come wet or dry, it will keep the fly off till the third or fourth seedling leaf is formed, and by this time they will all be somewhat bitterish, and consequently very much out of danger of the little black flying insect, which, in summer time of the year, may be sometimes seen in swarms on the wing near the ground, searching for, and settling on, fresh bites, till they ruin thousands of acres, by lying and residing under the little clods of earth all night, and coming forth during the day following."

2. WEEVILS.

The weevils are a very destructive class of insects to vegetable produce. They are provided with a long beak or proboscis, with which they perforate the objects of their attack; or slice off successive portions from

* Quart. Journal of Agriculture, viii., 360, 361.

the margins of the leaves. Some of them commit great ravages among seeds and grains, by depositing their eggs in holes drilled into them with their snout, whence proceed grubs that not only destroy the principle of vegetation, but devour the entire internal substance. None of the species attached to the turnip, so far as has been ascertained, are chargeable with this habit. One species, the *Nedyus contractus*, I have already mentioned in connection with the turnip beetle, as destructive to the young turnip. It is black, with a bluish tinge on the wing cases; the head is small, and furnished with a long, slender, bent snout, which at the insect's will, fits closely to the breast; the second division of its body bears anteriorly two acute projections; and its shoulders are prominent. It is even more minute than the turnip beetle, and, as it does not leap, but, on the least disturbance, falls to the ground, and pretends to be dead, none of the expedients for catching the insect will avail with it. In cold weather it retires into the soil at the root of the plant. It survives the winter in moss, or at the roots of nettles, on which it likewise feeds. It occurs in the turnip fields in December, and I have found it abundant among grass in February, and it continues on through the following months. The flowers of turnips, and of the wild mustard and radish, are much relished by it, and on them it pairs. It frequents, in like manner, all cruciferous weeds to which the turnip fly is attached. It is one of those insects to which has been ascribed the commencement of the disease called fingers-and-toes, anbury or club-root. Mr Kirby bred it, and *N. assimilis*, a larger greyish-black species, likewise common on the turnip blossom, from the small white maggot in the wen-like galls at the roots of *Sinapsis arvensis* (Wild Mustard).* The insect bred from turnips infested with fingers-and-toes,† was *Nedyus sulcicollis*, equally common with *N. assimilis*, and very similar to it; but differing by being of a deeper black, by its wing cases being more decidedly granulated, by having its beak and legs shorter, and its thighs stouter, and toothed. Besides these three, we have in the turnip fields, *N. Boraginis*, whose history has not been traced. The irritation occasioned by the larvæ, it has been conjectured, prevents the turnip from increasing in bulk, and causes the nourishment sent down from the leaves to be expended in the formation of those fantastic growths that characterise the disease, and in which it continues to indulge long after the insect has deserted its nidus. The roots thus affected speedily tend to corruption, become exceedingly fetid, and, before the autumn has closed, are infested with various kinds of insects that feed upon decaying substances.‡

The disease in this county manifests itself on moory soils destitute of lime, and on those with a superabundance of vegetable matter. A part of the field much cut up by carting manure will be affected, while the rest will comparatively escape. Lime, in this case, is the grand corrective, probably, by enabling the turnip to outgrow its early injuries. As a proof of this, I have noticed several examples of turnips originally diseased, forming two bulbs one above the other; which, although small, were quite sound and fleshy internally, and free from stringiness. Mr G. W. Johnson, who has written a paper in the *Quarterly Journal of Agriculture* on this disease, states that Mr Smith, gardener to M. Bell, Esq. of Wolsington, Northumberland, found that charcoal dust spread about half-an-inch deep on the surface, prevented its occurrence in the garden.§ Soot is equally efficacious. Marl has been recommended; also brick ash, and paring and burning. Mr Johnson tried salt, but the experiment was not decisive, and has a high opinion of hydrosulphate of lime, which may be procured from the gas-works; which substance, in a dry state, he also thinks, would destroy the turnip fly.‖ Soap-boiler's waste, incorporated with the soil, has been used with beneficial effect in the neighbourhood of London. Since its value has been discovered, the price has risen from 6d to 5s per cart-load.¶

* Kirby & Spence, Introduction to Entomology, i., 186, 448. † See note A.
‡ See note B.
§ Quart. Journ. of Agric., viii., 313. Trans. of London Hort. Soc., vi., art. 2.
‖ Quart. Journ. of Agric., viii., 315. ¶ J. M., Gardeners' Magazine, viii., 493.

3. WIREWORMS.

Considerable confusion prevails as to the application of the term wireworm, which is appropriate only to grubs of beetles of the family *Elateridæ*. But, in a general way of speaking, *Julus pulchellus*, and *Polydesmus complanatus*, two Myriapods* pernicious to root-plants, are likewise reckoned wireworms. The former, which is a long, round, linear, slender, whitish, slightly-spotted, many-footed worm, in the east of Berwickshire occurs only on the sea-coast in a red sandstone soil: I have not noticed it in the tracts where the subjacent rock is greywacke. Dr Johnston tells me it is very destructive to culinary herbs near Berwick. The *Polydesmus* has also a multitude of feet, is composed of joints not unlike those of a back-bone, is flat and compressed, of a tawny colour when full grown, but immaculate white while immature. It infests the roots of cabbages and carrots, often occasioning a failure of the crop. It likewise eats into the stems of potatoes, cutting them off where they unite with the roots; the shaws wither in consequence, and in this state are sometimes mistaken for symptoms of the dreaded potato disease. I have little doubt of their being pretty general feeders, and that they will occasionally pay the turnip a visit. They show a great dislike to peat-earth, and this, with exhausted tanner's bark, in making up the beds, has been successfully employed by gardeners by way of protection.† The true wireworms, however, in their perfect condition, are beetles. The most common within the district are—*Agriotes obscurus*, *Athous hæmorrhoidalis*, *Dolopius marginatus*, and *Hypnoidus riparius*. They are of obscure colours, of different tints of brown or black, of an elongate, oblong shape, with short, weak legs; the second division of the body ends in two acute points, and the somewhat comb-shaped antennæ are received into a groove on each side of the fore-breast, which last terminates with a sharp spine. In descending from heights, they often fall on their backs, from which position they escape by a mechanism similar to a spring, which, being quickly exercised, causes them to rise with a jerk, accompanied with a snapping noise, whence they have been named "clicks," or "spring-jacks." Their grub is a narrow, stiff, 12-jointed, chestnut yellow, 6-legged worm; and has a gliding, serpentine motion. Many insects pass through the phases of their existence within a few months; and the greater proportion in the course of a year; but the wireworm requires five years to arive at its ultimate development; during which period it is employed in devouring or gnawing through the roots of plants. It is most abundant in dry or peaty soils; stiff lands are also not exempt; and ground long in a state of pasturage, is particularly subject to it for some time after it has been brought under tillage. In grounds with defective drainage it has sometimes committed great ravages after wet seasons; the water lodged in the soil having forced it up too near the surface. It is often very destructive to the turnip crop, and sometimes cuts off the young plants before they arise above the ground. Fallows, frequent stirrings of the soil, and exposures to the frost, surface burnings, and a repeated and varied alternation of crops, appear to be among the most practicable means of suppressing it. Some approve of sowing the infected field with white mustard; the worm having a great aversion to its acrid roots, and, having no other sustenance, will, if the weeds be kept down, it is supposed, die of famine. The crop is afterwards fed off by sheep. Others strew in the soil pieces of rape-cake of the size of a hazel nut; the worms eat into it and are killed. Traps have been formed of slices of potatoes, turnips, and other roots, placed in the ground, with a skewer of wood stuck through them for a handle. These are examined every morning, and the worms obtained in them are removed or destroyed. The following plan has been suggested for getting rid of it in its attacks on turnips. Boys were employed to collect the worms at the rate of 2d

* Some of these are more popularly known as "Meggy-mony-feet." A description of the Berwickshire species, by Dr Johnston, may be found in Loudon's Magazine of Natural History, viii., 486, 494.

† M'Intosh's Practical Gardener, 75.

to 1½d per 100. No less than 18,000 were collected in a single field. This, at the latter price, would cost £1, 2s 6d, which was considered as well expended in saving an acre of turnips worth from £5 to £6. As many as 50 worms were found at one turnip.* Moles destroy great quantities of the grubs; and rooks, hens, and other fowls will eat them eagerly. As many as 1225 have been taken from the crop of a hen-pheasant, shot in January.† Guano is often fatal to them. Crops manured with it, and with bones dissolved in sulphuric acid have escaped, while other portions of a field have been doomed to destruction.‡ Soda-ash has recently acquired considerable celebrity in arresting these troublesome vermin, either by destroying them, or causing them to descend deepor into the soil. This substance is the soda of the alkali works before its last stage of purification, and consists of carbonate of soda, caustic soda, sulphate of soda, common salt, and carbonate of lime (chalk). It is sown broadcast at the rate of 1 cwt. to 1½ cwt. per acre, and sells at from 10s to 15s per cwt. The hands in sowing require to be protected with stout gloves, as it is highly caustic. It is reckoned a good fertilizer, and its effects continue to subsequent crops.§ Others deny its influence, stating that the worms will live hours in it uninjured; and that its disagreeable fumes merely keep away the parent beetles, and prevent them from depositing their eggs in the soil.‖ The perfect beetle itself, where the ground is free from stones, may be captured and destroyed, if after rolling, handfuls of hay, turves, or boards, be laid down at intervals, under which the insects may assemble in the evening, which they will sometimes do in great numbers.¶ Salt has it favourers, 2 or 3 bushels per acre requiring to be sown on the turnips in showery weather —for other crops, 20 bushels per acre are said to be little enough.**

This appears to be the fittest place for noticing the freckled, or spotted, whitish grub of a beetle, common in the turnip fields in some parts of Berwickshire, that, from its shape and manner of proceeding, might be confounded with the true wireworm. As it does not appear to be noticed by entomologists, I have appended a description at the close of this essay.†† It eats holes in the sides of turnips, burrows into the leaf stalk, and sometimes insinuates itself between the base of the leaf and the turnip, thus causing it to lose its hold. It likewise mines and perforates the tap root, and eats it off where it joins the bulb; and sometimes it excavates a deepish cavity in the top of the turnip, which may render it liable to rot.

4. CATERPILLARS OF BUTTERFLIES AND MOTHS.

The caterpillar of the Common Large White Cabbage Butterfly (*Pontia Brassicæ*) is often injurious to the Swedish variety of turnip, by stripping it of its leaves. The plant being thus deprived of its lungs, the growth of the root is necessarily impeded. The caterpillars of the Small White Cabbage Butterfly (*Pontia Rapæ*), as well as those of the Green-veined White Butterfly (*Pontia Napi*), are still more hurtful, and prevail to a considerable extent in this county. Their caterpillars are of a light green, with yellow stripes lengthways, and are difficult to detect from their hues assimilating with the tints of the foliage. A caterpillar of the *P. Rapæ*, which, after feeding on the white turnip, was converted into a chrysalis, or "nidnod," about Nov. 10, 1848, became a butterfly on the 18th of May, in the

* Spence, Trans. Ent. Soc. of London, ii., part 4, (Journal of Proceedings, lxxi.,) who derived the information from a newspaper.

† Sporting Magazine. Gardeners' Chronicle, Jan., 1844, p. 45. Westwood's Intr. to Entomology, i., 238.

‡ Gardeners' Chronicle, February 5, 1848, p. 90.

§ Gardeners' Chronicle, May 16, 1846, p. 320. Ib., June 19, 1847, p. 412. Ib., April 29, 1848, p. 291.

‖ Ib., 1846, pp. 588, 635. ¶ Ib., June 12, 1847, p. 394.

** Ib., November, 20, 1847, p. 770. Dec. 11, 1847, p. 827. Ib., July 22, 1848, p. 501.

†† See note C.

ensuing year. *P. Napi* appeared in the fields on May 3, 1849; the bulk do not appear till June; and about midsummer great numbers may be seen on the roads in the lower part of the shire, assembled around moist places, probably for the purpose of drinking. The leaves of the turnip are also the food of the caterpillars of various kinds of moths that infest oleraceous plants. The caterpillars of *Mamestra Brassicæ* (the Cabbage Moth), *Mamestra oleracea* (the White-line brown-eyed Moth), *Triphæna pronuba* (the yellow Underwing Moth), *Plusia Gamma* (the Silver Y Moth), *Agrotis segetum* (the Dart Moth), and *Agrotis exclamationis* (the Heart and Dart Moth), are of this description.* The caterpillars of a species of Noctua, probably of one of the two last mentioned insects which were once included in that genus, were very noxious in several parts of England during the droughty seasons of 1818, 1826, 1827, and in 1844, by eating out the heart of the plants, extensive fields being left "little better than fallow land."† Many of them are nocturnal, bury themselves in the earth, under stones, or at the roots of plants during the day, and issue forth at evening to feed. Salt water, bitter infusions, quick-lime, soot, soap-suds, hand-picking, and the services of ducks and poultry, are the only remedies hitherto suggested.‡ The spindle-shaped green caterpillar of a small, grey moth, one of the *Tineidæ*, has been rather abundant for two seasons, on the turnips at Penmanshiel. Happily its capacities of destruction are not very formidable, but it is well that the agriculturist should be acquainted with all his enemies, of which the least, in certain junctures, may be multiplied to ruinous excess.§

5. CATERPILLAR OF TURNIP SAW-FLY (*Athalia centifoliæ*).

The larva of *Athalia centifoliæ* (*A. spinarum* of continental authors), named the *nigger* or black caterpillar, is an enemy almost as much dreaded by the agriculturist as the turnip fly. Its appearance is periodical, and 1835, 1836, and 1837, were years in which it was exceedingly prevalent. In 1780 it was abundant in Northumberland, whence it probably migrated southwards, as, upon its arrival in Norfolk in 1782, it is stated to have come over the sea. In 1783 the destruction committed by it was so great, that many thousands of acres of turnips had to be ploughed up. The fly, which is a pretty four-winged species, of a yellow and black colour, with clear shining wings of a yellowish tinge, and well adapted for a long flight, lays its eggs, after making an incision with its saw, in the soft part of the leaf. In 5 or 6 days the larvæ are hatched. They are rough-coated, blackish caterpillars, with 22 feet. They are fond of resting curled up in a ring, into which shape they fold themselves when touched, or when they fall to the ground. They grow rapidly, and shed their coats several times, and, by their extreme voracity, strip the fields of every vestige of verdure, with almost incredible rapidity. There are two broods in the season. The full fed larva descends several inches into the soil, and forms an oval cocoon from particles of earth, which it plasters with a shining secretion. These individuals are not long in re-appearing, whence a crop sown in the interval, on the same soil, would be again doomed to destruction. The second broods remain in the soil till the subsequent season, appearing about the middle of May or the commencement of June.‖

The only effectual means hitherto suggested to destroy these obnoxious vermin, are hand-picking and the employment of ducks to eat the grubs.¶ By the latter means, as Rusticus wittily remarks, "two birds are killed with one stone—the ducks fattened and the turnips saved."** The experience

* Several of these are described in Kollar's Treatise on the Insects Injurious to Gardeners, Farmers, &c. London, 1840.

† Gardeners' Chronicle, September 28, 1844, p. 660.

‡ Curtis, Gard. Chron., Sept. 14, 1844, 619.

§ See note D.

‖ Westwood's Introduction to Entomology, ii., 102, 103; and the amusing and well written letters of "Rusticus," in the Entomological Magazine, iii., 339, 341.

¶ Trans. Ent. Soc. London, ii., Journal of Proceedings, p. lxv. **Entom. Mag., iii., 310.

of a Northumbrian farmer on this subject, I give verbatim from the *Newcastle Journal* for Aug. 5, 1780:—"A correspondent desires the public to take immediate notice of the following remedy for the present alarming attack upon turnips by caterpillars. An acquaintance of his having such prodigious numbers as to threaten the total destruction of a very forward close (inclosure) of turnips, put him upon thinking of a ready method to destroy them; when luckily he advised him to make use of the following scheme: to procure as many ducks or other fowls as he possibly could, and keep them in the close in the day time; which having done, and water in small vessels [having been] carried forward for them as they proceeded in their work; in three day's time, to his great astonishment, the whole close was entirely cleared of these formidable foes, though he had only about 60 in the first day, 100 the other two; and though the close was five acres, and had, upon an average, half a score of caterpillars on each plant."

6. GRUBS OF TWO-WINGED FLIES (*Diptera*).

I am not aware of any complaints of damage occasioned by what is commonly called "the grub," or the larva of the long-legged spinner fly (*Tipula oleracea*, &c.), to the turnip crop in Berwickshire, although other crops are often rapidly cut down by it. I notice, however, that in the isle of Anglesey, it was very hurtful to turnips in 1845.* It is partial to stiff, wet soils; and there is a probability that the extension of drainage will either extirpate it, or, at least, greatly modify its numbers.

I find that the leaves of many turnips, when full grown, are occasionally undermined by the larva of a two-winged fly,† which agrees pretty closely, but does not coincide, with the description of that of *Anthomyia Brassicæ* of Bouché, so destructive to plants of the cabbage tribe, by eating passages into the roots and stems, which cause them to rot.‡ Minute yellow and pink grubs of some small gnats (*Melobri ?*) are likewise found in a similar situation, when the leaves begin to decay.

7. APHIDES, OR PLANT LICE.

The last insects to which I shall call attention, are the Aphides, or Plant Lice. Their wonderful history, extraordinary mode of propagation, immense numbers, and the loathsome appearance they give to the vegetables on which they swarm, I can do little more than allude to. During the early part of the season, the females hatched from eggs laid in the preceding autumn, go on to produce generation after generation of which the members in their turn are equally prolific, without meeting with the male. The males appear in the autumn; when females differently organized from the foregoing generations are likewise produced, which lay eggs destined to preserve a race for the future year. A single individual, according to Reaumur, will, in 5 generations, be the progenitor of 5,904,900,000 descendants; and 10 (Mr Smee says 20) generations may exist in a year; an amount of fecundity almost transcending belief. The female is either wingless or winged. In the latter case, when at certain periods of the season, a restless desire of change is impressed upon the race, whether wingless or winged, the insects leave their original plants, and betake themselves in immense swarms to other districts, to settle on a kind of food, often totally different from that they have deserted; while those not similarly equipped become, in many instances, indiscriminate in their taste, and fall upon almost all kinds of herbage. The Aphis is oblong, conical, oval, or flask-shaped; has a soft and pulpy body; and may be readily crushed. Its head is furnished with a pair of long slender horns (antennæ) which are reflected in a state of repose, but in walking are directed forwards, and applied alternately to either side, to pilot its way. Its six legs are slender and long;

* Gardeners' Chronicle, 1845, 480. † See note E.

‡ Kollar on Injurious Insects, 159, 160. This appears to be the Musca radicum of Linn. Syst. Nat., ii., 992. Anthomyia radicum, Meigen, Europ. Zweiflug. Insekten, v., 168. Macquart (Suites a Buffon,) Dipteres, ii., 341.

its mouth consists of a thin tube, sometimes three-fourths of the length of its body, and when unemployed it is folded along the breast to near the base of the second pair of legs. With this instrument it pumps up the luices of plants, after penetrating through the cuticle. The wings, where they exist, are ample, thin, easily lacerated, hyaline, crossed by a few strong, occasionally coloured, ribs. Its body is peaked at the tip, and a little before it there are two short diverging tubes, through which oozes a clear saccharine fluid of the same nature as the honey-dews that besmear the foliage of the plants they infest. Their colours are varied; in some, sombre and opaque; in others, prettily mottled, or concealed by cottony filaments or a scaly scurf; while some are so transparent that their internal organization can be made the subject of microscopic inspection. They are of sluggish habits; and their movements, except those executed on the wing, are gradual and protracted. The species that frequent the turnip fields are a blackish green, mealy-coated species (*Aphis Brassicæ*), the "smother fly" of southern agriculturists, originally found upon the cabbage; and *Aphis Rapæ* of Curtis, of a yellowish green or purplish hue, an insect that, under the name of *Aphis vastator*, has acquired unprecedented notoriety in connection with the potato disease, which Mr Smee, in his publication, has attributed to it. I have not noticed it in Berwickshire, but instances have been told me of fields of turnips that have suffered extensively from Aphides, which, I conclude, from the description given, were of this species. In 1844, it appeared on the white turnip in some places in East Lothian.* Aphides, of which the species are not stated, according to Mr Darling of Hetton House, prevailed to "a frightful extent" in the northern parts of Northumberland, in the summer and autumn of 1842, and the farmers in that part of the district sustained very considerable damage in consequence.† According to an eye-witness, "the plant chiefly attacked by them was the turnip; though Swedes did not suffer so much as the kinds sown later, probably from these two reasons:—1. The Swedes, being sown earlier, had grown too large to be so easily destroyed; 2dly. On account of the property of the leaves to retain water longer than those of any other turnip. Thousands of these little insects might be observed sitting on the under side of the leaf, which they did not '*eat*,' but extracted the moisture from it in such a manner, that at the end of three or four days the turnip was completely killed, and could be crumbled between the finger and the thumb, like scorched leaves. Between five and six hundred acres of turnips were totally destroyed in this way in the neighbourhood of Alnwick and Wooler, particularly about Millfield Plain and Flodden Field, though in the southern parts of the county, and on the Scotch side of the Tweed there were none to be seen, or, at least, so few as not to be noticed."‡ Aphides abound chiefly in sheltered and low lying fields, especially towards autumn in close and sultry seasons; loving luxuriant food, and a temperature uniform and genial. They swarmed in 1846; during 1848 they were scarcely to be observed. They usually reside on the under side of the leaves, whence they are reached with difficulty; though applications of soot, salt, or quicklime, would probably check, if not wholly destroy, them. The Aphides are the prey of the larvæ of many other species of insects, which either deposit their eggs in living individuals, or devour them wholesale. The latter office is performed by a slug-like grub, from which a beautiful banded fly (*Syrphus sp.*), often seen hovering near infected plants, is produced; and likewise by the larvæ of the common spotted Lady-birds (*Coccinellæ*). Their production, however, is so amazing, that the presence of their parasites, or even the thinning of their ranks by birds, is little felt; those that perish by these means being replaced by others, which otherwise would have perished of inanition. For the correctness of this view, suggested by Mr Walker, who more than any other British

* Report of the Scotsman newspaper, for August, 1844.

† Berwickshire Naturalists' Club's Proceedings, ii., 11.

‡ Mr G. Clarke, in the Zoologist for 1843, 123, 125.

naturalist, has devoted attention to these neglected creatures, I need only refer to the ravages of the scale insects, a nearly allied race, on the sugar cane and cocoa nut tree in the West Indies; to those which have destroyed the fertility of the orange groves of the Azores, whereby the inhabitants are deprived of their usual means of subsistence and comfort; or to those at present desolating the coffee plantations of Ceylon, for which there is no apparent remedy but in consigning the infected trees to the flames. To the rigour of our northern clime, which determines the life of the plant as well as of the insect that it nourishes, we may look for a more plausible reason why the noxious insects of one year seldom re-appear in sufficient numbers to create alarm during that which succeeds. It thus happens that, although we cannot boast of the exquisite productions of a milder sky, we have yet, in this, as in many other respects, under the blessing of a good Providence, an adequate compensation.

SUPPLEMENTARY NOTES.

NOTE A.

ON THE TURNIP WEEVIL, CLUB-ROOT, AND FINGERS-AND-TOES.

In treating of the disease termed fingers-and-toes, I have stated the generally received opinion. The conclusion at which I have myself arrived, from several observations made since the first part of this paper was written, is not quite favourable to the insect theory. After two years' examination of turnips in the autumn, I have failed in detecting the larvæ of weevils in any portion of the diseased bulbs; and, even at the commencement of the disease in spring, I have seen no trace of them. I have, however, several times, found a larva enclosed in a gall on the yellow turnip; but it had only occasioned a slight globular elevation on the surface, about the size of a pea. This appears to be the "yellowish maggot" referred to by Mr G. W. Johnson, in the *Quarterly Journal of Agriculture*, viii., 317, as the product of a *Cynips;* and he states that turnips affected with it are "supposed to decay earlier than others, from the hollow left by the insect allowing the access of air, moisture, and putrefaction." The first statement appears to rest merely on conjecture; and, indeed, the same author elsewhere (*Gard. Mag.*, Dec. 1828, p. 451,) ascribes club-root among the Brassicæ, to an effort of the plant, similar to that which occasions some grasses to become bulbous-rooted in dry soils, to retrieve deficient perspiration of the foliage during droughts. The grub in question is that of one of the *Curculionidæ*, or weevils. It is slug-like, footless, thickest about the middle, rather convex above, yellowish white, shining, soft, lubricous, slightly slimy, with numerous undulated wrinkles above, the intestinal canal appearing through the integument, dusky or brownish; the sides, with an ill defined division line, minutely tuberculated; the separate segments there most distinct: belly scarcely less wrinkled, but flatter than the back, a brownish spot on the breast, and another near the anus; head corneous, small, rotundate-quadrate, with two converging depressions in front, and a sunk longitudinal line on the crown, light testaceous, front and mouth brown, tip of the jaws deeper tinted; eyes minute, black. Length, 1½ to 2 lines. It moves by applying its head to the object, and dragging itself onward by the vermicular contraction of its body, assisted by the wrinkles of its under side. When old it has a greater disposition to proceed in a circle than straight forward; whence the shape of its gall may be, in some respects, the result of its rotation. It frequently rolls itself over to a dis-

tance when dissatisfied with its position. On being first removed from its cell, it moves its little cibarian instruments with great rapidity; and emits from its mouth a considerable quantity of a light brownish fluid. This may, perhaps, be a preservative provision to annoy its enemies, and may likewise be employed as an irritant to divert the sap to form the curious excrescences under which it resides. On being extracted, it will again speedily bury itself within the substance of the turnip. It is quite similar, if not quite identical, with the grubs found in galls on the stems of cabbages; but it is yellower, and I do not find the spots on the breast and terminal segment of the latter. Specimens, however, quite the same with those on cabbages and greens, I have found in the mid-rib of the leaf, and near the top of the bulb of young turnips. I have not, as yet, reared any of them, but I have, in several instances, taken from the soil about the roots of greens infested with the disease, *Nedyus* (*Ceutorhynchus*) *sulcicollis*, in an *immature* state, the same species to which "fingers-and-toes" is ascribed. The pupa is naked, soft, and white, and, unlike those enclosed in a case, might be destroyed by a slight exposure to frost. It is liable, while in the gall, to become the prey of a small black, reddish legged, parasitic Ichneumon, which, on leaving the grub, envelopes itself in a loose hempen-like coccoon. On the cabbage, and in the few instances wherein I have observed it, likewise on the turnip, it commences its operations on the mid-rib of the leaves. Originating under a small green wart, caused, probably, by the puncturing of the parent insect preparatory to the deposition of its egg, it makes its way to the centre, along which it eats a channel in either direction, emerging occasionally, if one may judge from the opening of its little tunnel outwards. It probably settles finally in the roots, but I have not, as yet, followed its progress thither. As it is the outer leaves that are principally affected, these might be pulled off as soon as symptoms of decay appear. Another smaller and more linear species, with two sub-corneous brownish patches about the middle of the prothorax (second segment), is sub-cutaneous in the cabbage leaves. The clubbing of the cabbage stem takes place principally on the part immediately under the soil, and the swellings seldom come into contact with the roots. The grub does not penetrate very deeply, and may be readily removed with a knife; and it is to be observed of the turnip galls, that they are likewise somewhat superficial. In both instances, the grubs continue to tenant the galls during the winter. Most of them had deserted the stems of greens in June, but a few remained still later. From this, it would appear, that the readiest way of diminishing the insects would be, to remove the old plants from the soil as early as possible in the season, and that they should be disposed of in such a way as to prevent the insect from entering into the ground to undergo its final transformation. My object, however, in adducing these facts, is not so much for the sake of practical remark, as to shed light on a little understood disease. So far, then, as my observations go, the effects of grubs of the weevil on cabbages and turnips are precisely alike; they form surface galls, but they do not account for the protuberances and distortions that are constantly being generated in the turnip bulb and roots. That the grubs, if numerous, would cause an aggregation of tubercles to rise round the bulb, that may materially interfere with its increase in size, or that may even prevent any bulb from being produced at all, I have seen facts to prove; but this differs very considerably from the abnormal tendency to form a continual repetition of monstrous growths, which, from its occurrence only on particular soils and in special circumstances, may be more justly viewed as a consequence of these pernicious external influences. Professor Johnston mentioned before the Agricultural Chemistry Association a somewhat similar disease, as occurring at Pinkiehill, in a moory soil, containing a considerable proportion of manganese, which operated injuriously on the turnips grown on it. He described the disease as consisting in a "large fungus or wart, that gradually reached the head of the turnip and destroyed it;" which, indeed, is one of the many symptoms that characterise "fingers-and-toes." It would thus appear, that there may be two

diseases, one occasioned by insects, the other arising from noxious ingredients in the soil.

Since the preceding note was written, I have continued my observations on the turnip crop of the present season. I find the small Curculionideous mining larva of the cabbage leaf already mentioned, likewise of general occurrence in the leaves of turnips. The grub of *Nedyus contractus* is said to have this habit, but I have not been able to refer to an original authority for the statement. The present larva is rather linear, somewhat narrowed before and behind, white or yellowish, wrinkled, footless, with the segments rather distinctly marked along the sides, and with a pretty well defined clearer dorsal line; head corneous, less disproportionate to the succeeding segments than in the turnip-gall larva, brown, as are the oral parts, paler on the face, with sometimes a triangular brown spot on the forehead; two subcorneous brownish patches on the prothorax, separated by a white line; the anal end has two small prolegs, above and underneath which there are a pair, a single one on each side, of minute tubercles. Length 1½ line.

Till very recently I was not aware, nor have I anywhere seen it adverted to, that the larvæ of some of these weevils are very destructive to turnip seed grown for use or sale. On opening a pod that appeared rather turgid, there were scattered over its interior a large number of white semi-transparent grubs, which, however, were too minute to allow of any definite opinion being formed respecting them. Some time later, I observed many of the pods of a yellowish tint, and each of these had a round hole drilled in its side. On being opened, many of the seeds were found to be eaten or gnawed, particularly, which is the vital part, where they were attached to the dissepiment; and I was not long in detecting the little depredator at work, which proved in no respects to differ from the grub occurring in the cabbage and some of the turnip galls. There was usually only one grub in each pod, and, from the size of the hole, it is apparent that it must have been quite young when it gained access to the interior. Some pods were deserted, although bearing indications of previous occupation, and these were, for the most part, considerably swollen. These, from a previous observation, I consider the original depositaries of the eggs; the larvæ shortly after hatching, being, probably, obliged to migrate in quest of a more juicy food, from the tendency the seed has to ripen, after the insects have intercepted its supply of sap. The pod grows yellow prematurely; in the same manner as the worm-eaten apple, on the destruction of the seeds, which are the "end and aim" of the various chemical changes it undergoes, ripens and falls untimely. Whether, at a later stage, it will devour the ripened seed, has not been ascertained. I have several times noticed *Nedyus assimilis* engaged about the seed pods; but as the *N. sulcicollis* equally frequents the blooms, it cannot, without breeding the insect, be known to which of the two we are to ascribe these habits. Great numbers might be taken from the blossoms by a bag-net made of canvass, stretched on a hoop to which a handle is affixed. This might be used without injury to the plants, if swept lightly over them, just to strike them. It results from these observations that my remark that "none of the weevils attached to the turnip, so far as has been ascertained, are chargeable" with devouring seeds can no longer be entertained.

NOTE B.

INSECTS, &c., FOUND IN TURNIPS AFFECTED WITH FINGERS-AND-TOES.

In November and December, I met with the following insects, &c., in decaying turnips affected with fingers-and-toes. 1. *Omalium rivulare.* 2. *O. fossulatum*, Er. 3. *Proteinus brachypterus.* 4. *Oxytelus rugosus.* 5. *O. sculpturatus.* 6. *O. depressus.* 7. *O. nitidulus.* 8. *Aleochara nitida.* 9. *Tachinus marginellus.* 10. *T. subterraneus.* 11. *Homalota cauta*, Er. 12. *H. Fungi.* 13. *Oxypoda brevicornis*, Er. 14. *Xantholinus punctulatus.* 15. *X. linearis.* 16. *Quedius impressus.* 17. Larvæ of *Oxytelus sculpturatus?*

All these are members of the family *Staphylinidæ*. 18. *Helophorus grandis*. 19 *H. nubilus*. 20. The blackish larvæ of a species of *Telephorus*. 21. Larva of another species of *Telephorus*, of a pale brown colour, with a line of darker spots along each side of its body, of which the six anterior are somewhat elliptical. 22. Larvæ of a gnat, perhaps of *Trichocera regelationis*, of which I found perfect insects issuing from under turnips. 23. Spiny-coated larva of a two-winged fly, similar to that from which *Anthomyia canicularis* has been bred, and to another figured by Curtis in the *Gardeners' Chronicle*, Dec. 6., 1845, p. 817, under the name of *Anthomyia tuberosa*. 24. Smooth larvæ of another dipterous insect; apparently an *Anthomyia*. 25. *Gamasus coleoptratorum*, a kind of mite. 26. Two or three species of *Poduræ* or spring-tails. 27. A small Annelide, of frequent occurrence, under decaying substances, and in rich soils. It evidently belongs to the *Lumbrici* (earth-worms), and may have been described by Müller, to whose work on Vermes, I have not access. At risk of creating a synonyme, I will designate it as

LUMBRICUS PUTREDINIS: CHAR.—Filiform, minutely and closely annulate, translucent, whitish, shining; clitellum (genital-band or "knot") whitest, placed at one-fifth the length of the body; if absent, the part where it is situated likewise whitest; the centre of the body, behind it dusky, occasioned by earth in the intestinal canal; narrowest towards the tail, which is somewhat blunted; anterior end slightly tapered. Length, about an inch; breadth, half a line or more.

When taken out of the soil it wriggles like a Gordius; but while there, its motions are those of the earth-worm, but it is destitute of its agility. It is easily killed, and readily dries up.

NOTE C.

DESCRIPTION OF A COLEOPTEROUS LARVA PREJUDICIAL TO THE TURNIP.

Linear, narrowest towards the head, increasing in breadth posteriorly; the anal segment abruptly smaller; white, shining. Head moderate, ovate, corneous, with two deepish bent depressions converging behind and in front, and enclosing an ovate elevation; honey-yellow. Antennæ 5-jointed, the two basal much the stoutest and broadest; 1st sub-quadrate or slightly oblong, its base rather broadest; 2d cylindric, rather narrower than the 1st, and about its length, with a narrow elliptical process projecting from its tip internally; 3d one-half narrower, and a little longer than the 2d, subcylindric; 4th considerably narrower, and a little longer than the 3d, cylindric; 5th a little narrower than the 4th, elliptical, subacuminate; the bases of the several joints pale, the tips of a light brown. Mandibles shortish, minutely dentate, leaving a free space at the point. Maxillæ rather broad, deeply notched at the top, so as to appear strongly bidentate, the lobes hiant. Maxillary palpi 4 ?-jointed; 1st ? (invisible); 2d elongate, sub-clavate; 3d sub-equal, elongate, sub-clavate; 4th short, minute, blunt. Labium prominent, cordate, on a conical pedicel. Labial palpi 3 ?-jointed; 1st indistinctly seen, but apparently short and stout; 2d considerably narrower, cylindric; 3d not longer than the 2d, sub-acuminate. Eyelets (ocelli) two, small, black. A narrow white longitudinal dorsal line passes through the segments, and appears on the 2d and 3d as a deepish, often colourless, channel; 2d segment (prothorax) broader than the head, sub-quadrate, widest behind, dirty whitish in the middle, posterior and anterior margins with an olivaceous or brownish green band, broadest on the latter; 3d (mesothorax) transverse, a little wider than the preceding, with a narrow transverse line anteriorly, and a small band after the middle, olivaceous green, the interval and the posterior margin being white; 4th segment (metathorax) white, with two transverse, oblong, olive-green blotches, which are sometimes united into a band; all the remaining segments, except the last, white, with four olive or brownish green dots placed transversely on each, the two in the middle largest, closely approximating, transverse, trapezoidal, the external smaller, longi-

tudinal, slightly bent oval, sometimes all forming a nearly continuous band; two minute lighter coloured, tubercular spots (stigmata ?) placed obliquely on the lower part of the sides of each segment, from the 3d to the 12th; all the spots fovealated, and bearing a black bristle; 13th or anal segment, small, slightly dusky above. Anal styles, very distinct, whitish, with narrow dusky joints; 3-jointed; 1st stout, sub-cylindric, its tip rounded, with two or three long bristles; 2d less than half the breadth of the 1st, elongate, narrowest at the base, sub-cylindric, with a long bristle at its apex; 3d slender, one half the breadth of the second, very long, slightly bent, apex blunt, a bristle near its base, and another very long one at the tip. Underside pale whitish green, darkest about the breast, belly with faint shining spots. Legs six, corneous, shining, dirty castaneous white, with the tips darker, moderate; femora scarcely incrassated at the apex; tibiæ slightly bent, simple; tarsus, or claw, with a minute spine at its base. Length 3½—4 lines.

It has a gliding, slow motion. It is the larva of a Staphylinideous insect, perhaps of a *Philonthus;* but differs considerably from the description of *Ph. æneus,* quoted by Erichson (*Genera et Species Staphylinorum,* p. 428) from Bouchè, Hist. Nat. Ins. i., 179, 1. The parts of the mouth being described from specimens preserved in Canada balsam, I have not been able, in every case, to see their origin distinctly. I kept some specimens for about two months, by supplying them with the stalks of turnip leaves, into which they burrowed; so that there can be no doubt of their being vegetable feeders.

NOTE D.

DESCRIPTION OF THE CATERPILLAR OF A SMALL MOTH THAT LIVES ON THE TURNIP LEAF.

Fusiform, or sub-elliptical, being narrowed at both ends, but most so behind, of a green a little paler than the turnip leaf, with three dusky lines down the back, the posterior and lateral edges of the segments of a yellowish green; head smaller than the next segment, corneous, castaneous brown, with small fuscous spots; a few blackish specks about the mouth; on the crown a deep channel, which is bifurcate in front, enclosing a triangular space; second segment (prothorax) with two square shaped patterns of minute black points on the back, with two spots on each side of them, and two again on the lateral margins; on the other segments a longitudinal row of black spots in pairs runs along each side of the dorsal line; those on the third segment (mesothorax) closely approximate, and are transverse, and only slightly oblique; those on the succeeding segments are situated apart, obliquely, the two hindmost having a wider interval than the two anterior; on the penultimate and ante-penultimate segments, however, the first is placed in a line with the second, so as to form a parallelogram or square; terminal segment with an irregular line of minute spots, above a central blotch; a longitudinal line of similar spots, one on each segment, on the middle of the sides; and, finally, one of two, in pairs placed obliquely, along above the lateral margins; all the spots furnished with black bristles; legs dirty green, the joints and tips of the tibiæ blackish; prolegs longish, green, retractile; underside nearly uniform green, palest posteriorly, the two segments between the legs and prolegs, and the last, with some minute black points. Length, 3 lines. Eats holes in the turnip leaf, lying under a slight web of a few threads; walks backward equally well as forwards; suspends itself by a thread when alarmed; is irritable, and in danger prompt in getting out of the way.

When about to change into a chrysalis, it invests itself in a loose, gauze-like, white coccoon, attached to the under surface of a leaf, through which the pupa case is distinctly visible. This is of a pale green, with blackish longitudinal stripes. There appear to be several broods in a season.

The moth, Mr Logan of Duddingston tells me, is *Cerostoma Xylostella,*

Steph. Westw.—*Tinea Xylostella*, Linn. Fn. Suec.—*Plutella Cruciferarum*, Zeller (Zeit. 1843, p. 281); and is figured in Wood's Ind. Entomol., fig. 1547, and Westwood & Humphrey's British Moths, pl. cxviii., f. 4. Its palpi are cleft to the middle, and appear like horns around its mouth, whence the generic name; the antennæ are distant, porrected, silvery gray; head silvery, with a slight brownish tinge on the crown; body shining cinereous; fore wings narrow, with a depression before the tips, which are turned up, and fringed, dusky cinereous, with a white sinuated streak, extending to the anal angle, edged in front with a darker shade; hinder wings of a paler ash, deeper behind, and on the ribs, edged with a cinereous fringe. Expansion of the wings 6 to 7½ lines.

I find it on moors and in woods at various periods of the season up to November. It appears on the turnip fields in August.

NOTE E.

DIPTEROUS INSECTS INJURIOUS TO THE TURNIP.

In this note I will endeavour to give such additional particulars as I have been able to ascertain, since the foregoing memoir was written, respecting those two winged flies, whose larvæ are prejudical to the turnip. The *Anthomyia*, whose maggot I have alluded to as destroying the leaves by undermining the base, is, as I conjectured, the *Anthomyia radicum* of Meigen, which is probably the *A. Brassicæ* of Bouchè, and perhaps also of Curtis, but I have not seen the description of the latter author. The maggot is white, with a tint of straw-yellow, elongate cone-shaped, tapered in front, somewhat obliquely truncate behind; head with two black hooks, which diverge posteriorly beneath the skin; intestinal canal distinguishable only behind, by a pale brownish internal line, or merely by its pellucidity; body rather smooth, slightly wrinkled; segments pretty distinctly separated, more so beneath, and on the sides, where there is a series of ill-defined welled depressions when it moves, occasioned by the vermicular contraction of the rings; truncated end with a few wrinkles, furnished with two chestnut brown spiracular plates; its margins with 12 lobes, of which the two lower ones on each side approximate and are double; the second closely adjoining the first, and more projecting; the remaining four disposed more apart, and becoming less by degrees; an unoccupied space above dividing each series; the underside of this (the anal) segment, near the apex, bearing two approximating conical tubercles (prolegs), its surface much fovealated transversely behind the tubercles, and hollowed round the anus; body beneath more wrinkled than above, the segments after the four first, rather elevated, and slightly roughened or sub-granulated across the middle. Length 2½—3 lines. When younger it is whiter and more transparent, and shews more distinctly than when farther advanced, along each side of the back, two fine white lines, which converge anteriorly after forming several undulations, and then widen out to join the fore lamellar chestnut spiracles, which are situated, one on each side, about the commencement of the third ring. These are straight posteriorly where they terminate in the hind spiracular plates. The pupa is sub-cylindric, nearly straight, with the ends somewhat conical and contracted; brown, or deep chestnut with the tips more obscure, slightly shining; segments indistinct, finely and closely striated, or rather wrinkled, transversely, the three first more roughly, and with their sides keeled, somewhat depressed or foveated above and beneath along the border of the keel; the tip with two rather distant, somewhat divergent, lamellar spiracles, the inter-space roughened, and having two blackish elevations about the middle; the black oral processes visible beneath the skin, as viewed from the underside; posterior end rounded-truncate, with two slightly projecting brown spiracles separated by a sunk line, furnished with ten marginal lobes, of which the two lowest are bilobed, and the two uppermost minute; a wavy raised line forming a slight rim above; two slight mammillæ beneath separated by a fissure.

Length, 2½ lines. Two of the pupæ attained their final state as flies in about 24 days. They are blackish and common looking, not much less than the smallest domestic species. *Male.*—Black; face shining white, with blackish reflections, cheeks rather darkest as seen from beneath; sides of the forehead shining white, with a black triangle in which stands a small white point; eye-seam narrow, black; eyes naked, brown; hinder part of the head slaty; trunk, piceous towards the apex, griseous pubescent; antennæ with the third joint sub-cylindric, its bristle shortly feathered, as well as the palpi, black; posterior margin, lower part and sides of the head, edges of the frontal band, base of the antennæ, and the rim of the mouth, garnished with long stiff hairs; thorax black, somewhat slaty, greyish, with darker freckles on the sides, three black, not well defined bands on the back, the scattered hairs black; scutellum black; hinder part of the metathorax slaty; abdomen somewhat conic, narrowish, depressed, ash grey, with the base, a line along the back, and cross bands on the hinder edges of the segments, deep black, the longish pubescence black; beneath grey, the sides alone hairy, two black cylindric processes near the apex, somewhat pubescent; legs black, somewhat slaty; fore thighs fringed with long black bristle-like hairs beneath; intermediate with fewer and shorter, and two at the tip; hinder rather densely pubescent towards the base, with longer hairs after the middle, and towards the tip; fore shanks with a long and two short bristles near the tip; intermediate with a long and some short ones after the middle, and about four at the tip; hinder with seven or eight long ones, and about four at the tip, and ciliated with a shorter series; wing-scales brownish white; poisers yellowish; wings glassy, with a greyish tint, darker about the roots; second cross nerve oblique, rather bent. *Female.*—Little resembling the male, greyish; head whitish; frontal band rather wide, brownish or ferruginous anteriorly, where it sends off two minute lines to embrace the eyelet triangle, which is greyish on the ridge; a shining white spot in the space behind the antennæ; body pale ash grey, the surface of the thorax of a deeper tint than the sides, with a dusky abbreviated dorsal line; abdomen more ovate, with a darker dorsal line of changeable intensity, which goes distinctly on to the fourth segment, and appears composed of so many isosceles triangles; third segment at the apex, in certain lights, with a deeper shaded band; legs slaty or greyish, hinder femora with scattered long bristles, but without the thickish pubescence of the male; wings glassy, base of a dirty white; cross nerve oblique, straight. Length, 2½—2¾ lines. I observe in gardens a species very nearly related, but differing by having the abdominal processes in the male hirsute, and by the legs, especially the hinder femora, being not so hairy or bristled. The eggs of *A. radicum*, occur near the base of the foliage; they are white, rather opaque, elongate-ovate, closely longitudinally striate or sulculate. The grub or maggot on the ground proceeds rather quickly, dragging itself forward by means of its oral hooks, and its roughened ventral rings, and frequently rolls itself from one place to another. By this activity it easily removes from one part of the plant to another. Besides living at the base of the turnip leaf, it likewise attacks the bulb, but I have not traced its operations to any extent. It occurs also at the roots, and in the stems of the wild radish (*Raphanus raphanistrum*); and is particularly noxious to cabbages and greens, frequently causing the crop to fail, by separating the cuticle from the tap-root, and by the putrefaction which it induces on all sides of its track. The stems are often stuck full of them, and one of the largest usually occupies the centre of the pith. The plants thus infested may be known at once, by the drooping appearance which they assume in the sunshine. Cabbages may be saved by being pushed on vigorously from the commencement; for although the main root has failed, bundles of new radicles issue all round, above the wounded parts. Waterings of liquid guano, of weak gas-water, or of lime water, repeated at intervals, would probably be useful applications in this sphere, as well as top dressings of lime or soot.

Curtis, in the *Gardeners' Chronicle*, Feb. 22, 1845, p. 117, mentions having reared *Phytomyza nigricornis*, a small fly, from larvæ that form long galleries in the substance of turnip leaves. At Dunglass, on the immediate confines of Berwickshire, I met, on the 18th of July, with a mining dipterous larva on the Swedes, living in irregular bleached blotch-like spaces, out of which it had dug the parenchyma. The specimen unfortunately died, but it did not agree with some other larvæ known to belong to species of *Phytomyza*. It is narrow, elongate, spindle-shaped, much tapered in front, tapered also from the middle backwards, smoothish above, yellowish white; oral hooks and their internal apparatus well marked; intestinal canal faint; spiracular lines not very distinct, terminating on each side in front in two tubercles, surmounted by small scales, that look like ears, and cause the anterior end in front to appear deltoidal; posteriorly these lines end after approximating, in two minute stigmatic hooks, or rather bristle shaped processes arising in a minute tubercle; two prominent tubercular lobes on the margin on each side of these projections; above them the surface of the body has, as it were, been let down two steps, each marked by a transverse ridge; beneath them there is a slight slope inward, with about three little granulations at its apex; segments beneath slightly elevated along the incisions, granulated or sub-tuberculated. Length 2¼ lines.

Westwood's figure of the larva of his *Piophila Apii* (the Celery Stem Fly), *Gardeners' Chronicle*, May 20, 1848, p. 332, approaches nearest to it, of anything I can find, but differs posteriorly. I have subsequently found it both on the yellow and white turnip, and, in one instance, burrowing into the mid-rib of the leaf.

Address to the Members of the Berwickshire Naturalists' Club, delivered at the Anniversary Meeting, held at Etal, September 12, 1849. By G. C. Carpenter, Esq., President.

Gentlemen,

It becomes my duty this day to resign the President's chair, which, by your indulgence, I have been permitted to hold during the past year, and, in doing so, I must express my regret, that I was obliged to be absent from so many of the pleasant meetings which were held in my absence.

I am quite aware that the Society would have derived very little benefit from my presence, nor can I attribute my election to any other reason than being one of its oldest members, and it is therefore to that cause that I was nominated by my predecessor to this honour, and the kind election of the Club. I am sorry I have not to record many discoveries of interest, as I learn from our worthy Secretary, "that little has been done this year;" but this is not to be wondered at when we know that the various points of meeting have been so often searched by so many "Detectives" in the various branches of Natural History; indeed, were it not for the useful notes of our Secretary, I should have little to add to the yearly report. I will, therefore, proceed to the summary of the proceedings as I gather them from Dr. Johnston's notes, with some remarks of my own.

Belford, *September* 13, 1848.

The Club assembled at Twisell House for breakfast, and the manner in which it was entertained, proved our host's knowledge of the capacities and needs of his fellow-members. The party was a large one. Some, after breakfast, interested themselves in the examination of Mr. Selby's excellent collections; and, after a while, in three divisions, the party strolled through the beautiful gardens,—then through the romantic dean,—thence on to a valuable quarry, worked at present for stone to build the viaduct across the Tweed at Berwick,—and thence over the wide muirs which lie between Twisell and Belford, their rendezvous for dinner.

The members who attended were—

The President.	Mr. Home.
Dr. Johnston.	Mr. Murray.
Dr. R. D. Thomson.	Mr. Broderick.
Mr. Embleton.	Col. Younghusband.
Mr. Selby.	Rev. G. Rooke.
Capt. Carpenter.	Mr. Clay.
Dr. Clarke.	Mr. Tate.
Mr. Darling.	Mr. Geo. Carpenter.
Rev. J. Parker.	Mr. Wm. Brooks, Ch. Ch., Oxford.

The President read his annual Address, and thereafter nominated Captain Carpenter for President for the year. Dr. Clarke seconded the nomination, and the motion was carried by acclamation.

Dr. Johnston exhibited specimens of Anacharis alsinastrum, and read some remarks on its discovery in Berwickshire.

The Club adjourned in the evening to Belford Hall, where a liberal entertainment was provided by the kind foresight of our reverend colleague, Mr. Clark. The Hall contains a fine collection of pictures, more especially one by Morland.

The Club was much indebted to Mr. Clark, who was absent in Scotland, for the use of the Assembly Room at the Inn, and a welcome supply of fine fruits and vegetables from his garden, which made a great addition to the excellent dinner provided by the host of the "Blue Bell." Our worthy member thus pleasingly reminded us of the old adage: "though he could not favour us with his company he gave us his room." We should have preferred both.

BERWICK-UPON-TWEED, *October* 25, 1848.

The Club met to breakfast at Dr. Johnston's. After a hospitable repast and some desultory conversation, the business of the day was proceeded with. No papers were read, and the objects exhibited were only indirectly connected with the district. The only exception to this was a Ring of Gold shown by Captain Carpenter. It had been found near Ford, and was believed to be mediæval.*

* With reference to the ring exhibited to the meeting, the President has to add, that it was found by a young woman a short distance south of Ford

The members who attended the meeting were—

The President.	Mr. Broderick.
Dr. Johnston.	Rev. G. Walker.
Mr. Selby.	Mr. W. Dunlop.
Rev. J. D. Clark.	Mr. Clay.
Mr. Macbeath.	Mr. Milne.
Mr. Home.	Mr. Renton.
Mr. Murray.	Dr. Hood.

Cottage; it was discovered in a turnip field which she was employed in weeding, and on the surface of the ground, in 1846 or 1847. The Secretary was correct in his opinion that it was mediæval, as by reference to the Archæological Journal, Part 18, June 1848, page 160, it appears from the following extract that a similar one had been previously discovered:—"A very elegant gold ring was brought for examination by Mr. Whincopp, having recently been added to his valuable collection of personal ornaments of the Middle Ages. It is formed in imitation of two bands, or ribands twined together; one inscribed on the outside 'sanns Departir,' the other on the inner side 'a nul autre.'" The ring in Capt. Carpenter's possession had only engraved in gothic letters "sans Departir" on the inside. It would appear that these rings were either marriage tokens or funeral rings, but the President must leave the suggestion to be explained by those better versed in the subject.

It is rather surprising that so little has been discovered in mining, draining, and ploughing, in this (Ford) neighbourhood; the site of Border warfare, and the scene of the bloody battle of Flodden. A few cannon balls, one of which is in the author's possession, weighing nearly nine pounds, were found on the Encampment Farm a few years since. When these implements of war are brought to light, they generally are applied by the "guidwives" to the pounding of sandstone.

Some few years back a long grave filled with human bones was opened by labourers on the Encampment Farm on Flodden Field, but was closed again from a wish not to disturb the ashes of the dead.

On a mound of gravel (not, as the President considers, artificial) a curious necklace was brought to light by some labourers near the village of Crookham, near to the south of Crookham Dean. It consisted of several pieces of jet (?) and beads alternately strung on a metallic wire. The pieces of jet, or some similar substance, are of the form of the shape of an axe (securiform) and lozenge, and taper from the centre of the ornament to the end, the longest being in the middle. Some broken pottery was discovered at the same time.

In a field near Westfield Farm, in 1848, the ploughs being frequently impeded by large stones, these were removed by the tenant, Mr. Peter Purves; and it appears that this was a burial-place of the ancient inhabitants, as a burnt substance was found deposited under them, but no bones could be discovered. From the field lying between the river Till and where the Red Burn falls into that river, on a partial eminence, it would seem that it had been a place of encampment, guarded, as it might have been in those days, by marshy ground on two sides of a triangle; yet no traces of an encampment have ever been known on that spot.

BURNMOUTH, *May* 2, 1849.

There were present at this our first summer meeting—

Dr. Johnston.	Rev. Mr. Evans.
P. J. Selby, Esq.	Rev. Mr. Carr.
Dr. Clarke.	Dr. Hood.

Two or three years ago, some workmen employed in "whinning" sandstone at the Black Hill, whereon there is a perfect ancient British camp, came upon two graves formed of a few stones rudely placed together on their edges, but of short dimensions, and divided in the middle; lying, as nearly as the writer can recollect, north and south. No human remains were, however, discovered in them. No covering or base was perceived.

About twenty years since a jar or vase was dug up near Downham, six miles north-west of Ford, which contained a large quantity of silver coins of the smaller silver coinage of the Roman empire, four of which are in the author's possession.

It is to be hoped that the department of Archæologia will not be neglected, it being one of the desiderata of the Society; and situated as we are on classic ground, it is expected that some useful papers may be added to our future annual *Proceedings*.

The following sites of ancient Border warfare are worth notice:

CASTELLATED MANSIONS OR TOWERS.

1. Duddo Tower, in ruins.
2. Doddington Tower, in preservation.
3. Howtell Tower, in ruins.
4. Copeland Tower, built up in the present Castle.
5. Lanton Tower, only the base.

ENCAMPMENTS.

1. A square cone in Flodden wood (English).
2. The Black Hill (Danish?).
3. The Routing Linn, ditto?
4. One lower down the Kimmerston Burn, right bank, ditto.
5. On a field opposite, at Fenton farm, ditto.
6. In a field at East Flodden, now nearly effaced or ploughed up, ditto.
7, 8. Two opposite Howtell Tower on the hill.
9, 10. Two at Downham, probably, from the coins discovered there, Roman, though not square.
11. Etal Castle, ruins.
12. Old Rectory Tower, Ford.

Near Grindon Rigg, an ancient burial-place of four large stones, set up similar to Druidical cairns.

At Kirknewton Church, a roughly sculptured stone, "The Offering of the Magi," let into the inner wall; very curious.

A very large upright stone, on Mr. Askew's property, the memorial of the Battle of Flodden or Branxton.

A very large upright stone, near Bender gate, to commemorate the Battle of Homildon, near to that spot.

All these are within an easy walk from Ford.

Rev. Dr. Gilly. David Milne, Esq.
Mr. Broderick. J. Renton, Esq.
Mr. W. Dunlop.

The stroll, for it could not fairly be called a walk, between breakfast and dinner, lay down to Burnmouth, Ross, and Crab Hall, and along the coast northwards towards Eyemouth. The features of the coast are well known to the members, and some hour or so was spent in making a more familiar acquaintance with the fishermen of the triple colony. The cleanliness of their apartments is in striking contrast with the wet and uncomfortable nature of their calling, and with the filth and poultry about their doors. But this is a matter beyond the Club's sphere;—nor was the mind inclined to investigate the manners of even these men of lowly station, being reduced to the indolence which characterises the idle on idleness bent; so the dinner was rather impatiently anticipated, and no man was behind the hour.

After our genial repast, and the minutes read and agreed to, a letter was read from the President, explanatory of his absence.

The Rev. Samuel Fyler of Cornhill was then nominated as a member by the Rev. Dr. Gilly, and the nomination being seconded by the Rev. Mr. Carr, the motion was placed on the minutes for next meeting. A letter was read from William Spence, Esq., President of the Entomological Society, relative to a Larva described by Mr. Selby in the Club's *Proceedings*, and the same gentleman presented a copy of his address to the Entomological Society. A Table of the Weather for the last year was laid before us by J. S. Donaldson Selby, Esq., and a paper on the Wild Cat, by Mr. Hardy, was read. Mr. Hepburn sent some additional notes on the Cushat; and Dr. Hood read an essay on the Sensibility of Invertebrate Animals. Mr. William Dunlop exhibited two white Moles taken in Buncle Manse garden, March 1848; and a greyish white one taken in Mayfield garden, 6th Nov., 1848. It is curious that the white variety of the Mole is not uncommon in the vicinity of the places where these specimens were taken. Mr. Hardy sent for exhibition a number of rare Mosses found in Berwickshire; and Mr. Broderick mentioned that he had got a Hoopoe, which had been shot at Warren on the 20th April. A considerable number of plants were observed during

our walk, some of them interesting from their beauty; the following list embraces the principal:—

1. Myosotis collina—on the bank north of Crab Hall, noticed for the first time in Berwickshire, and first pointed out by the Rev. Mr. Carr.
2. Poterium sanguisorba—very abundant on the banks to the north of Burnmouth.
3. Primula vulgaris.
4. ——————— β umbellata.
5. ——————— veris.
6. Ligusticum scoticum.
7. Allium vineale.
8. Taraxacum officinale—a neat variety distinguished by the exterior leaflets of the involucre being ovate, acute, and retroverted, while the interior were erect and corniculate at the apex; but the leaves were finely and deeply runcinate and roseate-spread, like the variety on Spittal Links.
9. Orchis mascula.
10. Carlina vulgaris, plentiful.
11. Viola hirta, plentiful.
12. Viola sylvatica.
13. Pyrethrum maritimum, plentiful.
14. Lichina confinis. } most abundant on rocks at high-
15. ——————— affinis. } water mark.

LOWLYNN, *June* 25, 1849.

Members present, viz.:—

P. J. Selby, Esq.	Rev. T. Knight.
Wm. Broderick, Esq.	— H. Evans.
Mr. Geo. Tate.	Dr. Clarke.
Rev. Geo. Walker.	Mr. Embleton.
— J. A. Wood.	

The Rev. S. Fyler was admitted a member; and the Rev. W. Darnell, and Alex. Douglas, Esq., Surgeon, Belford, were proposed and seconded.

In the course of the walk by the base of the Kyloe Crags, the long-looked-for Convallaria polygonatum was re-found by Messrs. Broderick and Selby, and subsequently by Messrs. Embleton and Tate. It is to be hoped and desired that the exact site may be kept concealed from such botanical collec-

tors that know no "mense" in gathering specimens, and who would ruthlessly extirpate this fine plant, for it grows in a very limited spot, and only in small quantity. The discovery was ample reward for the day's expenses and fatigue.

GRANT'S HOUSE, *July* 25, 1849.

The members who attended this meeting were,—

Dr. Johnston.	Mr. Broderick.
P. J. Selby, Esq.	Mr. Melrose.
Mr. Boyd.	Mr. Jerdon.
Mr. Jas. Renton.	Mr. Hepburn.
Sir Thos. Tancred.	Dr. Wilson.

David Milne, Esq.

The party first visited Mr. Hardy to have an inspection of his extensive collection of British insects, and to examine some of those species whose habits and economy he has been so industriously studying. They then walked down the Pease Bridge-dean as far as the remarkable bridge that spans it near its termination in the sea. Here some members busied themselves in gathering some of our less common Ferns, and, among others, fine specimens of Aspidium angulare were eagerly collected; then the party returned hurriedly to their Inn, which was not reached until the dinner hour was a little beyond the time appointed.

After dinner the minutes of the previous meeting were read, and the Rev. Mr. Darnell and Mr. Alex. Douglas were admitted members.

Dr. Johnston laid before the meeting a continuation of his descriptions of the Berwickshire Acarides.

Mr. Stephens was proposed as a member by Jas. Renton, Esq., and was seconded by John Boyd, Esq.

I am sure the Club will feel with myself that our first duty is to express our deep regret for the recent loss of our esteemed associate, (and I may add personally, friend), the late Mr. Matthew Culley, whose kindness of heart endeared him to all, and who was so highly esteemed as a neighbour and a useful upright magistrate—it will be difficult to replace him. With this exception, we have no death to record among our members, which is the more to be thankful for, when we consider that so many are of the two professions, clerical and medical, and exposed in their ar-

duous duties at this critical time. The additions to our numbers during the year, now amounting to 69, are the following—the Rev. S. Fyler, Rev. W. Darnell, Mr. A. Douglas, and Henry Stephens, Esq., the author of the valuable *Book of the Farm.*

I should propose that an annual list of the members of the Club be added at the end of each year, with their present residence and date of admission ; it would make a very small addition to the yearly expense of printing, and it is usual in most Clubs and Societies.

It is to be hoped, (and I trust the Club will give me credit for being a well-wisher to its interests), if I suggest that some measure and plan be proposed, by which we may have hereafter a Museum and Library, serving as a Lecture-room, in Berwick ; our neighbours at Kelso and Newcastle possess each one, and I think that we ought not to be behind hand in that respect. I leave this idea for the fostering of our Secretary, and other influential members.

In reading over the strenuous Address of my predecessor, I am happy to add that the voice of our humble Society would almost seem to have reached the ears of "Alma mater." A committee has been formed at Oxford, and a large sum subscribed, for the purpose of the promotion of the study of Natural History, the list of which I have the honour to lay before the Club.

In conclusion, I have to congratulate the Club that we have prosperously arrived to the 18th anniversary of our foundation, and to the 2d vol. of our *Proceedings.* We ought to feel grateful that, while other lands have been visited by the flames of discord and civil war, we have been permitted to meet so often in peace and comfort. May these blessings be continued to us for many years to come.

When I reflect that about 300 years ago the spot we meet on was the scene of Border feuds, happily now at an end for ever, I cannot but feel that the words of the Psalmist are most applicable, which I must beg leave to quote before drawing to the end of this paper—"He maketh peace in thy borders, and filleth thee with the flour of wheat."—Ps. cxlvii, verse 14.

"Floreat Societas."

New Habitats for some Berwickshire Plants.

By Mr. James Hardy.

The following list comprises a number of the rarer Cryptogamous plants to be found in the East of Berwickshire, particularly in the parish of Cockburnspath. Some of them have been hitherto unrecorded, as may be ascertained by reference to the second volume of Dr. Johnston's *Flora*, and to the lists that have appeared in the first volume of the Club's *Proceedings;* the others have been given as illustrative of the distribution of species in a portion of the district, whose physical features are pretty distinctly defined.

MUSCI.

Phascum subulatum. Abundant on roadsides, Penmanshiel Wood, Coldingham Moor, &c.

Gymnostomum heimii. (Pottia heimii, *Br. and Schimp.*) Coast at Cockburnspath Cove, near the harbour.

——— conicum. Sea-banks at Greenheugh.

——— fasciculare. Side of a ditch, under long heath, on the moor near Penmanshiel, and on Greenside Hill.

——— pyriforme. Side of a small stream at Greenheugh. Rare.

Splachnum ampullaceum. Langstruther Bog, and elsewhere on Coldingham Moor.

Weissia curvirostra. Border of the moor at the head of Red-Clues Cleugh.

——— mucronata, *Br. and Schimp.* Kitchencleugh Dean, and on the moor near the Blakelaws, and Pyperton Hill. A species nearly allied to *Weissia controversa.*

—— verticillata. Sea-banks at the Rammel Cove; at St. Helen's Chapel; behind the Old Toll at Dunglass; and in fine fruit in Dunglass dean.

Grimmia trichophylla. On Greywacke rocks near the Slate Quarry at Oldcambus West Mains, and to the east of Redheugh. Dr. Greville tells me that my specimens represent his species.

——— doniana. On stone-walls, Bushiel Dean, and Penmanshiel; likewise on stones, Coldingham Moor. Rare.

Didymodon rigidulus. Edge of a bog on Ewieside Hill.

——— trifarius. Abundant below St. Helen's Chapel and on the coast to the west of it.

——— heteromallus. Penmanshiel Wood, Blackburn Rigg Wood, Reedy-burn Dean; and on sides of dry ditches, Coldingham Moor.

Trichostomum aciculare. Abundant in Reedy-burn Dean. It occurs also in Blackburn Rigg Dean, Kitchen Cleugh, Penmanshiel Wood, and on Coldingham Moor.

——— fasciculare. Not uncommon on stone-walls in the parish of Cockburnspath. Bushiel Dean; Glyn Fyn Bridge; Penmanshiel; near St. Helen's Chapel.

——— polyphyllum. A variety in small detached tufts in Penmanshiel Wood, near the Pease Mill, and in Kitchen Cleugh. In Bushiel Dean these become more compact, giving the plant a more alpine character.

Dicranum polycarpum. Of this rare moss I have gathered two or three specimens from a wall in Bushiel Dean; and have others from Dunglass Dean. Mr. Wilson, who considers *D. strumiferum* as a variety of this, assures me that my specimens are quite typical.

——— squarrosum. Head of the Braid Bog near Pyperton Hill. In fruit in Sisterpath, Penmanshiel Wood.

Tortula convoluta. At Penmanshiel, on the site of old lime heaps, to which it is confined.

——— ruralis. Sea-shore at Greenheugh, and the Bents. Inland on the wall of Penmanshiel Wood. Rare.

Polytrichum urnigerum. Red Clues Cleugh, and Penmanshiel Wood.

Orthotrichum cupulatum. Rocks at Deans or Danes Castles, Oldcambus West Mains.

——— anomalum. Old wall at Penmanshiel. Not common.

——— drummondii. On stones and trees, Kitchen Cleugh, Penmanshiel Wood, and Blackburn Rigg Dean. I am indebted to William Wilson, Esq., the distinguished bryologist, for ascertaining this, and some other intricate species.

Orthotrichum rupincola. Wall of Penmanshiel Wood.

——— diaphanum. Old wall at Penmanshiel; and on lime-coped walls, Penmanshiel Wood.

——— rivulare. On stones and the stems of sallows, in the Pease Burn, Bushiel Dean, near the entrance of Reedy Burn.

——— pulchellum. Not unfrequent on trees in Penmanshiel Wood, Kitchen Cleugh, Red Clues Cleugh, Bushiel Dean, Blackburn Rigg Wood; on stone walls near Penmanshiel.

Bryum carneum. Greenheugh; Pease Mill, at the junction of the Pease and Tower Burns.

—— pseudo-triquetrum. (B. cubitale, *Dicks.*) In swampy places, Langstruther and Braid Bogs, Greenside Hill, Bushiel Dean, &c. This Mr. Wilson considers as distinct from the *B. ventricosum*, Dicks.

—— ligulatum. In fruit in a bog in Sisterpath Dean, where it is drawn up, and nearly overgrown with a variety of *Hypnum proliferum*.

—— rostratum. Lower part of Red Clues Cleugh. Rare.

—— roseum. Red Clues Cleugh.

Anomodon curtipendulus. Of a lurid colour on a wall at Kitchen Cleugh; and a more slender and paler variety on a hazel, Witchy Cleugh in Penmanshiel Wood. Very rare, and not in fruit. In both instances it was running over, and attached to *Hypnum cupressiforme*.

Hookeria lucens. In Sisterpath Dean, Penmanshiel Wood; also, but rare, in Kitchen Cleugh, Blackburn Rigg Dean, and near the Lynn at Reedy-burn Dean. Abundant by the side of Langstruther Burn, and at the head of Winding Dean. Not in fruit.

Hypnum tenellum. Sea banks between Redheugh and Dulaw.

——— nitens. Langstruther Bog. Not in fruit.

——— alopecurum. Reedy-burn, Blackburn Rigg Dean, and Red Clues Cleugh. In fruit.

——— proliferum. Not uncommon in fruit. Penmanshiel Wood, &c.

Hypnum swartzii, *Turn.* (H. prælongum, var. *Hook.*) Bog at Greenside Hill.

——— cordifolium. Greenside Hill and Braid Bog.

——— filicinum, var. Ditch on Greenside Hill; and at the Meikle Blakelaw.

——— fluitans. Langstruther and Coldingham Moor.

——— aduncum. Bogs on Coldingham Moor, especially near what are called "Well-heads."

——— revolvens. (H. aduncum, var. *Hook.*) In swampy bogs; Langstruther Bog; Pyperton Hill, Bushiel Dean, &c. This Mr. Wilson considers distinct from the preceding. It may be readily known by its rusty tint, and very falcate leaves. It is an upland species.

——— uncinatum. Penmanshiel Wood, Kitchen Cleugh, Red Clues Cleugh, Bushiel Dean.

——— commutatum, var. *B. Wils. MSS.* (H. rugosum, *Dicks.* H. aduncum, var. *Hook.*) This alpine form, which, according to Mr. Wilson, is very generally mistaken for the typical form of *H. aduncum*, occurs on Greenside Hill, and at the foot of the Meikle Blakelaw.

——— cupressiforme, var. lacunosum. Greenside Hill in moist situations. The leaves are very much enlarged.

HEPATICÆ.

Jungermannia tomentilla. Langstruther Bog.

LICHENES.

Verrucaria epidermidis. Common on oaks. Penmanshiel Wood.

Endocarpon weberi, var. aquaticum. In Reedy-burn, often encrusting mosses.

Parmelia conspersa. Rocks at Oldcambus West Mains; and on stone walls at Penmanshiel.

Squamaria hypnorum. On rocks and mosses; Dean in Penmanshiel Wood, behind the forester's house. Sea banks to the east of Redheugh.

Collema cristatum. Sea banks at St. Helen's Chapel, and to the east from Redheugh.

Collema lacerum. In Red Clues Cleugh, Kitchen Cleugh, Blackburn Rigg Dean; bearing apothecia in Reedy-burn. A neat production; slaty coloured when dried.

Gyrophora polyphylla. Rocks at Deans Castles; abundant on stone walls near the site of St. David's Cairn.

Ramalina scopulorum. Rocks at Redheugh, St. Helen's Chapel, and at Kitcarle, near Cockburnspath Cove.

Isidium corallinum. Stone walls; Penmanshiel and Bushiel Dean.

Sphærophoron coralloides. Reedy-burn Dean.

Stereocaulon paschale. On an old road near the Little Blakelaw, abundant.

ALGÆ.

Chroolepus aureus. Greenside Hill, Winding Dean, and on the sea banks near St. Helen's Chapel.

——— ebeneus. On rocks in the Dean behind the forester's house, Penmanshiel Wood; and in Reedy-burn Dean.

Protonema orthotrichi. On the leaves of *Orthotrichum crispum*, Penmanshiel.

Nostoc commune. In marshy places destitute of herbage; Greenside Hill, the Blakelaws, and Penmanshiel Moss Hill.

FUNGI.

Puccinia anemones. On the leaves of Anemone nemorosa in spring. Penmanshiel Wood.

To these may be added *Callitriche autumnalis*, in a pool on Greenside Hill; *Allium vineale*, in the lower part of Dulaw Dean, and on the rocks at Deans Castles; and although it is a little beyond the district, *Anacharis alsinastrum* in Dunglass Pond.

Minutes of our Meeting at Beal, July 25, 1849.

By Robert Embleton, Esq.

In fulfillment of the promise made at our meeting at Beal, I beg to bring under the notice of the Club some of the plants that were observed in our walk on that day. Being too late to enjoy the breakfast prepared by Mr. Gregson, Mr. Tate and I wended our way across the salt grass at Beal to the shore, where we observed Triglochin maritimum, Scirpus maritimus, Atriplex rosea, Chenopodium maritimum, Zostera marina, Arenaria maritima, and many pure white flowering specimens of Statice armeria.

The following geological observations were made by Mr. Tate :—"On the Ross Sands, opposite to Beal House, we observed beds of limestone, 10 feet in thickness. The under bed is hard and chert, and weathers to a reddish colour. The upper beds are grey when fresh fractured, and generally weather to a buff colour; they are fine grained, and well adapted for the preservation of organisms, which we find numerously distributed in these beds; indeed they seemed almost entirely composed of organic remains. The following fossils were observed in them :—

1. Euomphalus catillus. A species not common in Northumberland, but which occurs at Bolland, and in Belgium.
2. Spirifer glaber. One of the most generally distributed of the mountain limestone fossils.
3. Terebratula reneformis. A small variety with three mesial ridges, identical with forms which I have obtained from Hetton, and Belgium. The species is but rarely found in Northumberland.
4. Lithodendron sociale. Very abundant; found also in the Hetton and Lowick beds.
5. Fenestrella ——; probably the intertexta of Portlock.
6. Chætetes radicans: A coral characteristic of the lower limestones of the carboniferous series, found abundantly in Russia; and which I have found also at Beadnell, Dunstanbro', and Holy Island.

"With the exception of the Chætetes, I have observed all the other fossils at Hetton; and as the mineral character of the Ross beds is the same as some of those at Hetton, it is probable that the limestones of both localities hold the same relative position. The Chætetes will very probably be found at Hetton; it may have hitherto escaped observation, as it is not easily detected, unless the surface of the rock is weathered.

"On the hill at Beal, a beautiful white fine-grained sandstone is quarried; although a sound stone, and adapted for building, it is thin bedded and much jointed, and would not therefore yield such large blocks as are required for railway purposes. The general dip of the strata is E.S.E."

Leaving the shore we directed our steps to Kyloe Crags, with the hope that another investigation might be rewarded by the discovery of the often sought-for Convallaria polygonatum; and the "wandering botanist" can only appreciate the feelings of delight that rushed across our mind, when we held the long-desired treasure within our grasp. Confined to a small space, it was there, however, plentiful, and in full flower. To point out its precise locality, would only be to ensure its destruction; as has already nearly happened to the other rare tenant of these crags, the Asplenium septentrionale, and that chiefly through the instrumentality of one, who calls himself a botanist, and a member of a club similar to our own. And I can well understand the feeling of the gentleman who told me, that "he was sorry they had such a Goth in their Club." Between Beal and the Crags, in the stagnant and running water, we observed the several varieties of Ranunculus aquatilis and hederaceus, Potamogeton natans, Chara aspera, Sparganium ramosum, &c. The day was very fine, and the bold face of the Crags seemed to have put on its holiday garb, in honour of the visit. The beautiful and delicate blossoms of Rosa spinosissima and canina, blended with those of Sorothammus scoparius, Erica cinerea, Orobus tuberosus, and Thalictrum minus. In many of the crevices the Ash, the Spindle, and the Rowan trees had firmly established themselves; and amongst the debris, the Ivy, the Honeysuckle, and the Juniper, mixed in wild profusion; whilst the boggy ground at

its foot was gay with the purple blossoms of Orchis mascula. Being obliged to accommodate our movements to the rules of the rail, we had to make a hurried march to Kitty Allison's, to partake of the repast prepared by our worthy hostess.

During the present season, in company with Mr. George Tate, junior, a young botanist of great promise, I have revisited many of the stations of our rarer plants, and I am happy to say we found them all. Along our shores, Astragallus glycyphyllus, Scilla verna, Ligusticum scoticum, Artemisia maritima, Asperugo procumbens, Carduus marianus, Apium graveolens, Œnanthe lachenalii, crocata and peucidanifolia, were observed in abundance. On the basaltic cliffs above Budle, Sedum villosum, Sagina maritima, Spergula subulata, Dianthus deltoides, and Allium oleraceum, were found plentifully. I had hoped the latter plant would have proved Allium schœnoprasum, as an old man in Bambro' told me that, when a boy, he had often gathered *shives* for the pot there. In Newham Bog, Habenaria bifolia and chlorantha, Pyrola rotundifolia, Scutellaria galericulata, Lycopus europœus, Typha latifolia, Ranunculus lingua, Stellaria glauca, and Selago selaginoides were observed; but from the recent extensive drainage of the bog, Sparganium simplex and natans had both disappeared from their old localities. An occasional visit to different localities is not without interest, as serving to mark the disappearance of species from well known spots. On Cheviot all the plants observed at our last meeting were again met with; but my visit being earlier, the rocks by the side of the rivulet were gay with the blossoms of Saxifraga hypnoides, stellaris and granulata, Epilobium alsinifolium, &c.; and on the sides and top of the hill, Rubus Chamæmorus, Carex rigida, Vaccinium vitis-idæus, Melampyrum montanum, Epilobium alpinum and Poa balfourii, were found plentifully. At the base near Langley Ford, Habenaria bifolia was found in great plenty; and every watery spot was gay with flowers of Myosotis repens. Sedum villosum was also found here, contrasting widely with its habitat on the top of the dry cliffs at Budle. Near the village of Ilderton, on an old wall, Sedum album was found in great profusion and beauty. Whether truly indigenous, it is diffi-

cult to say, but I do not think we are justified in at once asserting, as is often done, that the plant must have been planted, as it is so near a village. It is flourishing in a habitat where we would naturally look for it, and it is not a plant that the cottager was likely to cultivate for its beauty; nor am I aware of its being invested with any miraculous power. The different species of Ferns and Lycopodiums were all gathered.

In my own neighbourhood, two phanogamous plants and one Fern have been added to those previously observed. In the Foss at Dunstanbro' Castle, Potamogeton plantagineus and pusillus, var. tenuissimus, were discovered by Mr. Storey, of Newcastle; and Lastræa fœnischii has been observed by myself in several spots around Embleton.

On the Occurrence of the Wild Cat in Berwickshire.
By Mr. James Hardy.

The Wild Cat is probably by this time considered as an extinct animal in Berwickshire. According to my informant, it has not been noticed in this part of the county for at least forty years. I have, however, recently ascertained, that one at least yet survives, having hitherto been secured amidst the fastnesses of our rocky coast, from the unremitting persecution waged in modern times against our indigenous wild carnivora. On the 17th of March, 1849, while on a visit to the coast immediately to the east of St. Helen's Chapel, I had the pleasure of seeing an individual still frequenting the ancient haunts of its race. The banks here are elevated and steep, little removed from the perpendicular, with alternations of massive rocky cliffs, scarcely more abrupt. I first remarked it on the top of one of these precipices, named the Swallow Craig; and before I obtained another glance, it had cast itself down an intervening grassy declivity, and was seen hurrying at full speed, over the broken rocks far below at the base, to its place of refuge, situated among some rough projecting crags, washed at full sea and difficult of access. I had sufficient time to observe its deep grey colour, and superior size; and

as I have often seen prepared specimens of the animal, am not very apprehensive of being under a mistake. This was likewise the spot where, more than forty years ago, my father used to see them, when they were still numerous. He recollects of setting a dog after one, when it wheeled round and put the dog to flight. At that period they were in the habit of coming out only towards evening, about the same time as the foxes, with which they were sometimes associated. Rabbits probably constituted their chief subsistence, and these still swarm so numerously as to be sufficient to preserve the race, without its attracting particular notice. The banks were perfectly quiet, when I visited them; the sheep that graze there having been some time previously withdrawn; which will account for the individual I noticed being abroad during the day. The dark caverns, or "coves," of which there are several in the range of cliffs from this to Fast Castle, had the repute in former times of being tenanted by these animals, and it deepened not a little the superstitious dread these gloomy recesses inspired, that the entrance was guarded by a creature so determined as this in the defence of its offspring. I have even heard of one of the boldest of the smugglers, who once lived in this vicinity, having been so daunted by the expressions of rage and formidable demeanour of a wild cat, attended by her young, which he met near Windylaw Cove, that he deemed it the most prudent course to turn round and retire. By their occasional depredations in the hen-roost, they were known as far westward as Dunglass, perhaps finding a retreat in the deep and wooded glen. Fifty years ago, they were exceedingly numerous in the woods above the Pease Bridge, which consisting of a continuous cover of furze, intermixed with dwarf tangling oaks, and traversed by but a single foot-path, presented an impenetrable thicket for their effectual safeguard. Parties of five or six might have been seen in the neighbourhood by shepherds, whose duties led them to be early abroad; and the dogs despatched in quest of their straggling charge, had frequent encounters with the quarrelsome inmates. Their savage yells, on occasion of their nocturnal assemblages in the sequestered dells called North and Witchy Cleughs, are de-

scribed as having a most dreary effect. These animals likewise dwelt in the precipitous sea-banks between Gunsgreen and Fairneyside. Below a place named Blaikie, once a moor, there are several holes in the banks, still called the Cat-holes, which were the head-quarters of the wild cats that prevailed there, while the surrounding tract lay unimproven, and tenanted by its wild game. It is now cultivated, and the cats extirpated; but it is only wituin a recent period that the last of them was killed.

I need scarcely advert to the impressions these animals have left in popular language, and familiar comparison. "To turn the wull cat," is to be able to hang from a transvrese beam by the hands and feet, and then recover the upright position. "She has een like a wull cat," is an expression much less flattering to rustic beauty, than the Greeks attributed to the empress of their mythology, when they bestowed on her the eyes of an ox!

Note on Remedies for the Turnip-Fly amongst the Ancients, and on the Turnip-Fly of New Holland, with Notice of a New Genus and Species of Diptera. By Mr. JAMES HARDY.

IN looking over my notes, I find that in my paper on Turnip Insects, I have omitted to state that the ancients, who, particularly the Romans, were well acquainted with the culture of the Turnip, had recourse to several of the expedients resorted to in modern times as preservatives against the "fly." Columella, for this purpose, recommended the dust of chambers or soot to be sprinkled with water, and mixed with the seed on the night previous to its being sown. He also mentions that, as a remedy against insects, Democritus directed that seeds should be anointed with the juice of the herb *sedum* (house-leek, or perhaps one of the stone-crops well known for their acrid properties). "This," adds he, "I have found to be true from experience. But as the sowing of this plant is not very great, I have more frequently used soot and the above-mentioned dust, and have thereby well enough secured the plants from injury. Palladius recommended the

spreading of the lees of oil, or soot from the chimney, as a remedy from the fly."—*Vide Bell's Rollin's Arts and Sciences*, p. 42.

It is deserving of notice, that among the insects described by Mr. Waterhouse, from the collections brought to this country by Mr. Darwin, is a *Haltica*, which is nearly identical with our Turnip-Fly, and is stated to be equally destructive in New Holland.—*Proceedings of the Ent. Soc. of London, 2d January*, 1837.

The Mining Grub, described at p. 339 of the present volume of the Club's *Proceedings*, having now completed its transformations, I am enabled to relate the subsequent stages of its history. The pupa is narrowish, elongate-oval, finely striated transversely, convex above, less so beneath, brown, darker at the tips and across the lines of the segments; the segments are pretty distinct, finely and closely wrinkled at the edges; some minute foveolæ run down the edges both below and above; the anterior end is compressed on the upper surface, and as it were scooped out, the hollow being margined on each side by a lateral keel, which, after occasioning the sides to protrude a little at this part, turns in and nearly converges behind; the keeled margin is slightly foveated beneath, and the compressed area has a space longitudinally elevated in the middle; the apex is sub-truncate, and consists of a roughish ridge, tipped at each end with a small tubercle produced into a fine divergent spine, which is bifid at the tip, and has at its base two minute spines placed in opposite directions; the posterior apex is somewhat narrowed, its two ends project in the form of small bluntish tubercles; exactly between these, but a little above their level, there is a stoutish prominence, which is surmounted by two ovate, sharp-pointed, spine-tipped, palish-coloured, divergent tubercles, which, as well as the process that bears them, point somewhat upwards; beneath the apex the slope is almost that of the under surface, and the anus is indicated by a slight tubercle, divided lengthways, situated behind a wrinkle. Length $1\frac{1}{4}$–$1\frac{1}{2}$ lines. The pupa is sometimes found in the chamber the Grub has excavated, but more frequently beneath the soil. The Fly appeared on the 3d of September, having been in the

pupa state about 21 days. It belongs to the genus *Drosophila* as at present constituted, which includes the well-known Cellar-fly, *Musca cellaris* of Linnæus, whose larva occurs in wine-casks and neglected paste; and other species whose larvæ are considered, and have in some instances been proved, to be either fungivorous or saprophagous. From the difference in habit, as well as an accompanying modification in character, I propose detaching it along with *D. graminum*, to which it is closely allied, from its present connection, and constituting a new genus to receive them. Its characters are the following:—

SCAPTOMYZA,* *Hardy MSS.*

Antennæ with the third joint parallelogrammic, with its tip rounded (lingulate); seta with a few long hairs, mostly on the upper side; face somewhat slanted, keel moderate; bristles of the mouth-rim rather scant and short; apex of the trunk dilated, palpi narrowish ovate, or sub-elliptical; head sub-triangulate, behind moderately transverse, sides obliquely sloped so as to narrow it anteriorly, which contraction slightly affects the fore part of the frontal band; front sparingly bristly; eyes sub-oval, finely downy; body elongate and narrowish; thorax somewhat longer than broad, subparallelogrammic, faintly glossy, the colouring striped; abdomen longish, narrowish, subconical; its tip in the female slightly compressed, oblique, with shining serrated plates beneath; wings nearly as in *Drosophila*, but not so broad; larva living as a miner on the parenchyma of leaves.

The species are:—

1. S. GRAMINUM. Drosophila graminum, *Fallen*, Geomyz. 8, 11. *Meigen*, Zweif. Ins. vi. 86. *Macquart*, Dipt. (Suites à Buffon) ii. 550.

"Thorace cinereo fusco-vittato; abdomine nigro; antennis pedibusque flavis." Long. corp. lin. 1. *Meig.*

The larva is subcutaneous in the leaves of the common Chickweed (*Stellaria media*), of the Corn Cockle (*Lychnis githago*), of *Chenopodium album*, and of *Viscaria oculata*, and *Silene armeria* in gardens. Its operations are marked by a large shapeless blotch, with smaller winding galleries conducting to it.

* Σκαπτειν, to dig, to scoop out.

2. S. APICALIS, *Hardy MSS.*

Flava; thorace subferrugineo, albo-vix-micante, linea longitudinali, marginibusque lateralibus ferrugineis; meta-thorace Maris subcinereo; puncto verticis anoque nigris; pedibus concoloribus, apicibus tarsorum vix fuscescentibus; antennis flavis, seta nigra, sparse pubescente; alis hyalinis, nervis flavis. Long. corp. vix l. 1¼. Exp. alar. lin. 3.

Var. Dorso thoracis cinereo, lineis tribus longitudinalibus fuscis; scutello cinereo flavo-limbato; abdomine supernè fusco.

The larva mines the leaves of the Turnip and the Pea; and on the sea-coast, it is found as late as the end of October in those of the common Scurvy-grass *(Cochlearia officinalis)* and the Lady's fingers *(Anthyllis vulneraria)*. It mines sometimes in companies of four or five; but in a small leaf, many of these desert the seat of the original colony, and commence a separate establishment. In some leaves the pulp is so completely dug away, that the upper cuticle can be separated entire. In the turnip, it sometimes, as elsewhere remarked, cuts out long channels down the stalks; but this office more particularly belongs to another Dipterous miner, whose history remains still to be written.

The ACARIDES *of Berwickshire Specifically Described.*

By GEORGE JOHNSTON, M.D., &c. (Continued from Page 316.)

20. TROMBIDIUM CURTIPES.

Tr. sanguineum pedibus palpisque clarioribus, corpore postice integro setis simplicibus brevissimis tomentoso. Long. ⅔ lin.—*Acarus sulcatus*, ruber, abdomine ovato rugoso; pedibus mediis brevioribus, *Mull.* Zool. Dan. prod. 187.—Trombidium curtipes, *Herm.* Mem. Apter. 26. pl. 1, fig. 4. *Walck and Gerv.* Insect. Apt. iii. 177.

DESC. Mite small, of a scarlet colour, with brighter legs, palpi and rostrum: *Body* elongate-quadrangular, depressed, shouldered in front, widely sinuated on the sides at the middle, rounded and narrower behind, tomentose; the back flattened, uneven with two transverse foveolate furrows and a foveola farther backwards: *Rostrum* triangular: *Mandibles* large, but not long, armed with very unequal chelæ, the external curved

over the lesser inner one: *Palpi* twice as long as the rostrum, very bristly, bulged in the middle and sharp-pointed, 4-jointed; 1st joint small, 2d and 3d large and coalite, 4th small, with a single rather long slightly curved claw, and suspended at its base an ovate bristly appendage: *Eyes* situated at the base of the rostrum, one on each side and very distinct, somewhat pedunculated, dark brown, glistening: *Legs* 8, filiform, very bristly, the anterior very distant from the posterior pairs, the first pair stoutest and longest and nearly as long as the body; the fourth next in length, and then the second and third, which are about equal, 7-jointed; the 1st joint small, the others becoming successively longer, the tarsal the longest and elliptical and armed with two curved sharp claws moving in the same direction, the articulations constricted and pellucid: *Bristles* of the body short and equal and so thickly set as to constitute a hirsute covering; they arise from a bulbous root, are a little curved, sharp, and simple, or without any barbs or spinules: those of the members are similar but the bulbous base is not so obvious; they are sub-appressed, point downwards, and are about the length of the diameter of the joints.

I am indebted for specimens of this pretty species to Mr. James Hardy. It occurs at the roots of grass and amongst moss in woods. In form it resembles Tr. holosericeum, but is less brilliant (and only a little less) in colouring, and is not half the size. It is tolerably quick in its walk.

Hermann says,—"Les poils des pieds sont barbus latéralement, comme dans les Trombides soyeux et fuligineux; mais ces poils latéraux sont beaucoup plus courts que ceux du corps des autres espèces où il en a déjà été question." I have not noted this character, perhaps from using too low a magnifier.

21. Rhyncholophus murorum.

R. ferrugineus pilis brevissimis barbatis velatus, corpore quadrangulari postice rotundato integro, pedibus anticis posticis subæqualibus corpore non longioribus. Long. 1¼ lin.—*Koch* Uebers. 50.—Trombidium murorum, *Herm.* Mem. Apter. 28, pl. 2, fig. 5. *Walck* and *Gerv.* Insect. Apt. iii. 178.

Desc. Mite of a deep reddish-brown colour, with a somewhat paler fascia down the back,* densely covered with very short thick bristles: *Body* subquadrangular, depressed, broadish

and shouldered in front, rounded behind, the sides sinuated at the shoulders and more widely in the middle, the back uneven with a longitudinal furrow (distinguished by its darker hue) on each side, beginning behind the eye and extended beyond the insertions of the posterior legs terminating in a deeper fovea, and with a foveola near the centre and two others situated far backwards: *Venter* plane, of the colour of the back with a paler patch towards the anus: *Eyes* distinct, glistening, reddish-brown, placed on each side of the vertex in a line with the shoulders, sessile: *Rostrum* triangular, armed with some simple sharp bristles on the sides below the apex which is truncate, and furnished with a very long extrusile sharp-pointed stylette: *Palpi* very obvious, clothed with hirsuties like the legs, 4-jointed, the first minute, the second large and elliptical, the third much slenderer and of about equal length, the ultimate small, ovate-acute with a single claw and an elliptical appendage underneath: *Legs* 8, homologous, filiform, densely clothed with appressed short rough spines, the 1st pair as long or nearly as long as the 4th and as long as the body, the 2d shortest, and the third only a little longer, all of about the same thickness and 7-jointed; 1st and 2d joints small, 3d and 4th twice the length of the second and equal, 5th and 6th rather longer and also nearly equal, 7th equal to the 6th in length, elliptic-oblong, obtuse, armed with two small claws almost hidden in the hirsuties; this joint is as it were enlarged and heavy, and is covered with a thicker and denser hirsuties, and is shortly-ovate and truncate in the second and third legs: *Bristles* of the back short, thick, elliptical, and barbed with minute spinules; those of the limbs only differ in being somewhat more acutely pointed, and some at the articulations are longer than the rest.

I have made this description from a specimen sent to me by Mr. James Hardy, Dec. 15th, 1848. It is nearly of the size of Trombidium holosericeum, but not distinctly divided into two portions by any transverse fold. The eyes appear to be sessile and resemble those of a spider. There are two ocelli in each group. The stylette with which the mouth is armed reminds one of the tongue of the humble bee, and consists of two pieces which have a motion independent of each other. When protruded together they form an instrument well fitted to pierce the bodies of other insects. The bristles are not nearly so evidently barbed as those of Trombidium holosericeum, and indeed it is difficult to discover that they

are actually spinulose. The mite creeps with moderate quickness and at a regular pace, the first pair of legs being kept well forward and used as feelers, touching the ground with short and unintermitting palpitations.

When first I saw this mite there seemed to me no doubt of its being the Trombidium fuliginosum. The character of this given by Latreille applies well to our species, but Koch's figure of it proves them to be distinct and very different. In the true T. fuliginosum the sides do not appear to be sinuated; and the eyes are supported on the branches of a common pedicle which stands at the base of the rostrum. This is a very essential distinction,—so much so that, in conjunction with the contour of the front and structure of the mouth, it removes the insect from the genus Trombidium, and places it in Rhyncholophus. It possesses all the characters of this genus as defined by Dugès,* but differs from the few species he describes, although nearly allied to his R. cendrè.

After the preceding remarks were written I had an opportunity of referring to Hermann's work, in which our species is figured under the name of Trombidium murorum. The figure is a good one, but the description is very defective. Hermann says that it lives upon walls in troops.

22. Dermanyssus musculi.

D. oblongus fulvus margine postico albido, dorso villoso, vittâ biflexa nigricante ad latera signato, setis crurum semipectinatis.—Dermanyssus musculi, *Koch* Uebers. Arachnid. p. 81, tab. 9, fig. 46.

Desc. Mite of a yellowish-brown colour marked on the back with a dark vitta or line forming two sigmoid flexures on each side in front: *Body* ovate-oblong, contracted at the shoulders and hence narrowed forwards to an obtuse point armed with two stout bristles; the back plano-convex with a narrow white membranous border, thickly covered with very short appressed somewhat curved bristles or setæ; the venter membranous with an elongated triangular sternal plate situated near the middle and with its base towards the anal pore, which is placed near the margin in a kidney-shaped

* Yet being tartigrade, it differs greatly from our Erythræus rupestris, as also in the proportional length of the legs to the body.

coriaceous region of the same colour and texture as the sternal plate and the back: *Rostrum* triangular, acuminate: *Mandibles* large and protrusile, the shaft two-jointed, and armed with chelæ lightly tinted with brown: *Palpi* large, 5-jointed, spinous, tapered, the penultimate joint rather longest and armed with a moveable spine, the terminal small, rounded and setigerous: *Legs* 8, originating near the sides from the anterior half of the venter, approximated at their insertions and almost equally distanced, stout and tapered, spinous, of the colour of the body with paler articulations, 6-jointed; 1st joint short and thick, 2d small, 3d, 4th, and 5th as long as both together, and progressively increasing a little in length, 6th nearly twice as long as the penultimate, tapered and terminated with a pedicled vesicle; the anterior pairs are rather thicker than the posterior, not very unequal in length, but the first pair is longest, the second and fourth equal, and the third shortest; the 3d joint of the first pair is much constricted at its articulation with the 2d joint; *Bristles* setaceous, pointed downwards, longer than the diameter of the joint, barbed with minute spinules on one side.

D. musculi is equal in size to the Gamasus coleoptratorum. Numerous specimens occurred on the same field mouse which furnished those of the Lælaps and Pteroptus, about to be described. It is exceedingly active, and courses over the body of its victim with great rapidity.

23. Pteroptus muris.

Pt. albus, corpore accuratè ovato antice trisinuato sparse setoso, pedibus anticis crassioribus.

Desc. Mite minute, of a white colour with irregular duskier shades, the legs of the colour of the body: *Body* ovate, sparingly covered with short setaceous bristles, even, the frontal margin trisinuated or obsoletely 3-lobed, and sinuated on the sides a little behind: *Mandibles* forming together a porrect rostrum situated between the palpi, each mandible consisting of a two-jointed elongated protrusile shaft terminated with two minute curved denticles: *Palpi* pediform, very slightly tapered, with a rounded bristly apex: *Legs* 8, much shorter than the body, the two first pairs stouter than the posterior, the 1st rather longest, the 2d and 4th about equal, the 3d shortest, but there is in respect of length little difference between them, and all are terminated with a pedunculated trumpet-shaped vesicle, furnished with two minute divergent claws; all the joints are short and not very unequal, the

third and sixth or tarsal being the longest, armed with bristles not longer than the diameter of the joint, tarsal joint conoid, rounded at the extremity and rather obtuse.—The anterior legs are a little distant from the posterior pairs at their insertions.

This is a little larger than the cheese-mite. I procured my specimens in December, 1848, from the field mouse. It is slow in its motions; and, when at rest, the fore legs are kept stretched forwards, the lower half being bent towards the oral organs as if to guard them, while the upper half is everted outwards, the whole leg having the figure of the letter S, or rather of a sickle, the base represented by the handle.

This mite is a member of the family Gamasides, having every character assigned to them by Dugès. I refer it to the genus Pteroptus, of which five species have been described by Koch, and I regret that I am not in a position to say whether any of them is identical with ours. The upper lip consists of a double trifid plate placed above the base of the mandibles, the segments spine-like; and the palpi exactly resemble those of the Gamasides in general, being 5-jointed with the terminal one minute and setigerous, and the penultimate armed with a moveable spine.

24. Lælaps muris.

L. rotunde-ovalis fusca nitida setosa, dorso tuberculato, pedum priorum articulo 2do crassiore et setis duabus validioribus armato. Long. $\frac{1}{4}$ lin.

Desc. Mite of a yellowish-brown colour a little darker forwards, roundish-ovate, slightly narrower in front and bisinuated on the margin with two stout spines projecting from the central prominence, sinuated on the sides behind the front, bristly; the back convex, glossy, tubercled, bulged a little at the vertex and depressed behind, where it is semitransparent: *Rostrum* triangulate, produced into a stylette and furnished on each side with a mandibular shaft forcipate at the apex, the chelæ colourless neat moveable and curved, the outer claw largest and armed with two denticles on its inner edge: *Palpi* longer than the rostrum, filiform, colourless, sparingly spinous, the penultimate joint rather the longest, the terminal minute, and both of them bristled:

Legs 8, shorter than the body, 6-jointed, armed with short spines, tapering to the tarsus which is terminated with an obversely conoid elongated vesicle; the two anterior are removed at the origins from the two posterior pairs and stouter, 1st pair rather thicker than the 2d but equal in length, 3d pair shortest, 4th rather the longest and slenderer; the 2d and 3d joints of the first and second pairs are swollen, and the 2d joint of the first is armed with two stout and longer bristles projecting from the inner side: *Venter* brown, even and smooth, the anal pore posterior and submarginal in the centre of a small heartshaped elevated region: *Skin* very delicately striolate on the hinder parts at least: *Bristles* from a bulbous root, straight, setaceous, smooth; those on the posterior membranous margin of the body numerous and longest; those of the legs shorter than the diameter of the joint, excepting those on the hinder legs which are rather longer.

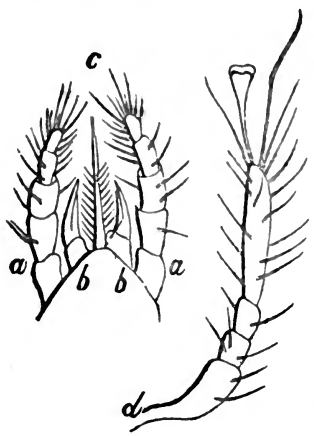
The specimens from which this description is derived were taken from a long-tailed field mouse, caught by Mr. Broderick in his house at Belford, in the winter of 1848. "I have caught," says Mr. Broderick, "in the same trap, set in the same place, several common house mice, but did not find any of the Acari upon them." The mite is small, and about the size of Uropoda vegetans. It runs quickly; and, when at rest, the palpi and posterior legs are held bent under the abdomen, while the mandibles are thrust far beyond the palpi. It belongs to the family Gamasides. In the structure of the oral organs there is a close resemblance to Eumæus, but there is a considerable difference in the character of the legs. These remind one of those of the true Acarus, and, in their form and origin, entirely correspond with the typical species of Lælaps of Koch, to which genus I have accordingly referred it.

The little tubercles on the back, in some lights, resemble punctures. They are, perhaps, connected with the bristles, and may be their bulbous roots.

25. Uropoda cassidea.

U. ovale-orbiculata brunnea nitida setis rectis aspersa, pedibus anticis setigeris, posticis brevioribus solumque spinosis.—Uropoda cassidea, *Gervais* in Walck. Insect. Apt. iii. 221.

Desc. Mite about half the size of the Gamasus coleoptratorum and of a uniform brown colour: *Body* rounded, convex dorsally, slightly narrower and obsoletely pointed in front, bristly; the *back* even and glossy, minutely punctulated; the *venter* plano-convex, margined, the insertions of the legs half-way between the margin and the mesial line on a sternal plate truncate behind, the insertions of the three hinder pairs approximated, that of the first pair a little more distant:



Palpi (Fig. *a*) longer than the rostrum, filiform or only slightly tapered, bristly, 6-jointed, the three lower joints larger and longer than the other three, and the terminal one minute rounded on the apex and armed with longer bristles: *Legs* 8, about half the length of the body, the first pair (Fig. *d*) longest and directed forwards, the fourth pair next in length but scarcely exceeding the intermediate pairs which are about equal, 6-jointed; the two basilar joints minute, the 3d much thickened and kneed with a constricted articulation, the 4th and 5th about half the size of the third, the 6th elongate, straight in the anterior legs and obliquely truncate at the extremity, which is armed with long straight bristles, one extended far beyond the others and beyond the pedunculated *vesicle*, which is lobed and furnished with two minute claws; the tarsal joint of the other legs tapered, armed with short spines (not with bristles), and the vesicle is less and only shortly pedunculated.

The oral apparatus consists of a pair of strong slightly-curved mandibles (Fig. *b b*) which have two claws and one or two setæ on their inner aspect; and between them there projects a long tapered sharp-pointed stylette (Fig. *c*) which is beautifully barbed with short setæ. These organs can be seen only when the mite is compressed under the microscope, for when at rest they and the palpi do not project beyond the front, but are kept bent underneath. This is often the case too with some of the hinder legs, which can be bent and con-

ceal ed under the venter;* but the fore legs are always extended and curve inwards on the mouth. The bristles of the body are rather long, smooth, straight and setaceous; the skin corneous.

I find this species abundantly in hot-beds, and in warm borders of gardens. It is moderately quick. In one specimen there was a long gummy thread attached to the anal pore, which is situated near the posterior margin of the venter. It is nearly allied to Uropoda vegetans.

26. Scirus vulgaris, *Hermann.*

Bd. coccinea setosa longè rostrata, palporum articulo extremo obconico 2do. multo breviore et setis duabus prælongis terminato. Long. $\frac{1}{3}$ lin.—Scirus vulgaris, *Herm.* Mem. Apter. 61, pl. 3, fig. 9, and pl. 9, fig. S.—Bdella rubra, *Latr.* Gen. Crust. et Insect. i. 154, and in *Cuv.* Reg. Anim. iv. 287, (in part). Lam. Anim. s. Vert. v. 55.—Bd. longicornis, *Gerv.* and *Walck.* Ins. Apt. iii. 156, (in part).—Bd. vulgaris, *Koch* Uebers. p. 74.

Desc. Mite minute, of a uniform scarlet colour. After death the body becomes dark blood red, the legs retaining their red colour: *Body* ovate-elliptical with a long porrect rostrum, roughish, sparingly hispid, distinctly divided into head, thorax and abdomen: *Head* rostrated, the rostrum elongate-triangular, as long as the diameter of the thorax, armed on both sides with several rather long curved bristles in opposite pairs, the apex divided bifidly and fringed with a series of sharp short setæ: *Thorax* equal in length and breadth with two long moveable bristles on its back towards the sides: *Abdomen* slightly notched at its junction with the thorax, rounded behind and sparingly bristly, marked with four foveolæ on each side of the back which is hence rather uneven and plano-convex: *Palpi* much slenderer than the legs, geniculate, arising from about the base of the rostrum, and exceeding it in length, 5-jointed, the basal joint minute, the 2d greatly elongated and claviform, the 3d small, 4th minute, the 5th pearshaped, obtuse, armed with two very long bristles on the apex, and with two much shorter and unequal bristles underneath; the other joints have only a few scattered very short setæ: *Legs* 8, homologous, about the length of

* "In quieta corpori infero appressi, complicati."—*Latreille.* It reminds one of Gyrinus natator.

the body, not very unequal but the two hinder pairs are rather the thickest and longest, the second pair shortest, bristled, tapering, six-jointed; 1st small, 2d longer than the 3d which is a little longer than the 4th, 5th longer than the second, the tarsal longer than it, conoidal, obtuse and furnished with two curved subpedicled claws with a pulvillus between them: *Bristles* of the legs scattered, not longer (with a few exceptions) than the diameter of the joints, those of the tarsal joint short and principally arranged along its inner edge: *Skin* beautifully striolate, the striæ being very obvious and regular on the joints of the palpi and legs.

The rostrum consists of a central triangular piece bifidly divided at the apex and armed as already described; and it is sheathed between two large elongated mandibles which are of a triangular form also, having a broad base and a rather suddenly narrower point. These mandibles are equal in length to the central piece and are terminated, on the apex, with two minute neat chelæ. This structure of the rostrum is very similar to that of Acarus longicornis.

This mite is scarcely half the size of the Acarus longicornis, but they are alike in colour and in their Apion-like shape. It varies a little in colour and in size; and I have seen specimens with pale legs when the body itself was darker than usual. These variations undoubtedly depend upon the individual's state of repletion. I have seen no eyes, and their existence is at least very doubtful.

Bdella vulgaris is common in many places of our district. It is found under stones and lichens on wall-tops and on dry gravelly banks, for moisture is noxious to it; and it may be found throughout the summer and even in winter. It creeps at a uniform moderately quick pace,—slower, however, considerably than Acarus longicornis; and readily runs backwards when stopt in its progress. In most specimens I can see, on the anal extremity, a minutely bituberculated wart, somewhat like the spinnerets of the spider; and I have been hence led to infer that this species may probably spin a web for the protection of its eggs.

27. Ixodes canisuga.

Ix. ovatus, scuto cordiformi punctato, abdomine albido lævi integro nec marginato, pedibus ferrugineis.

Desc. *Body* obovate, compressed, of a skimmed milk-white

colour, soft and smooth, the *back* marked with two short impressed lines anteriorly and with two elongated furrows behind separated by a faint mesial line, the bottom of the furrows crenulate or somewhat punctured; the *venter* with a deeply impressed line or furrow on each side beginning near the insertion of the hinder legs, curved a little in their course backwards and produced beyond the *anus*, which is a brown circular pore situated under a sort of ledge with a furrow continued from it to the posterior margin: there is a genital *pore* on the breast opposite the insertion of the third pair of legs; and on each side of the body, near the middle, a deep *fossa* with a brown stigma or spiracle in its bottom: *Skin* beautifully striated: *Scutum* small, somewhat heartshaped with the base forward and widely emarginate, chesnut-brown, punctured, obsoletely foveolate on each side: *Head* small quadrangular, darker than the scutum, with two circular fossæ on the vertex surrounded by a slightly raised rim: *Palpi* of the same colour as the head, longer than the rostrum, porrect, bristly, the basal joints minute, the terminal one large, flattened and dilated, of an oval shape with unequal sides: *Legs* 8, homologous, arising from the sides of the anterior third of the venter, equally distanced in their origins, of a chesnut brown colour with paler constricted joints, filiform, armed with short bristles principally on the inner aspect, the hinder pair longest but scarcely longer than the first, the third next, and the second shortest; 1st joint immoveable, thick and short, 2d smaller but of the same length, 3d, 4th, and 5th twice as long and nearly equal in length, the tarsal longer consisting of two subequal articulations, abruptly cut at the extremity in an oblique manner so as to form a sort of shoulder with a short shank to which the claws are articulated by a kind of pedicle: *Claws* 2, strong and powerful, curved, smooth, moving in the same direction, with a cushion or vesicle at their base.

This description is made from specimens which were three lines in length and one-half of that in breadth. They varied in their degree of turgescence, and in turgid individuals the furrows of the body were faintly marked. In small individuals, perhaps lessened by inanition, the body was much compressed and lineated with dusky fasciæ down the back and sides from the cœcal appendages or internal viscera; the shield was proportionably larger and distinctly emarginated; and the legs were nearly as long as the body.

My specimens were taken from the pointer and were sent

to me as the dog tick. The insect crawls with sufficient quickness, using all the legs but not in any regular alternation; and it holds on its way with a sort of dogged air. If overturned it readily recovers its right position.

I cannot identify this with any described species. It is, however, nearly allied to the Ixodes hexagonus of Leach.

Meteorological Tables,

Compiled from a Daily Register kept at Cheswick during the Year 1848. Latitude 55° 41′ north, longitude 2° 3′ west; altitude 95 feet above the level of the sea, from which it is distant one mile. By John S. Donaldson Selby, Esq.

Months in 1848.	Barometer.			Faht.'s Thermometer.			Pluviometer. By Luke Howard.		
	Lowest Inches.	Highest Inches.	Mean Inches.	Lowest Degrees.	Highest Degrees.	Mean Degrees.	Rain in inches.	Dry Days.	Rain or Snow Days.
January,....	29·55	30·55	29·98	8	46	27	1·21	22	9
February,...	28·25	30·23	29·28	20	50	35	3·84	15	14
March,.....	29·40	30·0	29·47	26	53	39	3·26	11	20
April,.....	28·50	30·10	29·70	27	64	45	1·52	18	12
May,.....	29·20	30·34	29·96	34	70	52	0·77	25	6
June, ...	29·30	30·15	29·72	40	70	55	5·98	12	18
July,.....	29·0	30·42	29·71	41	74	57	1·87	19	12
August,....	29·40	30·10	29·75	33	69	51	2·46	14	17
September,	29·90	30·30	30·10	30	63	46	0·72	21	9
October, ...	29·20	30·10	29·65	27	60	43	4·37	6	25
November,.	29·20	30·44	29·82	22	45	33	0·96	20	10
December,..	29·30	30·37	29·83	20	50	35	0·97	24	7
Mean or avge. for the year,			29·75		43°		27·93	207	159

OBSERVATIONS.

The barometer was highest on the 25th January, viz., - - 30·55 inches.
Ditto lowest on the 10th February, viz., - 28·25 "
The mean of these two observations gives - - - - 29·40 "
And the mean of the entire year, - - - - - 29·75 "
The Thermometer was highest on the 12th July, viz., - - - - - - - 74°, no wind, and cloudy sky.
And lowest on the 29th January, viz., - 8°, wind N.W., and clear sky.
The hottest days were 12th and 13th July, on which days the average of the thermometer for 48 hours, and at six observations day and night, reached 64°.

Coldest day was the 28th January, when the average height of the thermometer for 24 hours, at three observations day and night, reached 17°.

The greatest fall of rain was on the 18th June, when 1·65 inches fell in twelve hours.

The wettest month was June, when 5·98 inches of rain fell.

The dryest month was September, when only 0·72 inches of rain fell.

July 26.—The blight of the potatoes first noticed this year, at Cheswick, on this day. It made little progress until the wet weather set in. The crop was half destroyed.

On the 27th November, the Aurora Borealis appeared in great splendour for several hours, viz., from 8 until 11 P.M.

There were, in 1848, dry days, - - - 207
(Rain or snow) wet days, - - - - 159

And 27·93 inches of rain fell during the year.

In 1847 the mean temperature was 44°.

Rain, 24·20 inches.

Dry days, - - - 283 days.
Rain or snow, - - 82 days.

JOHN S. DONALDSON SELBY.

INDEX.

ERRATA.

Page 10, line 25 from top, for *Catocula*, read *Catocala*.

Page 15, line 18 from top, for *genuine*, read *generic*.

Page 18, the "Ewe-gowan" in Berwickshire and elsewhere is *Trifolium repens*. J. H.

Page 20, line 7 from bottom, for *Cecindela*, read *Cicindela*.

Page 26, line 21 from top, for *Trichodermus* read *Trichoderma*.

Page 44, line 15 from bottom, for *Carruca*, read *Curruca*.

Page 59, line 5 from top, for *vitcorious*, read *victorious*.

Page 63, line 19 from bottom, for *shock*, read *choke*.

Page 66, line 4 from top, for *two* read *too*.

Page 88, line 9 from bottom, for *Pettycur*, read *Pen-y-cur Wick*.

Page 111, line 10 from top, for *Colymees*, read *Colymbetes;* line 1 from bottom, for *Ctenicorus*, read *Ctenicerus tessellatus*.

Page 112, line 11 from top, for *nigrcians*, read *nigricans;* line 26 from top, for *Otiorynchus*, read *Otiorhynchus*.

Page 113, line 8 from top, for *Dosythus*, read *Dosytheus;* line 20 from top, for *tess alata*, read *tessellata*.

Page 114, line 4 from top, for *lateralis*, read *lutaria*.

Page 122, line 10 from top, for *Jacobæ*, read *Jacobæa*.

Page 141, line 25 from top, for *Ceutorynchus*, read *Ceutorhynchus*.

Page 167, line 18 from top, for *Lanias*, read *Lanius*.

Page 170, line 4 from top, for *Holypt-techius*, read *Holoptychius*.

Page 196, line 4 from top, remove "two" from before "striæ," and place it before "impressions."

Page 279, line 3 from bottom, for *moria*, read *morio*.

Page 282, line 18 from bottom, for *mareida*, read *marcida*.

Page 317, line 15 from bottom, for *properly*, read *popularly*.

Page 318, line 7 from bottom, *dele* the apostrophe.

Page 354, line 11 from bottom, for *reneformis*, read *reniformis*.

Page 356, line 10 from top, for *Astragallus*, read *Astragalus;* line 20, for *chlorantha*, read *chloranthe;* line 33, for *vitis-idæus*, read *vitis-idæa*.